

Faribault County, Minnesota

Joint County Ditch #202FM

Staff Repair Report

February 2021

FARIBAULT COUNTY
Drainage Dept

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JCD202FM Repair

BACKGROUND

Landowners on JCD202FM Branch 9 have made comments about cattails and vegetation growing in the bottom of the channel impacting the flow of water through the system.

DATA COLLECTION

The JCD202FM open ditch system (upstream of the confluence of the old JD12MF system) was surveyed in the summer 2020, including Branch 9 and Branch 3. The legal grade for the ditch was determined from the 1979 improvement report which was generated in mean sea level datum. There is a discrepancy between the stationing from the 1979 improvement report and that surveyed by the Drainage Department. A repair grade was developed by applying the elevations of critical points (headwalls and grade breaks) to the adjusted repair stationing (see Table 1). Stationing and legal grade for Branch 9 and Branch 3 lined up well with the 1979 improvement report.

Table 1: Comparison of 1979 Main Open Ditch stationing with the repair stationing developed by Drainage Department Staff

Critical Points	1979 Station	1979 Legal Grade	1979 Elevation	Repair Station	Repair Grade
Confluence w/ old JD12MF	0+00	-	1082.80	0+00	-
2' Headwall	2+00	0.08%	1084.96	2+31	0.07%
Confluence w/ Branch 9	90+60	0.08%	1095.05	85+50	0.08%
3' Headwall	146+00	0.08%	1102.48	140+50	0.08%
Grade Change	180+00	0.08%	1105.20	174+00	0.08%
Confluence w/ Branch 3	224+66	0.06%	1107.88*	218+30	0.06%
End of Main Open Ditch	236+00	0.06%	1108.56	231+50	0.05%

*Adjusted

Field crossings, road crossings, and headwall elevation were largely found to be on grade. Two of the three original concrete headwalls from 1979 were in place, however the concrete headwall on the Main Trunk at station 18+00 has been destroyed. The destruction of this headwall caused the ditch bottom to down-cut up to the CR1 Road Crossing, making the CR1 Road Crossing the new grade control point.

PROPOSED REPAIR DETAILS

The JCD202FM Main Truck Open Ditch system is in relatively good condition except for required repairs to two ditch crossings and spot cleaning of the open ditch. It is clear from the profiles that Branch 9 is impacted by sediment accumulation in the ditch bottom. On average, 1 to 2 feet of sediment is impacting the entire length of Branch 9, approximately 7,400 linear feet.

Open Ditch Excavation: The entire 7,400 linear feet of Branch 9 channel needs to be restored to legal grade, whereas 8,350 linear feet of spot cleaning is required on the Main Trunk (see profiles).

Main Trunk Station	54+00 – 63+00
Main Trunk Station	90+00 – 140+50
Main Trunk Station	159+00 – 170+00
Main Trunk Station	174+00 – 178+00
Main Trunk Station	222+00 – 231+00
Branch 9 Station	23+00 – 97+00

Repair 310th Ave. Ditch Crossing: The 72" RCP 310th Ave Township Road Crossing (Faribault-Martin County Line) has a joint that is depositing gravel and sediment into the pipe. Three RCP sections of this crossing need to be removed, re-set, and tied together. The gravel road shall be restored with Class V gravel.

Armor Existing Open Ditch Crossings: It is recommended that each open ditch crossing on the Main Trunk and Branch 9 be protected with rock riprap armoring. This is especially true for the 96" RCP CR1 Road Crossing on the Main Trunk at station 20+00.

Remove and Dispose of Field Crossing: The 96" RCP Field Crossing on the Main Trunk at station 7+00 should be removed and disposed of. The ditch slopes should be seeded and blanketed.

Tile Outlet Repair: Repair tile outlets with 20' of HDPE dual-wall non-perforated tile. See Detail.

- | | |
|----------------------------------|------------------------------------|
| 1. Main Trunk Station 61+80 (E) | Replace 10" CMP outlet |
| 2. Main Trunk Station 74+30 (E) | Replace 18" CMP Branch 9 outlet |
| 3. Main Trunk Station 86+80 (S) | Replace 12" CMP outlet |
| 4. Main Trunk Station 112+50 (S) | Replace 15" CMP outlet |
| 5. Main Trunk Station 118+90 (N) | Replace 18" CMP Branch 7 outlet |
| 6. Main Trunk Station 125+40 (W) | Replace 15" CMP outlet |
| 7. Main Trunk Station 153+50 (E) | Replace 15" CMP outlet |
| 8. Main Trunk Station 166+40 (E) | Replace 10" CMP outlet |
| 9. Branch 9 Station 26+10 (S) | Replace 15" CMP outlet (clay tile) |
| 10. Branch 9 Station 86+80 (S) | Replace 15" HDPE SW outlet |
| 11. Branch 9 Station 88+50 (S) | Replace 15" CMP outlet |
| 12. Branch 9 Station 94+70 (S) | Replace 10" CMP outlet |
| 13. Branch 9 Station 96+30 (N) | Replace 10" CMP outlet |
| 14. Branch 9 Station 96+60 (S) | Replace 15" CMP Branch 9-I outlet |
| 15. Branch 9 Station 97+20 (W) | Replace 24" CMP Branch 9 outlet |
| 16. Branch 9 Station 97+20 (W) | Replace 10" CMP outlet |

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

- | | |
|----------------------------------|--|
| 1. Main Trunk Station 10+20 (S) | Replace 10" CMP with 8" ASI w/ Standard Hickenbottom |
| 2. Main Trunk Station 111+50 (S) | Replace 15" CMP with 15" ASI w/ Trash Grate |
| 3. Main Trunk Station 119+60 (W) | Replace 12" CMP with 18" ASI w/ Trash Grate |
| 4. Main Trunk Station 124+00 (E) | Replace 12" CMP with 12" ASI w/ Trash Grate |
| 5. Branch 9 Station 27+00 (S) | Replace 15" CMP with 15" ASI w/ Trash Grate |
| 6. Branch 9 Station 75+50 (W) | Replace 12" CMP with 12" ASI w/ Trash Grate |
| 7. Branch 9 Station 81+30 (S) | Replace 10" CMP with 12" ASI w/ Trash Grate |
| 8. Branch 9 Station 97+20 (W) | Replace 15" CMP with 24" ASI w/ Trash Grate |

February 9, 2021

TIMELINE

The completion date for this project is August 31, 2021.

ESTIMATED COST

Item	Unit	Quant	County Est Unit Price	County Est Amount
Mobilization	LS	1	\$ 5,000.00	\$ 5,000.00
Open Ditch Cleaning, 4' bottom. 7,400 LF on Branch 9 and 2,000 LF spot cleaning on Main Trunk	LF	15750	\$ 2.50	\$ 39,375.00
Re-attach three sections of 72" RCP for 310th Ave Crossing (includes excavation, ties, and granular base)	LS	1	\$ 4,000.00	\$ 4,000.00
Restore gravel road (310th Ave) with Class V gravel	EA	1	\$ 1,500.00	\$ 1,500.00
Armor existing ditch crossings with Class III riprap and Type IV Geotextile Fabric	TON	1030	\$ 35.00	\$ 36,050.00
Remove and dispose of RCP ditch crossing at Station 7+00. Blanket and seed banks	EA	1	\$ 1,000.00	\$ 1,000.00
10" Tile Outlet Repair	EA	5	\$ 800.00	\$ 4,000.00
12" Tile Outlet Repair	EA	1	\$ 850.00	\$ 850.00
15" Tile Outlet Repair	EA	7	\$ 900.00	\$ 6,300.00
18" Tile Outlet Repair	EA	2	\$ 1,100.00	\$ 2,200.00
24" Tile Outlet Repair	EA	1	\$ 1,250.00	\$ 1,250.00
8" ASI w/ Standard Hickenbottom Top	EA	1	\$ 1,550.00	\$ 1,550.00
12" ASI w/ Trash Grate Top	EA	3	\$ 1,750.00	\$ 5,250.00
15" ASI w/ Trash Grate Top	EA	2	\$ 1,850.00	\$ 3,700.00
18" ASI w/ Trash Grate Top	EA	1	\$ 2,100.00	\$ 2,100.00
24" ASI w/ Trash Grate Top	EA	1	\$ 2,750.00	\$ 2,750.00
Till and Seed Buffer Strip	AC	6.0	\$ 500.00	\$ 3,000.00
Contingency 10%				\$ 11,987.50
				\$ 131,862.50

APPENDICES

Appendix A:	Repair Overview Map
Appendix B:	Plan Profiles
Appendix C:	Typical Ditch Cleaning Drawing
Appendix D:	Alternative Side Inlet Drawing
Appendix E:	Typical Tile Outlet Repair Drawing
Appendix F:	Typical Field Crossing Drawing

INSPECTION PHOTOS



Confluence of JCD202FM with JD2FM



96" RCP Field Crossing at Station 7+00 on Main.



Control structure at Station 2+00.



310th Ave Township Road Crossing. Sediment is being deposited in the pipe from a wide joint.



96" RCP County Road 1 Crossing. This crossing is acting as a grade control point.



Main Trunk channel condition.

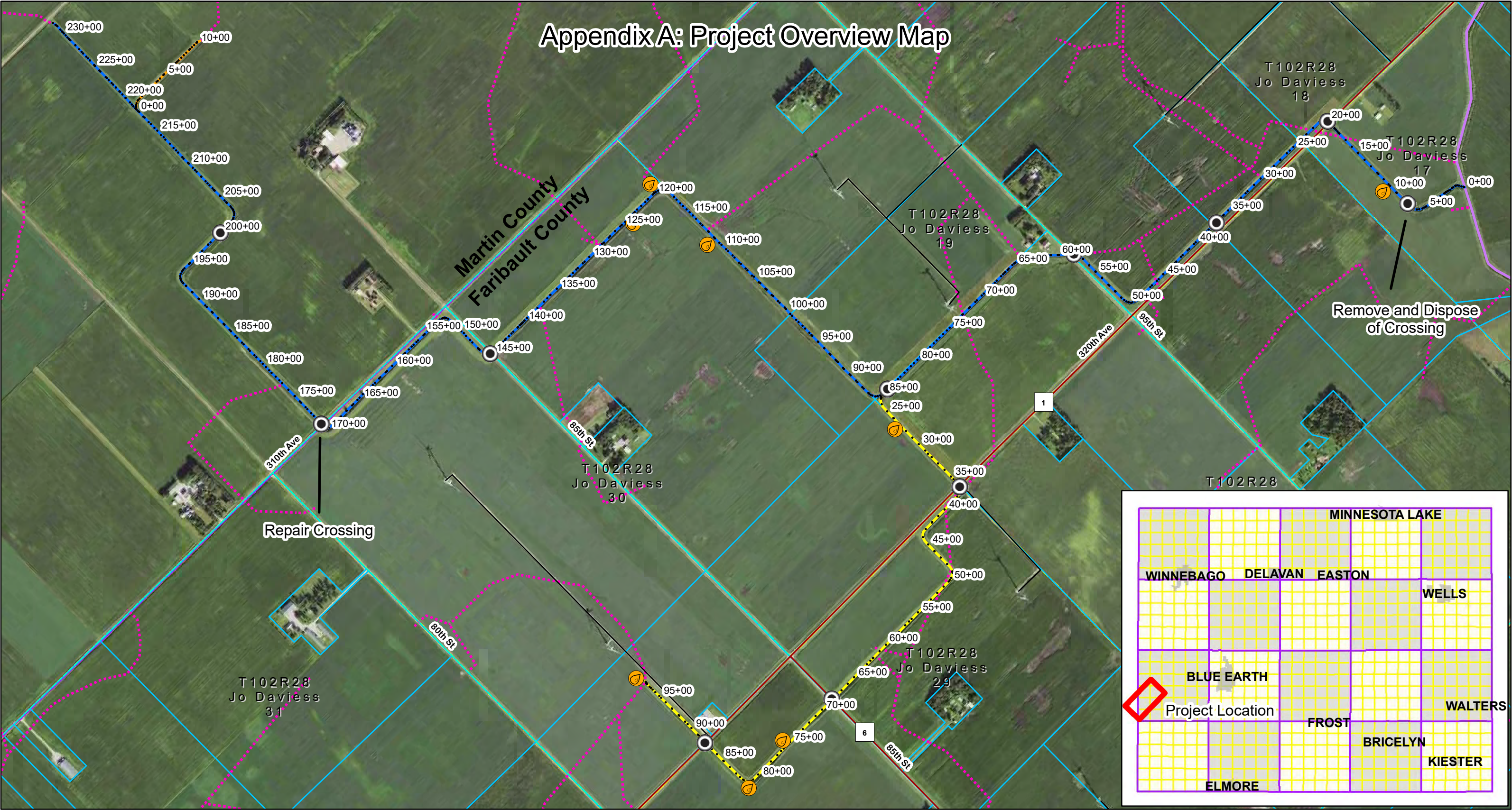


Confluence of Branch 9 with Main Trunk



Branch 9 channel condition.

Appendix A: Project Overview Map



Legend

- Branch 3
- Branch 9
- Main Trunk
- Parcels
- Public Open Ditch
- Public Tile
- Culvert Crossing
- Alternative Side Inlet

JCD202FM Open Ditch Repair
Faribault & Martin County

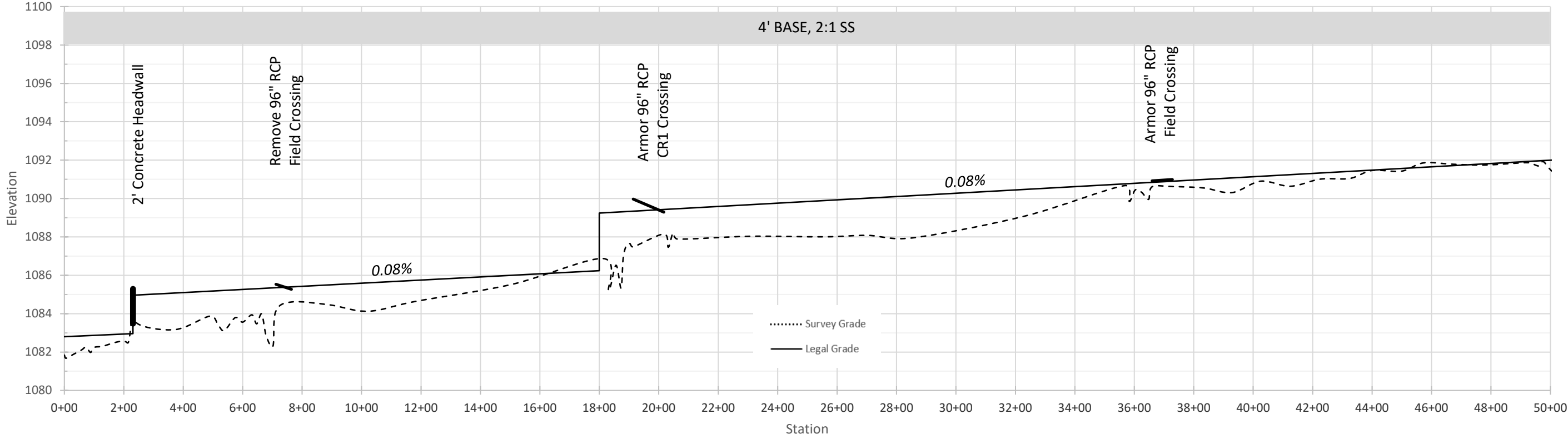
1 inch = 1,000 feet



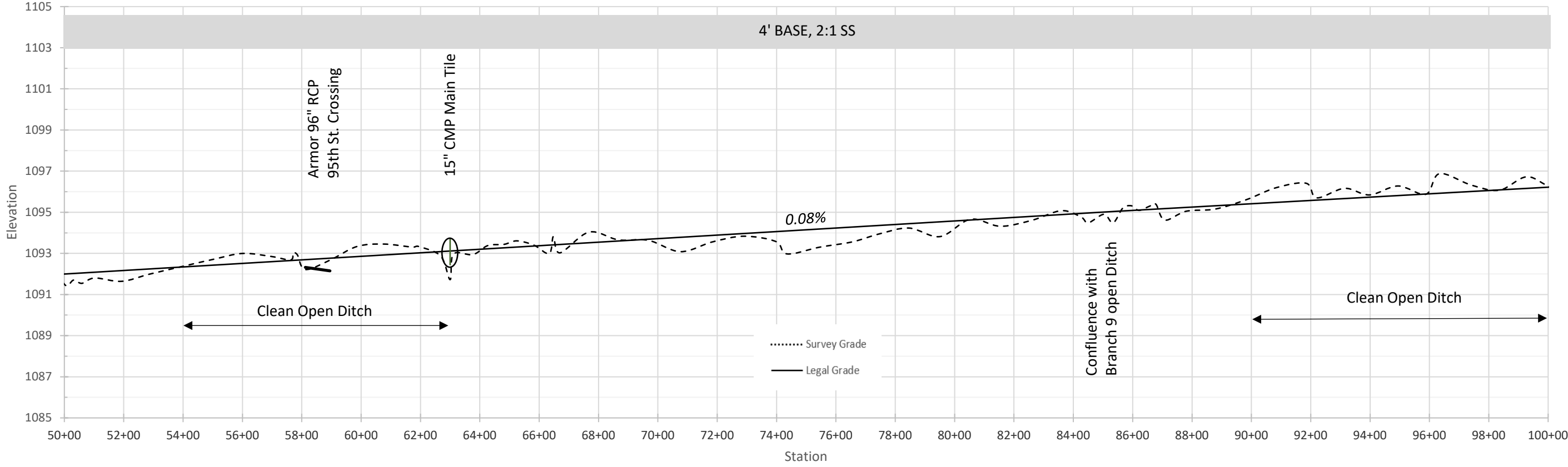
Disclaimer: Faribault County and Faribault County SWCD do not warrant or guarantee accuracy of the GIS data. The data is meant for reference purposes only and should not be used for official decisions. The data contained in the maps were compiled from the best available records that could be found and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

Appendix B: Plan Profiles

JCD202FM Main Trunk

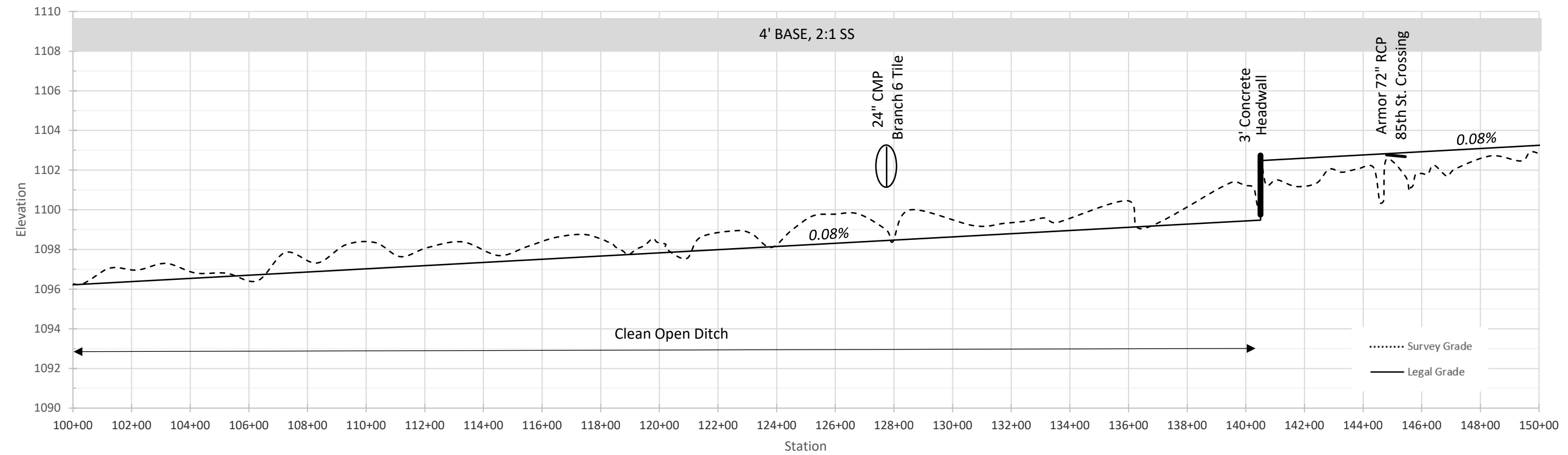


JCD202FM Main Trunk

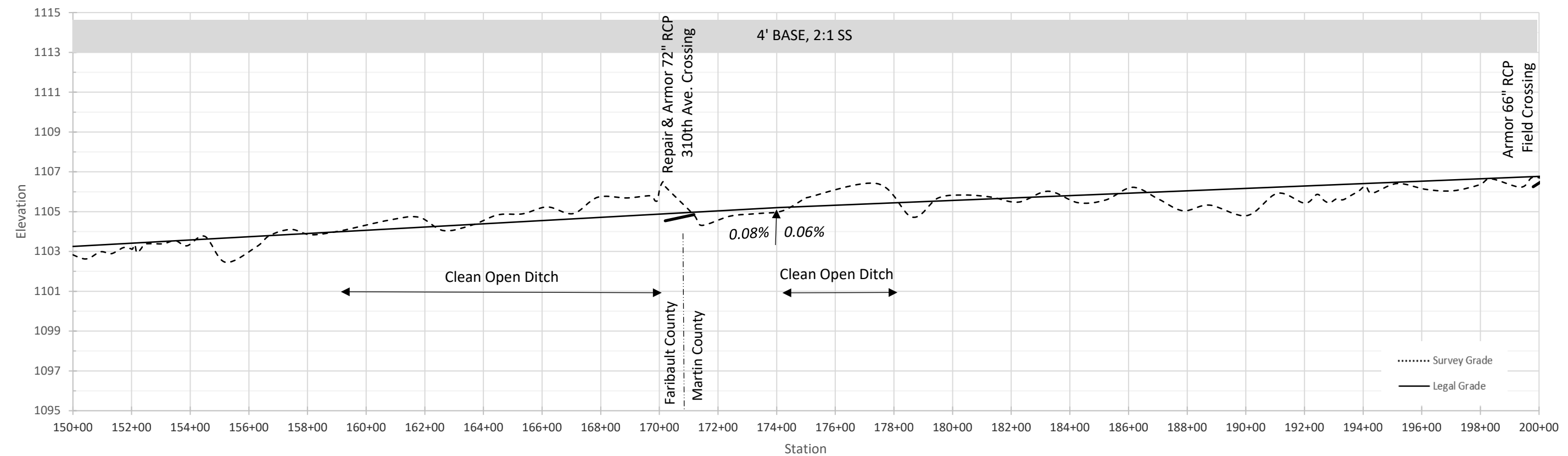


Appendix B: Plan Profiles

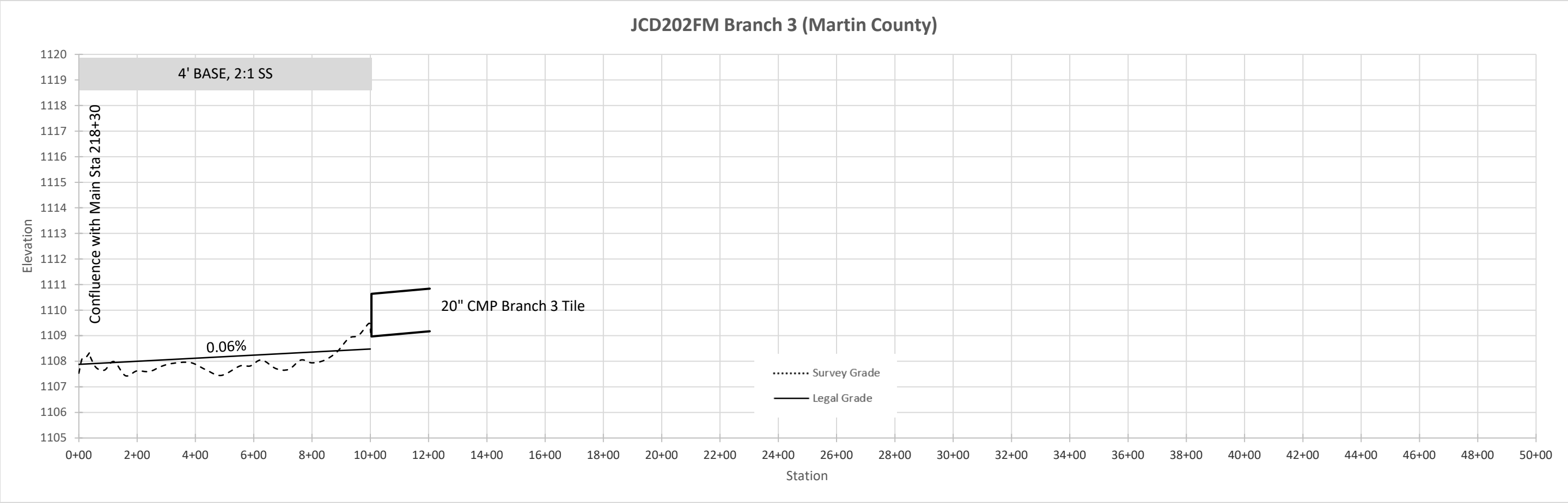
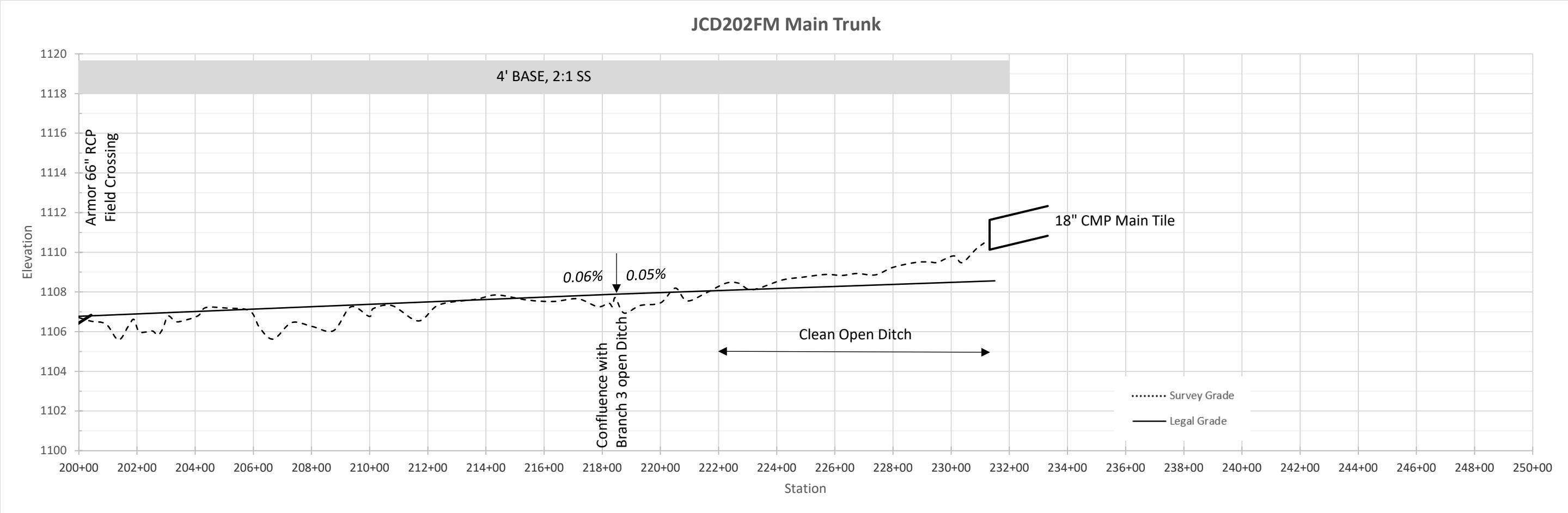
JCD202FM Main Trunk



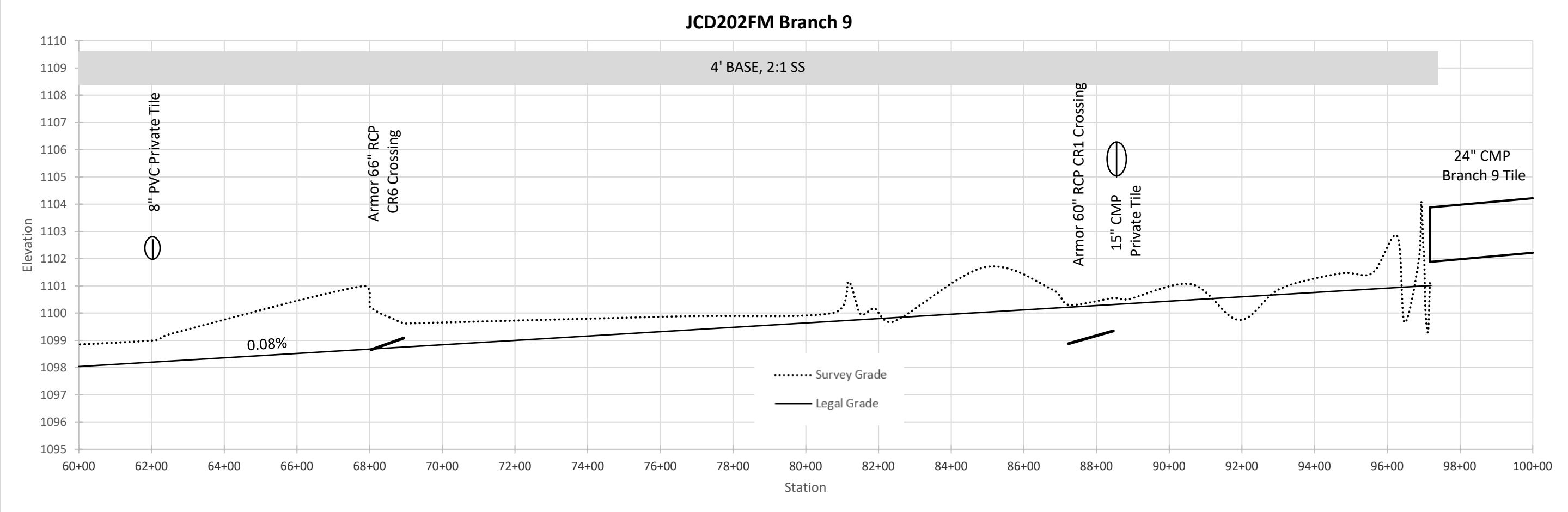
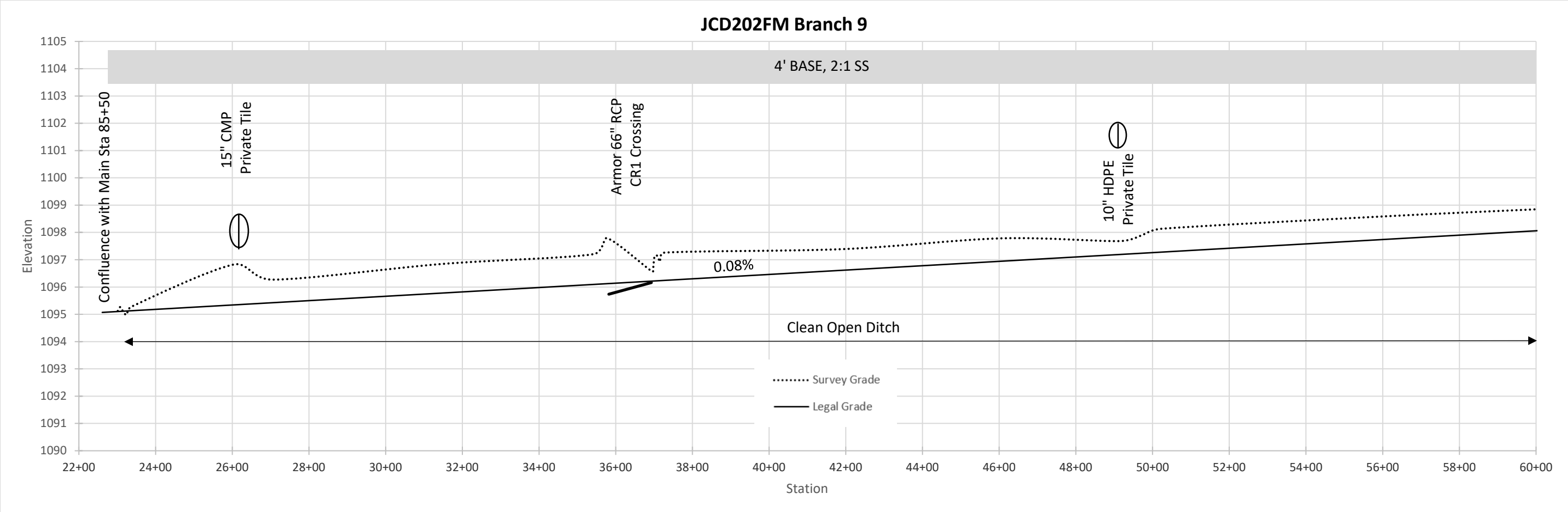
JCD202FM Main Trunk



Appendix B: Plan Profiles

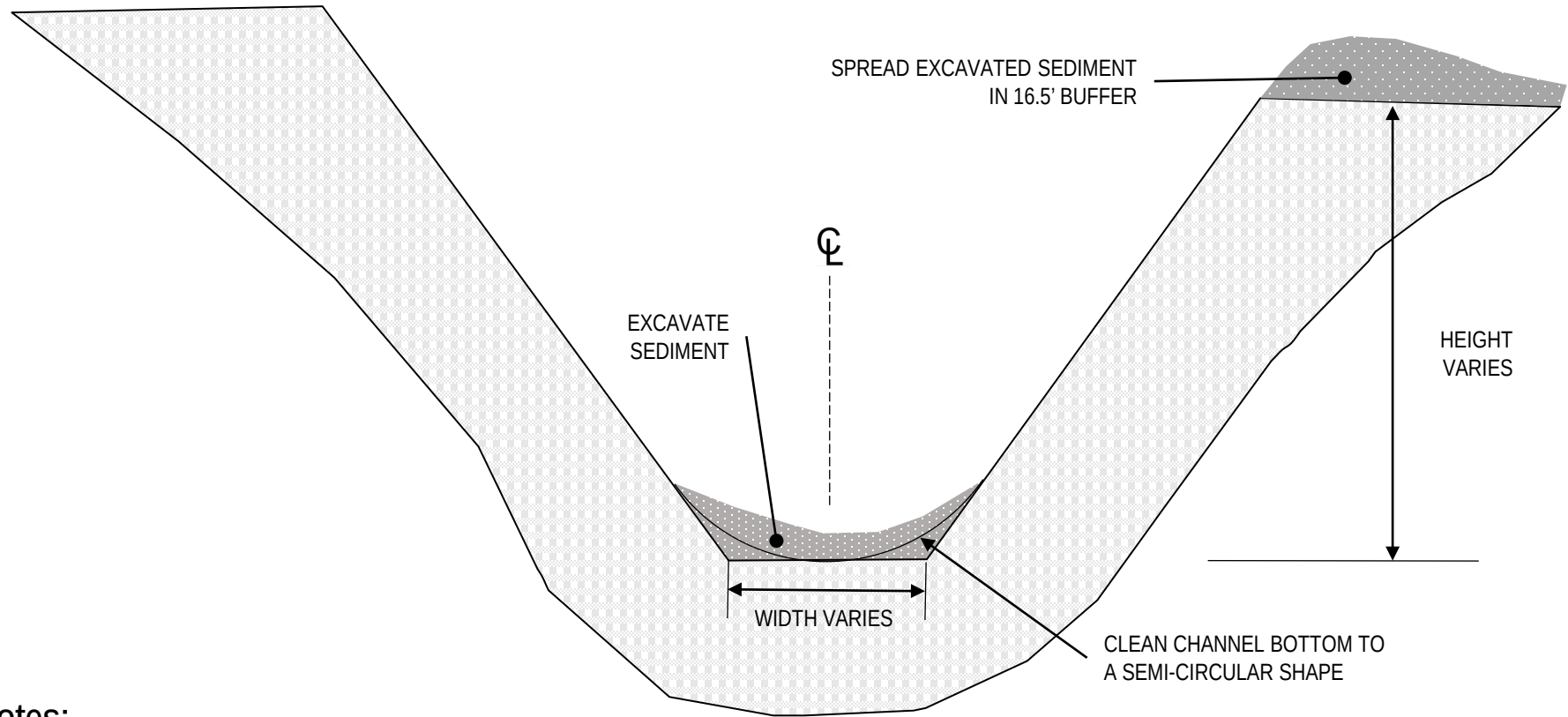


Appendix B: Plan Profiles



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.

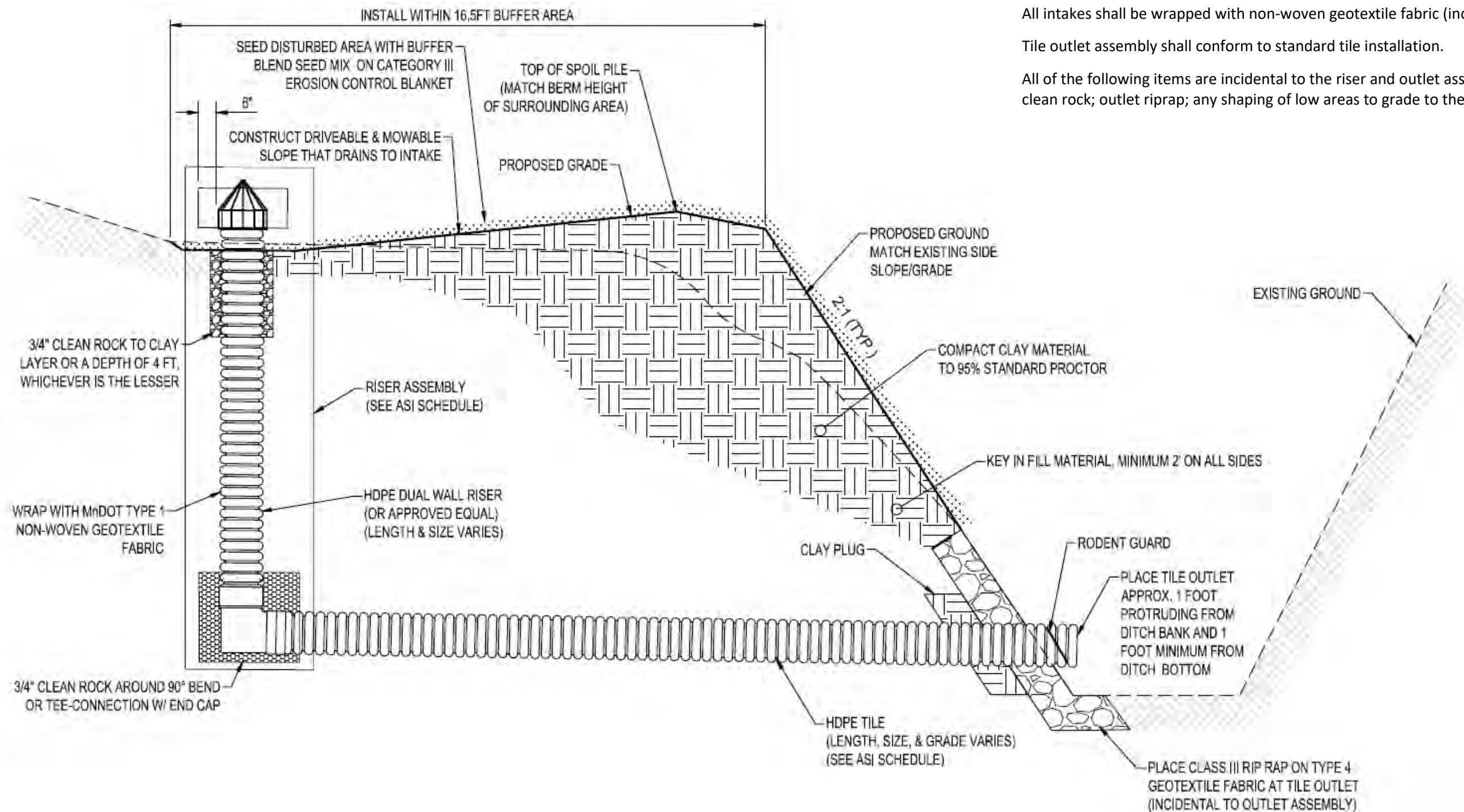
ALTERNATIVE SIDE INLET (ASI)
NTS

Intake type and tile size varies per ASI (see ASI schedule)

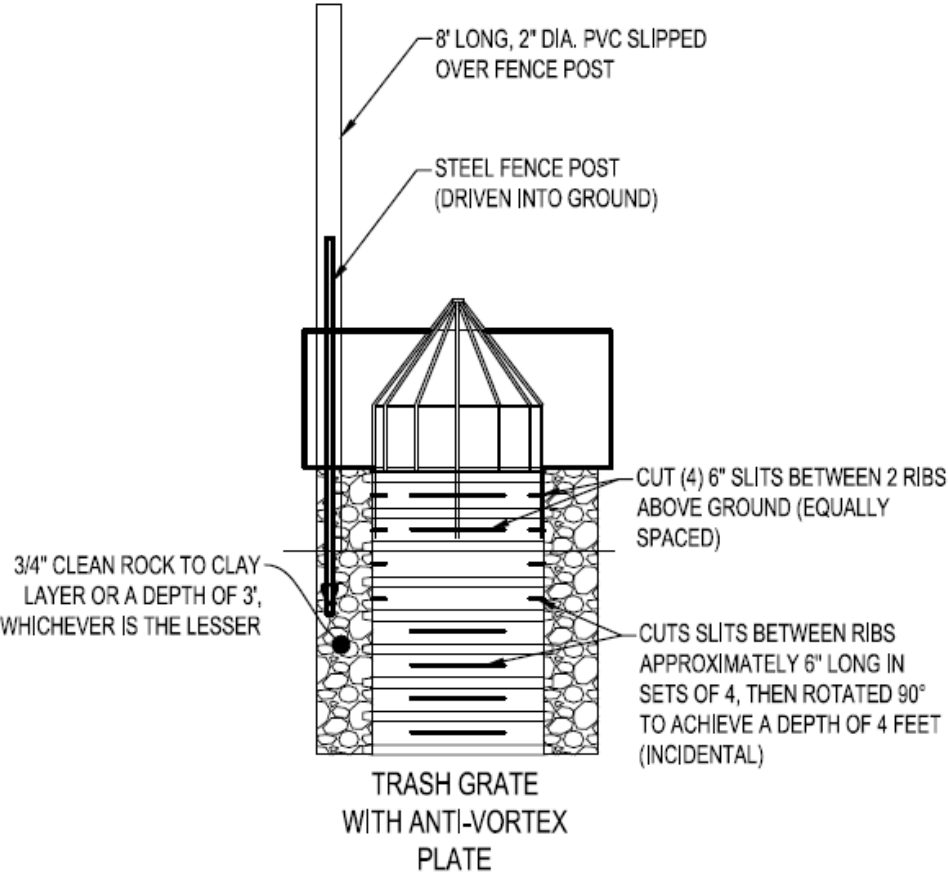
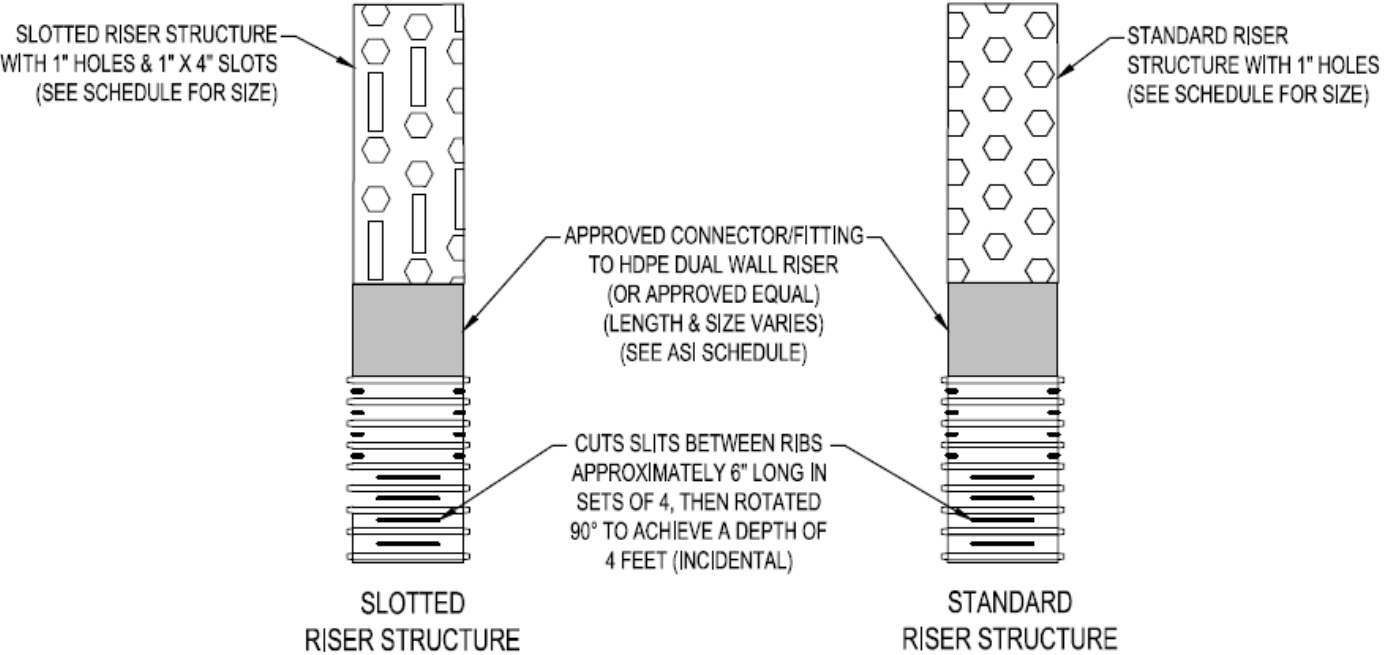
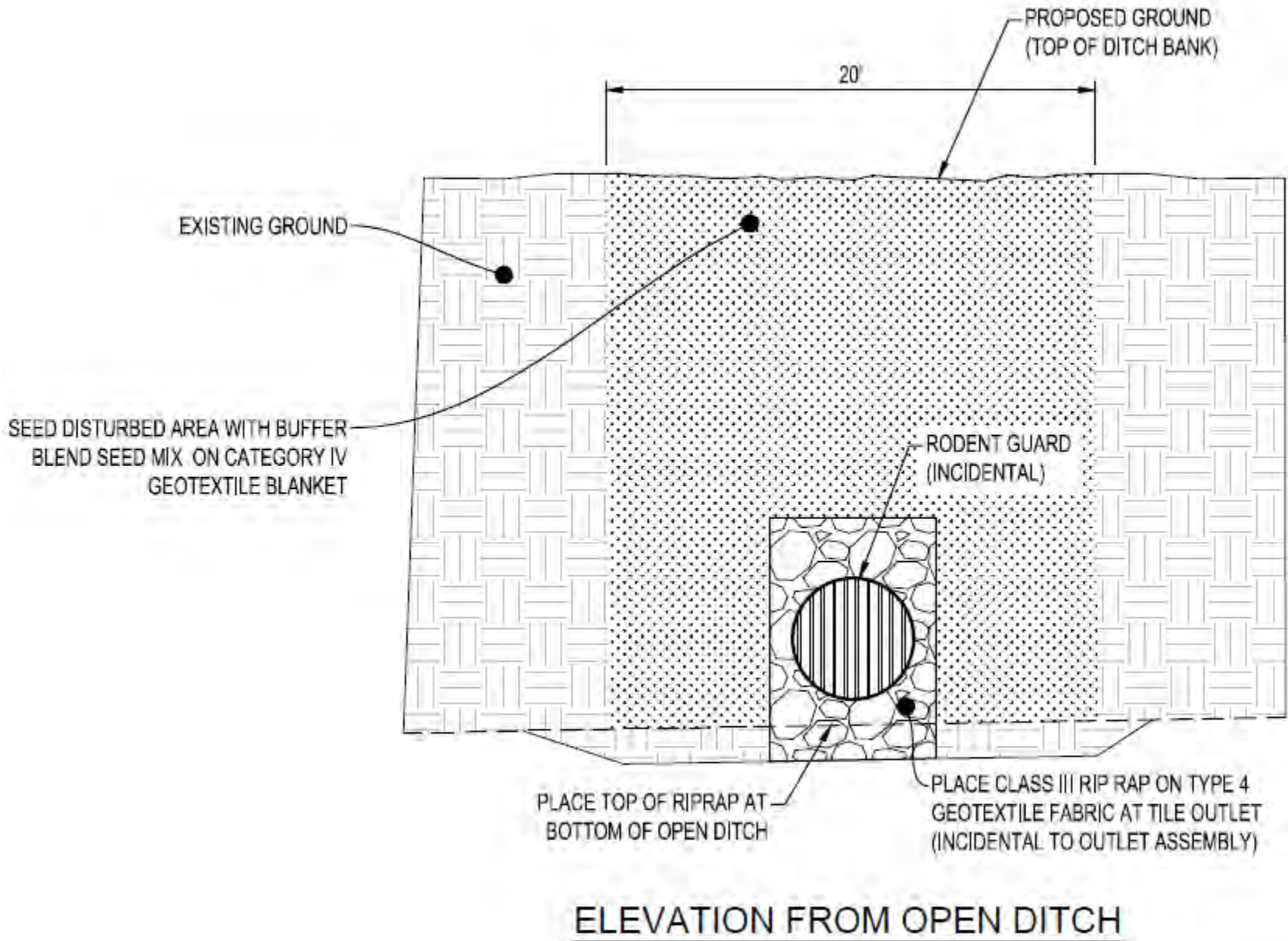
All efforts shall be made to separate soil types. Backfill shall be compacted prior to placement of topsoil, except the top two feet, for which compaction shall be minimized to the extent possible. Topsoil shall be placed to a minimum depth of 6", or uniform to the topsoil depth of the surrounding area. All efforts shall be made to keep topsoil on top and separated. No topsoil shall be placed in the trench below 2' from existing ground unless approved by the Drainage Department.

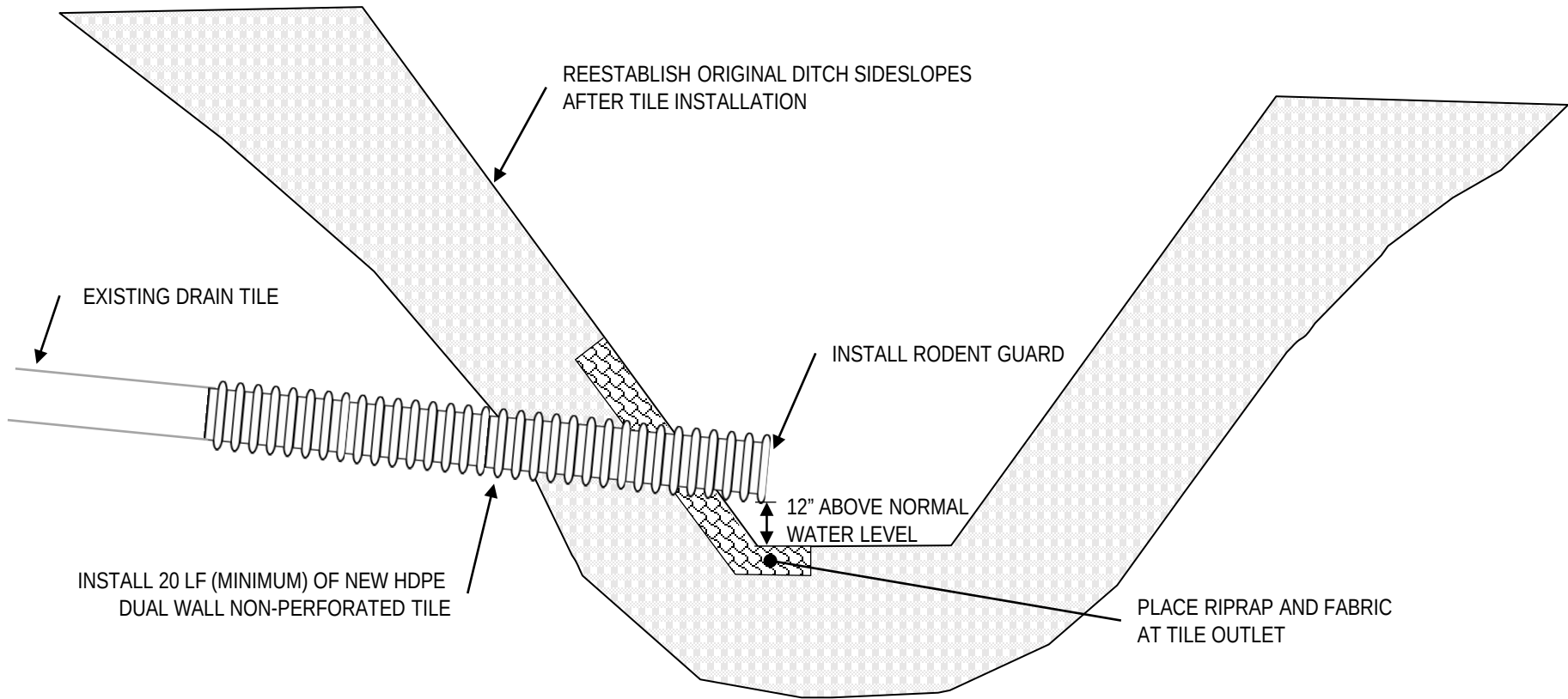
Tile outlet assembly shall conform to standard tile installation.

All of the following items are incidental to the riser and outlet assembly: slits cut into the riser; all ¾" clean rock; outlet riprap; any shaping of low areas to grade to the drop intake.



ALTERNATIVE SIDE INLET (ASI)
NTS





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.

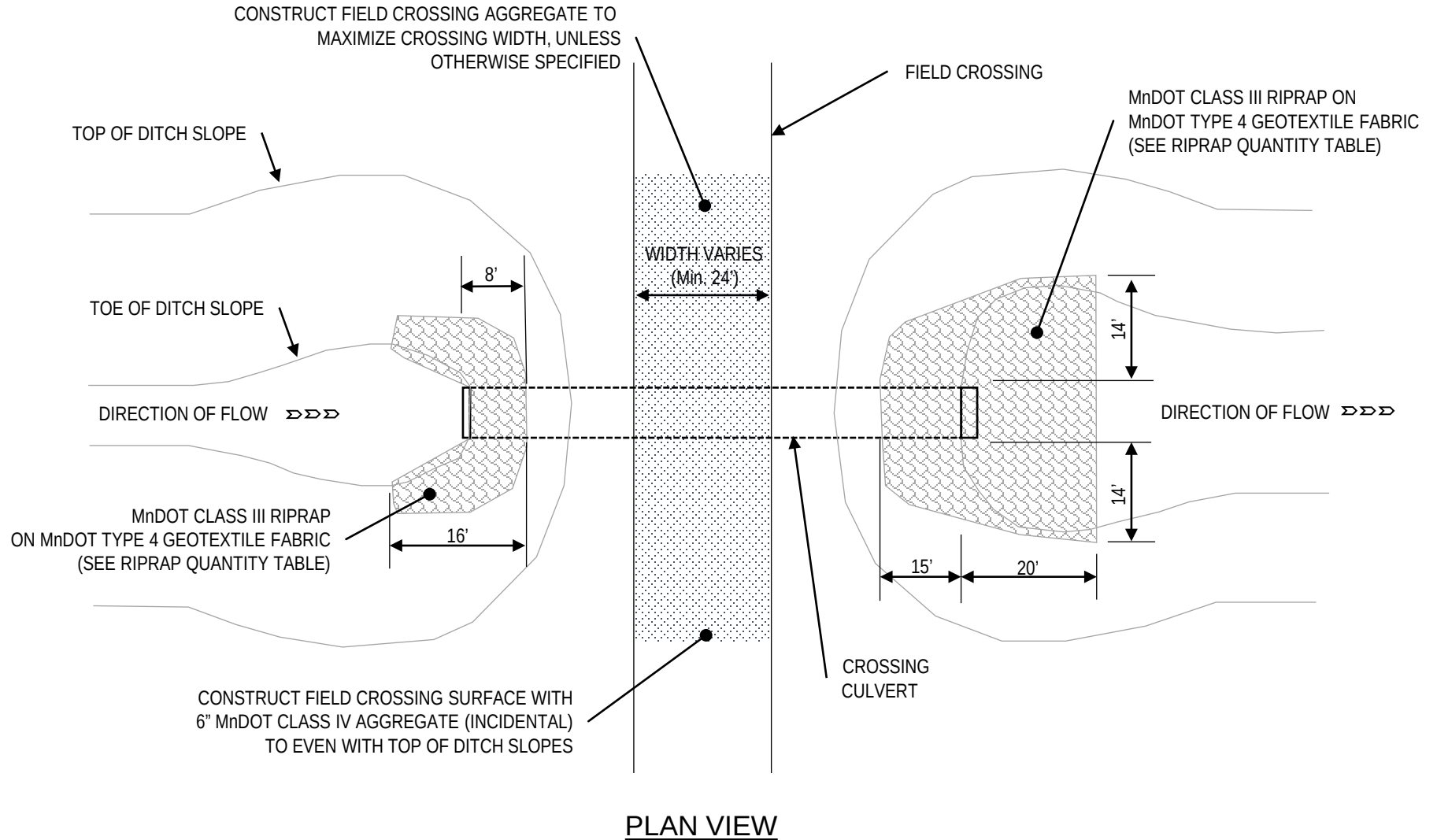
Rodent guards shall be installed on all tile outlet repairs 24" and smaller (incidental).

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 F

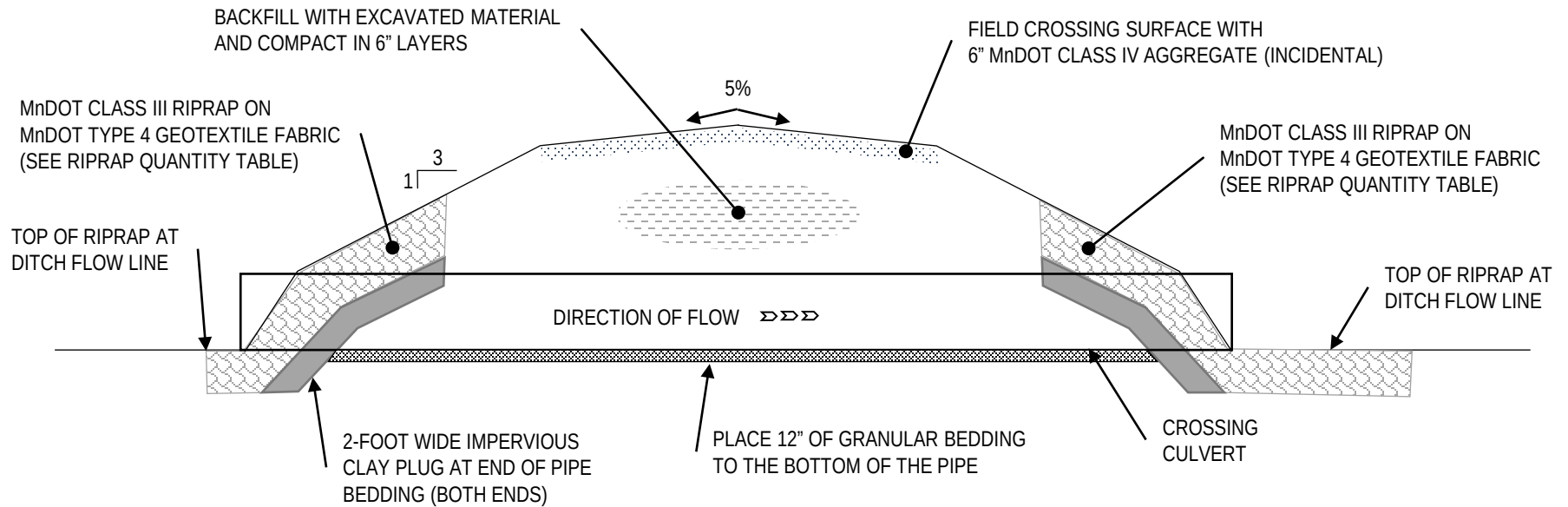
TYPICAL FIELD CROSSING

NOT TO SCALE



TYPICAL FIELD CROSSING

NOT TO SCALE



SECTION VIEW

Notes:

All construction shall comply with Faribault County Requirements and MnDOT Standard Specifications for Construction (2018).

Contractor is responsible for all Gopher One calls for utility locations.

Common excavation and structure excavation is to be included in bid price for pipe. Additional fill material needed shall be furnished from sources selected by the contractor and approved by the Drainage Department.

MnDOT Class V aggregate surface is incidental to crossing restoration.

All disturbed areas shall be seeded with County Buffer Mix and erosion control blanket placed (incidental).

Excavate to 12" below bottom of culvert or bottom of unsuitable soil, whichever is greater, and backfill with granular foundation.

RIPRAP QUANTITY	
CULVERT SIZE	UPSTREAM - DOWNSTREAM
≤ 48"	10 CY – 20 CY
60"	15 CY – 25 CY
72"	20 CY – 30 CY