

Faribault County, Minnesota

County Ditch #14

Repair Report

March 2024

FARIBAULT COUNTY
Drainage Dept

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www.co.faribault.mn.us/drainage



CD14 Open Ditch Repair Report

BACKGROUND

County Ditch #14 (CD14) is a combination open ditch and tile system established in 1913 that drains 8,500 acres in Prescott, Blue Earth City, Barber, and Emerald Townships. The outlet for the system is the East Branch of the Blue Earth River (Figure 1). Three improvement proceedings occurred in 1947-1957 that replaced portions of the Branch A and Branch B tiles, expanding the open ditch to its current extent. There are several locations where the Branch A and B tiles were outlet to the expanded open ditch where the ditch severed the tile (Figure 1).

The CD14 open ditch splits into a Main and Branch A that diverge just north of Interstate 90. The most recent significant repair to the CD14 open ditch occurred in 1983. The repair report mentioned sediment accumulation in the Branch A and Main open ditch, primarily north of Interstate 90. Repairs also included tile outlet repairs, tree removal, and armoring existing road and ditch crossings.



Figure 1. The outlet of CD14 to the East Branch Blue Earth River (left) and a branch of CD14 outlet into the expanded open ditch (right).

DATA COLLECTION

In the summer 2023, the Drainage Department surveyed the CD14 open ditch bottom, open ditch crossing flowline elevations, and the location and condition of tile outlets and side inlets. The profiles generated for the 1983 open ditch repair informed the establishment of the legal grade. Some minor adjustments were made based on the existing flowline elevations of key ditch and road crossings. The sediment accumulated observed from the 2023 survey are very similar to that observed in the 1983 repair report. The top end of both the Main and Branch A/B open ditch channels are impacted by sediment accumulation (Figure 2). Numerous tile outlets and side inlets were also found to be out of repair and impacting the open ditch banks. Some sloughing was also observed.



Figure 2. The channel condition of the top end of Branch A/B (left) and the Main (right) open ditch. Sediment has accumulated in the channel in the upper reaches of both branches, impacting drainage.

PROPOSED REPAIR DETAILS

Open Ditch Cleaning: Remove sediment from the channel according to the open ditch profiles and level spoils. Seeding of buffer strips to be completed by a separate contractor, however buffer strips must fit for seeding.

1. Main Open Ditch Station 152+00 to 279+00
2. Branch A Station 13+00 to 94+00

Slough Repair: Pull back slough material, riprap toe, re-shape and seed ditch bank w/ erosion control blanket.

1. Main Open Ditch Station 104+00 (E) 90 LF

Armor Existing Tile Outlets: Tile outlets that don't need to be repaired but require outlet protection shall have riprap placed under them to protect the ditch bank. See Tile Outlet Repair Detail.

1. Estimate 25 tile outlets to armor

Tile Outlet Repair: Repair existing tile outlet with 20' of dual wall, non-perforated tile. See Tile Outlet Detail.

ID	Branch	Station	Ditch Side	Existing Condition
1	Main	20+00	W	12" CMP
2	Main	51+60	N	Unknown size
3	Main	78+80	W	8" CMP
4	Main	79+20	W	12" CMP
5	Main	83+00	N	Br 160 8" CMP
6	Main	93+20	N	Br 150 10" CMP
7	Main	112+70	S	12" CMP
8	Main	117+00	W	Branch U 18" CMP
9	Main	117+60	E	18" CMP
10	Main	119+50	W	6" CMP
11	Main	132+60	N	8" CMP
12	Main	151+50	N	10" CMP
13	Main	178+00	N	Br K 10" CMP
14	Main	187+00	N	6" CMP
15	Main	197+50	N	24" CMP
16	Main	232+10	W	6" CMP
17	Main	246+80	E	12" CMP
18	Main	254+60	E	12" CMP
19	Main	266+60	E	6" CMP
20	Main	277+80	W	8" CMP
21	Main	279+00	E	8" CMP
22	A/B	13+80	E	6" CMP
23	A/B	16+00	W	Branch A48 6" CMP
24	A/B	32+90	S	8" CMP
25	A/B	34+50	W	10" CMP
26	A/B	41+90	W	8" CMP
27	A/B	42+00	W	6" CMP
28	A/B	44+40	E	Br M Aux 24" CMP
29	A/B	67+60	W	6" CMP
30	A/B	83+80	W	15" CMP
31	A/B	85+30	E	Br B22 10" CMP

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

ASI_ID	Branch	Station	Ditch Side	Intake Type	Riser Size	Riser Depth (ft)	Outlet Length (ft)	Outlet Grade
ASI_1	Main	4+40	W	Trash Grate	8"	3	22	3.0%
ASI_2	Main	11+00	W	Trash Grate	12"	3	20	1.0%
ASI_3	Main	16+00	W	Hickenbottom	8"	3	22	1.0%
ASI_4	Main	19+80	W	Trash Grate	8"	7	22	1.0%
ASI_5	Main	26+80	E	Trash Grate	10"	9	22	2.0%
ASI_6	Main	38+50	S	Hickenbottom	10"	8	30	1.0%
ASI_7	Main	58+10	S	Hickenbottom	8"	9	34	1.0%
ASI_8	Main	58+70	N	Hickenbottom	10"	7	32	1.0%
ASI_9	Main	81+30	S	Trash Grate	18"	6	34	1.0%
ASI_10	Main	81+50	N	Trash Grate	10"	6	30	1.7%
ASI_11	Main	97+00	W	Trash Grate	12"	7	28	1.8%
ASI_12	Main	97+10	E	Trash Grate	12"	5	28	1.9%
ASI_13	Main	106+40	W	Trash Grate	12"	6	30	1.0%
ASI_14	Main	110+90	S	Hickenbottom	10"	4	26	1.0%
ASI_15	Main	110+90	N	Trash Grate	12"	5	28	1.3%
ASI_16	Main	116+70	W	Trash Grate	24"	7	24	1.0%
ASI_17	Main	117+00	E	Trash Grate	15"	4	26	1.2%
ASI_18	Main	126+60	N	Trash Grate	18"	7	30	1.3%
ASI_19	Main	133+20	W	Trash Grate	24"	9	24	1.0%
ASI_20	Main	134+40	E	Hickenbottom	12"	9	30	3.0%
ASI_21	Main	149+40	N	Trash Grate	18"	12	34	1.0%
ASI_22	Main	166+90	N	Trash Grate	10"	5	34	3.0%
ASI_23	Main	179+50	N	Trash Grate	24"	5	34	1.0%
ASI_24	Main	197+20	N	Trash Grate	18"	5	26	1.0%
ASI_25	Main	202+00	W	Hickenbottom	8"	3	26	1.0%
ASI_26	Main	202+00	E	Hickenbottom	10"	4	26	1.0%
ASI_27	Main	208+80	W	Trash Grate	18"	2	24	1.3%
ASI_28	Main	210+00	E	Trash Grate	15"	3	22	1.0%
ASI_29	Main	227+20	E	Trash Grate	18"	3	24	1.0%
ASI_30	Main	260+20	W	Trash Grate	15"	9	22	1.2%
ASI_31	Main	268+00	W	Hickenbottom	12"	4	20	1.0%
ASI_32	A/B	18+80	W	Trash Grate	15"	12	40	1.4%
ASI_33	A/B	27+00	N	Trash Grate	15"	10	40	1.4%
ASI_34	A/B	33+10	S	Trash Grate	10"	9	36	3.0%
ASI_35	A/B	36+50	E	Hickenbottom	8"	6	34	2.0%
ASI_36	A/B	44+20	E	Trash Grate	24"	5	28	1.0%
ASI_37	A/B	46+40	W	Trash Grate	24"	5	26	1.0%
ASI_38	A/B	51+70	N	Trash Grate	15"	8	26	1.2%
ASI_39	A/B	61+80	W	Trash Grate	12"	5	32	1.0%
ASI_40	A/B	67+20	W	Trash Grate	12"	8	32	1.4%
ASI_41	A/B	70+10	W	Trash Grate	15"	8	32	1.4%
ASI_42	A/B	81+50	W	Hickenbottom	12"	6	28	1.0%
ASI_43	A/B	86+50	W	Trash Grate	15"	6	28	1.8%
ASI_44	A/B	87+00	E	Trash Grate	18"	6	28	1.5%
ASIRO_1	Main	10+50	E	Trash Grate	15"	2	20	1.2%
ASIRO_2	Main	270+60	E	Trash Grate	24"	3	22	1.0%
ASIRO_3	A/B	62+70	E	Trash Grate	24"	5	24	1.2%

ESTIMATED COST

The Drainage Department has partnered with the Soil & Water Conservation District to apply for funding through the Board of Water and Soil Resources to help offset the cost of the alternative side inlets (ASI). The potential funding for these structures is not included in the cost estimate below.

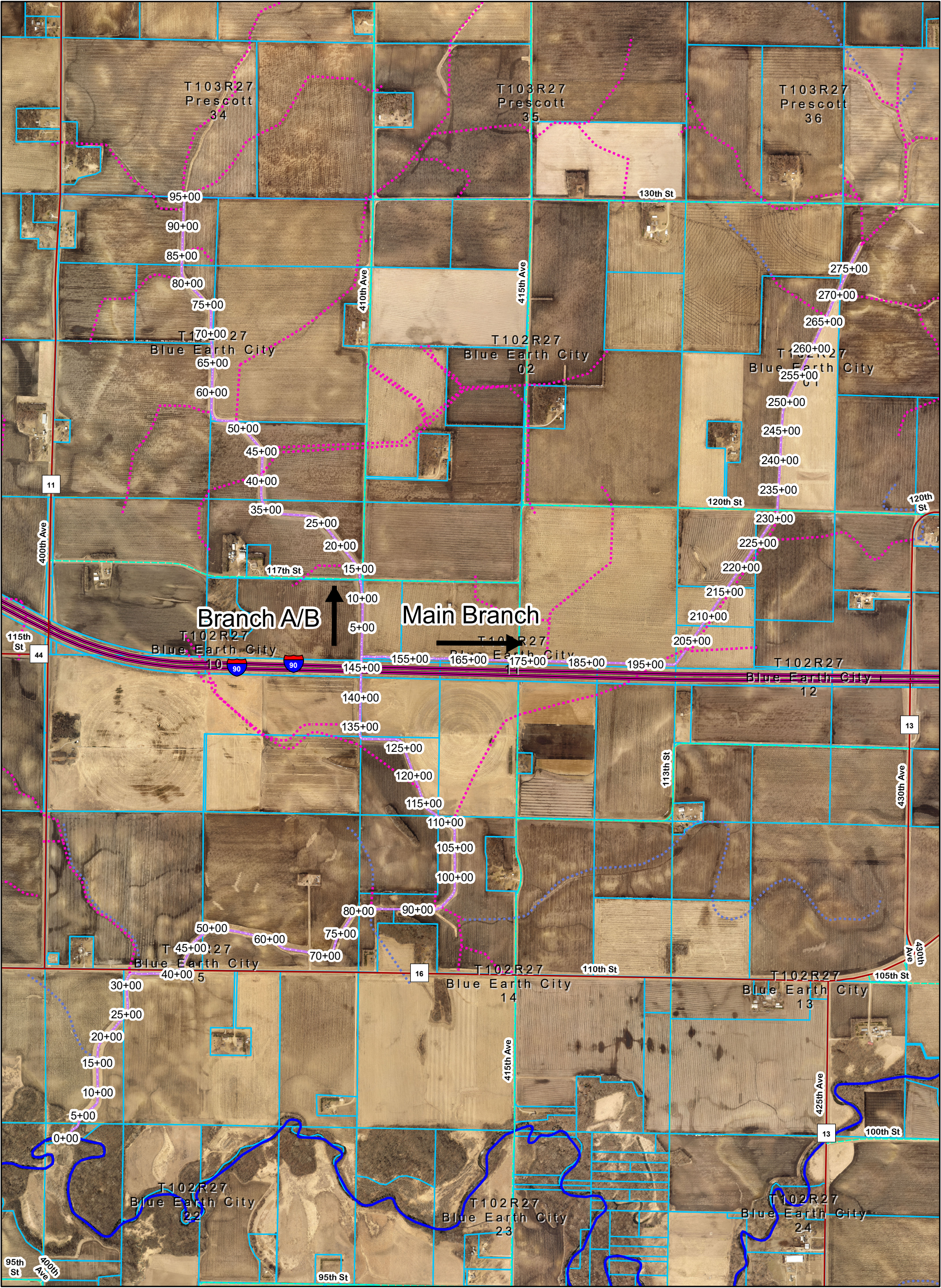
Item	Unit	Quant	County Est Unit Price	County Est Amount
Mobilization	LS	1	\$ 2,000.00	\$ 2,000.00
Open Ditch Cleaning, 4-5' bottom, level spoils	LF	20800	\$ 2.50	\$ 52,000.00
Tile Outlet Repair (6-12")	EA	26	\$ 850.00	\$ 22,100.00
Tile Outlet Repair (15-24")	EA	5	\$ 1,100.00	\$ 5,500.00
Armor Existing Tile Outlet	EA	25	\$ 300.00	\$ 7,500.00
Slough Repair	LF	90	\$ 7.00	\$ 630.00
8" ASI with Trash Gate	EA	2	\$ 1,100.00	\$ 2,200.00
8" ASI with Hickenbottom	EA	4	\$ 1,300.00	\$ 5,200.00
10" ASI with Trash Gate	EA	4	\$ 1,200.00	\$ 4,800.00
10" ASI with Hickenbottom	EA	4	\$ 1,400.00	\$ 5,600.00
12" ASI with Trash Gate	EA	7	\$ 1,400.00	\$ 9,800.00
12" ASI with Hickenbottom	EA	3	\$ 1,600.00	\$ 4,800.00
15" ASI with Trash Gate	EA	9	\$ 1,600.00	\$ 14,400.00
18" ASI with Trash Gate	EA	7	\$ 1,800.00	\$ 12,600.00
24" ASI with Trash Gate	EA	7	\$ 2,250.00	\$ 15,750.00
Riprap for ASI Riprap Overflow	TON	90	\$ 40.00	\$ 3,600.00
Buffer Strip Seeding	AC	8	\$ 600.00	\$ 4,680.00
				\$ 173,160.00

TIMELINE

The project may be bid and completed in the Summer and Fall of 2024, with an anticipated completion date of November 30, 2024.

APPENDICES

Appendix A:	CD14 Overview Map
Appendix B:	CD14 Main Branch Map
Appendix C:	CD14 Branch A/B Map
Appendix D:	Open Ditch Profile
Appendix E:	Open Ditch Cleaning Detail
Appendix F:	Tile Outlet Repair Detail
Appendix G:	Alternative Side Inlet Detail



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Drainage Department**

CD14 Overview Map

Appendix A

Legend

- CD14 Open Ditch
- CD14 Tile
- Public Watercourse
- Private Tile

1 inch = 1,500 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.



Legend

- CD14 Open Ditch
- CD14 Tile
- Public Watercourse
- Private Tile
- Alternative Side Inlet
- Tile Outlet Repair

1 inch = 750 feet



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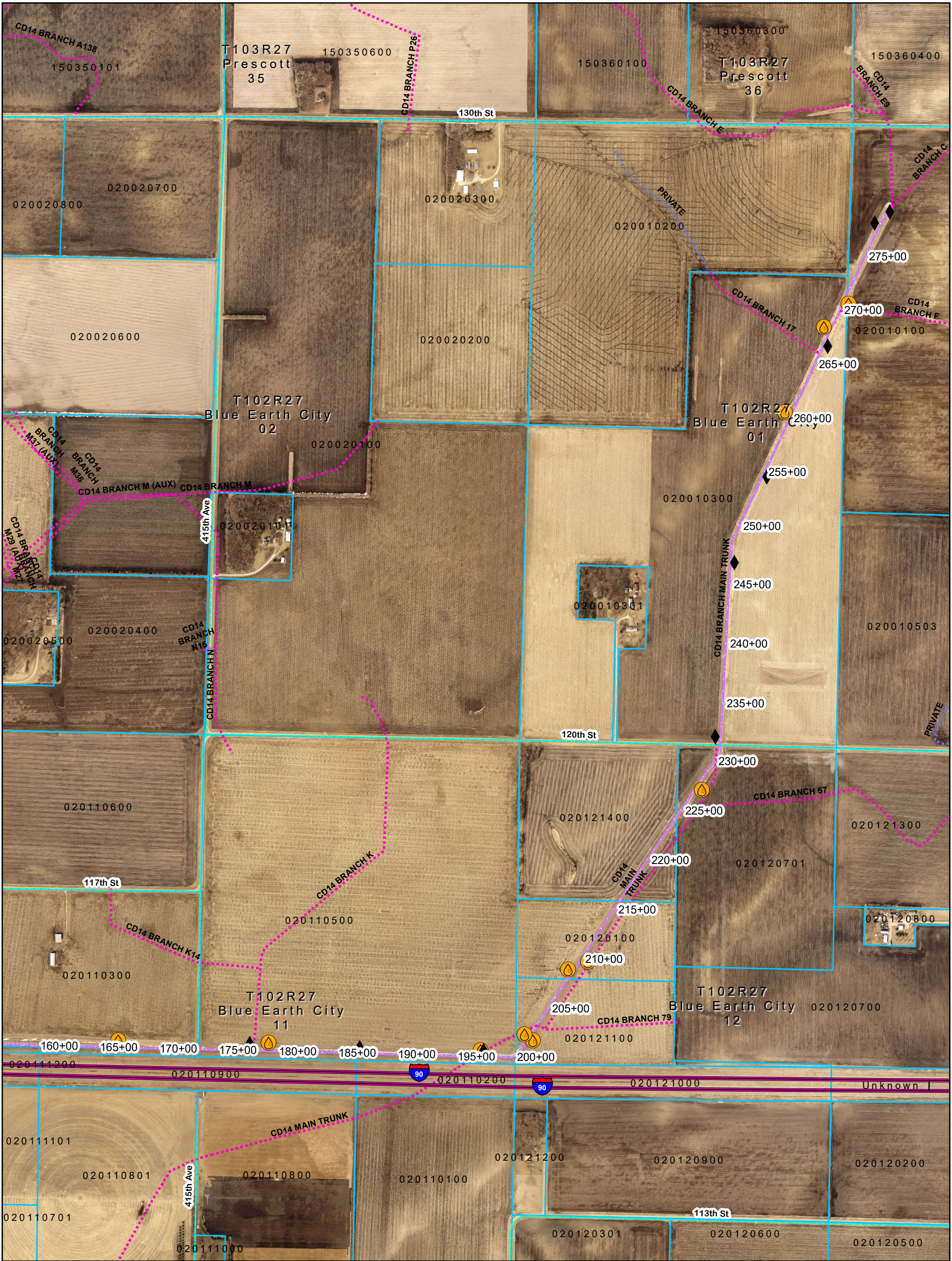


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Faribault County
Drainage Department

CD14 Main Branch

Appendix B



Legend

- CD14 Open Ditch
- CD14 Tile
- Public Watercourse
- Private Tile
- Alternative Side Inlet
- Tile Outlet Repair

1 inch = 750 feet



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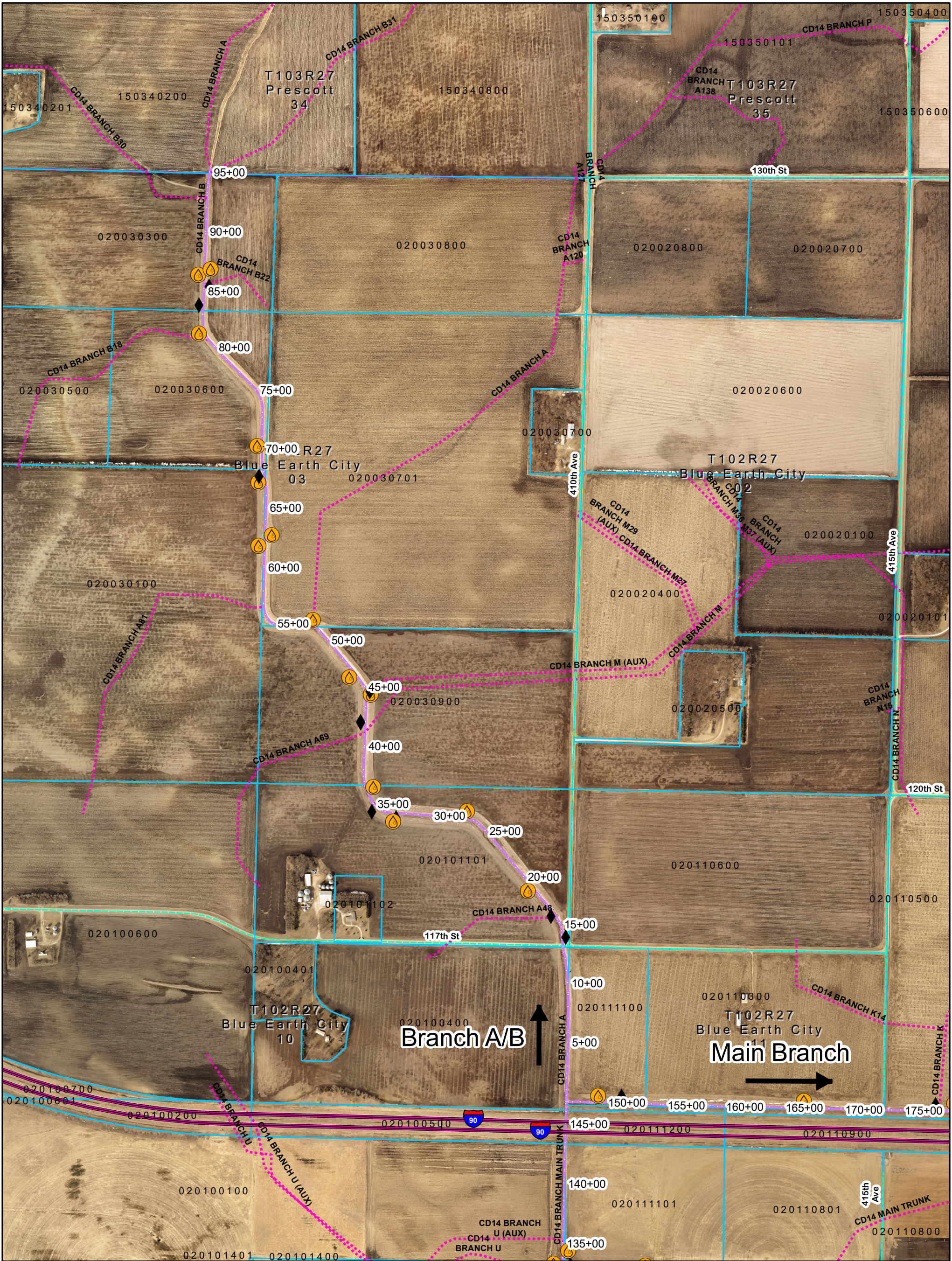


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CD14 Main Branch

Appendix B



Legend

- CD14 Open Ditch
- CD14 Tile
- Public Watercourse
- Private Tile
- Alternative Side Inlet
- Tile Outlet Repair

1 inch = 750 feet



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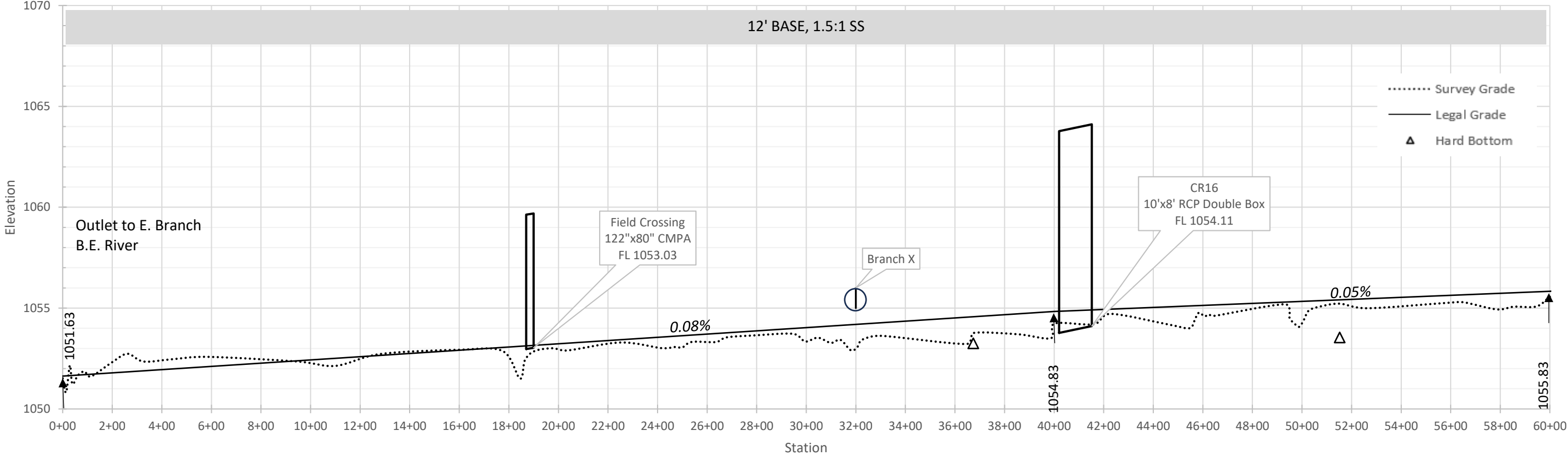
Faribault County
Drainage Department

CD14 Branch A/B

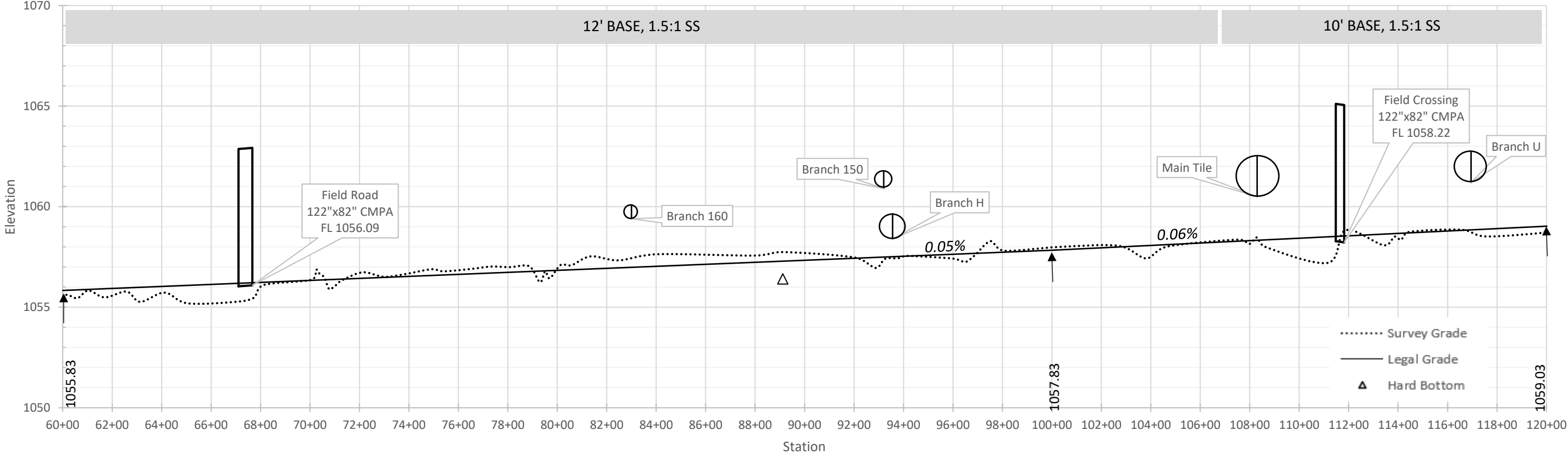
Appendix C

Appendix D

CD14 Main Open Ditch Profile

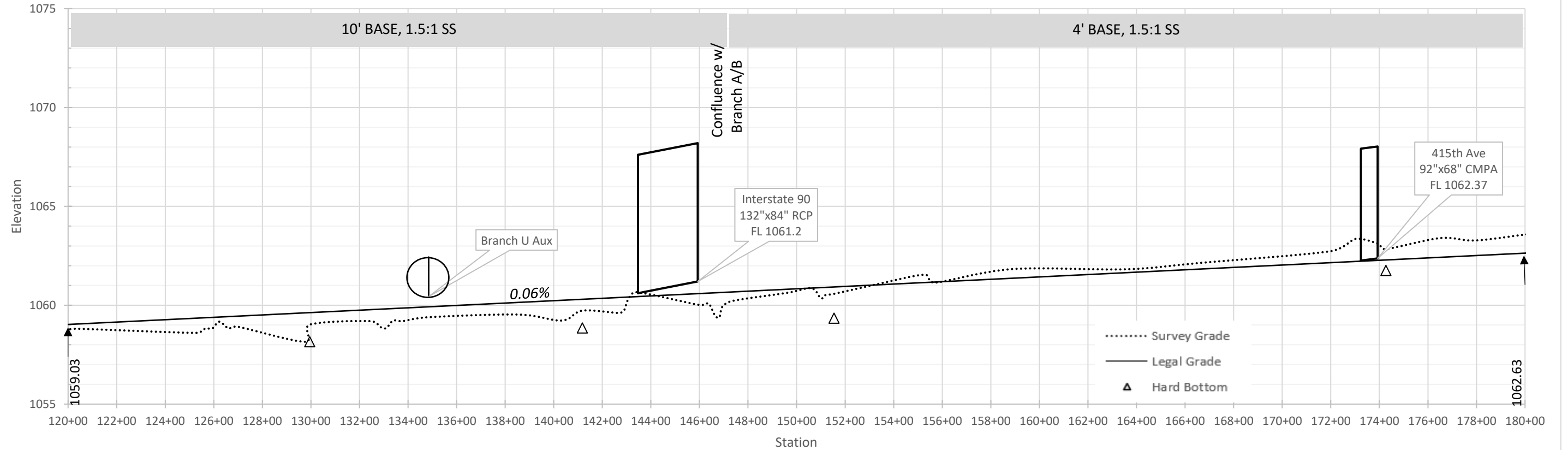


CD14 Main Open Ditch Profile

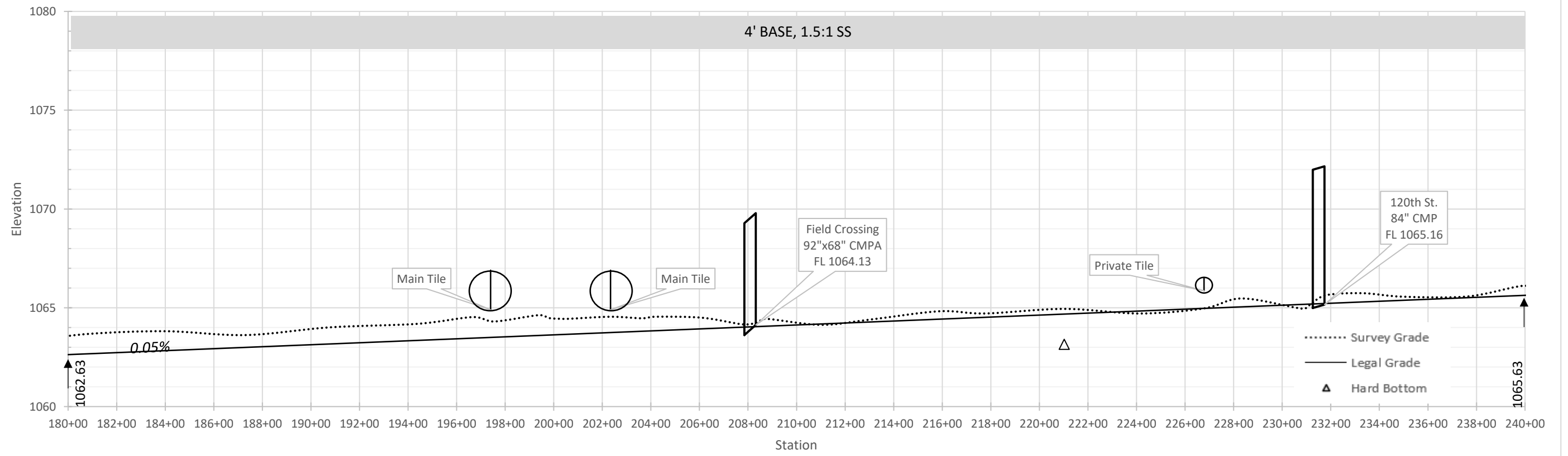


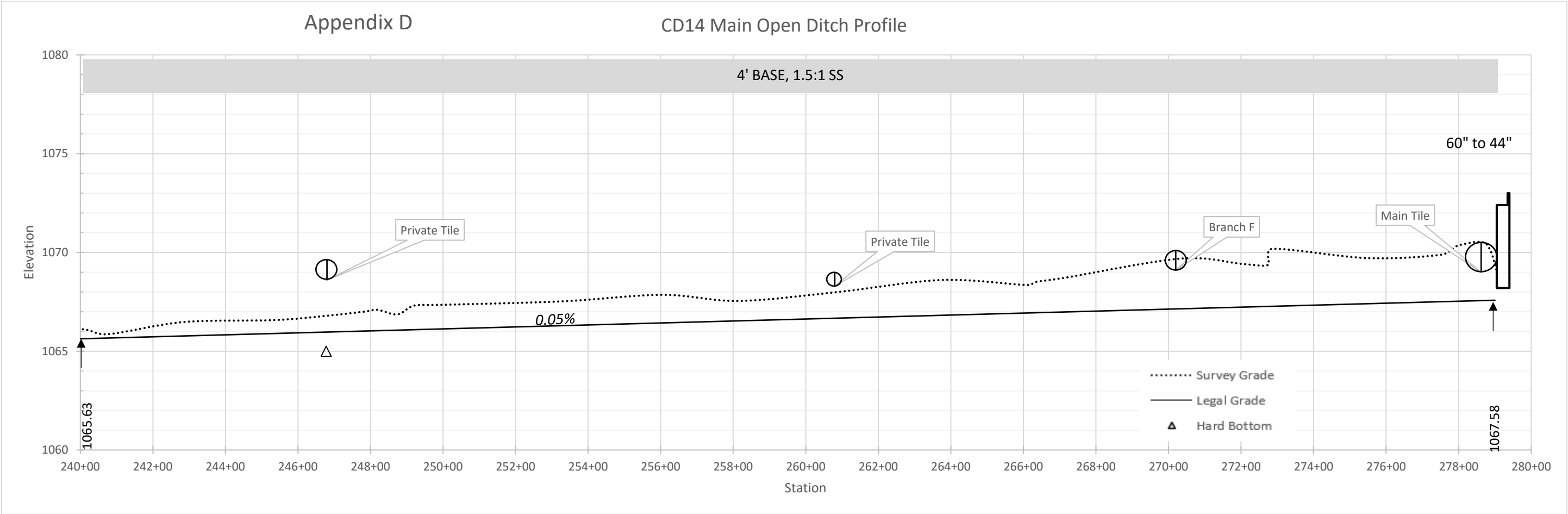
Appendix D

CD14 Main Open Ditch Profile



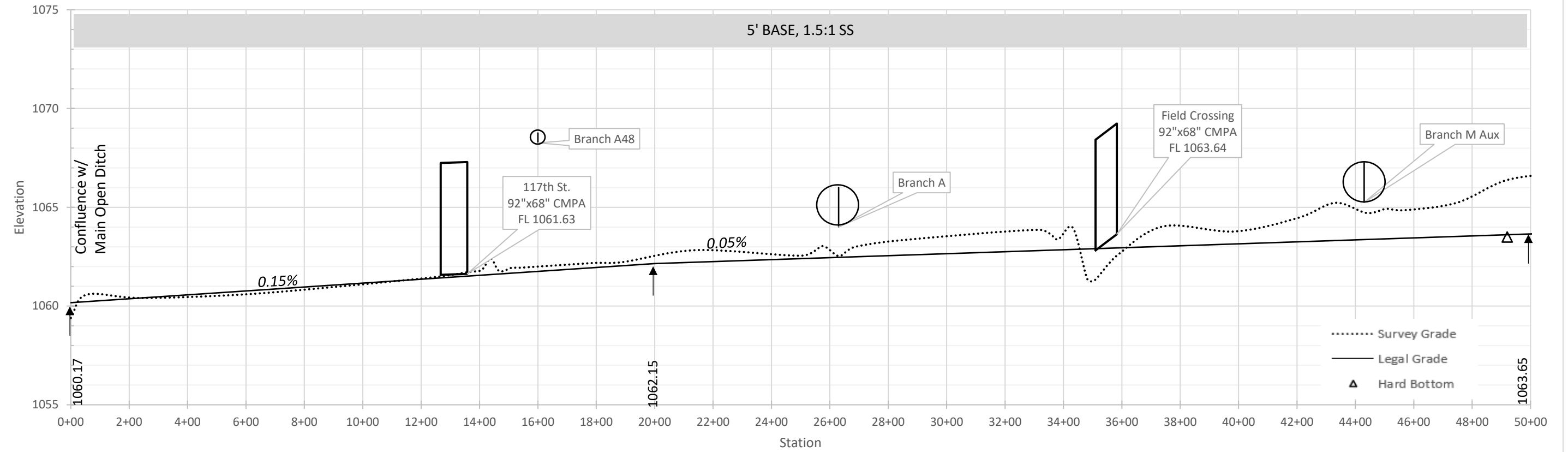
CD14 Main Open Ditch Profile



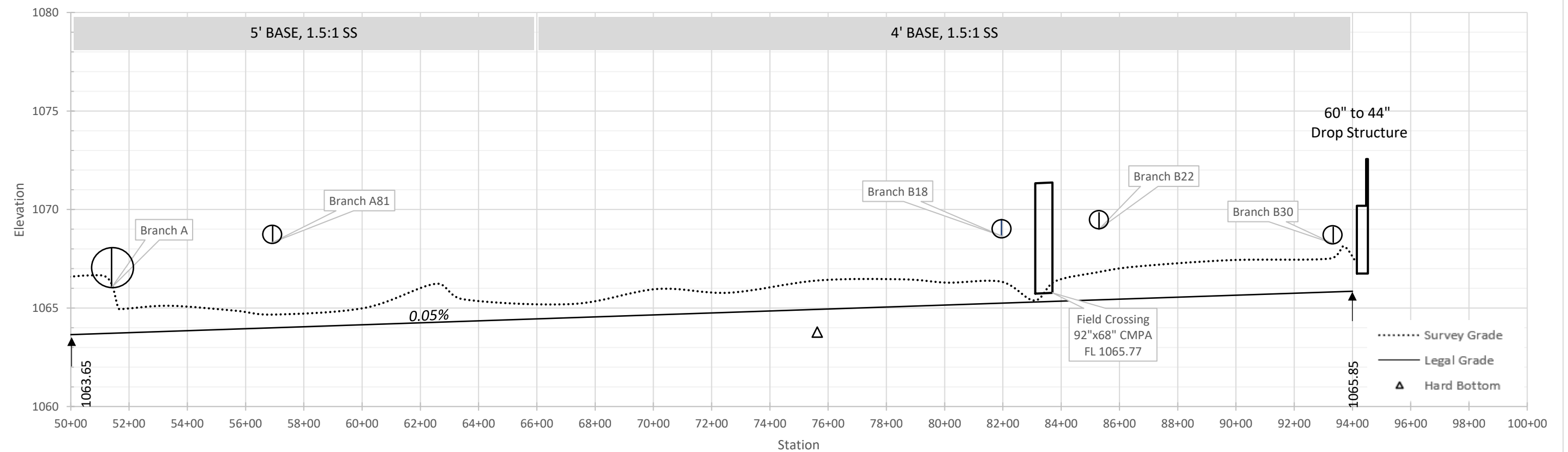


Appendix D

CD14 Branch A/B Open Ditch Profile

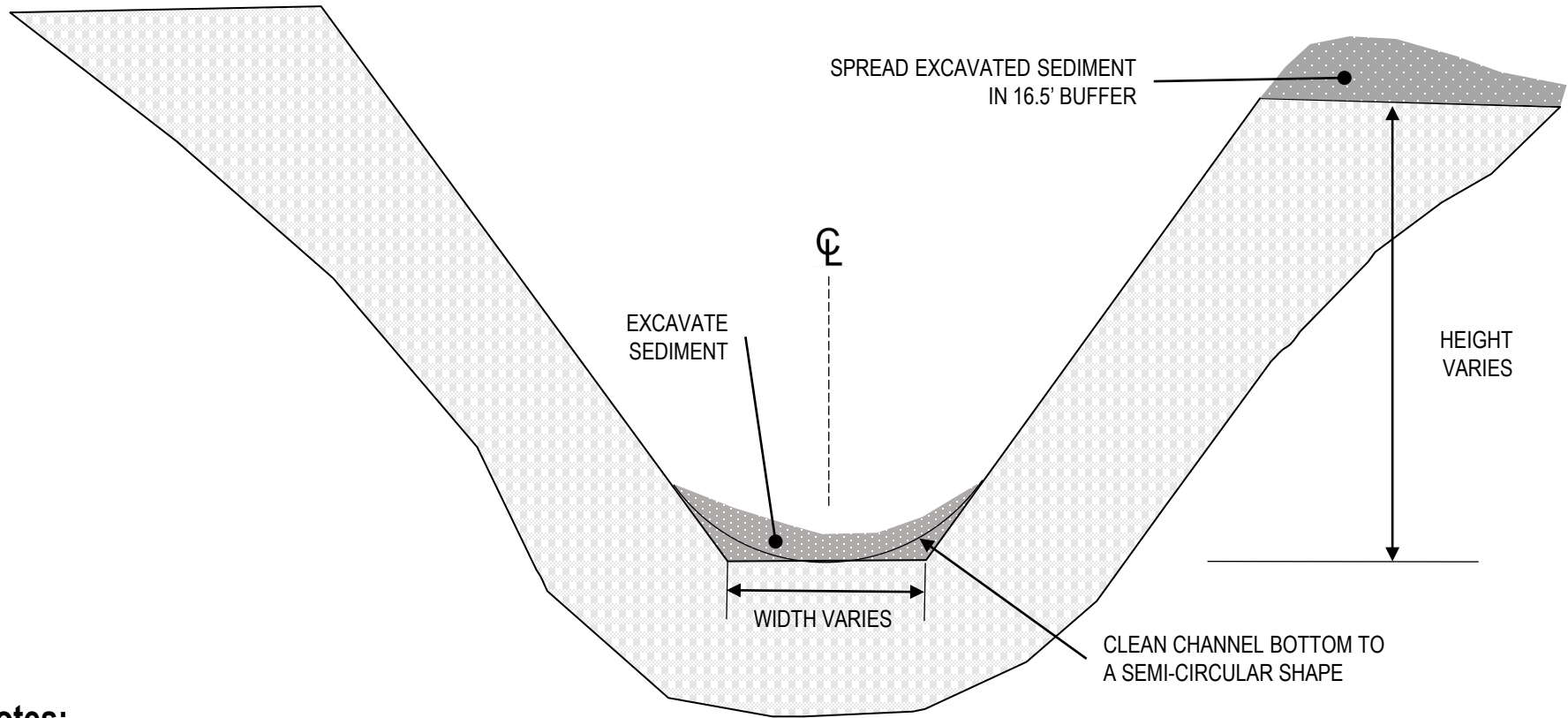


CD14 Branch A/B Open Ditch Profile



OPEN DITCH CLEANING

NOT TO SCALE

**Notes:**

Open ditch cleaning shall be bid per linear foot and includes the spreading and leveling of spoils.

Excavated sediment shall be graded to divert water to existing side intake structures.

For ditch bottom widths $\leq 4'$, clean the channel bottom in a semi-circular fashion to limit disturbance of the bank toe and side slopes as much as possible.

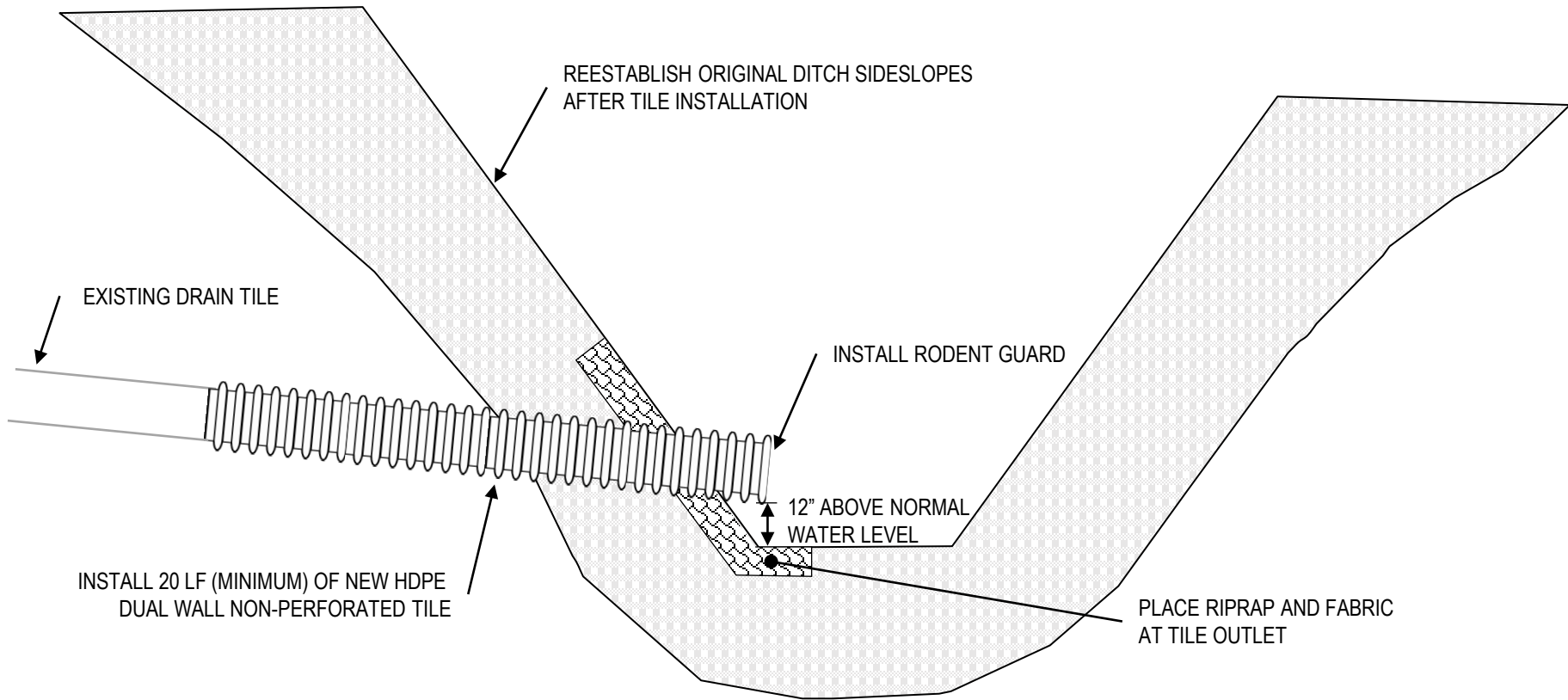
Depending on excavated material, the topsoil of the buffer strip shall be stripped before placing the excavated material in the designated area. The topsoil will be re-graded over the spoil placement.

At the direction of the Drainage Department, spoils may be spread in the adjacent field to prevent damage to the buffer strip.

Avoid over-excavation of the channel bottom. Adhere to the grade and depths of excavation provided in ditch profiles.

TYPICAL TILE OUTLET REPAIR

NOT TO SCALE



Notes:

Tile joint between field tile and outlet pipe shall be wrapped in Type I fabric and concrete or connected with appropriate fittings (incidental).

The riprap shall not impede flow from the pipe and shall extend above and along the sides of pipe. Riprap and fabric are incidental.

Rodent guards shall be installed on all tile outlet repairs 24" and smaller (incidental).

All disturbed areas within the buffer easement area and ditch banks shall be seeded with buffer blend seed mix on category III erosion control blanket (incidental).



Appendix G

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PROJECT

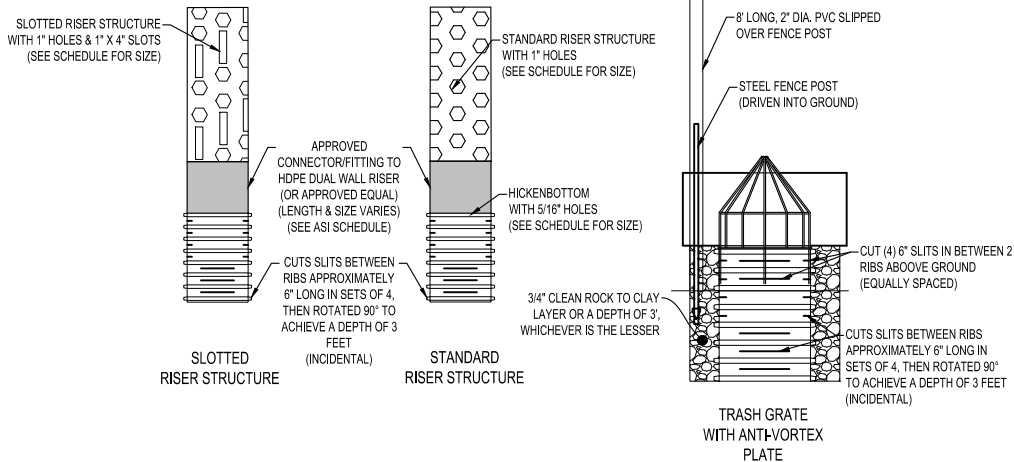
FARIBAULT COUNTY DITCH No.14

FARIBAULT COUNTY MINNESOTA

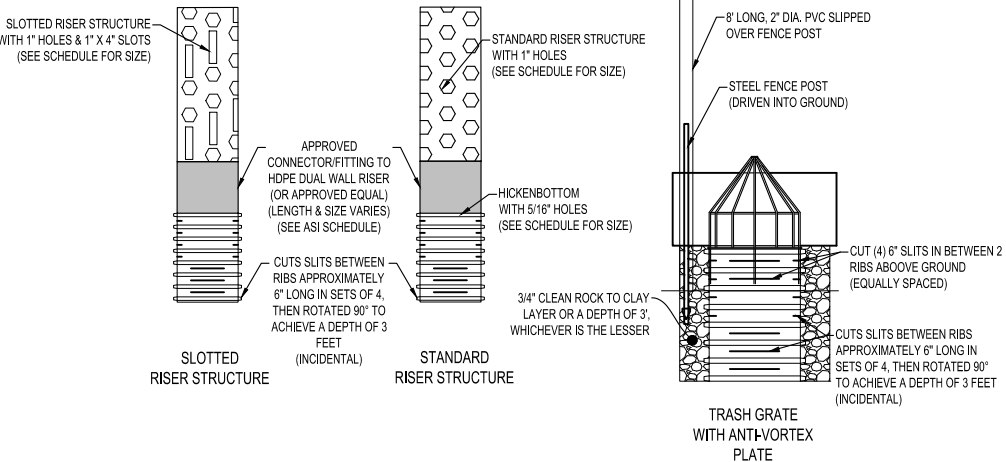
REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	
FILE NAME	22834 DETAILS
DRAWN BY	-
DESIGNED BY	-
REVIEWED BY	-
ORIGINAL ISSUE DATE	--/--
CLIENT PROJECT NO.	-

ALTERNATIVE SIDE INLET DETAILS



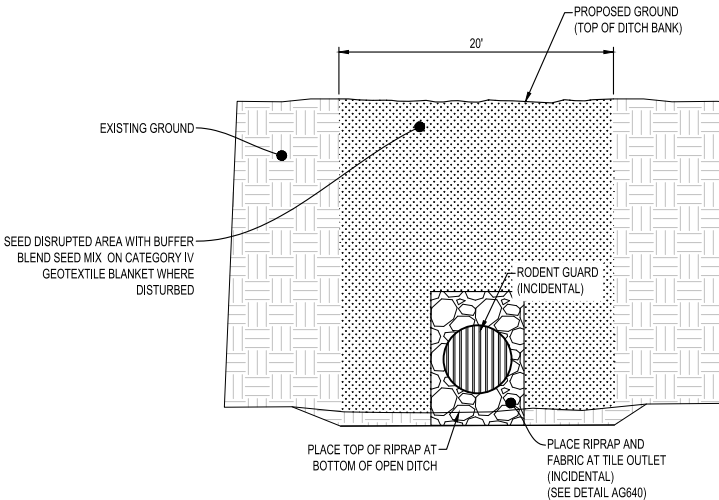
DETAIL A



DETAIL A

NOTES:

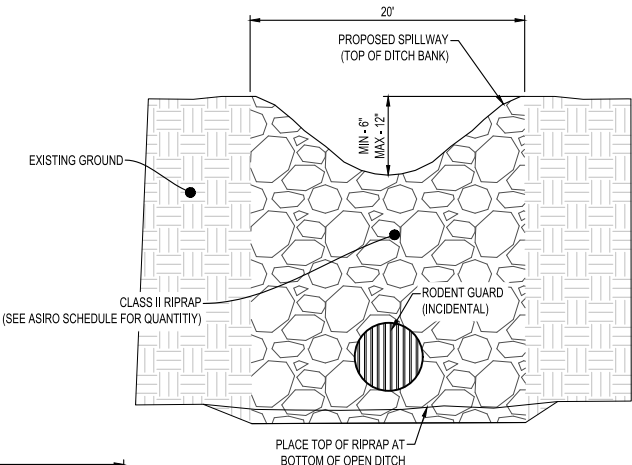
- INTAKE TYPE & TILE SIZE VARIES PER ASI. (SEE SCHEDULE)
- RISER ASSEMBLY SHALL BE BID SEPARATE THAN OUTLET ASSEMBLY.
- ALL DISRUPTED AREAS WITHIN BUFFER EASEMENT SHALL BE SEEDED WITH BUFFER BLEND SEED MIX ON CATEGORY III EROSION CONTROL BLANKET.
- ALL DISBURBED AREAS SHALL RECEIVE A MINIMUM OF 4" OF TOPSOIL.
- ALL INTAKES SHALL BE WRAPPED WITH NON-WOVEN GEOTEXTILE FABRIC. (INCIDENTAL TO RISER ASSEMBLY)
- ALL SLITS CUT INTO RISER ARE INCIDENTAL TO RISER ASSEMBLY.
- ALL 3/4" CLEAN ROCK IS INCIDENTAL TO RISER ASSEMBLY.
- ALL OUTLET RIPRAP IS INCIDENTAL TO OUTLET ASSEMBLY
- INTAKES SHALL BE FIELD ADJUSTED BASED ON ACTUAL LOCATION OF LOW AREAS, AS DETERMINED BY THE ENGINEER.



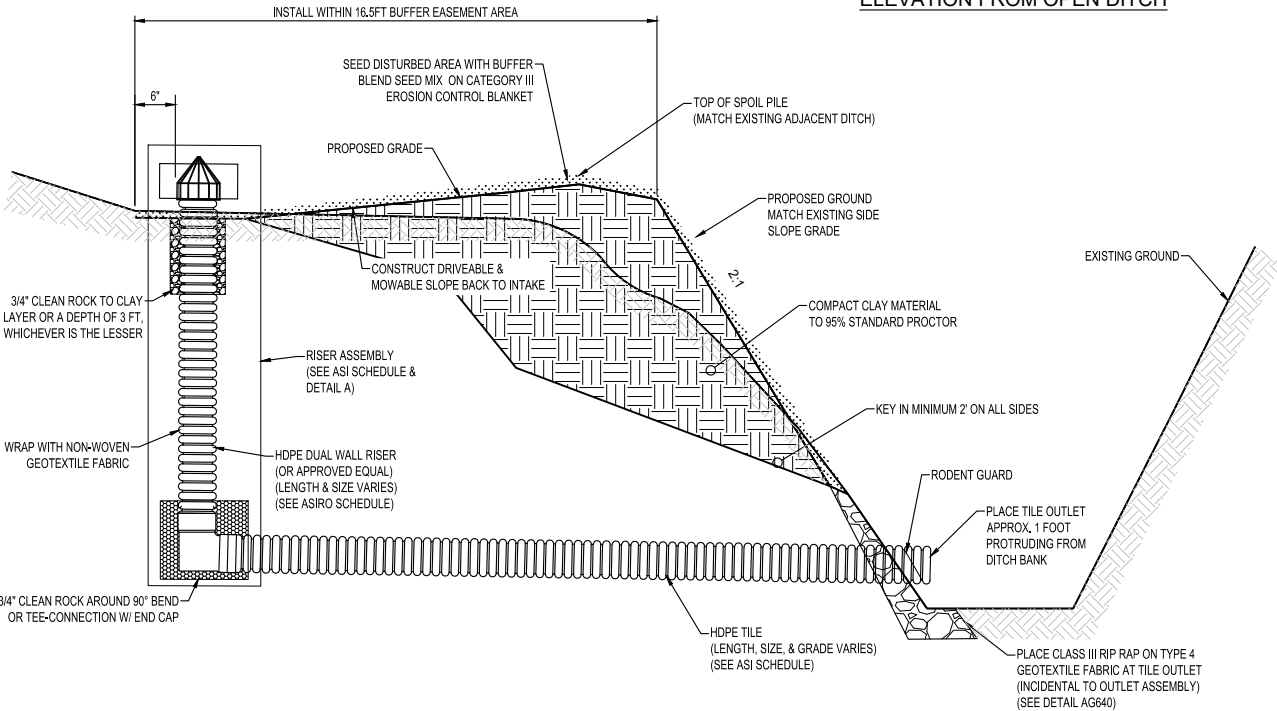
ELEVATION FROM OPEN DITCH

NOTES:

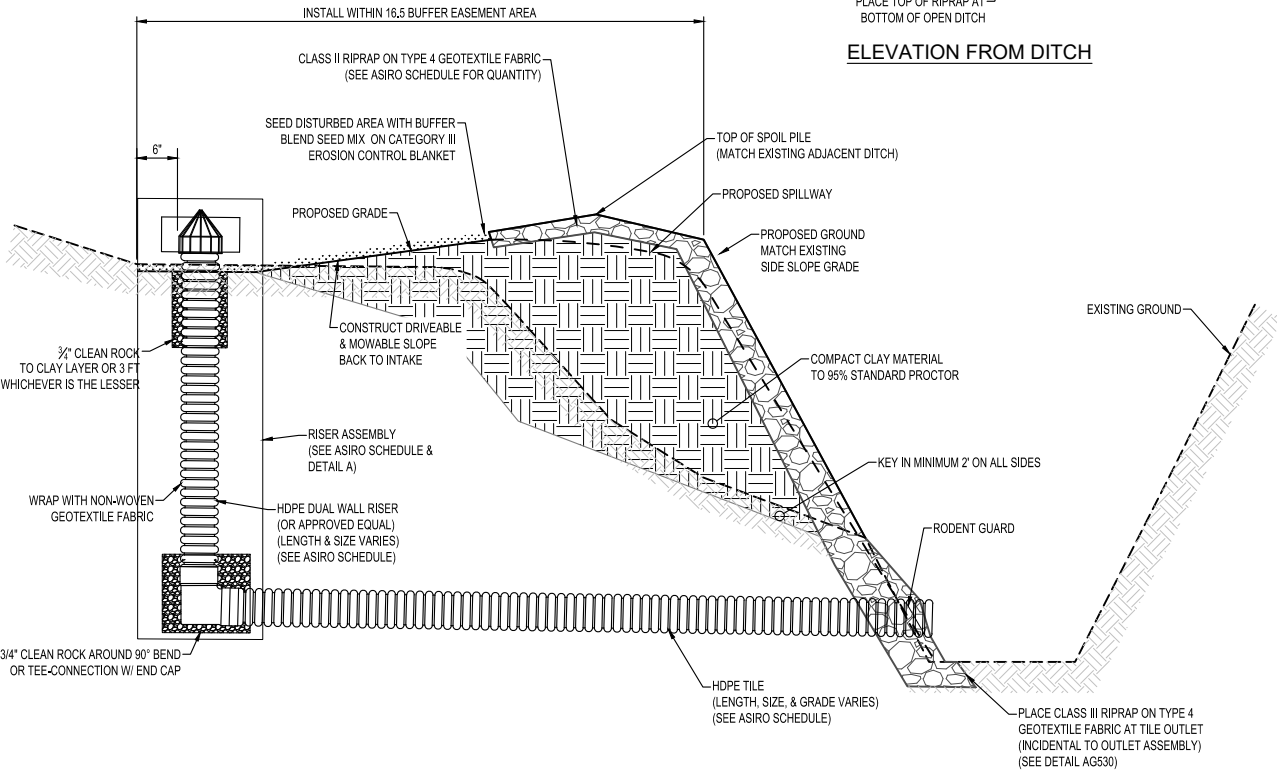
- INTAKE TYPE & TILE SIZE VARIES PER ASIRO. (SEE SCHEDULE)
- RISER ASSEMBLY SHALL BE BID SEPARATE THAN OUTLET ASSEMBLY & RIPRAP.
- RIPRAP SHALL BE BID SEPARATE THAN OUTLET & RISER ASSEMBLIES.
- ALL DISRUPTED AREAS WITHIN BUFFER EASEMENT SHALL BE SEEDED WITH BUFFER BLEND SEED MIX ON CATEGORY III EROSION CONTROL BLANKET.
- ALL DISTURBED AREAS WITHOUT RIPRAP SHALL RECEIVE A MINIMUM OF 4" OF TOPSOIL.
- ALL INTAKES SHALL BE WRAPPED WITH MnDOT TYPE 1 GEOTEXTILE FABRIC. (INCIDENTAL TO EACH INTAKE)
- ALL SLITS CUT INTO RISER IS INCIDENTAL TO RISER ASSEMBLY.
- ALL 3/4" CLEAN ROCK IS INCIDENTAL TO RISER ASSEMBLY.
- INTAKES SHALL BE FIELD ADJUSTED BASED ON ACTUAL LOCATION OF LOW AREAS, AS DETERMINED BY THE ENGINEER.
- PLACE TOP OF RIPRAP EVEN WITH PROPOSED CROSS SECTION.



ELEVATION FROM DITCH



ALTERNATIVE SIDE INLET (ASI) AG350



ALTERNATIVE SIDE INLET WITH RIPRAP OVERFLOW (ASIRO) AG360