Final Engineer's Report for

Improvement of Main Open Ditch, Branch 309 & Branch C of Renville County Ditch No. 59

S15.112473

September 2023

Submitted by:
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Certification

Final Engineer's Report

For

Improvement

Of

Main Open Ditch, Branch 309, & Branch C

Of

Renville County Ditch No. 59

September 2023

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

By: Shaun P. Luker

Shaun P. Luker, P.E.
License No. 48756

Date: September 15, 2023

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Exhibits

STATE OF MINNESOTA

RENVILLE COUNTY, MINNESOTA

IN THE MATTER OF THE PETITION FOR AN IMPROVEMENT OF RENVILLE COUNTY DITCH NO 59 IN RENVILLE COUNTY, MINNESOTA:

In January 2017, the Renville County Board, acting as the Ditch Authority for County Ditch No. 59 (CD 59) in Renville County, in accordance with Minnesota Statute 103E.215, accepted a petition for the improvement of portions of CD 59. Subsequent to that authorization, Final field surveys were performed to obtain elevations and establish an alignment for the proposed open ditch and culvert crossing improvements, as well as to evaluate the outlet for the system.

A Preliminary Hearing was held on February 27, 2018. At that time the Ditch Authority found that the proposed project meets the requirements for an Improvement and ordered the preparation of this Final Engineer's Report and appointed Viewers to determine the benefits and damages for the system.

This Final Engineer's Report summarizes the findings of the research, surveys, and analysis for the improvement and is submitted for consideration by the Ditch Authority.

I. LOCATION AND SCOPE OF IMPROVEMENT

County Ditch No. 59 lies within and provides drainage to a large watershed in the north-central portion of Renville County. The open ditch system is about seven miles long and drains generally from east to west. The system provides drainage to:

- portions of two Sections in Crooks Township.
- portions of fifteen Sections in Winfield Township.
- portions of two Sections in Emmet Township.
- portions of five Sections in Troy Township.

County Ditch No. 59 serves as an outlet for County Ditch No. 17A at their confluence about two miles northwest of Danube, approximately 850 feet southwest of the CD 59 crossing of County Road 59. CD 17A drains portions of Crooks and Winfield Township. The total estimated watershed for CD 17A from USGS Streamstats data is 42.2 square miles.

The outlet for CD 59 is into County Ditch 37 about two miles west of Danube, just north of the Twin Cities & Western (TC&W) Railroad. The total estimated watershed for CD 59 from USGS Streamstats data is 58.5 square miles. However, the majority of this watershed is from CD 17A. Upstream of County Road 59, the CD 59 watershed is approximately 15.9 square miles.

The petition presented to the Board requests consideration for the improvement of the Main open ditch, Branch 309, and Branch C, of CD 59. The main open ditch initially drains from west to east and then forms a loop to drain to the west. The loop crosses US Highway 71 (TH 71) twice.

Branch 309 drains portions of Sections 32 and 33 in Winfield Township. The branch drains in general from north to south and discharges into the Main open ditch of CD 59. The existing watershed for Branch 309 is approximately 229 acres. Included in the scope of the petitioned improvements to Branch 309, is to extend the Branch tile to the north approximately 3,800 feet, and intercept the Main tile of CD 59. The goal of this portion of the improvement is to reroute the water drained by the upper portion of the system in a more direct route to the Main open ditch, and relieve the stress on the existing open ditch crossings of TH 71. The drainage area proposed to be re-routed is 628 acres.

Branch C drains portions of Sections 2, 3, and 4 in Troy Township and Section 34 in Winfield Township and drains in general from east to west. The existing watershed for Branch C is approximately 786 acres.

Bolton & Menk, Inc. collected field survey information in November of 2011 for a repair of the main open ditch conducted in 2014. This field survey information included the elevation of the bottom of the ditch, and the top of one side of the ditch. The survey also included establishing the elevation and size of the culvert crossings, as well as centerline information of the roadway, railroad, or field crossing at the culvert crossings. Additional field survey information was collected by our firm in July of 2017, which included the top of the second side of the ditch, tile intakes near the Branch 309 and Branch C improvements, as well as ground elevations in potential storage areas.

The design of the improvements has also utilized LIDAR data provided by the Minnesota Department of Natural Resources. This data, obtained from an aerial flight, provides additional elevation data at a confidence level equal to two-foot vertical contours.

Other information used for this report includes plans obtained from Renville County files. However, the County plans do not show existing tile grades. Thus, it was necessary to use information gathered through intakes to make some interpretations regarding the existing tile grades. The existing plans, and other available information, do not identify the nomenclature of sub-branches of the CD 59 system. As a result, we have given the sub-branches unique identifiers, but only for the purposes of this improvement.

II. EXISTING DITCH SYSTEM

Public information regarding the County Ditch No. 59 system was received from Renville County. This information provides a limited history of the CD 59 system. CD 59 was petitioned for establishment on June 26, 1916. Construction was completed on August 1, 1921. The original benefits for the ditch system were $161,735.

An extensive repair of the existing system, known as Repair F occurred in 1967.

III. CAPACITY OF THE EXISTING DRAINAGE SYSTEM

The portion of the proposed system improvements consists of an open ditch and underground tiles. From petitioner reports, the system is not able to drain the watershed adequately, resulting in extended ponding in portions of the watershed. This ponding results in crop stress and crop loss. Because of the limitations of the drainage system, the petitioners requested an improvement of the drainage system.

The existing drainage system analysis used standard engineering methods. The estimated capacity of the existing open ditch used the Manning equation. The capacity calculations for the culvert crossings used HY-8, a culvert modeling software developed by the Federal Highway Administration. The amount of drainage needed for modern crop production has been compared to standards recommended by the Natural Resources Conservation Service (NRCS). The NRCS Engineering Field Handbook Minnesota Supplement 650.0703 for Grassed Waterways Curve 2 was used to determine the design discharge for the ditch watershed at each of the culvert crossings within the study area. The watershed contributing flow to the open ditch at each of the culverts was delineated using the USGS Streamstats program and confirmed using LIDAR data.

The exiting capacity of the culverts within the study area was calculated by determining the headwater (upstream) elevation for each of the culverts at the design flow. NRCS Code 608 guidance states that one-foot of freeboard should be provided between the design water surface profile in the open ditch, and the ground elevation of the low areas being served by the open ditch. The headwater elevation was then compared to the maximum elevation for one-foot of freeboard for each of the culverts.

A summary of the existing headwater elevations for the culverts within and downstream of the area of the Improvement is in Table 1.

Table 1 – Existing Ditch Capacity Computations

Culvert Location	Culvert Size and Material	Upstream Watershed (Acres)	NRCS Ditch Flow (cfs)	NRCS Ditch Flow (In./ Day)	Ditch Bottom Width (ft)	Est. Max Depth (ft)	Ditch Grade (%)	Ditch Capacity (cfs) (n= 0.035)	Culvert Capacity (cfs) at Max Depth	Limiting Capacity (cfs)	Ditch Efficiency Ratio
TH 71 Crossing North	6' x 4' Cattle Pass	2,309	74	0.76	6	5.6	0.05	128	99	99	1.34
TH 71 Crossing South	6' x 4' Cattle Pass	4,016	125	0.74	6	5.0	0.05	102	85	85	0.68
Field Crossing Section 34	72" RCP	5060	157	0.74	8	6.6	0.03	167	139	139	0.89
310th Street	72" RCP	5,890	182	0.74	8	7.1	0.03	193	154	154	0.85
300th Street	72" RCP	7,154	220	0.73	8	8.1	0.03	250	194	194	0.88
Field Road Section 5	72" RCP	7,335	225	0.73	8	7.8	0.03	232	253	232	1.03
CSAH 1	84" RCP	8,202	251	0.73	8	8.5	0.03	276	233	233	0.93
280th Street	84" RCP	9,090	278	0.73	8	9.5	0.03	346	278	278	1.00
County Road 59	84" RCP	9,702	296	0.73	8	8.1	0.10	457	319	319	1.08
CD 59 at TC&W Crossing w/o CD 17A or CD 37	Dual 16'x10' Box Culverts	9,858	301	0.73	20	7.3	0.10	772	735	735	1.78
CD 59 with CD 17A	Dual 16'x10' Box Culverts	36,858	1111	0.72	20	7.3	0.10	772	735	735	0.48
CD 59 with CD 37	Dual 16'x10' Box Culverts	41,008	1235	0.72	20	7.3	0.10	772	735	735	0.43

As can be seen in Table 1, the culverts are generally the limiting factor that determines the capacity of the ditch. The south Highway 71 crossing has the lowest efficiency upstream of County Road 59, and the addition of the CD 17A and CD 37 watersheds have a dramatic impact on the efficiency of the TC&W crossing. The limiting factor at the TC&W crossing is the relatively low ground adjacent to the open ditch on the upstream side of the TC&W crossing. The crossing consists of dual sixteen-foot wide by ten-foot tall box culverts, but the maximum depth that can be attained in the ditch while maintaining one-foot of freeboard is 7.3 feet.

The capacity of the existing tile has been estimated using the Manning equation, assuming the original hydraulic efficiency of the system as constructed. Estimated tile sizes and grades are based on limited field data collected through tile intakes and general land grades. The amount of drainage that is needed for modern crop production has been compared to standards recommended by the Natural Resource Conservation Services (NRCS). These standards recommend that for drainage of row crops in mineral soils, where surface water intakes are provided, that a modern drainage system should be able to convey 1/2 inch of runoff per day. Watershed areas have been estimated using LIDAR data. The capacity of the existing tiles in Branch 309 is shown in Table 2 and the capacity of the existing tiles in Branch C is shown in Table 3.

Table 2 – Branch 309 Existing Tile Capacity Computations

Branch Label	Location	Cumulative Drainage Area (Acres)	NRCS Tile Flow (cfs) (1/2" Per Day)	Tile Size (in.)	Tile Grade (%)	Tile Capacity (cfs) (n = 0.013)	Tile Efficiency Ratio	Tile Coefficient (in./Day)
309	Br. 309 west of 300th St.	44	0.92	10	0.10*	0.69	0.75	0.38
	Br. 309 east of 300th St.	88	1.85	10	0.10*	0.69	0.38	0.19
	Low area in E1/2 of W/12 Section 33	149	3.13	12	0.10	1.13	0.36	0.18
	Br. 309 prior to Br. 309-2	167	3.51	12	0.10	1.13	0.32	0.16
	Br. 309 meets Br. 309-2	193	4.05	14	0.16	2.16	0.53	0.27
	Br. 309 meets Br. 309-1	219	4.60	14	0.16	2.16	0.47	0.23
	Br. 309 meets CD 59 Open Ditch	229	4.81	14	2.48	8.49	1.76	0.88
309-2	Br. 309-2	26	0.55	10	0.19	0.96	1.75	0.88
309-1	Br. 309-1	11	0.23	5	0.10*	0.11	0.47	0.24
Main	EOP to 6"/8" Transition	4	0.08	6	0.10	0.18	2.12	1.06
	6"/8" Transition to 8"/10"	24	0.50	8	0.10	0.38	0.76	0.38
	8"/10" Transition to 10"/12"	120	2.52	10	0.10	0.69	0.28	0.14
	10"/12" Transition to 12"/14"	261	5.48	12	0.10	1.13	0.21	0.10
	12"/14" Transition to 14"/15"	338	7.10	14	0.10	1.70	0.24	0.12
	14"/15" Transition to 15"/16"	369	7.75	15	0.10	2.05	0.26	0.13
	15"/16" Transition to 16"/18"	478	10.04	16	0.10	2.43	0.24	0.12
	16"/18" Transition to 18"/20"	594	12.48	18	0.10	3.33	0.27	0.13
	18"/20" Transition to 20"/22"	818	17.18	20	0.10	4.41	0.26	0.13
	20"/22" Transition to 22"/24"	880	18.49	22	0.10	5.69	0.31	0.15
	22"/24" to open ditch	894	18.78	24	0.10	7.17	0.38	0.19
*Denotes Assumed Tile Grade								

As shown in Table 2, the majority of Branch 309 is capable of draining the watershed at a rate of about 3/16" to ¼" per day. When compared to the NRCS recommended standard of ½" per day, the tile system is delivering about 32% to 50% of the recommended flow. Thus, there is inadequate capacity in the existing drainage system to provide for the efficient production of row crops.

As shown in Table 3, the majority of Branch C is Capable of draining the watershed at a rate of about 3/32" to 3/16" per day. When compared to the NRCS recommended standard of ½" per day, the tile system is delivering about 18% to 35% of the recommended flow. Thus, there is inadequate capacity in the existing drainage system to provide for the efficient production of row crops.

Many of the existing tiles have been televised by Renville County. The existing tile systems were found to be in poor condition, showing offset joints and collapsed pipes in some areas. Since there is evidence that the pipe system is in poor repair, the system is likely delivering even less flow than has been calculated. A few of the tiles have been reconstructed at the original size and grade.

Another limitation of the existing Branch 309 and Branch C tile system is the very shallow depths at which the exiting tiles are installed. The shallow tile is prone to damage from modern farming equipment.

Table 3 – Branch C Existing Tile Capacity Computations								
Branch Label	Location	Cumulative Drainage Area (Acres)	NRCS Tile Flow (cfs) (1/2" Per Day)	Tile Size (in.)	Tile Grade (%)	Tile Capacity (cfs) (n = 0.013)	Tile Efficiency Ratio	Tile Coefficient (in./Day)
C	Br C East 1/2 of E 1/2 of Section 2	21	0.44	6	0.40	0.36	0.81	0.40
	Br. C prior to Br. C5	78	1.64	8	0.15	0.47	0.29	0.14
	Br. C meets Br. C5	102	2.14	10	0.04	0.44	0.21	0.10
	Br. C meets Br. C-4	228	4.79	15	0.04	1.30	0.27	0.14
	Br. C meets Br. C-3	476	10.00	18	0.03	1.82	0.18	0.09
	Br. C meets Br. C-2	585	12.29	20	0.03	2.42	0.20	0.10
	Br. C meets Br. C-1	685	14.39	18	0.17	4.34	0.30	0.15
	Br. C meets Open Ditch 59	786	16.51	18	0.34	6.14	0.37	0.19
C-5	Br. C-5	24	0.50	6	0.20*	0.25	0.50	0.25
C-4	Br. C-4 beginning	34	0.71	6	0.15*	0.22	0.31	0.15
	Br. C-4 meets Br. C-4-2	40	0.84	6	0.15*	0.22	0.26	0.13
	Br. C-4 meets Br. C-4-1	102	2.14	12	0.16*	1.43	0.67	0.33
	Br. C-4 meets Br. C	109	2.29	12	0.16*	1.43	0.62	0.31
C-4-2	Br. C-4-2 meets Br. C-4	6	0.13	6	0.15*	0.22	1.73	0.86
C-4-1	Br. C-4-1 meets Br. C-4	41	0.86	8	0.20	0.54	0.63	0.31
C-3	Br. C-3 north of 840th Avenue	23	0.48	6	0.07*	0.15	0.31	0.15
	Br. C-3 meets Br. C-3-2	48	1.01	6	0.08*	0.16	0.16	0.08
	Br. C-3 meets Br. C-3-1	66	1.39	8	0.28	0.64	0.46	0.23
	Br. C-3 north of driveway	71	1.49	8	0.28	0.64	0.43	0.21
	Br. C-3 meets Br. C	79	1.66	8	0.28	0.64	0.39	0.19
C-3-2	Br. C-3-2 meets Br. C-3	25	0.53	6	0.07*	0.15	0.28	0.14
C-3-1	Br. C-3-1 East of TH 71	17	0.36	5	0.10*	0.11	0.31	0.15
C-2	Br. C-2 meets Br. C	29	0.61	6	0.18	0.24	0.39	0.20
C-1	Br. C-1	53	1.11	8	0.05*	0.27	0.24	0.12
*Denotes Assumed Tile Grade								

IV. DISCUSSION OF IMPROVEMENT

The petitioners for the Improvement of the Main Open Ditch, Branch 309, and Branch C of CD 59 have requested the consideration of the construction of improvements in order to increase the drainage capacity of the system. A final survey and the hydrologic and hydraulic analysis of potential improvements to the drainage system has been performed in order to establish preliminary grades and sizes of the proposed improved ditch and culverts, and the preliminary grades, sizes, and depths of the tile systems, and to analyze the outlet. General observations and results of the analysis are as follows:

A. DESCRIPTION

As shown in Exhibit 1, the proposed Improvement consists of the following:

1. **Main Open Ditch** – The improvement will consist of widening and lowering the Main Open Ditch from the downstream side of County Road 59 to the downstream side of the southerly TH 71 crossing. The remaining open ditch upstream of the Southerly TH 71 crossing will be cleaned.

The existing culvert crossing at County Road 59 is to be reconstructed as an 84-inch diameter at a lower grade. The existing culverts at 280th Street, and CSAH 1 are to be replaced with 96-inch diameter reinforced concrete pipe culverts with aprons. The existing culvert crossings at the Field Road east of CSAH 1, and the field crossing between 310th Street and the southerly TH 71 crossing are to be replaced with salvaged 84-inch diameter reinforced concrete pipe culverts without aprons. The existing culverts at 300th Street and 310th Street are to be replaced with new 84" reinforced concrete pipe culverts with aprons. The crossings of the roadways would preferably be made by open cut methods.

The existing open ditch is proposed to be reconstructed from the upstream end of County Road 59 to 280th Street at a 0.03% slope with a ten foot wide bottom and 1V:2H side slopes and from 280th Street to the southerly TH 71 crossing at a 0.03% slope with an eight foot wide bottom and 1V:2H side slopes. The project includes cleaning out the existing open ditch from the southerly TH 71 to the upstream end of the open ditch at the previously established ditch grade.

2. **Branch 309** – The improvement will consist of new tile to replace the existing system. The proposed tiles are offset from the existing tiles in Exhibit 1 for clarity only. The improvement will also include a new tile to the north to intercept the existing CD 59 Main Tile, and bring the runoff from a majority of the Main Tile watershed directly to the lower portion of the Main Open Ditch. The improvement also consists of an extension of Branch 309 into the Northeast Quarter of the Northeast Quarter of Section 32 of Winfield Township.

3. **Branch C** – The improvement will consist of new tiles to replace the existing system. The proposed tiles are offset from the existing tiles in Exhibit 1 for clarity only. The TH 71 crossing will be made by boring and jacking methods, and the route of Branch C-3-1 has been adjusted to avoid a second crossing of TH 71.

4. **Pond #1** – The improvement will consist of a 36" inlet pipe to equalize the water elevation level between CD 59 and the proposed Pond. The outlet for the Pond is a 10" HDPE that discharges on the west side of County Road 59. Due to the proposed location being a currently active gravel pit both the inlet and the outlet pipe will be installed with valves to prevent water flowing into the Pond during mining operations. This Pond as

modeled will store approximately 82 acre-feet of water. A low grade riprap weir will be constructed in the open ditch to promote water flowing into the pond.

5. Other components of the proposed Improvement include:

a) Reconstructing the outlets of existing tiles coming into the open ditch, and any intakes adjacent to the spoil berm impacted by the work.

b) Construct riprap as erosion protection on the outlet side of the culverts, and at the inlet side of the culverts if warranted.

c) Construct riprap slope stabilization along the ditch slopes where side slope stability has been an issue.

d) Reseed the ditch slopes, a minimum of a one-rod buffer (16.5 feet), and any portions of the spoil bank that exceed a one rod width.

e) Reconstructing the surface above the culvert crossings.

f) Generally the new tiles will be constructed lower in elevation than the existing pipe so that all existing tiles will have an outlet.

g) Existing tiles cut by the new tile line will be connected to the new tile.

B. DESIGN DATA

As shown on Exhibit 1, the proposed improvements to the Main Open Ditch CD 59 consists of improving the open ditch and replacing or reinstalling the culvert crossings. The type of pipe that should be used for the improvement is as follows:

1. Precast Reinforced Concrete Pipe (RCP) meeting the requirements of the Minnesota Department of Transportation (MnDOT).

The criteria for the design of the open ditch system are based on Natural Resources Conservation Service (NRCS) methodology. The NRCS Engineering Field Handbook Minnesota Supplement 650.0703 for Grassed Waterways Curve 2 was used to determine the design discharge for the ditch watershed at each of the culvert crossings within the study area and then sizing the culverts to provide 1-foot of freeboard as stated in NRCS Code 608 guidance.

The proposed improvements' efficiency of the Main open ditch is shown in Table 4

Table 4 – Proposed Ditch Capacity Computations

Culvert Location	Culvert Size and Material	Upstream Watershed (Acres)	NRCS Ditch Flow (cfs)	NRCS Ditch Flow (In./ Day)	Ditch Bottom Width (ft)	Est. Max Depth (ft)	Ditch Grade (%)	Ditch Capacity (cfs) (n= 0.035)	Culvert Capacity (cfs) at Max Depth	Limiting Capacity (cfs)	Ditch Efficiency Ratio
TH 71 Crossing North	6' x 4' Cattle Pass	1,683	55	0.78	6	5.6	0.05	128	99	99	1.80
TH 71 Crossing South	6' x 4' Cattle Pass	3,390	107	0.75	6	5.0	0.05	102	102	102	0.95
Field Crossing Section 34	84" RCP	4,434	138	0.74	8	8.4	0.03	422	282	282	2.04
310th Street	84" RCP	5,264	163	0.74	8	9.0	0.03	493	314	314	1.93
300th Street	84" RCP	7,154	220	0.73	8	10.2	0.03	656	370	370	1.68
Field Road	84" RCP	7,335	225	0.73	8	10.0	0.03	627	356	356	1.58

Section 5											
CSAH 1	96" RCP	8,202	251	0.73	8	10.3	0.03	671	424	424	1.69
280th Street	96" RCP	9,090	278	0.73	8	11.9	0.03	937	519	519	1.87
County Road 59	96" RCP	9,702	296	0.73	10	9.0	0.03	543	417	417	1.41
CD 59 at TC&W Crossing w/o CD 17A or CD 37	Dual 16' x 10' Box Culverts	9,858	301	0.73	20	7.3	0.10	772	735	735	1.78
CD 59 with CD 17A	Dual 16' x 10' Box Culverts	36,858	1111	0.72	20	7.3	0.10	772	735	735	0.48
CD 59 with CD 37	Dual 16' x 10' Box Culverts	41,008	1235	0.72	20	7.3	0.10	772	735	735	0.43

The proposed grades for the Branch 309 and Branch C tile improvements are shown on Exhibit 1. The type of pipe to be used for the construction will be specified as one of the following:

1. Dual Wall Polyethylene Drain Tile meeting the requirements of the American Association of State Highway Transportation Officials (AASHTO) Specification No. M294. Pipe will be bedded in granular material as shown on Exhibit 1 and will be both non-perforated and perforated with a geotextile sock.
2. Reinforced concrete pipe meeting the specifications of MnDOT Specification 3352. The joints of the pipe will be covered with geotextile fabric in order to allow some infiltration.
3. Polypropylene Pipe meeting the requirements of ASTM F2736 and AASHTO M330.

The criterion for the design of the tile system size is based on Natural Resource Conservation Services (NRCS) methodology. The minimum design coefficient recommended by the NRCS for drainage systems where row crops are raised on mineral soils, and open intakes are placed on the tile, is 1/2" per day. In other words, the system should be able to drain the amount of water produced by 1/2" of runoff over the entire watershed in one day. Since the Improvement will serve several areas which are depressional in nature, this design criteria has been selected.

The new Branch 309-3 Tile is proposed to relive the existing Main Tile upstream of the connection point by bringing 628 acres straight south to the open ditch rather than the circuitous route that it currently makes.

The capacity of the proposed tiles for Branch 309 and Branch C are shown in Table 5 and Table 6. The tables also show the resulting runoff coefficient provided for the watershed served.

Table 5 – Branch 309 Proposed Tile Capacity Computations

Branch Label	Location	Cumulative Drainage Area (Acres)	NRCS Tile Flow (cfs) (1/2" Per Day)	Tile Size (in.)	Tile Grade (%)	Tile Capacity (cfs) (n = 0.012)	Tile Efficiency Ratio	Tile Coefficient (in./Day)
309	SW & SE 850th and 300th	91	1.91	12	0.30	2.12	1.11	0.55

	Br. 309 Upper End	114	2.39	12	0.50	2.74	1.14	0.57
	Br. 309 West of 300th St.	136	2.86	15	0.20	3.14	1.10	0.55
	Br. 309 East of 300th St.	180	3.78	18	0.15	4.42	1.17	0.58
	Low Area in E1/2 of W/12 Section 33	241	5.06	18	0.20	5.10	1.01	0.50
	Br. 309 Prior to Br. 309-2	259	5.44	24	0.10	7.77	1.43	0.71
	Br. 309 meets Br. 309-2 & 309-3	996	20.92	36	0.10	22.91	1.10	0.55
	Br. 309 meets Br. 309-1	1022	21.47	36	0.10	22.91	1.07	0.53
	Br. 309 meets CD 59 Open Ditch	1032	21.68	36	0.10	22.91	1.06	0.53
New 309-3	Connection to Main Tile	628	13.19	30	0.10	14.09	1.07	0.53
	Connection to Br. 240 Tile	711	14.94	30	0.12	15.43	1.03	0.52
309-2	Br. 309-2	26	0.55	8	0.30	0.72	1.32	0.66
309-1	Br. 309-1	11	0.23	6	0.20	0.27	1.18	0.59

Table 6 – Branch C Proposed Tile Capacity Computations								
Branch Label	Location	Cumulative Drainage Area (Acres)	NRCS Tile Flow (cfs) (1/2" Per Day)	Tile Size (in.)	Tile Grade (%)	Tile Capacity (cfs) (n = 0.012)	Tile Efficiency Ratio	Tile Coefficient (in./Day)
C	Br. C Upper End	9	0.19	6	0.20	0.27	1.44	0.72
	Br. C East 1/2 of E 1/2 of Section 2	21	0.44	8	0.30	0.72	1.63	0.81
	Br. C Prior to Br. C5	78	1.64	12	0.20	1.73	1.06	0.53
	Br. C meets Br. C5	102	2.14	15	0.10	2.22	1.04	0.52
	Br. C meets Br. C-4	277	5.82	24	0.10	7.77	1.34	0.67
	Br. C Meets Br. C-3-1-A	422	8.86	30	0.05	9.96	1.12	0.56
	Br. C meets Br. C-3	525	11.03	30	0.06	10.91	0.99	0.49
	Br. C meets Br. C-2	634	13.32	36	0.05	16.20	1.22	0.61
	Br. C meets Br. C-1	734	15.42	36	0.05	16.20	1.05	0.53
	Br. C meets Open Ditch 59	835	17.54	36	0.06	17.75	1.01	0.51
C-5	Br. C-5	24	0.50	8	0.20	0.59	1.16	0.58
C-4	Br. C-4 Beginning	83	1.74	12	0.20	1.73	0.99	0.50
	Br. C-4 meets Br. C-4-2	89	1.87	15	0.10	2.22	1.19	0.59
	Br. C-4 meets Br. C-4-1	151	3.17	18	0.10	3.61	1.14	0.57
	Br. C-4 meets Br. C	158	3.32	18	0.10	3.61	1.09	0.54
C-4-2	Br. C-4-2 meets Br. C-4	6	0.13	6	0.15	0.24	1.87	0.94
C-4-1	Br. C-4-1 meets Br. C-4	41	0.86	10	0.20	1.06	1.24	0.62
C-3	Br. C-3 North of 840th Avenue	23	0.48	8	0.15	0.51	1.05	0.53
	Br. C-3 Meets Br. C-3-2	48	1.01	8	1.46	1.59	1.57	0.79
	Br. C-3 Meets Br. C-3-1	49	1.03	8	0.70	1.10	1.07	0.53
	Br. C-3 North of Driveway	54	1.13	8	0.75	1.14	1.00	0.50
	Br. C-3 Meets Br. C	62	1.30	10	0.30	1.30	1.00	0.50
C-3-2	Br. C-3-2 Meets Br. C-3	25	0.53	10	0.10	0.75	1.43	0.72
C-3-1-A	Br. C-3-1 East of TH 71	17	0.36	8	0.10	0.42	1.16	0.58
C-2	Br. C-2 Meets Br. C	29	0.61	8	0.25	0.66	1.08	0.54
C-1	Br. C-1	53	1.11	12	0.10	1.22	1.10	0.55
Main	EOP Transition to 20"/22"	224	4.71	20	0.10	4.41	0.94	0.47
	20"/22" Transition to 22"/24"	286	6.01	22	0.10	5.69	0.95	0.47
	22"/24" to open ditch	300	6.30	24	0.10	7.17	1.14	0.57

C. WATER AND SEDIMENT CONTROL BASIN

Exhibit 1 shows the locations for proposed water and sediment control basins (WASCOB). From the Agricultural Best Management Practices Handbook for Minnesota, "WASCOBs consist of an embankment across the slope of a field or minor waterway to temporarily detain and release water through a piped outlet or through infiltration. They are constructed perpendicular to the flow direction. The key benefit of WASCOBs is detaining water from contributing areas, inducing sedimentation, and controlling the release of water, thereby reducing the erosive power of the water downstream."

The proposed basins will temporarily store overland runoff from the watershed. Four basins are proposed to be constructed by constructing berms across natural draws in the land. Details regarding each basin are as shown in Table 7. The slopes on the berms in agricultural fields will be at 1V:40H or flatter so that the berms can still be farmed. The berm will be constructed without a top so that it can be easily navigated. The material used to construct these berms will come from the excess ditch excavation material that is generated by the improvement. These berms will create storage for runoff and will reduce the peak overland flows discharged to the CD 59 Main Open Ditch.

Table 7: Proposed WASCOB Summary

Station	WASCOB	Overflow Elevation	Existing Ground Elevation	Storage Created (Acre-feet)	Total Ponding Area (Acres)
425+00	1	1075	1073	16.5	17.5
566+50	2	1074	1073	15.0	10.5
587+75	3	1078	1076	41.8	38.9

Table 8: Estimated Hydraulic Efficiency of Proposed WASCOBs

WASCOB	Storm of Overtopping	Ponding Time				Ponding Time (hrs)	Ratio of Stress (hr/hr)	Hydraulic Efficiency (%)
		2-year	5-year	10-year	25-year			
1	2-year	33.2	36.4	39.6	45.8	33.2	0.692	30.8%
2	2-year	21.2	27.0	31.0	37.6	21.2	0.442	55.8%
3	25-year	7.4	11.0	14.2	19.0	19.0	0.396	60.4%

The hydraulic efficiency of the proposed WASCOBs can be seen above in 8. The recommended value to use is the average of the four WASCOBs which is 48.6%. This recommendation is based on each of the WASCOBs being Hydraulically connected. To calculate this efficiently the ratio of stress was derived for each of the WASCOBs. This ratio of stress is the ponding time of the WASCOB overtopping divided by 48 hours. 48 hours was chosen based on it being the common recommendation for maximum time water being ponded over vegetation. Hydraulic Efficiency is simply equal to the ratio of stress subtracted from one then multiplied by one hundred percent (to convert it into a percentage). The Hydraulic Efficiency Reduction for these WASCOBs is equal to the Hydraulic Efficiency without the WASCOBs subtracted by the average Hydraulic Efficiency (48.6%). For this system the hydraulic efficiency without the WASCOBs was set to 62% due to the WASCOB located in naturally ponding areas. Therefore, the reduction in hydraulic efficiency for the WASCOBs is equal to 13%.

D. POLLUTION REDUCTION CALCULATIONS

Pollution reduction was calculated using the MPCA watershed pollutant load reduction calculator. The results of those calculations can be seen below in Table 9. These best management practices allow for net reductions between 3.03% and 9.22% for common preventable pollution sources. The treatment acres within Table 9 are watershed acres for the WASCOBs and acre-feet of storage for the Ponds. Please note that for the WASCOBs 49 acres was deducted from the total due to Pond #2 being within the same watershed.

Table 9: Pollution Reduction Calculations							
Best Management Practice	Treatment Acres	Nitrogen (lbs/year)	Nitrogen Reduction (%)	Phosphorus (lbs/year)	Phosphorus Reduction (%)	Suspended Sediment, TSS (T/yr)	TSS Reduction (%)
WASCOBs	926	1,421	2.33	177.1	8.05	13.55	8.42
Ponds	114.9	425	0.7	12.36	0.56	1.295	0.8
Total	1040.9	1845.9	3.03	189.46	8.61	14.845	9.22

E. ONLINE STORAGE

It is porposed to construct online storage within the ditch system. This proposal would provide the storage by excavating out the low areas adjacent to the ditch to the same elevation as the bottom of the ditch. The excavated material would then be placed in the remaining surrounding low areas. This proposal would have the benefit of maintaining similar peak flows for the smaller, more frequent, rainfall events. This proposal would also allow the remaining low area near the storage to be raised up, and offer additional protection from the larger rainfall events.

Three areas, as shown on Exhibit 1, were identified as sites for a potential storage basins.

Pond #1 is located on the upstream side of the County Road 59 crossing. The overtopping elevation of this Pond is to be equivalent to the overtopping elevation of County Road 59 (1066.5-feet). Due to the Pond being an existing gravel pit there is no additional excavation that will need to take place to ensure flow in and out.

Pond #2 is located at the confluence of Branch C-3 and Branches C-3-1 & C-3-2. This location was chosen due to it flooding with some regularity. Pond #2 adds an additional 12,500 cubic yards of storage within the CD 59 system.

Pond #3 is along the open ditch north of 850th Avenue and west of TH 71, just upstream of the northerly TH 71 crossing. The storage area is approximately 7 acres in size, and is approximately 8 to 10 feet lower than the existing ground. Preliminary calculations estimate 75,000 cubic yards of excavation from this site. The excavation material would be used to raise surrounding low areas to the west, and north, higher than elevation 1073.

Construction of these three storage basins will allow the existing TH 71 crossings to be of sufficient size for the design flow event, and freeboard limitations of the surrounding fields.

V. ALTERNATIVE SOLUTIONS

A. "DO NOTHING ALTERNATIVE"

The "Do Nothing" Alternative has been discussed. However, the petitioners have experienced poor drainage throughout the drainage system for many years with the excess surface water damaging crops and resulting in frequent crop stress or crop loss. This loss of production equates to an economic loss for Renville County and the State of Minnesota. The loss results in a reduced property value for the wet acres, thus affecting the taxing capacity of the County and State. In addition, the ability of the landowners to receive a reasonable return on their investment is diminished because of this inadequate drainage.

For these reasons, the "Do Nothing" alternative has been dismissed. The economic question of the cost of the Improvement versus the benefits derived still needs to be evaluated. However, the "Do Nothing" alternative is not viewed as solving the drainage problem in the watershed.

B. WETLAND RESTORATION

Another alternative would be to restore the typically flooded areas of the watershed to wetland use. This alternative would provide storage in the watershed depressional areas for the water that is currently accumulating in these areas and drowning out agricultural crops. The proposal would also have added benefits for wildlife and possibly water quality.

In order to be effective, this alternative would need to restore sufficient acres to wetland use so that the existing ditch system could convey the excess runoff. Utilizing NRCS data, about 380 acre feet of water cannot be discharged from the CD 59 watershed upstream of County Road 59 through the existing drainage systems in a 48-hour period for a 5-year rain event. If sufficient wetland acres were available to store this runoff at a one foot depth, approximately 380 acres of wetland restoration would be needed to provide sufficient storage capacity for the excess runoff.

In order to convert the 380 acres to wetlands, at least twice this many acres would need to be acquired for irregular wetland shapes and marginal damp soils. Thus, about 760 acres of land would be needed. This acquisition would likely involve several properties, whose owners would voluntarily need to agree to the reversion. The estimated cost of acquisition plus reconstructing tile lines for wetland restoration would likely be about $10,000 per acre, resulting in a total cost of about $7.60 million. Wetland restoration is about 2.0 times the estimated cost for the Improvement of the Main Ditch without additional storage, or about 1.6 times the estimated cost for the Improvement of the Main Ditch with the additional storage.

Wetland restoration remains a viable option for providing some improvement in the functioning of the drainage system. If sufficient acres of wetlands could be restored, particularly in the upper part of the watershed, it could reduce the need for as large of an outlet as is proposed. Finding willing landowners to participate in a restoration project and locating sufficient funding would be critical in order to make this option viable. Copies of this Report will be provided to the SWCD and NRCS so that early coordination can occur for potential funding and technical assistance toward this option.

VI. OTHER CONSIDERATIONS

A. PERMIT REQUIREMENTS

A permit from the Minnesota Pollution Control Agency for stormwater and erosion control for the project would be necessary. This permit requirement, which applies to any project that disturbs more than one acre of land, requires that the contractor and owner secure a permit for the project. The permit process will also require erosion control measures to be taken during the construction. Typical erosion control measures include place of riprap and grass stabilization on the ditch bank and inlet protection around installed inlet areas. The fee for this permit is currently $400.00. This permit will be applied for shortly before construction is scheduled so that the contractor can also sign the permit application.

A permit will also be necessary for the crossing of CR 59 and CSAH 1 from the Renville County Highway Department. This permit will be applied for after the Preliminary Hearing

A permit will also be necessary for any work within the TH 71 right of way from MnDOT. This permit will be applied for following the Final Hearing.

B. WETLANDS

National Wetland Inventory Maps have been reviewed to locate potential wetlands subject to regulations. These maps do not show any wetlands within the project watershed, as shown on Sheet 1.01 in Exhibit 1. However, wetlands on farm ground often do not show up on the national inventory maps. Impacts of the potential drainage system on individual land parcels will be evaluated by the Natural Resources Conservation Service upon filing of a Form AD 1026 by landowners. This NRCS process will identify any wetlands and measures that need to be taken in order for the drainage project to avoid impact to these wetlands. Because of federal data privacy requirements, it is not possible for non-landowners to obtain this information. Thus, the obligation for filling out these forms and doing this investigation will rest with individual landowners.

Drainage of non-directly impacted wetland will be controlled by supplemental drainage systems installed by private owners. Owners are advised that under US Army Corps of Engineers and NRCS rules, such supplemental drainage may not be permitted, and may affect US Department of Agriculture program eligibility.

C. PUBLIC AND PRIVATE BENEFITS AND COSTS

The estimated cost of the proposed Improvement to CD 59 is shown in Exhibit 3 of this report. Benefits for the Improvement, both public and private, will be established by the viewers and a report will be available at the final hearing.

Landowners certainly have other costs associated with construction and maintenance of their individual drainage systems. The proposed Improvement would only serve as an outlet or collector of runoff and drainage flow from the lands within the watershed. Each landowner is responsible to construct and maintain their own drainage system in order to drain their farmlands adequately. Individual benefits for an adequate drainage system are in increased crop production from farmlands.

The estimated cost of the proposed Improvement is included in this report. The public and private benefits and damages will be available at the final hearing.

D. AGRICULTRUAL EFFECTS

Once the improvements are constructed, the lands within the improved watershed will be largely dependent on this drainage system for both surface and subsurface drainage flows. Thus, it is imperative that the proposed system have adequate capacity in order to allow for modern farming operations.

It should be noted that many of the established ditch systems in Minnesota are now 70 to 100 years old. These systems are approaching the need for complete repair or replacement if the farmland is to remain productive. When feasible, it is economically imperative that these drainage systems be improved to become compatible with present day farming techniques and they be continually maintained. If properly maintained during normal growing seasons, the agricultural lands in the watershed are some of the most productive in the State of Minnesota.

E. WATER QUALITY

Little change in measureable water quality is anticipated because of this Improvement. However, there are components of the Improvement that will mitigate erosion and help improve water quality on a micro watershed scale. Some of the existing culvert crossings are hydraulically undersized, which leads to higher velocities through the undersized culvert, which can cause scour and erosion on the outlet end of the culvert. Increasing the size of the culvert crossings will lead to lower outlet velocities. At the culvert outlets, riprap will be constructed to further reduce the energy at the outlets, and lessen the erosive force. The largest source of suspended solids in tile system drainage is from water discharging into open intakes. Although open intakes will still be used on the system, ponding occurs around these intakes for any significant storm events. Thus, solids have time to settle rather than being discharged. The use of Hickenbottom risers on these intakes has been shown to result in a significant reduction in suspended solids discharge and thus their use will help with water quality. The one-rod (16.5 feet) buffer strip will be acquired if not already done so, or re-established along the Improvement limits.

Construction of the WASCOBs will also reduce sediment transport and reduce overland flow.

This is done by sediment deposition as water is forced to temporarily pond before over topping the WASCOB or infiltrating through the ground and tile system. The proposed WASCOBs will collect the overland flow from the watershed, which is currently directly discharging into the CD 59 open ditch. Studies have shown that WASCOBs can reduce sediment discharges by 64 to 97%, and sediment-bound phosphorus by 74% to 80%.

As a requirement of the MPCA Erosion Control Permit, the establishment of an erosion control plan is anticipated. Incorporation of such devices as inlet protection, riprap at the outlet and permanent grasses as soon as possible following the construction are anticipated. All of these measures will help to reduce erosion and maintain water quality during the construction of the project.

The Renville County SWCD and NRCS Offices have been contacted regarding conservation measures. The SWCD encourages landowners to sign up for the Conservation Reserve Program (CRP). This is a volunteer program, so landowners are encouraged to call the local agencies to discuss additional conservation measures.

F. FISH AND WILDLIFE

The only threatened or endangered species to have the potential to be in Renville County at the time of this report is the northern long-eared bat. According to the Minnesota DNR, there are no known roost trees or hibernacula in Renville County. Additionally, there are no trees to be removed as a part of the improvement, so there is no impact to the northern long-eared bat. Bald eagles are present in Renville County, and are protected under the Bald and Golden Eagle Protection Act. Again, there are no trees to be removed as a part of the improvement, so there is no impact to the bald eagle.

The open ditch and existing grass buffers are potential wildlife habitat. These areas will be temporarily impacted during the construction of the improvement, but will be restored or improved following the construction. The improvements made to the culvert crossings will reduce the water velocities through the culverts, which will allow for easier passage of fish.

Current wet areas within the project watershed do provide for transitory stop over locations for migratory waterfowl. However, these areas currently dry up following wet periods and are then under cultivation and production. It is anticipated that some of these temporary ponding areas will still exist after the construction of the Improvement although ponding times will likely be reduced. Therefore, the provisions for adequate drainage of these lands will not be of a detrimental nature to local wildlife resources.

G. GROUNDWATER

The purpose of an agricultural drainage system is to maintain the elevation of the shallow groundwater table sufficiently below the surface to provide for efficient production of crops. The level at which the groundwater will be maintained has been and will be determined by the depth of the tile system and private tiles in the area. The proposed Improvement will not significantly lower the bottom of the ditch or the tile system. Additionally, soils within the watershed are typically C or D soils, with low infiltration rates. Therefore, no change in the availability, distribution, or use of the groundwater beyond that necessary for the sufficient production of crops within the watershed is anticipated by this construction. Tiles that have a depth of 6 feet or greater to the invert of the pipe will be non-perforated. Therefore, no change in the availability, distribution or use of the shallow groundwater beyond that necessary for the sufficient production of crops within the watershed is anticipated by this construction.

H. ENVIRONMENTAL IMPACT

The adverse effects of the proposed Improvement are of a temporary nature and are listed as follows:

1. Disturbing of the ground surface during construction could result in the loss of one crop within the construction limits.
2. Embankment areas will be stripped of topsoil prior to the placement of non-topsoil material in order to preserve topsoil.
3. Temporary noise and dust generation can be expected from the construction operations. These impacts are not viewed as significant since there are no residences near the proposed construction route.
4. Temporary erosion of soil may occur in the construction area until permanent ground cover and ground stabilization occurs. Although these effects need to be considered, they are not significantly different from the current topsoil loss that occurs annually from erosion of topsoil due to overland flow in the watershed. This construction erosion will be minimized using inlet protection, riprap, and rapid establishment of permanent grass cover.

Numerous beneficial effects are anticipated from the proposed Improvement. Most of these benefits are directly attributable to increased crop production from lands presently damaged through period flooding and ponding. Among the most obvious benefits are the following:

1. The re-establishment of the grass buffer along the open ditch, decreasing the outlet velocity at the culvert crossings, and the use of Hickenbottom intakes will improve water quality on a micro watershed scale.
2. Increased personal farm income
3. Increased value of benefited farm land
4. Contribution to the local economy through additional purchases, farm modernization, and expansion.

I. LAND USE

The present use of the land in the Improvement watershed is largely agricultural. This use is expected to continue into the future.

J. RESPONSE TO DNR COMMENTS

An advisory report from the Minnesota Department of Natural Resources (DNR) was received by the Drainage Authority prior to the Preliminary Hearing in February of 2018. The advisory report requested that the concerns raised by the DNR be addressed in this Final Engineer's Report.

The DNR requested that mechanisms be explored to reduce flow velocity, trap sediment, and remove excess nutrients. Typically, the highest velocities on open ditch systems are found at the outlets of culvert crossings. This is because the culverts act as a restriction to the flow channel. Typically, the highest velocities and erosive forces are at the outlets for culverts. DNR guidance for culvert crossings seeks to reduce culvert velocity and minimize the difference between the headwater and tailwater differential at culverts. As can be seen in Table , The peak velocities at the County Road 59 outlet are reduced for all events. This generally true for all of the other upstream culverts because the headwater to tailwater differential is being reduced by lowering the hydraulic gradeline of the ditch and reducing the restrictive forces at the culvert crossings.

Table 10 – HydroCAD Existing vs. Proposed + Storage Model Summary at County Road 59			
Flow Event	Existing Peak Culvert Velocity (fps)	Proposed Peak Culvert Velocity (fps)	Change in Peak Culvert Velocity (fps)
0.72" Runoff	9.4	8.4	-1.0
2-Year	10.9	10.9	0.0
5-Year	11.8	11.5	-0.3
10-Year	12.3	12.1	-0.2
25-Year	13.0	12.7	-0.3
50-Year	13.4	13.1	-0.3
100-Year	13.4	13.5	0.1

VII. ADEQUACY OF THE OUTLET

A. GENERAL INFORMATION

As mentioned earlier, CD 59 flows generally east to west to an eventual outlet into County Ditch 37 about two miles west of Danube, just north of the Twin Cities & Western (TC&W) Railroad.

B. ADEQUACY OF THE OUTLET

A HydroCAD model of the watershed was developed to estimate the change in the peak flow rates at County Road 59. HydroCAD is a computer model that computes the runoff storm hydrograph using methodology developed by the Natural Resources Conservation Service. The peak flows computed in HydroCAD are typically higher than those from other models. The intent of the 0.72" runoff event in Table is to show the change in peak flow and elevation for a rain event with a runoff amount equal to the NRCS design ditch flow. A summary of the existing and proposed peak flows and upstream water surface elevations for various frequency flow events at County Road 59 are presented in Table 11, 12 & 13. Three tables are provided to represent a condition with no additional storage created through this project (Table 11). Another to represent a condition when Pond #1 is offline due to minning operations (Table 12). And finally, a condition to represent when the system is operating with all the proposed Best Management Practices (Table 13).

Table 11 – HydroCAD Existing vs. Proposed Without Storage						
Flow Event	Existing Peak Flow (cfs)	Existing Peak Elevation	Proposed Peak Flow (cfs)	Proposed Peak Elevation	Change in Peak Flow (Pro.-Ex.) (cfs)	Change in Peak Elevation (Pro.-Ex.)
0.72" Runoff	347	1061.3	344	1060.7	-3	-0.6
2-Year	418	1062.6	433	1062.5	15	-0.1
5-Year	455	1063.4	460	1063.6	5	0.2
10-Year	473	1064.1	481	1064.4	8	0.3
25-Year	498	1065.2	504	1065.4	6	0.2
50-Year	516	1065.9	525	1066.1	9	0.2
100-Year	574	1066.5	593	1066.6	19	0.1

As can be seen in Table 11, the HydroCAD model shows an increase in the peak headwater elevation at County Road 59 and an increase in peak flowrate for all events except the 0.72" and 2-year Runoff events. Therefore it is our opinion that alternative storage measures should be considered as can be seen below in Tables 12 & 13.

Table 12 – HydroCAD Existing vs. Proposed Without Pond #1						
Flow Event	Existing Peak Flow (cfs)	Existing Peak Elevation	Proposed Peak Flow (cfs)	Proposed Peak Elevation	Change in Peak Flow (Pro.-Ex.) (cfs)	Change in Peak Elevation (Pro.-Ex.)
0.72" Runoff	347	1061.3	342	1060.6	-5	-0.7
2-Year	418	1062.6	432	1062.4	14	-0.2
5-Year	455	1063.4	459	1063.5	4	0.1
10-Year	473	1064.1	480	1064.4	7	0.3
25-Year	498	1065.2	504	1065.4	6	0.2
50-Year	516	1065.9	524	1066.1	8	0.2
100-Year	574	1066.5	592	1066.6	18	0.1

As can be seen in Table 12, the HydroCAD model shows an increase in the peak headwater elevation at County Road 59 and an increase in peak flowrate for all events except the 0.72" and 2-year Runoff events. Therefore, the downstream storage options are not having as significant an impact on the discharge point as Pond #1 (as can be seen below in Table 13).

Table 13 – HydroCAD Existing vs. Proposed With Storage						
Flow Event	Existing Peak Flow (cfs)	Existing Peak Elevation	Proposed Peak Flow (cfs)	Proposed Peak Elevation	Change in Peak Flow (Pro.-Ex.) (cfs)	Change in Peak Elevation (Pro.-Ex.)
0.72" Runoff	347	1061.3	333	1060.4	-14	-0.9
2-Year	418	1062.6	422	1062.1	4	-0.5
5-Year	455	1063.4	446	1063.0	-9	-0.4
10-Year	473	1064.1	466	1063.8	-7	-0.3
25-Year	498	1065.2	489	1064.8	-9	-0.4
50-Year	516	1065.9	505	1065.4	-11	-0.5
100-Year	574	1066.5	522	1066.1	-52	-0.4

As can be seen in Table 13, the HydroCAD model shows a decrease in the peak headwater elevation at County Road 59 and a decrease in peak flowrate for all events. Therefore, it is our opinion that the system is adequate when storage is included.

Table 14 – HydroCAD at TH 71 & 850th Street					
Flow Event	Existing Peak Flow (cfs)	Proposed (w/o Storage) Peak Flow (cfs)	Change in Peak Flow (Pro.w/o-Ex.) (cfs)	Proposed Peak Flow (w/ Storage) (cfs)	Change in Peak Flow (Pro. w/-Ex.) (cfs)
0.72" Runoff	110	81	-29	65	-45
2-Year	121	84	-37	70	-51
5-Year	124	85	-39	76	-48
10-Year	126	86	-40	81	-45
25-Year	127	86	-41	82	-45
50-Year	202	152	-50	133	-76
100-Year	396	319	-77	296	-100

As can be seen in Table 14, the HydroCAD model there is a net reduction in flow rates with or without the storage options.

Table 15 – HydroCAD for Branch C Outlet					
Flow Event	Existing Peak Flow (cfs)	Proposed (w/o Storage) Peak Flow (cfs)	Change in Peak Flow (Pro.w/o-Ex.) (cfs)	Proposed Peak Flow (w/ Storage) (cfs)	Change in Peak Flow (Pro. w/-Ex.) (cfs)
0.72" Runoff	53	57	4	55	2
2-Year	57	161	104	72	15
5-Year	101	275	174	147	46
10-Year	184	389	205	225	41
25-Year	359	572	213	372	13
50-Year	521	728	207	530	9
100-Year	702	900	198	711	9

As can be seen in Table 15, the HydroCAD model shows a net increase in flow rates for both with and without storage. But, the condition with storage significantly decreases the flow rate from the improvement.

Table 15 – HydroCAD for Branch 309 Outlet					
Flow Event	Existing Peak Flow (cfs)	Proposed (w/o Storage) Peak Flow (cfs)	Change in Peak Flow (Pro.w/o-Ex.) (cfs)	Proposed Peak Flow (w/ Storage) (cfs)	Change in Peak Flow (Pro. w/-Ex.) (cfs)
0.72" Runoff	58	57	-1	55	-3
2-Year	185	211	26	175	-10
5-Year	305	354	49	289	-16
10-Year	429	502	73	410	-19
25-Year	690	747	57	629	-61
50-Year	924	961	37	897	-27
100-Year	1,189	1,202	13	1,160	-29

As can be seen in Table 16, the HydroCAD model shows a net increase in flow rate for the proposed condition without storage. But, it also shows a net reduction in flow rate for the proposed condition with storage.

Between the TC&W Railroad, and County Road 59, CD 17A joins with CD 59, and then CD 59 joins with CD 37. The peak flows from Streamstats was obtained at the TC&W Railroad, at CD 17A and CD 37 prior to their confluences with CD 59, and CD 59 at County Road 59. A summary of the flows are presented in Table .

Table 17 – Streamstats Peak Flows

Point Of Interest	TC&W Railroad	CD 17A Prior to CD 59	CD 59 at CR 59	CD 37 Prior to CD 59
Area (Sq Mi)	64.07	42.15	15.88	5.6
2-Year Peak Flood (cfs)	297	214	113	33.5
5-Year Peak Flood (cfs)	675	483	254	74
10-Year Peak Flood (cfs)	1030	733	383	111
25-Year Peak Flood (cfs)	1580	1130	587	171
50-Year Peak Flood (cfs)	2070	1480	769	224
100-Year Peak Flood (cfs)	2650	1890	980	287
2-Year Peak / Area (cfs/Sq Mi.)	4.64	5.08	7.12	5.98

An analysis of Table shows that the peak flow at the TC&W Railroad is not simply the sum of the peak flows of the incoming streams. Peak flow is directly proportional to the watershed area, and inversely proportional to the time of concentration. Therefore, dividing the peak flows from a single event by the watershed area will yield a relationship to the time of concentration. A higher peak flow per area value means that the time of concentration for that watershed is a smaller value (shorter duration). The last row in Table shows the 2-Year peak flow divided by the watershed area for each of the points of interest.

VIII. ESTIMATE OF COST

The preliminary cost estimate to construct the proposed Improvements, as described in this report is shown in Exhibit 3. The total estimated project cost is approximately $5,330,508. Included in the project cost estimate are the acreages of land to be permanently taken out of production for: the widening of the ditch (15.92 acres), and the excavation of Ponds (12.77 acres). The cost estimate also includes compensation for agricultural land that will be temporarily taken out of production by the construction for temporary right-of-way (120.88 acres), and disposal of the Pond #3 excavation (16 acres). The individual landowners will be compensated for this loss through the damage process of the further ditch proceedings.

IX. RECOMMENDATIONS

The proposed Improvements to the Main Open Ditch, Branch 309, and Branch C of CD 59 in Renville County as described in this report is feasible and practical and is necessary in order to provide drainage for the cultivation of crops in this watershed area. The existing drainage in the area is inadequate to provide proper drainage for current agricultural practices. The outlet is adequate in order to convey the discharge with or without the Best Management Practices.

It is the recommendation of your engineer that the Final Engineer’s Report be approved, the Board determines if the Best Management Practices alternatives are to be included in the scope of the improvement and the Board orders the Improvement.

EXHIBIT 1: PRELIMINARY PLANS AND PROFILES

PLAN REVISIONS		
REV	ISSUED FOR	DATE
-	-	-

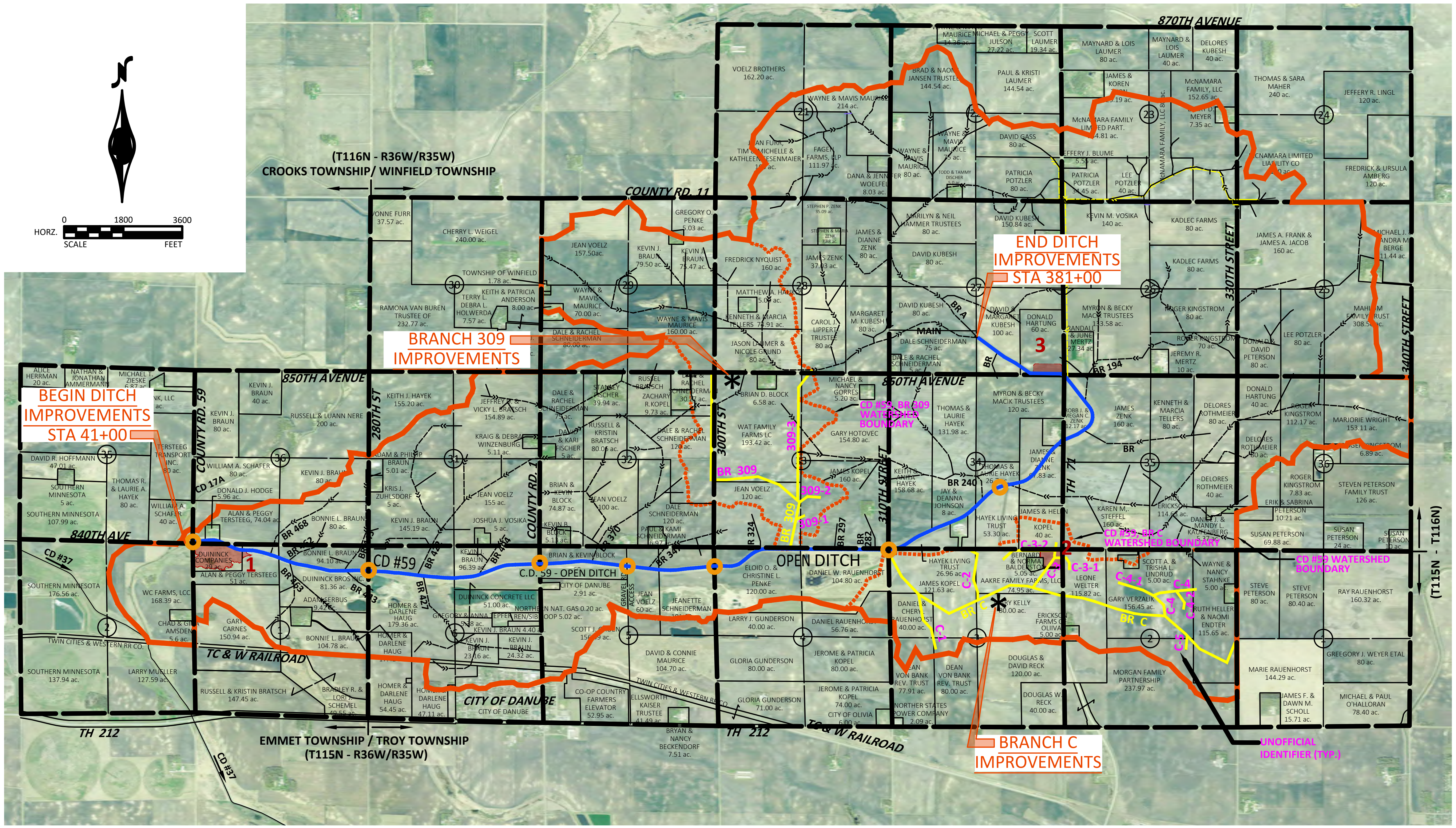
PRELIMINARY CONSTRUCTION PLANS FOR

COUNTY DITCH No. 59 IMPROVEMENTS

RENVILLE COUNTY, MINNESOTA

DITCH IMPROVEMENTS, CULVERT REPLACEMENTS, TILE AND INTAKE IMPROVEMENTS

September, 2023



SHEET INDEX

SHEET NO.	
	GENERAL
G0.01 - G0.02	TITLE, LEGEND & NOTES
	EXISTING CONDITIONS & REMOVALS
C0.01	SECTION NOT USED
	TABLES, DETAILS & PHASING
C1.01	TYPICAL SECTIONS & DETAILS
C1.02	DETAILS
C1.03	DETAILS
	EROSION CONTROL (SWPPP)
C2.01 - C2.02	PLAN & NARRATIVE
C2.03 - C2.05	SOILS
C2.06 - C2.11	EROSION CONTROL & SEEDING
	GRADING
C3.01	GRADING PLAN - STORAGE AREA 2
	SANITARY AND WATER
C4.01	SECTION NOT USED
	STORM SEWER
C5.01-C5.12	COUNTY DITCH 59 - STORM PLAN & PROFILES
C5.21-C5.26	CD 59, BRANCH 309 - STORM PLAN & PROFILES
C5.31-C5.43	CD 59, BRANCH C - STORM PLAN & PROFILES
C5.51-C5.53	CD59, RETENTION POND
	STREETS
C6.01	SECTION NOT USED
	STANDARD DETAILS
C7.01	SECTION NOT USED
	TRAFFIC CONTROL
C8.01	SECTION NOT USED
	CROSS SECTIONS
C9.01-C9.32	COUNTY DITCH 59- CROSS SECTIONS

THIS PLAN SET CONTAINS 82 SHEETS.

NOTE: EXISTING UTILITY INFORMATION SHOWN ON THIS PLAN HAS BEEN PROVIDED BY THE UTILITY OWNER. THE CONTRACTOR SHALL FIELD VERIFY EXACT LOCATIONS PRIOR TO COMMENCING CONSTRUCTION AS REQUIRED BY STATE LAW. NOTIFY GOPHER STATE ONE CALL, 1-800-252-1166 OR 651-454-0002.

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."

LEGEND

- C.D. #59 OVERALL WATERSHED BOUNDARY
- PROPOSED OPEN DITCH IMPROVEMENTS
- PROPOSED TILE IMPROVEMENTS
- BR C OFFICIAL LATERAL IDENTIFIER
- C-1 UNOFFICIAL SUB-LATERAL IDENTIFIER
- C.D. #59 BRANCH 309 & C WATERSHED BOUNDARIES
- STORAGE AREAS
- 1 STORAGE AREAS IDENTIFIER
- PROPOSED CULVERT REPLACEMENT

✦ BM=1058.62	✦ BM=1079.90	✦ BM=1077.05
BENCHMARK DISC NORTH HEADWALL RAILROAD BOX CULVERT & C.D. 59 CROSSING	REFERENCE MARK DISC, NE QUAD COUNTY RD 1 & 840TH AVENUE	BENCHMARK DISC NE QUAD T.H. #71 & 850TH AVENUE

PROJECT DATUM: RENVILLE CO COORDINATES
HORIZONTAL: RENVILLE CO - NAD83 (2007ADJ)
VERTICAL: NAVD88

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
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NOT FOR CONSTRUCTION
SHAUN P. LUKER
LIC. NO. 48756 DATE MM/DD/YYYY

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DESIGNED SPL
DRAWN JGB, CV
CHECKED SPL, BLH
CLIENT PROJ. NO. S15.112473

NO.	ISSUED FOR	DATE

RENVILLE COUNTY, MINNESOTA
CD 59 IMPROVEMENTS
G0 - GENERAL
TITLE

SHEET G0.01

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EXISTING TOPOGRAPHIC SYMBOLS

- ACCESS GRATE
- AIR CONDITION UNIT
- ANTENNA
- AUTO SPRINKLER CONNECTION
- BARRICADE PERMANENT
- BASKETBALL POST
- BENCH
- BIRD FEEDER
- BOLLARD
- BUSH
- CATCH BASIN RECTANGULAR CASTING
- CATCH BASIN CIRCULAR CASTING
- CURB STOP
- CLEAN OUT
- CULVERT END
- DRINKING FOUNTAIN
- DOWN SPOUT
- FILL PIPE
- FIRE HYDRANT
- FLAG POLE
- FLARED END / APRON
- FUEL PUMP
- GRILL
- GUY WIRE ANCHOR
- HANDHOLE
- HANDICAP SPACE
- IRRIGATION SPRINKLER HEAD
- IRRIGATION VALVE BOX
- LIFT STATION CONTROL PANEL
- LIFT STATION
- LIGHT ON POLE
- LIGHT-GROUND
- MAILBOX
- MANHOLE-COMMUNICATION
- MANHOLE-ELECTRIC
- MANHOLE-GAS
- MANHOLE-HEAT
- MANHOLE-SANITARY SEWER
- MANHOLE-STORM SEWER
- MANHOLE-UTILITY
- MANHOLE-WATER
- METER
- ORDER MICROPHONE
- PARKING METER
- PAVEMENT MARKING
- PEDESTAL-COMMUNICATION
- PEDESTAL-ELECTRIC
- PEDESTRIAN PUSH BUTTON
- PICNIC TABLE
- POLE-UTILITY
- POLE-BRACE
- POST
- RAILROAD SIGNAL POLE
- REGULATION STATION GAS
- SATELLITE DISH
- SIGN NON TRAFFIC
- SIGN TRAFFIC
- SIGNAL CONTROL CABINET
- SOIL BORING
- SIREN
- TELEPHONE BOOTH
- TILE INLET
- TILE OUTLET
- TILE RISER
- TRANSFORMER-ELECTRIC
- TREE-CONIFEROUS
- TREE-DEAD
- TREE-DECIDUOUS
- TREE STUMP
- TRAFFIC ARM BARRIER
- TRAFFIC SIGNAL
- TRASH CAN
- UTILITY MARKER
- VALVE
- VALVE POST INDICATOR
- VALVE VAULT
- VAULT
- VENT PIPE
- WATER SPIGOT
- WELL
- WETLAND DELINEATED MARKER
- WETLAND
- WET WELL
- YARD HYDRANT

PROPOSED TOPOGRAPHIC SYMBOLS

- CLEANOUT
- MANHOLE
- LIFT STATION
- STORM SEWER CIRCULAR CASTING
- STORM SEWER RECTANGULAR CASTING
- STORM SEWER FLARED END / APRON
- STORM SEWER OUTLET STRUCTURE
- STORM SEWER OVERFLOW STRUCTURE
- CURB BOX
- FIRE HYDRANT
- WATER VALVE
- WATER REDUCER
- WATER BEND
- WATER TEE
- WATER CROSS
- WATER SLEEVE
- WATER CAP / PLUG
- RIP RAP
- DRAINAGE FLOW
- TRAFFIC SIGNS

SURVEY SYMBOLS

- BENCHMARK LOCATION
- CONTROL POINT
- MONUMENT FOUND
- CAST IRON MONUMENT
- STONE MONUMENT

EXISTING TOPOGRAPHIC LINES

- RETAINING WALL
- FENCE
- FENCE-DECORATIVE
- GUARD RAIL
- TREE LINE
- BUSH LINE

SURVEY LINES

- CONTROLLED ACCESS
- BOUNDARY
- CENTERLINE
- EXISTING EASEMENT LINE
- PROPOSED EASEMENT LINE
- EXISTING LOT LINE
- PROPOSED LOT LINE
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- SETBACK LINE
- SECTION LINE
- QUARTER LINE
- SIXTEENTH LINE
- TEMPORARY EASEMENT

EXISTING UTILITY LINES

- FORCEMAIN
- SANITARY SEWER
- SANITARY SERVICE
- STORM SEWER
- STORM SEWER DRAIN TILE
- WATERMAIN
- WATER SERVICE

PROPOSED UTILITY LINES

- FORCEMAIN
- SANITARY SEWER
- SANITARY SERVICE
- STORM SEWER
- STORM SEWER DRAIN TILE
- WATERMAIN
- WATER SERVICE
- PIPE CASING

GRADING INFORMATION

952
950
952
950
× 953.53
× STA:5+67.19
980.87
1:4

- EXISTING CONTOUR MINOR
- EXISTING CONTOUR MAJOR
- PROPOSED CONTOUR MINOR
- PROPOSED CONTOUR MAJOR
- PROPOSED GRADING LIMITS / SLOPE LIMITS
- PROPOSED SPOT ELEVATION
- RISE:RUN (SLOPE)

HATCH PATTERNS

- BITUMINOUS
- CONCRETE
- GRAVEL

EXISTING PRIVATE UTILITY LINES

NOTE:
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- UNDERGROUND FIBER OPTIC
- UNDERGROUND ELECTRIC
- UNDERGROUND GAS
- UNDERGROUND COMMUNICATION
- OVERHEAD ELECTRIC
- OVERHEAD COMMUNICATION
- OVERHEAD UTILITY

UTILITIES IDENTIFIED WITH A QUALITY LEVEL :

LINE TYPES FOLLOW THE FORMAT: UTILITY TYPE - QUALITY LEVEL
EXAMPLE: G-A G-A UNDERGROUND GAS, QUALITY LEVEL A
UTILITY QUALITY LEVEL (A,B,C,D) DEFINITIONS CAN BE FOUND IN CI/ASCE 38-02.

UTILITY QUALITY LEVELS:

QUALITY LEVEL D: PROVIDES THE MOST BASIC LEVEL OF INFORMATION. IT INVOLVES COLLECTING DATA FROM EXISTING UTILITY RECORDS. RECORDS MAY INCLUDE AS-BUILT DRAWINGS, DISTRIBUTION AND SERVICES MAPS, EXISTING GEOGRAPHIC INFORMATION SYSTEM DATABASES, CONSTRUCTION PLANS, ETC.

QUALITY LEVEL C: INVOLVES SURVEYING VISIBLE SUBSURFACE UTILITY STRUCTURES SUCH AS MANHOLES, HAND-HOLES, UTILITY VALVES AND METERS, FIRE HYDRANTS, PEDESTALS AND UTILITY MARKERS, AND THEN CORRELATING THE INFORMATION WITH EXISTING UTILITY RECORDS TO CREATE COMPOSITE DRAWINGS. INCLUDES QUALITY LEVEL D ACTIVITIES.

QUALITY LEVEL B: INVOLVES DESIGNATING THE HORIZONTAL POSITION OF SUBSURFACE UTILITIES THROUGH SURFACE DETECTION METHODS AND COLLECTING THE INFORMATION THROUGH A SURVEY METHOD. INCLUDES QUALITY LEVEL C AND D TASKS.

QUALITY LEVEL A: PROVIDES THE HIGHEST LEVEL OF ACCURACY. IT INVOLVES LOCATING OR POTHOLING UTILITIES AS WELL AS ACTIVITIES IN QUALITY LEVELS B, C, AND D. THE LOCATED FACILITY INFORMATION IS SURVEYED AND MAPPED AND THE DATA PROVIDES PRECISE PLAN AND PROFILE INFORMATION.

ABBREVIATIONS

A	ALGEBRAIC DIFFERENCE	GRAV	GRAVEL	RSC	RIGID STEEL CONDUIT
ADJ	ADJUST	GU	GUTTER	RT	RIGHT
ALT	ALTERNATE	GV	GATE VALVE	SAN	SANITARY SEWER
B-B	BACK TO BACK	HDPE	HIGH DENSITY POLYETHYLENE	SCH	SCHEDULE
BIT	BITUMINOUS	HH	HANDHOLE	SERV	SERVICE
BLDG	BUILDING	HP	HIGH POINT	SHLD	SHOULDER
BMP	BEST MANAGEMENT PRACTICE	HWL	HIGH WATER LEVEL	STA	STATION
BR	BEGIN RADIUS	HYD	HYDRANT	STD	STANDARD
BV	BUTTERFLY VALVE	I	INVERT	STM	STORM SEWER
CB	CATCH BASIN	K	CURVE COEFFICIENT	TC	TOP OF CURB
C&G	CURB AND GUTTER	L	LENGTH	TE	TEMPORARY EASEMENT
CIP	CAST IRON PIPE	LO	LOWEST OPENING	TEMP	TEMPORARY
CIPP	CURED-IN-PLACE PIPE	LP	LOW POINT	TNH	TOP NUT HYDRANT
CL	CENTER LINE	LT	LEFT	TP	TOP OF PIPE
CL.	CLASS	MAX	MAXIMUM	TYP	TYPICAL
CLVT	CULVERT	MH	MANHOLE	VCP	VITRIFIED CLAY PIPE
CMP	CORRUGATED METAL PIPE	MIN	MINIMUM	VERT	VERTICAL
C.O.	CHANGE ORDER	MR	MID RADIUS	VPC	VERTICAL POINT OF CURVE
COMM	COMMUNICATION	NIC	NOT IN CONTRACT	VPI	VERTICAL POINT OF INTERSECTION
CON	CONCRETE	NMC	NON-METALLIC CONDUIT	VPT	VERTICAL POINT OF TANGENT
CSP	CORRUGATED STEEL PIPE	NTS	NOT TO SCALE	WM	WATERMAIN
DIA	DIAMETER	NWL	NORMAL WATER LEVEL		
DIP	DUCTILE IRON PIPE	OHW	ORDINARY HIGH WATER LEVEL		
DWY	DRIVEWAY	PC	POINT OF CURVE	AC	ACRES
E	EXTERNAL CURVE DISTANCE	PCC	POINT OF COMPOUND CURVE	CF	CUBIC FEET
ELEC	ELECTRIC	PE	PERMANENT EASEMENT	CV	COMPACTED VOLUME
ELEV	ELEVATION	PED	PEDESTRIAN, PEDESTAL	CY	CUBIC YARD
EOF	EMERGENCY OVERFLOW	PERF	PERFORATED PIPE	EA	EACH
ER	END RADIUS	PERM	PERMANENT	EV	EXCAVATED VOLUME
ESMT	EASEMENT	PI	POINT OF INTERSECTION	LB	POUND
EX	EXISTING	PL	PROPERTY LINE	LF	LINEAR FEET
FES	FLARED END SECTION	PRC	POINT OF REVERSE CURVE	LS	LUMP SUM
F-F	FACE TO FACE	PT	POINT OF TANGENT	LV	LOOSE VOLUME
FF	FINISHED FLOOR	PVC	POLYVINYL CHLORIDE PIPE	SF	SQUARE FEET
F&I	FURNISH AND INSTALL	PVMT	PAVEMENT	SV	STOCKPILE VOLUME
FM	FORCEMAIN	R	RADIUS	SY	SQUARE YARD
FO	FIBER OPTIC	R/W	RIGHT-OF-WAY		
F.O.	FIELD ORDER	RCP	REINFORCED CONCRETE PIPE		
GRAN	GRANULAR	RET	RETAINING		

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PRELIMINARY
NOT FOR CONSTRUCTION

SHAUN P. LUKER
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DESIGNED SPL
DRAWN JGB, CV
CHECKED SPL, BLH
CLIENT PROJ. NO. S15.112473

NO.	ISSUED FOR	DATE

RENVILLE COUNTY, MINNESOTA
CD 59 IMPROVEMENTS
LEGEND, GENERAL NOTES

SHEET G0.02

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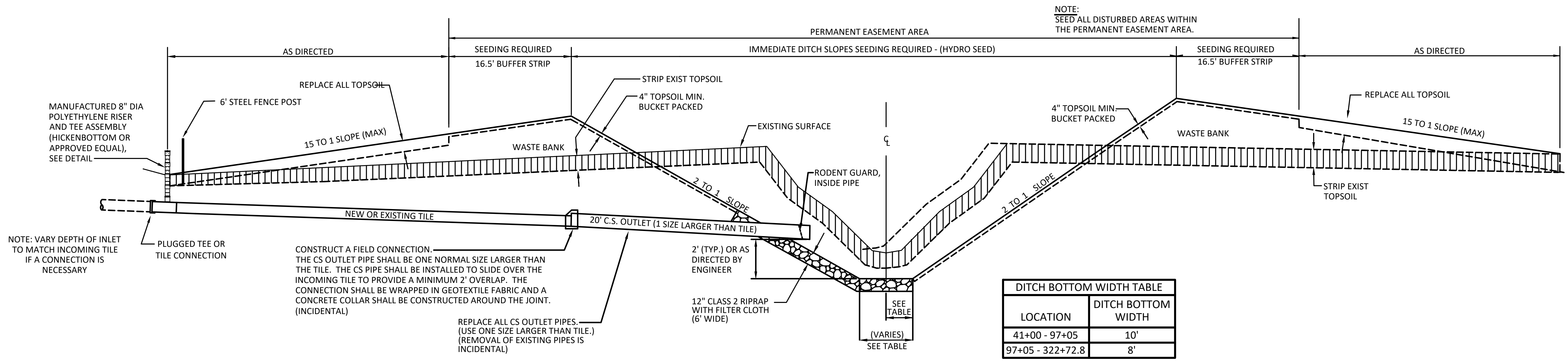
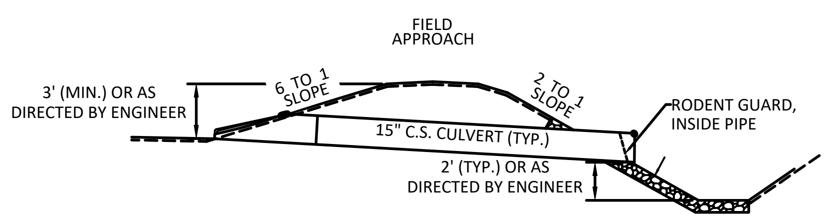


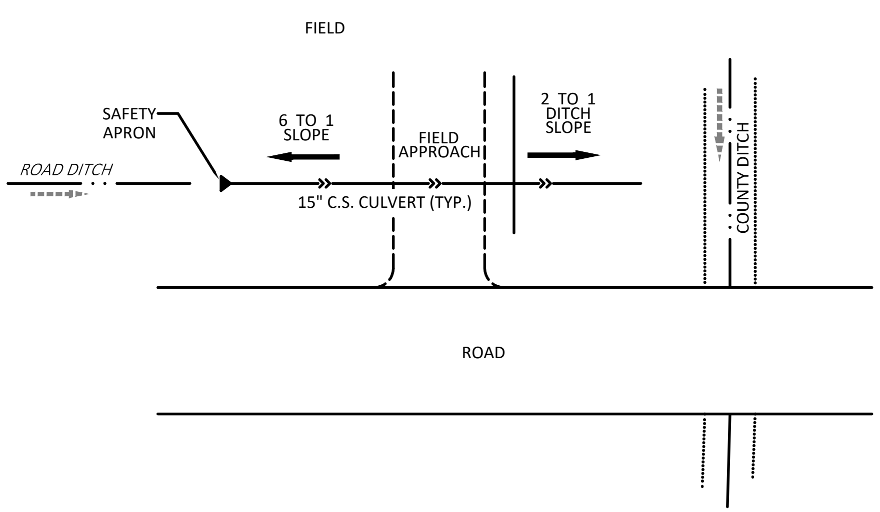
DITCH BOTTOM WIDTH TABLE	
LOCATION	DITCH BOTTOM WIDTH
41+00 - 97+05	10'
97+05 - 322+72.8	8'

TYPICAL SECTION OF OPEN DITCH 43+06 TO 322+72

NOT TO SCALE



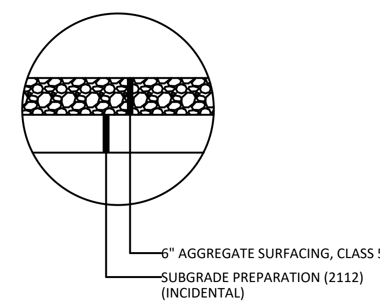
CROSS SECTION



PLAN VIEW

FLUME/FIELD APPROACH

NOT TO SCALE



DRIVEWAY RESTORATION

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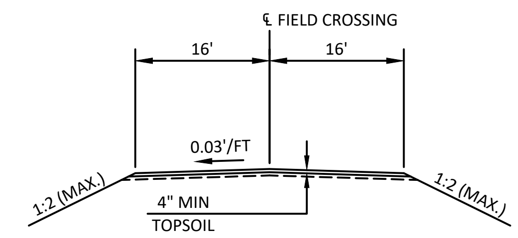
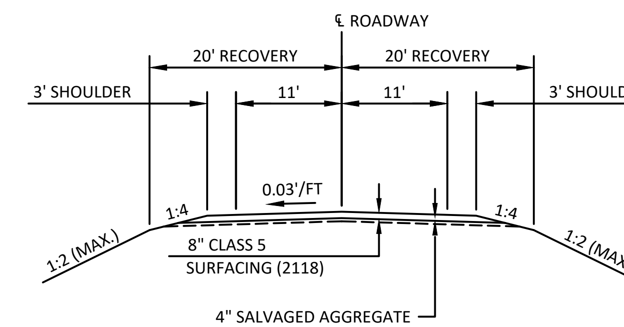


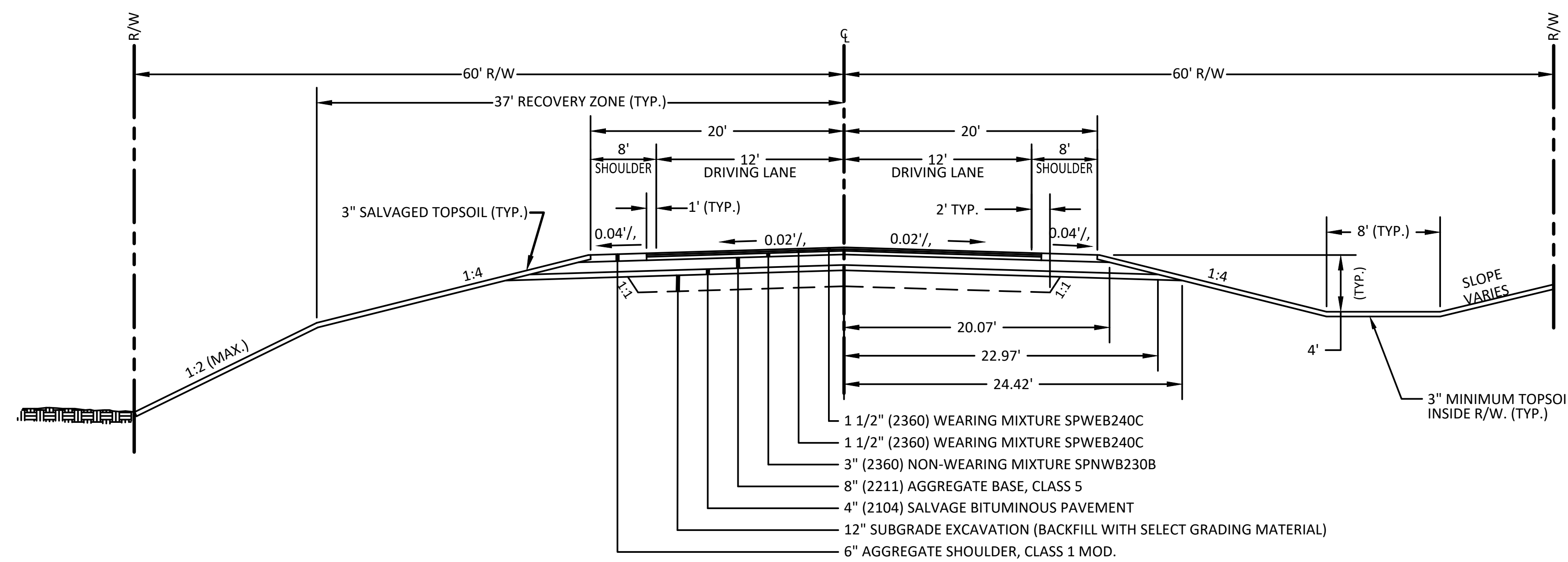
PROPOSED FIELD CROSSING TYPICAL SECTION

NOT TO SCALE



PROPOSED TOWNSHIP ROAD TYPICAL SECTION

NOT TO SCALE



PROPOSED CSAH 1 ROAD TYPICAL SECTION

NOT TO SCALE

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NOTE: DETAILS ARE NOT TO SCALE

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LIC. NO. 48756 DATE MM/DD/YYYY

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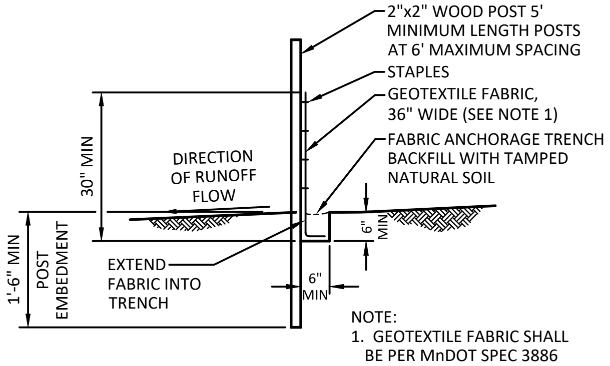
NO.	ISSUED FOR	DATE

RENVILLE COUNTY, MINNESOTA
CD 59 IMPROVEMENTS
C1 - TABLES DETAILS & PHASING
112473C101 - DET 1

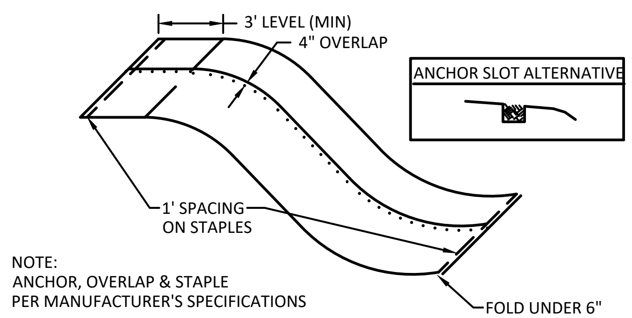
SHEET C1.01



NOTE:
1. GEOTEXTILE FABRIC SHALL BE PER MnDOT SPEC 3886

HAND PLACED SILT FENCE - PREASSEMBLED

NOT TO SCALE

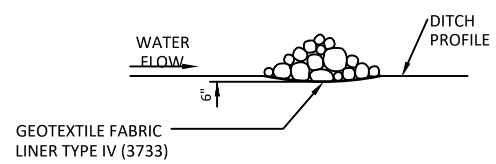


NOTE:
ANCHOR, OVERLAP & STAPLE PER MANUFACTURER'S SPECIFICATIONS

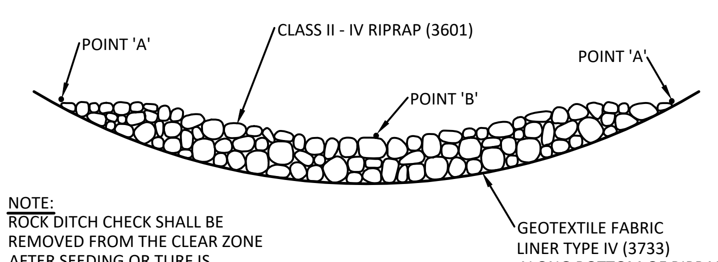
NOTE:
CONSTRUCT EROSION CONTROL BLANKET AT DESIGNATED LOCATIONS AS SHOWN ON PLANS.

EROSION CONTROL BLANKET INSTALLATION

NOT TO SCALE



PROFILE VIEW



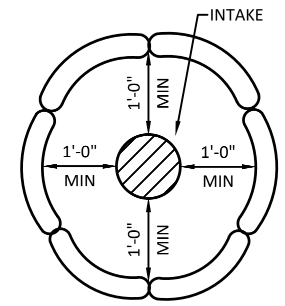
NOTE:
ROCK DITCH CHECK SHALL BE REMOVED FROM THE CLEAR ZONE AFTER SEEDING OR TURF IS ESTABLISHED AND PRIOR TO FINAL ACCEPTANCE

CROSS SECTION

POINT 'A' MUST BE 1'-0" MINIMUM HIGHER THAN POINT 'B' TO ENSURE THAT WATER FLOWS OVER THE DIKE AND NOT AROUND THE ENDS.

DITCH CHECK - RIPRAP

NOT TO SCALE

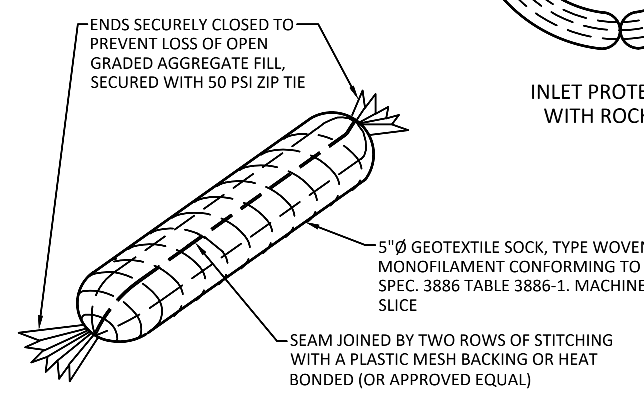


FILL ROCK LOG WITH 45 LBS. OF OPEN GRADED AGGREGATE CONSISTING OF SOUND, DURABLE PARTICLES OF CRUSHED QUARRY ROCK OR GRAVEL CONFORMING TO THE FOLLOWING GRADATION.

GRADATION

SIEVE SIZE	PERCENT PASSING
1 1/2"	100
1"	95-100
3/4"	65-95
3/8"	30-65
NO 4	10-35
NO 10	3-20
NO 40	0-8
NO 200	0-3

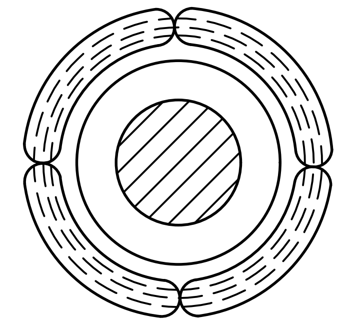
NOTE:
CRUSHED CONCRETE OR BITUMINOUS SHALL NOT BE USED FOR OPEN GRADED AGGREGATE.



INLET PROTECTION ROCK BAG

NOT TO SCALE

PAYMENT SHALL INCLUDE ALL MATERIALS, FILLING OF LOG, PLACEMENT, MAINTENANCE & REMOVAL;
80% OF BID PRICE SHALL BE PAID UPON PROPER PLACEMENT WITH THE FINAL 20% PAID UPON REMOVAL



INLET PROTECTION WITH ROCK LOG

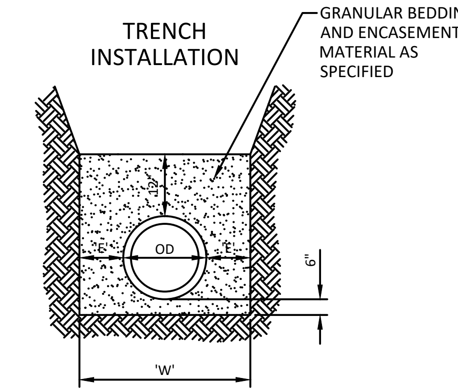
NOTES:
1. BEDDING AND EMBEDMENT MATERIAL PER SPECIFICATIONS.

2. CONSTRUCTION REQUIREMENTS PER SPEC 2451 MODIFIED SO THAT EMBEDMENT MATERIAL IS COMPACTED IN UNIFORM LIFTS, 8" OR LESS IN DEPTH, LOOSE MEASURE, TO 95% STANDARD PROCTOR DENSITY FROM THE BEDDING TO A MINIMUM DEPTH OF AT LEAST 12" ABOVE THE CROWN OF THE PIPE.

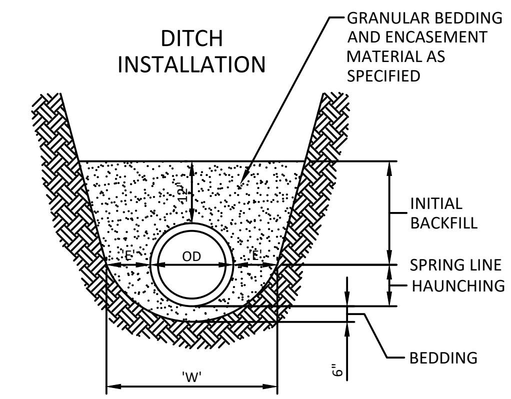
3. COST FOR FURNISHING AND INSTALLING GRANULAR BEDDING AND ENCASEMENT MATERIALS SHALL BE INCLUDED IN THE PRICE BID FOR POLYETHYLENE PIPE, PER LINEAL FOOT.

PIPE SIZE	PIPE OD (Nominal)	'E' ENVELOPE WIDTH (Minimum)	MINIMUM TRENCH WIDTH (OD+2E)
4"	4.6"	3"-4"	10"
6"	6.8"	4"-6"	14"
8"	9.5"	4"-6"	20"
10"	11.6"	5"-8"	24"
12"	14.2"	5"-8"	30"
15"	17.7"	5"-8"	34"
18"	22.0"	6"-10"	38"
24"	29.5"	8"-12"	46"
30"	35.4"	8"-12"	60"
36"	41.0"	8"-12"	65"

TRENCH INSTALLATION

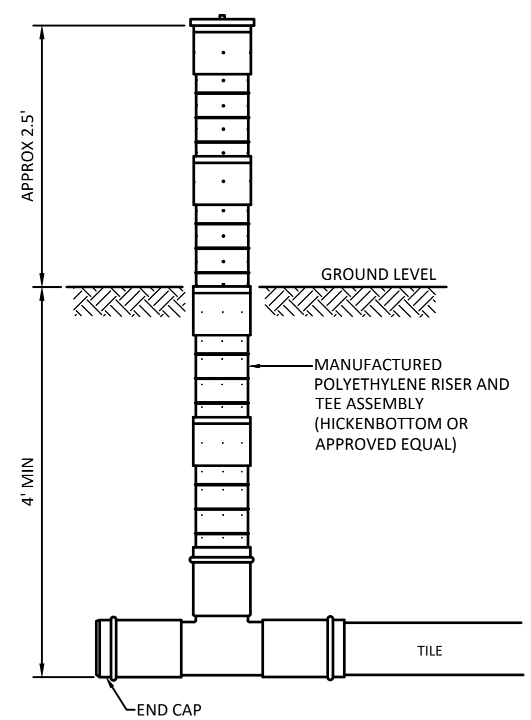


DITCH INSTALLATION



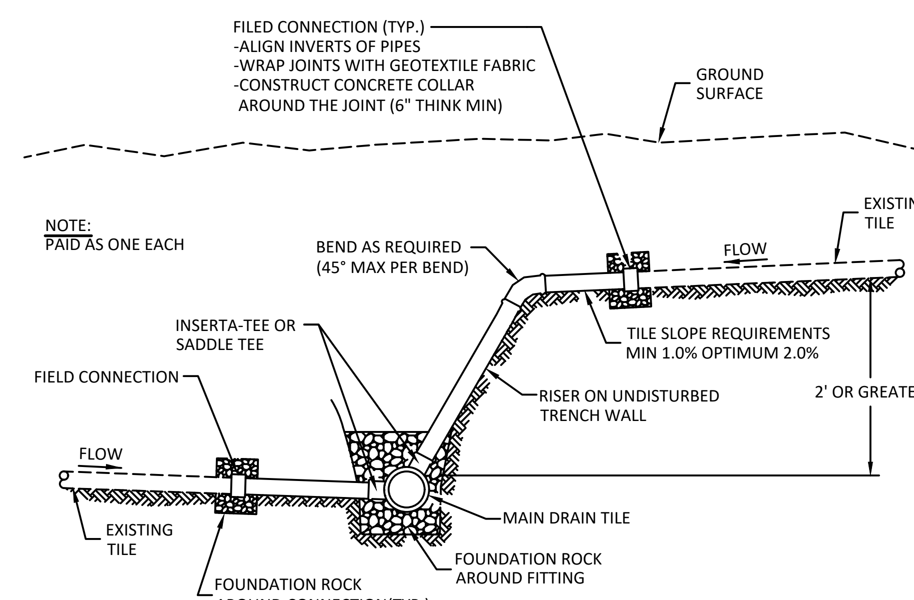
DUAL WALL POLYETHYLENE TRENCH

NOT TO SCALE



SURFACE WATER INTAKE RISER

NOT TO SCALE



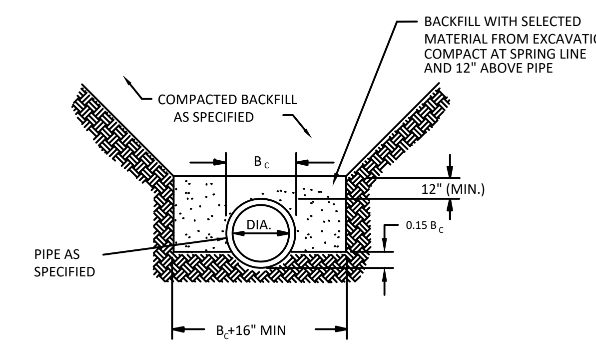
NOTE:
PAID AS ONE EACH

NO RISER REQUIRED

RISER REQUIRED

DRAIN TILE CONNECTION

NOT TO SCALE



PIPE DIA.	B
36" OR LESS	B_c+ 24"
42" TO 54"	1.5 x B_c
60" OR OVER	B_c+ 36"

TRENCH DETAIL
C.S. & REINFORCED CONCRETE PIPE
CLASS "C" BEDDING CONDITION

NOT TO SCALE

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PRELIMINARY
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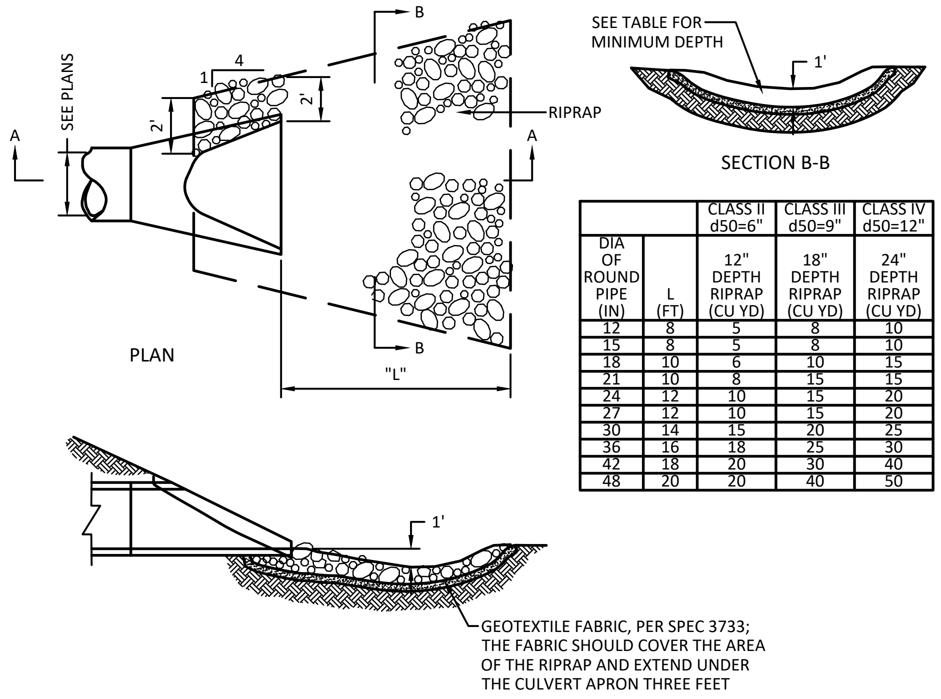
DESIGNED	SPL
DRAWN	JGB, CV
CHECKED	SPL, BLH
CLIENT PROJ. NO.	S15.112473

NO.	ISSUED FOR	DATE

RENVILLE COUNTY, MINNESOTA
CD 59 IMPROVEMENTS
C1 - TABLES DETAILS & PHASING
112473C101 - DET 2

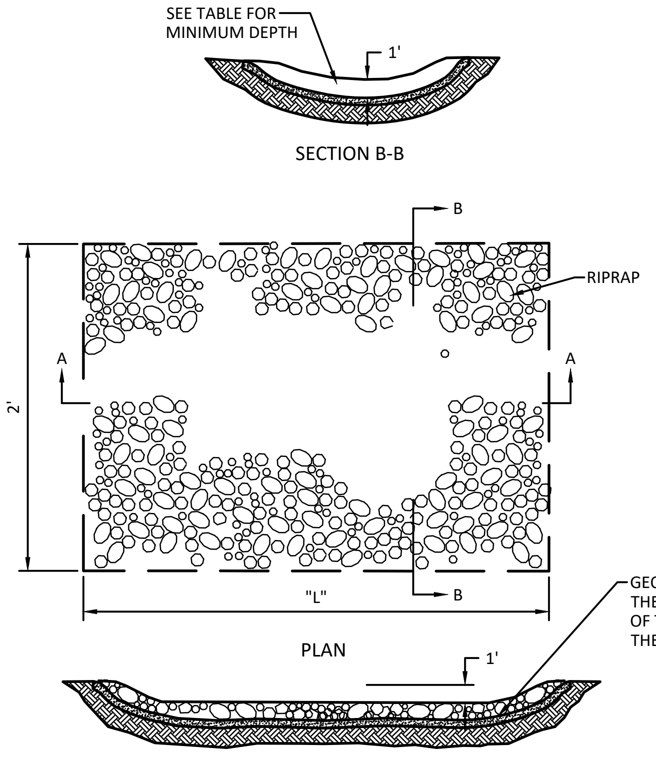
SHEET
C1.02



		CLASS II d50=6"	CLASS III d50=9"	CLASS IV d50=12"
DIA OF ROUND PIPE (IN)	L (FT)	12" DEPTH RIPRAP (CU YD)	18" DEPTH RIPRAP (CU YD)	24" DEPTH RIPRAP (CU YD)
12	8	5	8	10
15	8	5	8	10
18	10	6	10	15
21	10	8	15	15
24	12	10	15	20
27	12	10	15	20
30	14	15	20	25
36	16	18	25	30
42	18	20	30	40
48	20	20	40	50

RIPRAP AT RCP CULVERT END

NOT TO SCALE



RIPRAP BASIN

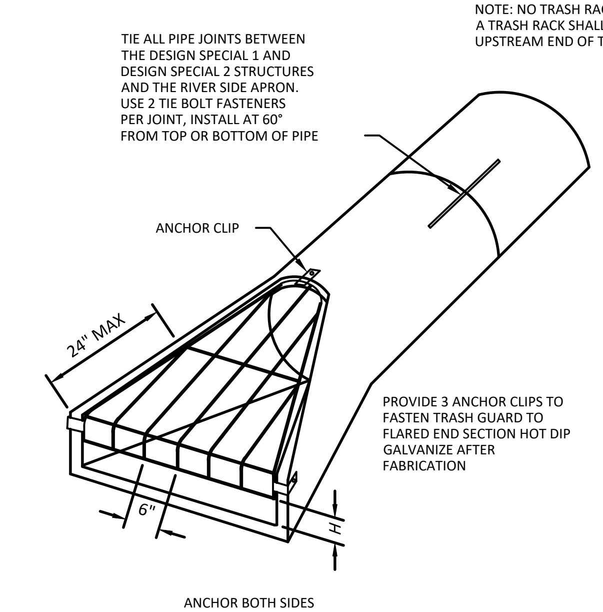
NOT TO SCALE

			CLASS III d50=9"	CLASS IV d50=12"
DIA OF ROUND PIPE (IN)	L (FT)	W (FT)	18" DEPTH RIPRAP (CU YD)	24" DEPTH RIPRAP (CU YD)
72	40	30	200	
84	40	30	200	
84	100	60		1333
96	40	30	200	

OR

DIA OF ROUND PIPE (IN)	L (FT)	W (FT)	DEPTH RIPRAP (IN)	CLASS RIPRAP
72	40	30	18	III
84	40	30	18	III
84	12	12	24	IV
96	40	30	18	III

NOTE: NO TRASH RACK ON DOWNSTREAM ENDS
A TRASH RACK SHALL BE FURNISHED ON THE
UPSTREAM END OF THE 60" RCP CULVERT

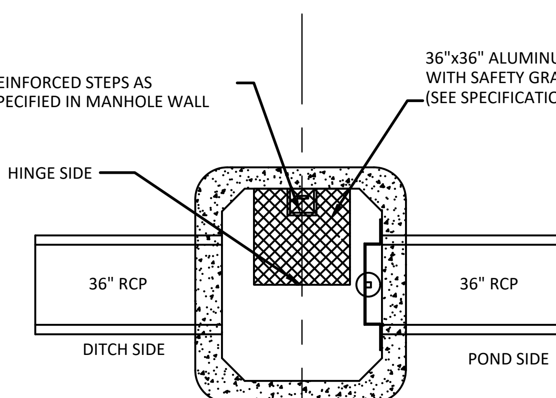


TRASH GUARD SIZES			
PIPE SIZE	BARS	"H"	BOLTS
12"-18"	3/4"Ø	4"	5/8"
21"-42"	1"Ø	6"	3/4"
42"-72"	1 1/4"Ø	12"	1"

RC APRON TRASH RACK

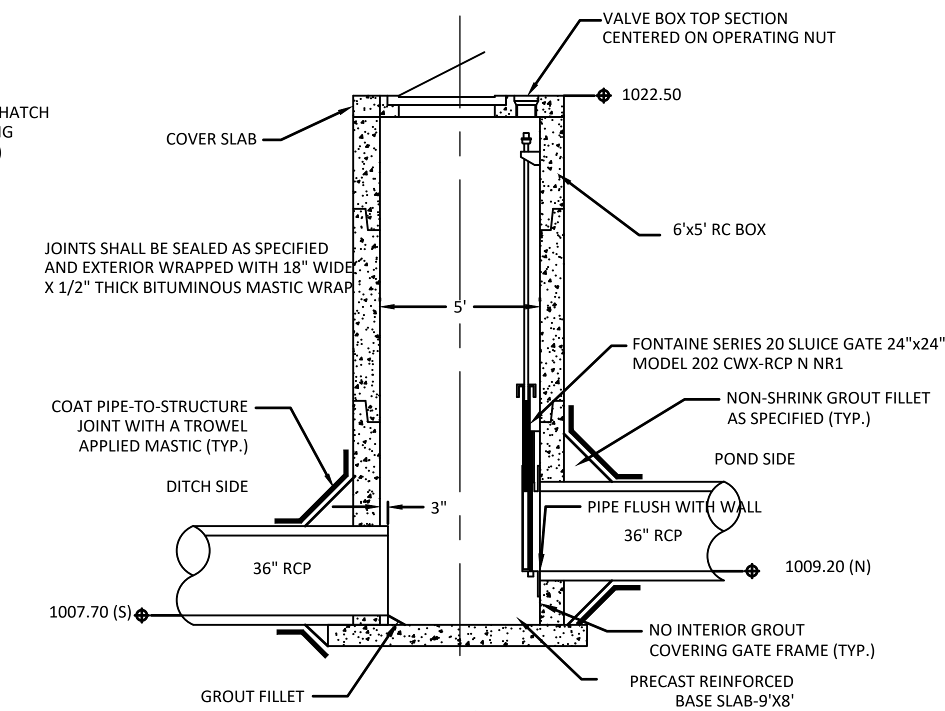
(STEEL BARS)

NOT TO SCALE



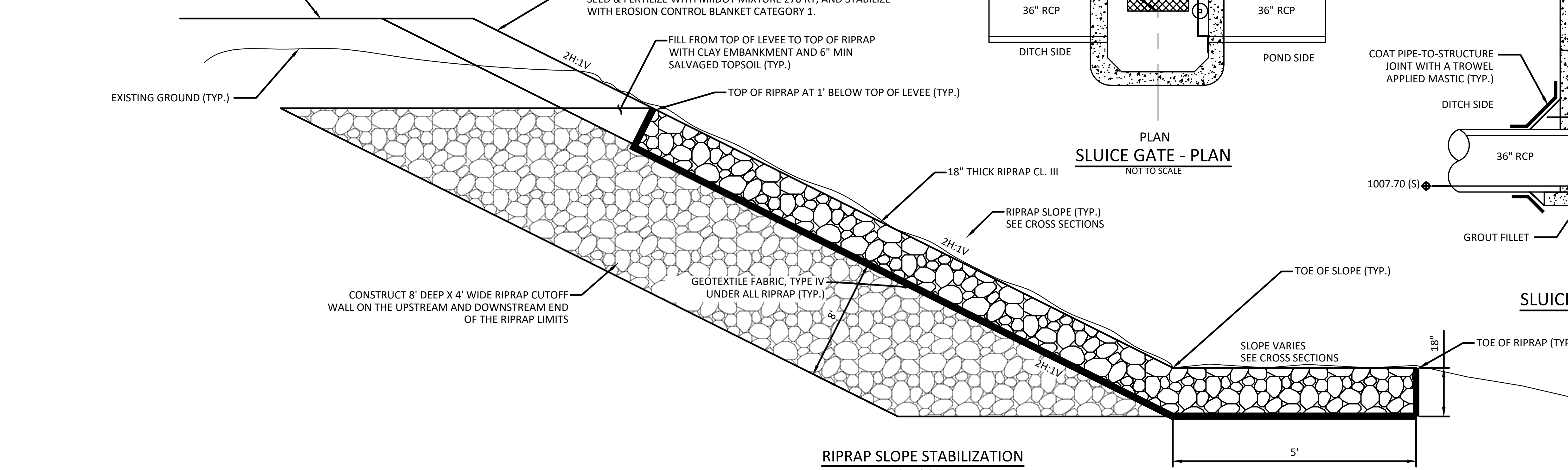
SLUICE GATE - PLAN

NOT TO SCALE



SLUICE GATE - SECTION

NOT TO SCALE



RIPRAP SLOPE STABILIZATION

NOT TO SCALE

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DESIGNED SPL	NO.	ISSUED FOR	DATE	
DRAWN JGB, CV				
CHECKED SPL, BLH				
CLIENT PROJ. NO. S15.112473				

RENVILLE COUNTY, MINNESOTA

CD 59 IMPROVEMENTS

C1 - TABLES DETAILS & PHASING

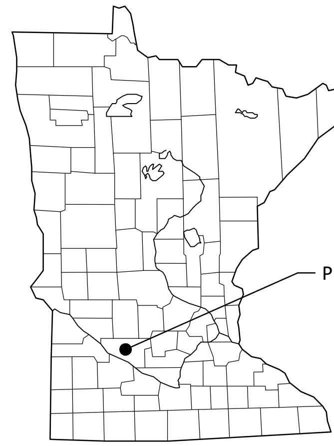
112473C101 - DET 3

SHEET C1.03

STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

CD 59 IMPROVEMENTS - 2022

RENVILLE COUNTY, MINNESOTA



LEGEND

- 1-MILE BOUNDARY
- PROJECT BOUNDARY
- IMPAIRED, SPECIAL OR PROTECTED WATERS
- NATIONAL WETLANDS INVENTORY
- RECEIVING WATERS

RESPONSIBLE PARTIES:
The Contractor and Owner will be joint applicants under the MPCA's General Stormwater Permit for Construction Activity as required by the National Pollutant Discharge Elimination System (NPDES) Phase II program.

The Contractor shall provide one or more trained Construction SWPPP Manager(s) knowledgeable and experienced in the application of erosion prevention and sediment control BMPs that will oversee the implementation of the SWPPP, and the installation, inspection and maintenance of the erosion prevention and sediment control BMPs.

A Construction SWPPP Manager must be available for an on-site inspection within 72 hours upon request by the MPCA.

	COMPANY	CONTACT PERSON	PHONE
OWNER:	Renville County	Seth Sparks	320-523-3746
SWPPP DESIGNER:	Bolton & Menk, Inc.	Shaun Luker	507-794-5541
CONTRACTOR:	TBD	TBD	TBD
CONSTRUCTION SWPPP MANAGER:	TBD	TBD	TBD
PARTY RESPONSIBLE FOR LONG TERM O&M:	Renville County	Seth Sparks	320-523-3746

The SWPPP Designer, Construction SWPPP Manager, and BMP Installer must have appropriate training. Documentation showing training commensurate with the job duties and responsibilities is required to be included in the SWPPP prior to any work beginning on the site. Training documentation for the SWPPP Designer is included on the Narrative sheet. The Contractor shall attach training documentation to this SWPPP for the Construction SWPPP Manager and BMP Installer prior to the start of construction. This information shall be kept up to date until the project NOT is filed.

ADDITIONAL COMPENSATION
Payment for all work associated with Erosion and Sediment Control shall be as described in the Project Manual. Unless otherwise authorized by the Owner no additional payment shall be made for any work required to administer and maintain the site erosion and sediment control in compliance with the Minnesota Pollution Control Agency (MPCA) - General Stormwater Permit for Construction Activity (MN R100001) including but not limited to inspection, maintenance, and removal of BMPs or addition of BMPs to accommodate Contractor phasing.

DOCUMENT RETENTION
Permittees must make the SWPPP, including all inspection reports, maintenance records, training records and other information required by this permit, available to federal, state, and local officials within three (3) days upon request for the duration of the permit and for three (3) years following the NOT.

GENERAL STORMWATER DISCHARGE REQUIREMENTS
All requirements listed in Section 5.1 of the Permit for the design of the permanent stormwater management system and discharge have been included in the preparation of this SWPPP. These include but are not limited to:

1. The expected amount, frequency, intensity, and duration of precipitation.
2. The nature of stormwater runoff and run-on at the site
3. Peak flow rates and stormwater volumes to minimize erosion at outlets and downstream channel and stream bank erosion.
4. The range of soil particle sizes expected to be present on the site.

Permanent stormwater treatment systems for this project have been designed in accordance with the guidance in the MN Stormwater Manual in place at the time of bidding. Copies of the design information and calculations are part of this SWPPP and will be provided in digital format upon written request to the Engineer.

PROJECT AREAS:

Total Project Size (disturbed area) =	215.3	ACRES
Existing area of impervious surface =	0.5	ACRES
Post construction area of impervious surface =	0.5	ACRES
Total new impervious surface area created =	0.0	ACRES

Planned Construction Start Date:	TBD
Estimated Construction Completion Date:	TBD

PERMANENT STORMWATER MANAGEMENT SYSTEM:
Type of storm water management used if more than 1 acre of new impervious surface is created:

	Wet Sedimentation Basin
	Infiltration/Filtration
	Regional Pond
X	Permanent Stormwater Management Not Required
X	Less than 1 Acre of Impervious Surface Created

PROJECT LOCATION:

COUNTY	TOWNSHIP	RANGE	SECTION	LATITUDE	LONGITUDE
RENVILLE	T115N, T116N	R35W, R36W	1-2, 2-6, 36, 21-36	44.8038°	-95.0671°

BMP SUMMARY	QUANTITY	UNIT
RAPID STABILIZATION, METHOD 4	6750	SQ YD
RAPID STABILIZATION, METHOD 3	15	ACRES
INTERMEDIATE DITCH SLOPE SEEDING	366	STATION
TYPE 1 MULCH	140	TON
INLET PROTECTION	170	EACH
FILTER BERM, TYPE 5	150	LIN FT
SEDIMENT CONTROL LOG, TYPE STRAW	5500	LIN FT
STABILIZED CONSTRUCTION EXIT	1	LUMP SUM

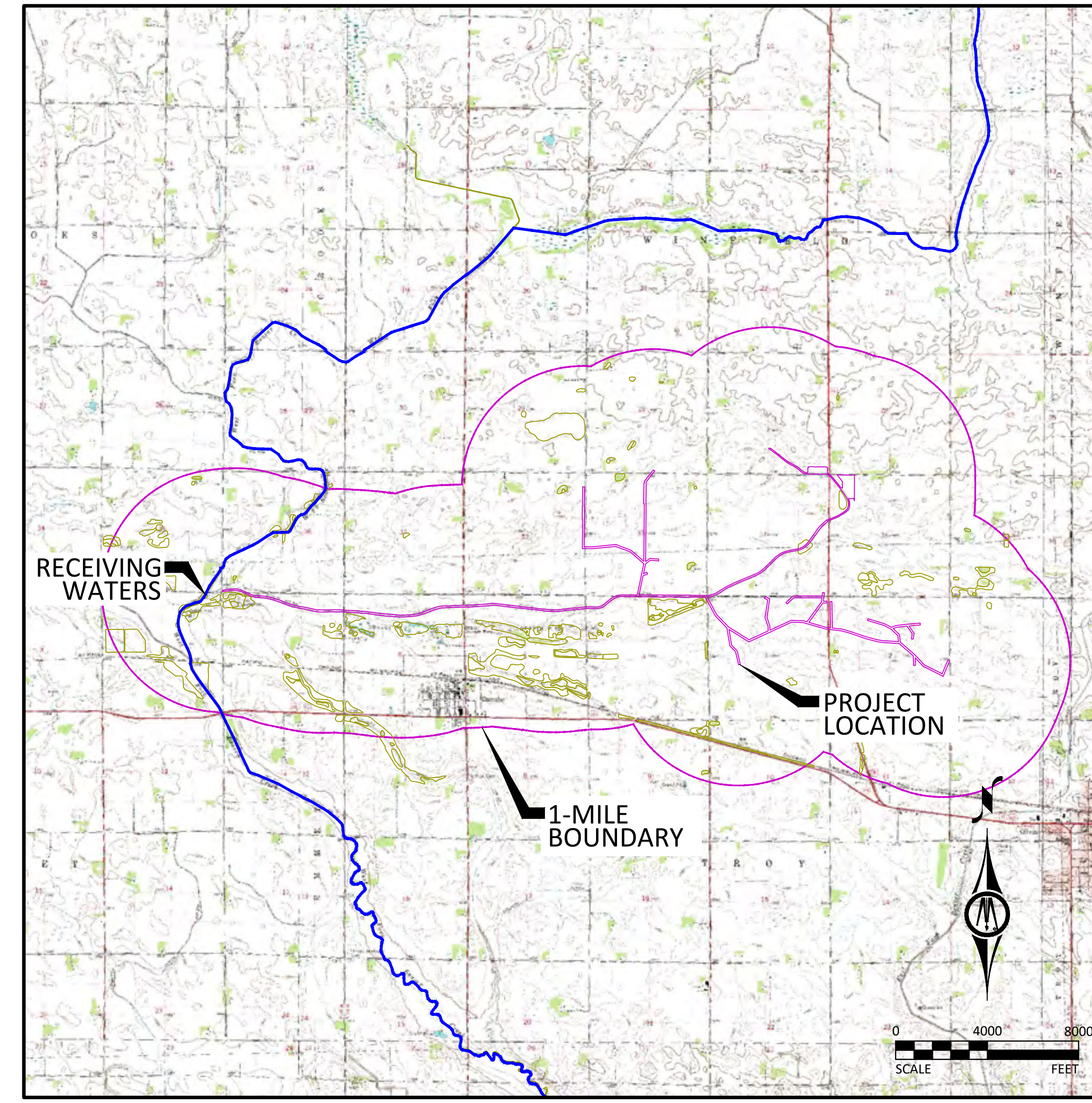
DESCRIPTION OF CONSTRUCTION ACTIVITIES AND STORMWATER MANAGEMENT:
Construction activities include: Site grading, sanitary sewer and water main extensions, temporary erosion and sediment control, and permanent stabilization.

Stormwater currently flows overland in agricultural fields, through various tiles, and then to the existing CD 59.

After construction is complete stormwater will continue to flow overland, and through the updated tile system.

This project includes the following stormwater management BMPs

- Rapid Stabilization, Method 4
- Rapid Stabilization, Method 3
- Type 1 Mulch
- Inlet Protection
- Filter Berm, Type 5
- Sediment Control Log, Type Straw



RECEIVING WATERS:
Receiving waters, including surface water, wetlands, Public Waters, and stormwater ponds, within 1-mile of the project boundary are identified on the USGS 7.5 min quad map above. Receiving waters that are impaired, the impairment, and WLA are listed as follows. All specific BMPs relative to construction activities listed in the permit for special, prohibited, restricted, or impaired have been incorporated into this plan. All specific BMPs listed in approved TMDLs and those BMPs listed for construction related waste load allocations have also been incorporated.

NAME OF WATER BODY	TYPE (ditch, pond, wetland, lake, etc.)	Special, Prohibited, Restricted Water [1]	Flows to Impaired Water Within 1-Mile [2]	USEPA Approved Construction Related TMDL [3]
COUNTY DITCH 59	DITCH	YES	YES	NO

[1] Special, prohibited, and restricted waters are listed in Section 23 of the MN Construction Stormwater General Permit (MNR100001).
[2] Identified as impaired under section 303 (d) of the federal Clean Water Act for phosphorus, turbidity, TSS, dissolved oxygen, and/or aquatic biota.
[3] Construction Related TMDLs include those related to: phosphorus, turbidity, TSS, dissolved oxygen, and/or aquatic biota.

IMPLEMENTATION SCHEDULE AND PHASING: The Contractor is required to provide an updated schedule and site management plan meeting the minimum requirements of Section 1717 of the Minnesota Standard Specifications for Construction.

1) Submit SWPPP Updates to Engineer. Submittal shall include any requested changes to the SWPPP, including but not limited to: Trained Personnel, Locations for Stockpiles, Concrete Washout, Sanitation Facilities, Types and Locations of Erosion & Sediment Control. Failure to submit updates shall be considered acceptance of the SWPPP as designed with no changes.
2) Install perimeter sediment control, inlet protection, and construction exit.
3) Install Drain tile.
4) Grading Open Ditch.
5) Backfilling and Final Grading.
6) Add additional temporary BMPs as necessary during construction based on inspection reports.
7) Ensure final stabilization measures are complete.
8) Provide digital copy of all Field SWPPP Documentation including Inspection Reports and SWPPP Revisions to the Owner.
9) Submit Notice of Termination (NOT) to MPCA. NOTE: The NOT must be submitted to MPCA before Final Stabilization is considered complete.

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PRELIMINARY
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SHAUN P. LUKER
LIC. NO. 48756 DATE MM/DD/YYYY

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DESIGNED	SPL
DRAWN	JGB, CV
CHECKED	SPL, BLH
CLIENT PROJ. NO.	S15.112473

NO.	ISSUED FOR	DATE

RENVILLE COUNTY, MINNESOTA
CD 59 IMPROVEMENTS
STORM WATER POLLUTION PREVENTION PLAN
SWPPP PLAN

SHEET C2.01

Information contained in this SWPPP narrative sheet summarizes requirements of the GENERAL PERMIT AUTHORIZATION TO DISCHARGE STORMWATER ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM/STATE DISPOSAL SYSTEM PROGRAM - Permit No: MN RI0000l (Permit) as they apply to this project. All provisions of the Permit including those not specifically cited herein shall apply to this project. The Contractor is responsible to be familiar with and comply with all conditions of the permit. The full text of the Permit is available at: https://www.pca.state.mn.us/sites/default/files/wq-strm2-80a.pdf

SWPPP AMENDMENTS AND SUBMITTALS

Contractor must prepare and submit to the Engineer a SWPPP amendment as necessary to include additional Best Management Practices (BMPs) to correct problems identified or address the following situations.

1. Contact information and training documentation for Construction SWPPP Manager and BMP Installer,
2. There is a change in construction method of phasing, operation, maintenance, weather or seasonal conditions not anticipated during the design of the SWPPP including but not limited to:
   a. Types and/or Locations of BMPs
   b. Material Storage and Spill Response
   c. Fueling Plans
   d. Locations for Stockpiles, Concrete Washout, and Sanitation Facilities and
   e. Project Phasing
3. It is determined that the SWPPP is not achieving objectives of minimizing pollutants in stormwater discharges associated with construction activity, or
4. The SWPPP is not consistent with the terms and conditions of the permit.

The Contractor may implement SWPPP amendments immediately and is not required to wait for Engineer review of the submittal. The responsibility for completeness of SWPPP amendments and compliance with the Permit lies with the Contractor. Review, comment, or lack of comment by the Engineer on a SWPPP amendment shall not absolve the responsibilities of the Contractor in any way.

If a change order is issued for a design change the SWPPP amendment will be prepared by the Engineer and included in the change order.

In addition to SWPPP amendments, the Contractor shall submit to the Engineer Weekly Erosion and Sediment Control Schedule meeting the requirements of MnDOT 1717.

The Contractor shall keep copies of all SWPPP amendments, Weekly Erosion and Sediment Control Schedules, inspection logs, and maintenance logs with the field copy of the SWPPP. A PDF copy of these documents will be provided along with a copy of the final Field Copy of the SWPPP to the Engineer along with the signed Notice of Termination when final stabilization is complete.

EROSION PREVENTION PRACTICES

Stormwater conveyance channels shall be routed around unstabilized areas. Erosion controls and velocity dissipation devices shall be used at outlets within and along the length of any constructed conveyance channel.

The normal wetted perimeter of all ditches or swales, including storm water management pond slopes, that drain waters from the site must be stabilized within 200' of any property edge or discharge point, including storm sewer inlets, within 24 hours of connection.

Temporary or permanent ditches or swales used as sediment containment during construction do not need to be stabilized during temporary period of use and shall be stabilized within 24 hours after no longer used as sediment containment.

Mulch, hydromulch, tackifier, or similar practice shall not be used in any portion of the wetted perimeter of a temporary or permanent drainage ditch or swale section with a continuous slope of greater than 2 percent.

Energy dissipation shall be installed at all temporary or permanent pipe outlets within 24 hours of connection to a surface water or permanent stormwater treatment system.

The Contractor shall phase construction and use construction methods to the extent practical to minimize exposed soils. The project phasing shall be documented in the Weekly Erosion and Sediment Control Schedule.

SEDIMENT CONTROL PRACTICES

Down gradient BMPs including perimeter BMPs must be in place before up gradient land- disturbing activities begin and shall remain in place until final stabilization.

All BMPs that have been adjusted or removed to accommodate short-term activities shall be re-installed or replaced the earlier of the end of the work day or before the next precipitation event even if the activity is not complete.

Inlet BMPs may be removed for specific safety concerns. The BMPs shall be replaced as soon as the safety concern is resolved. The removal shall be documented in the SWPPP as a SWPPP amendment.

Temporary stockpiles must have sediment control BMPs. The Contractor shall prepare and submit to the Engineer a SWPPP amendment showing the location of temporary stockpiles and the BMPs for each stockpile. The SWPPP amendment must meet the minimum requirements of Section 9 of the Permit.

Soil compaction shall be minimized and topsoil shall be preserved, unless infeasible or if construction activities dictate soil compaction or topsoil stripping.

The use of polymers, flocculants, or other sedimentation treatment chemicals are not proposed as part of this SWPPP as designed by the Engineer. If methods or phasing of construction require the use of any of these chemicals, the Contractor shall prepare and submit to the Engineer a SWPPP amendment that meets the minimum requirements of Section 9 of the Permit.

TEMPORARY SEDIMENTATION BASINS

A temporary sedimentation basin has not been included in this SWPPP as designed by the Engineer. If a basin is later determined to be desirable or necessary the Contractor shall prepare and submit to the Engineer a SWPPP amendment. Temporary sedimentation basins shall meet or exceed the minimum requirements of Section 14 of the Permit and shall include a basin draining plan meeting or exceeding the minimum requirements of Section 10 of the Permit. Where the site discharges to Special and/or Impaired Waters the SWPPP amendment shall also meet or exceed the minimum requirements of Section 23 of the permit.

DEWATERING

A dewatering plan has not been included in this SWPPP as designed by the Engineer. If dewatering is required for this project, the Contractor shall prepare and submit to the Engineer a SWPPP amendment. All dewatering shall meet or exceed the minimum requirements of Section 10 of the Permit.

POLLUTION PREVENTION

Products and materials that have the potential to leach pollutants that are stored on the site must be stored in a manner designed to minimize contact with stormwater. Materials that are not a source of potential contamination to stormwater or that are designed for exposure to stormwater are not required to be covered.

Hazardous materials including but not limited to pesticides, fertilizer, petroleum products, curing compounds and toxic waste must be properly stored and protected from stormwater exposure as recommended by the manufacturer in an access restricted area.

Solid waste must be stored, collected and disposed of in compliance with Minnesota Administrative Rules Chapter 7035.

Portable toilets must be positioned so that they are secure and will not be tipped or knocked over. Sanitary waste must be disposed of properly in accordance with Minn. R. CH 7041.

Exterior vehicle or equipment washing on the project site shall be limited to a defined area of the site. No engine degreasing is allowed on site. A sign must be installed adjacent to each washout facility that requires site personnel to utilize the proper facilities for disposal of concrete and other washout wastes.

The Contractor shall prepare and submit a SWPPP amendment detailing the location and BMPs proposed for storage of materials, solid waste, portable toilets, and exterior vehicle or equipment washing on the site. The SWPPP amendment shall include a spill prevention and response plan that is appropriate for the materials proposed to be on the site. The SWPPP amendment shall meet or exceed the minimum requirements of Section 12 of the Permit.

INSPECTION & MAINTENANCE

A trained person shall routinely inspect the entire construction site at the time interval indicated on this sheet of the SWPPP during active construction and within 24-hours after a rainfall event greater than 0.5 inches in 24 hours. Following an inspection that occurs within 24-hours after a rainfall event, the next inspection must be conducted at the time interval indicated in the Receiving Waters Table found on the SITE PLAN AND INFORMATION SHEET of the SWPPP.

All inspections and maintenance conducted during construction must be recorded on the day it is completed and must be retained with the SWPPP. Inspection report forms are available in the Project Specifications. Inspection report forms other than those provided shall be approved by the engineer.

The Contractor may request a change in inspection schedule for the following conditions:

a. Inspections of areas with permanent cover to be reduced to once per month,
b. Inspections of areas that have permanent cover and have had no construction activity for 12 months to be suspended until construction resumes,
c. Inspections of areas where construction is suspended due to frozen ground conditions, inspections to be suspended until the earlier of within 24 hours of runoff occurring, or upon resuming construction.

No change in inspection schedule shall occur until authorized by the Engineer.

Inspections must include:

1. All erosion prevention and sediment control BMPs and Pollution Prevention Management Measures to ensure integrity and effectiveness.
2. Surface waters, including drainage ditches and conveyance systems for evidence of erosion and sediment deposition.
3. Construction site vehicle exit locations, streets and curb and gutter systems within and adjacent to the project for sedimentation from erosion or tracked sediment from vehicles.
4. Infiltration areas to ensure that no sediment from ongoing construction activity is reaching the infiltration area and that equipment is not being driven across the infiltration area.

All non-functioning BMPs and those BMPs where sediment reaches one-half (1/2) of the depth of the BMP, or in the case of sediment basins one-half (1/2) of the storage volume, must be repaired, replaced, or supplemented by the end of the next business day after discovery, or as soon as field conditions allow.

Permittees must repair, replace or supplement all nonfunctional BMPs with functional BMPs by the end of the next business day after discovery, or as soon as field conditions allow.

Any sediment that escapes the site must be removed and the area stabilized within 7 calendar days of discovery unless precluded by legal, regulatory, or physical access in which case the work shall be completed within 7 calendar days of authorization. Paved surfaces such as streets shall have any escaped or tracked sediment removed by the end of the day that it is discovered. Sediment release, other than paved surfaces that can be cleaned up with street sweeping shall be reported immediately upon discovery to the Engineer.

PUBLIC WATER RESTRICTIONS:

For public waters that have been promulgated "work in water restrictions" during fish spawning time frames, all exposed soil areas that are within 200 feet of the water's edge, and drain to these waters must complete stabilization within 24-hours during the time period. MN DNR permits are not valid for work in waters that are designated as infested waters unless accompanied by an Infested Waters Permit or written notification has been obtained from MN DNR stating that such permit is not required. There is no exception for pre-existing permits. If a MN DNR Permit has been issued for the project and the water is later designated as infested, the Contractor shall halt all work covered by the MN DNR Permit until an Infested Waters Permit is obtained or that written notification is obtained stating that such permit is not required.

FINAL STABILIZATION

Final Stabilization is not complete until all the following requirements have been met:

1. Substantial Completion has been reached and no ground disturbing activities are anticipated.
2. Permanent cover has been installed with an established minimum uniform perennial vegetation density of 70 percent of its expected final growth. Vegetation is not required in areas where no vegetation is proposed by this project such as impervious surfaces or the base of a sand filter.
3. Accumulated sediment has been removed from all permanent stormwater treatment systems as necessary to ensure the system is operating as designed.
4. All sediment has been removed from conveyance systems
5. All temporary synthetic erosion prevention and sediment control BMPs have been removed. BMPs designated on the SWPPP to remain to decompose on-site may remain.
6. For residential construction only, permit coverage terminates on individual lots if the structures are finished and temporary erosion prevention and downgradient perimeter control is complete, the residence sells to the homeowner, and the permittee distributes the MPCA's "Homeowner Fact Sheet" to the homeowner.
7. For agricultural land only (e.g., pipelines across cropland), the disturbed land must be returned to its preconstruction agricultural use prior to submitting the NOT.

SITE STABILIZATION COMPLETION:

Stabilization of exposed soils shall begin immediately and shall be completed after the construction activity has temporarily or permanently ceased no later than:	14 calendar days

SITE INSPECTION INTERVAL:

A trained person shall routinely inspect the entire construction site during active construction at an interval of no more than:	7 calendar days

SPECIAL ENVIRONMENTAL CONSIDERATIONS AND PERMITS:

1)	Was an environmental review required for this project or any part of a common plan of development or sale that includes all or any portion of this project?	NO
2)	Does any portion of the site have the potential to affect threatened or endangered species or their critical habitat?	NO
3)	Does any portion of this site discharge to a Calcareous fen.	NO
4)	Will any portion of the site potentially affect properties listed on the National Register of Historic Places or a known or discovered archeological site?	NO
5)	Have any Karst features have been identified in the project vicinity?	NO
6)	Is compliance with temporary or permanent stormwater management design requirements infeasible for this project?	NO
7)	Has the MN DNR promulgated "work in water restrictions" for any Public Water this site disharges to during fish spawning?	NO

TYPE OF PERMIT	PERMITTING AGENCY	PERMIT STATUS AND CONDITIONS
Construction Stormwater NPDES	MPCA	

SWPPP DESIGNER TRAINING DOCUMENTATION:

UNIVERSITY OF MINNESOTA

Cristian Vera

Design of Construction SWPPP (May 31 2024)

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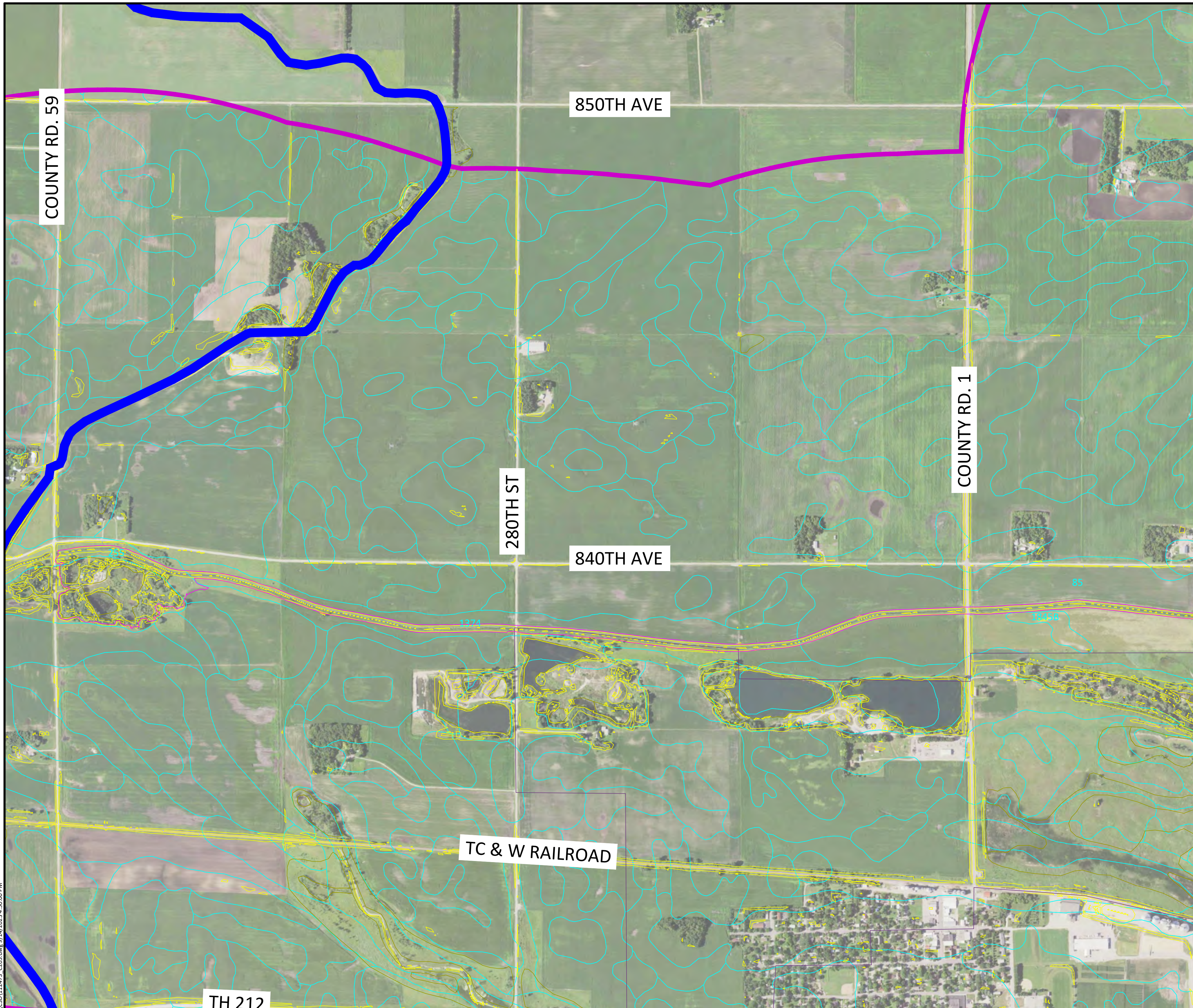
RENVILLE COUNTY, MINNESOTA
CD 59 IMPROVEMENTS
STORM WATER POLLUTION PREVENTION PLAN
SWPPP NARRATIVE

SHEET C2.02



LEGEND

- PROJECT BOUNDARY
- SOIL TYPE
- IMPAIRED, SPECIAL OR PROTECTED WATERS
- NATIONAL WETLANDS INVENTORY
- DWSMA, LOW VULNERABILITY
- STEEP SLOPES (>33.3%)
- RECEIVING WATERS

0 600 1200
SCALE FEET

SOIL TYPE SUMMARY

Map Unit Symbol	Soil Name	Hyd. Soil Group
1100	Nicollet	B/D
1101	Webster	B/D
112	Harps	B/D
1262	Seaforth	B/D
1286	Prinsburg	B/D
1355B	Amiret	B/D
1371B	Swanlake	B
1374	Havelock	B/D
1845B	Estherville	A
1900	Okoboji	C/D
255	Mayer	B/D
318	Mayer	B/D
336	Delft	B/D
35	Blue Earth	B/D
423	Seaforth	C
817	Canisteo	B/D
85	Calco	B/D
875C	Estherville	A
899	Harps	B/D
927	Okoboji	C/D
954C2	Ves	B
978	Cordova	C/D
L163A	Okoboji	C/D
L201A	Normania	C
L83A	Webster	B/D

LOCATION OF SWPPP REQUIREMENTS IN PROJECT PLAN

DESCRIPTION	SHEET NO.
SITE MAP	C2.01
FINAL STABILIZATION	C2.06 - C2.11
SOILS	C2.03 - C2.05
STORM SEWER PLAN & PROFILE SHEETS	C5.01 - C5.43
EROSION & SEDIMENT CONTROL DETAILS	C2.04
EROSION CONTROL TABULATION	C2.01
TURF ESTABLISHMENT TABULATION	C2.01
NARRATIVE & NOTES	C2.01 - C2.02

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SWPPP SOILS

SHEET C2.03

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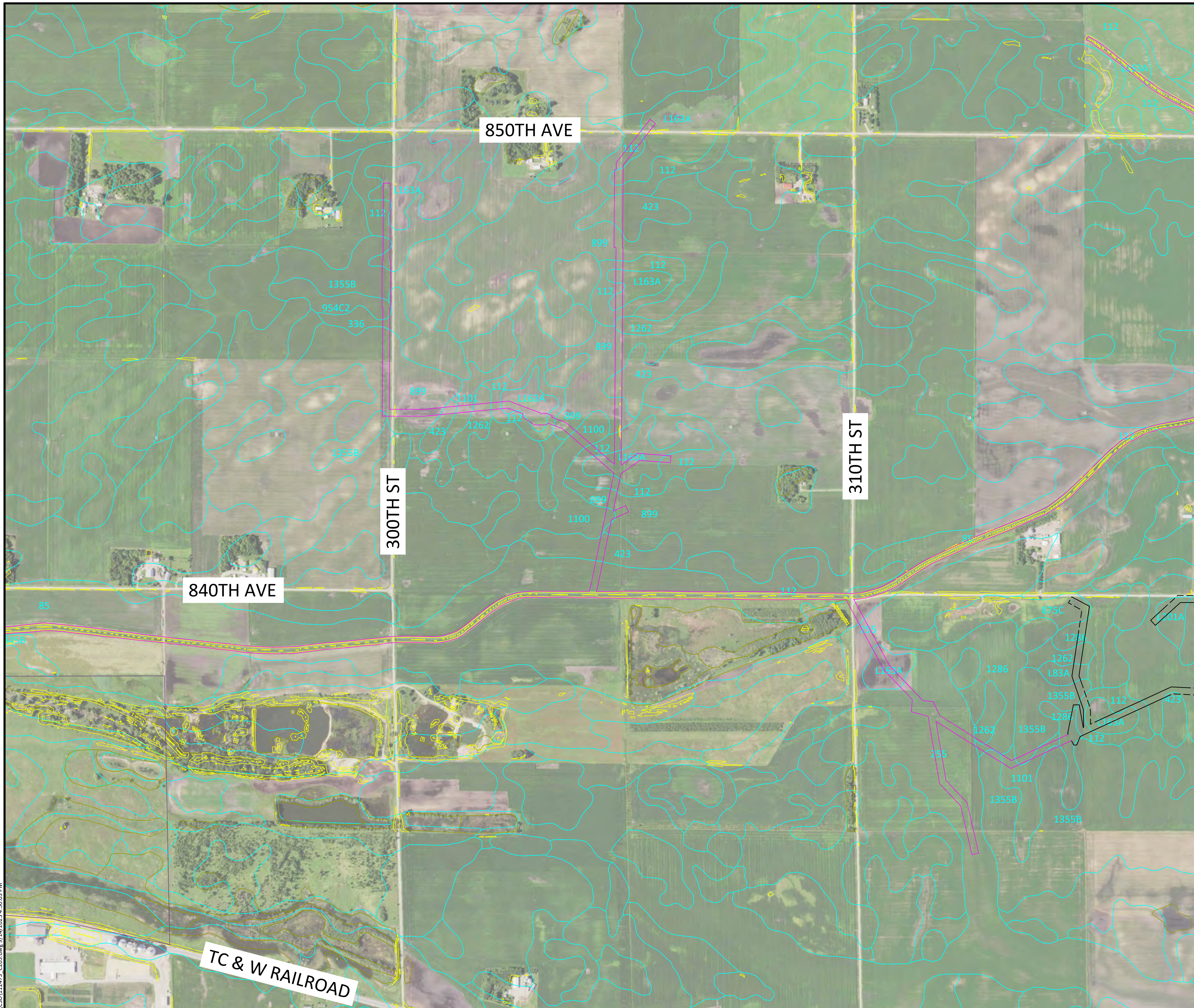

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0 600 1200
SCALE FEET

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1355B	Amiret	B/D
1371B	Swanlake	B
1374	Havelock	B/D
1845B	Estherville	A
1900	Okoboji	C/D
255	Mayer	B/D
318	Mayer	B/D
336	Delft	B/D
35	Blue Earth	B/D
423	Seaforth	C
817	Canisteo	B/D
85	Calco	B/D
875C	Estherville	A
899	Harps	B/D
927	Okoboji	C/D
954C2	Ves	B
978	Cordova	C/D
L163A	Okoboji	C/D
L201A	Normania	C
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FINAL STABILIZATION	C2.06 - C2.11
SOILS	C2.03 - C2.05
STORM SEWER PLAN & PROFILE SHEETS	C5.01 - C5.43
EROSION & SEDIMENT CONTROL DETAILS	C2.04
EROSION CONTROL TABULATION	C2.01
TURF ESTABLISHMENT TABULATION	C2.01
NARRATIVE & NOTES	C2.01 - C2.02

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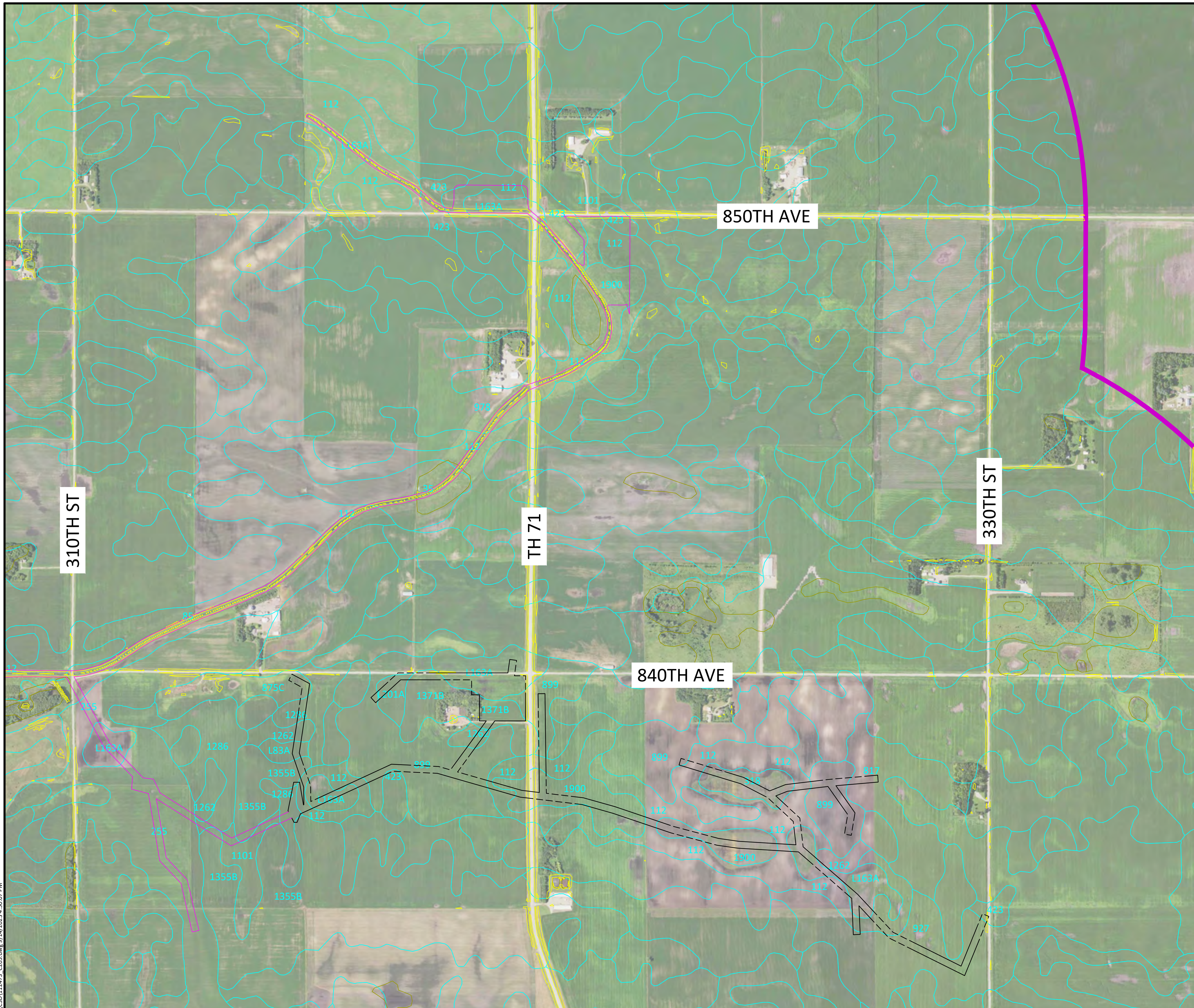
SWPPP SOILS

SHEET C2.04



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0 600 1200
SCALE FEET

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EROSION CONTROL TABULATION	C2.01
TURF ESTABLISHMENT TABULATION	C2.01
NARRATIVE & NOTES	C2.01 - C2.02

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CD 59 IMPROVEMENTS
STORM WATER POLLUTION PREVENTION PLAN
SWPPP SOILS

SHEET C2.05

EROSION CONTROL LEGEND

RAPID STABILIZATION, METHOD 3	STORM DRAIN INLET PROTECTION
RAPID STABILIZATION, METHOD 4	MULCH TYPE 1
INTERMEDIATE DITCH SLOPE SEEDING	STABILIZED CONSTRUCTION EXIT (TO BE DETERMINED BY CONTRACTOR & MARKED ON PLANS)

HORZ. 0 200 400
SCALE FEET

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SHEET C2.06

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EROSION CONTROL LEGEND

RAPID STABILIZATION, METHOD 3	STORM DRAIN INLET PROTECTION
RAPID STABILIZATION, METHOD 4	MULCH TYPE 1
INTERMEDIATE DITCH SLOPE SEEDING	STABILIZED CONSTRUCTION EXIT (TO BE DETERMINED BY CONTRACTOR & MARKED ON PLANS)

HORZ. 0 200 400
SCALE FEET

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EROSION CONTROL LEGEND

RAPID STABILIZATION, METHOD 3	STORM DRAIN INLET PROTECTION
RAPID STABILIZATION, METHOD 4	MULCH TYPE 1
INTERMEDIATE DITCH SLOPE SEEDING	STABILIZED CONSTRUCTION EXIT (TO BE DETERMINED BY CONTRACTOR & MARKED ON PLANS)

HORZ. 0 300 600
SCALE FEET

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EROSION CONTROL LEGEND

RAPID STABILIZATION, METHOD 3	STORM DRAIN INLET PROTECTION
RAPID STABILIZATION, METHOD 4	MULCH TYPE 1
INTERMEDIATE DITCH SLOPE SEEDING	STABILIZED CONSTRUCTION EXIT (TO BE DETERMINED BY CONTRACTOR & MARKED ON PLANS)

HORZ. 0 300 600
SCALE FEET

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EROSION CONTROL LEGEND

- RAPID STABILIZATION, METHOD 3
- RAPID STABILIZATION, METHOD 4
- INTERMEDIATE DITCH SLOPE SEEDING
- STORM DRAIN INLET PROTECTION
- MULCH TYPE 1
- STABILIZED CONSTRUCTION EXIT (TO BE DETERMINED BY CONTRACTOR & MARKED ON PLANS)

HORZ. SCALE 0 200 400 FEET

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EROSION CONTROL LEGEND

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RAPID STABILIZATION, METHOD 4	MULCH TYPE 1
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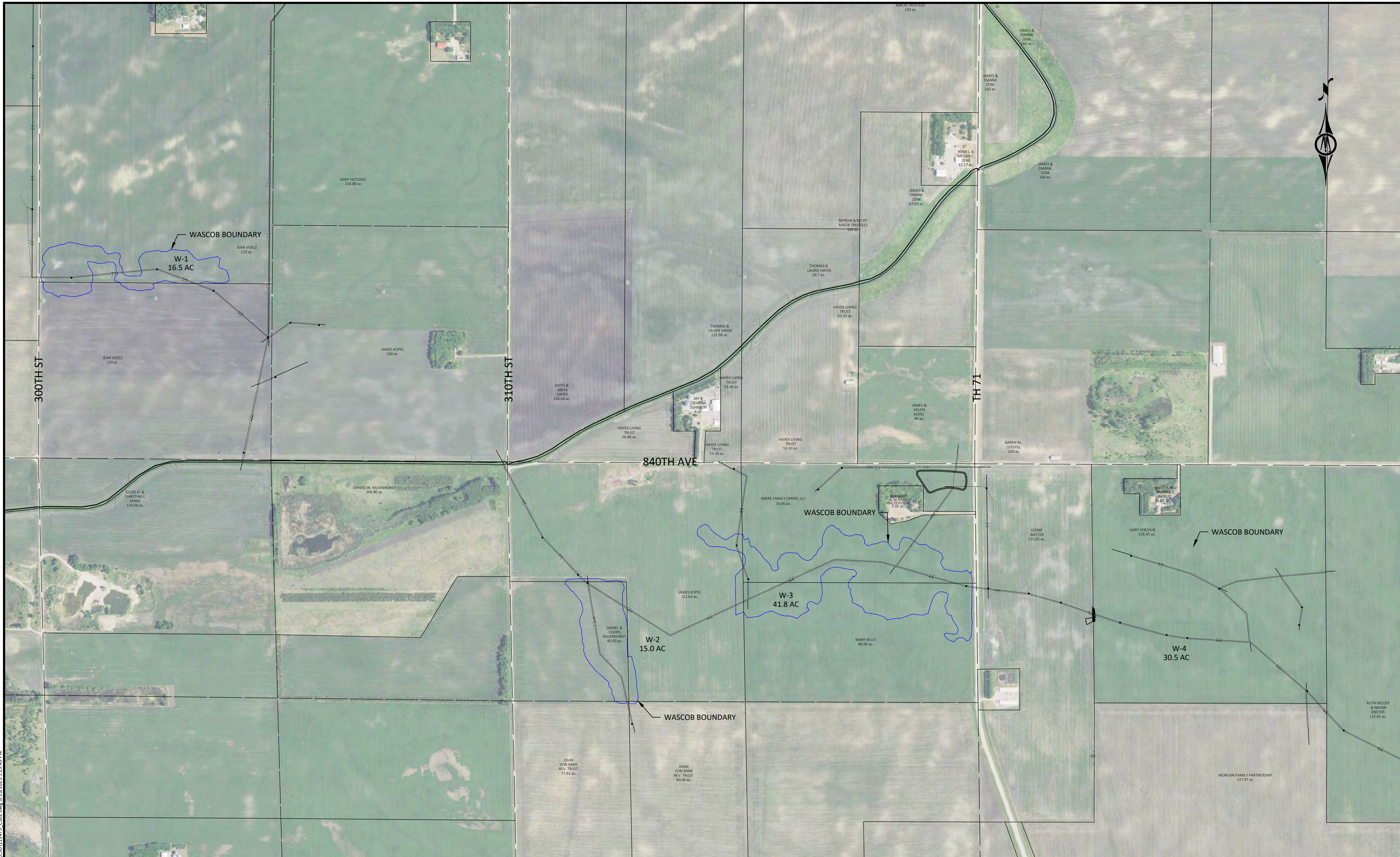

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RENVILLE COUNTY, MINNESOTA

CD 59 IMPROVEMENTS

C3 - GRADING PLAN

WASCOB OVERVIEW

SHEET

C3.01

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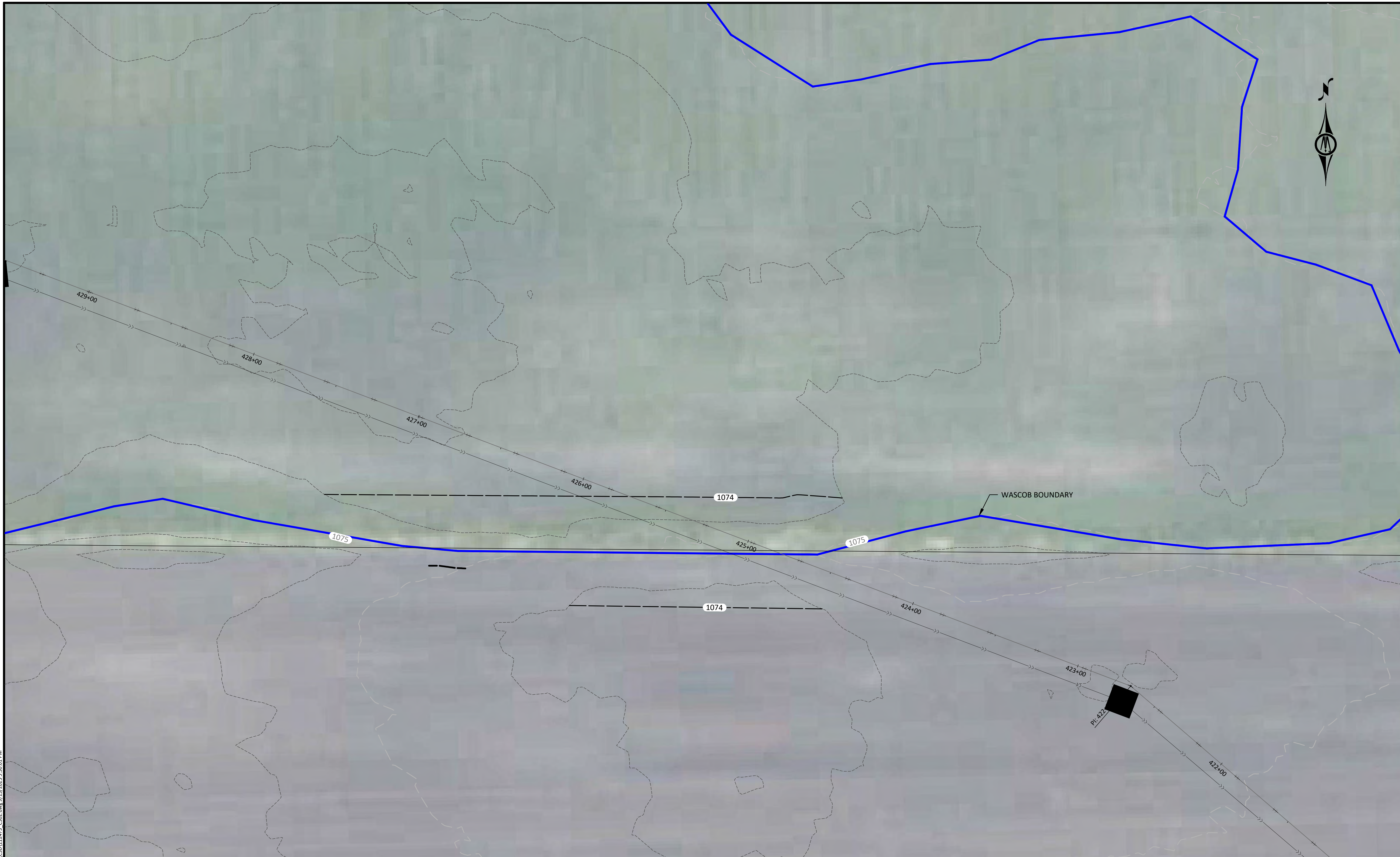

HORZ. 0 25 50
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RENVILLE COUNTY, MINNESOTA
CD 59 IMPROVEMENTS
C3 - GRADING PLAN
WASCOB - 1

SHEET
C3.02

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C3 - GRADING PLAN
WASCOB - 2

SHEET C3.03

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C3 - GRADING PLAN
WASCOB - 3

SHEET
C3.04

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C3 - GRADING PLAN
WASCOB - 4

SHEET
C3.05

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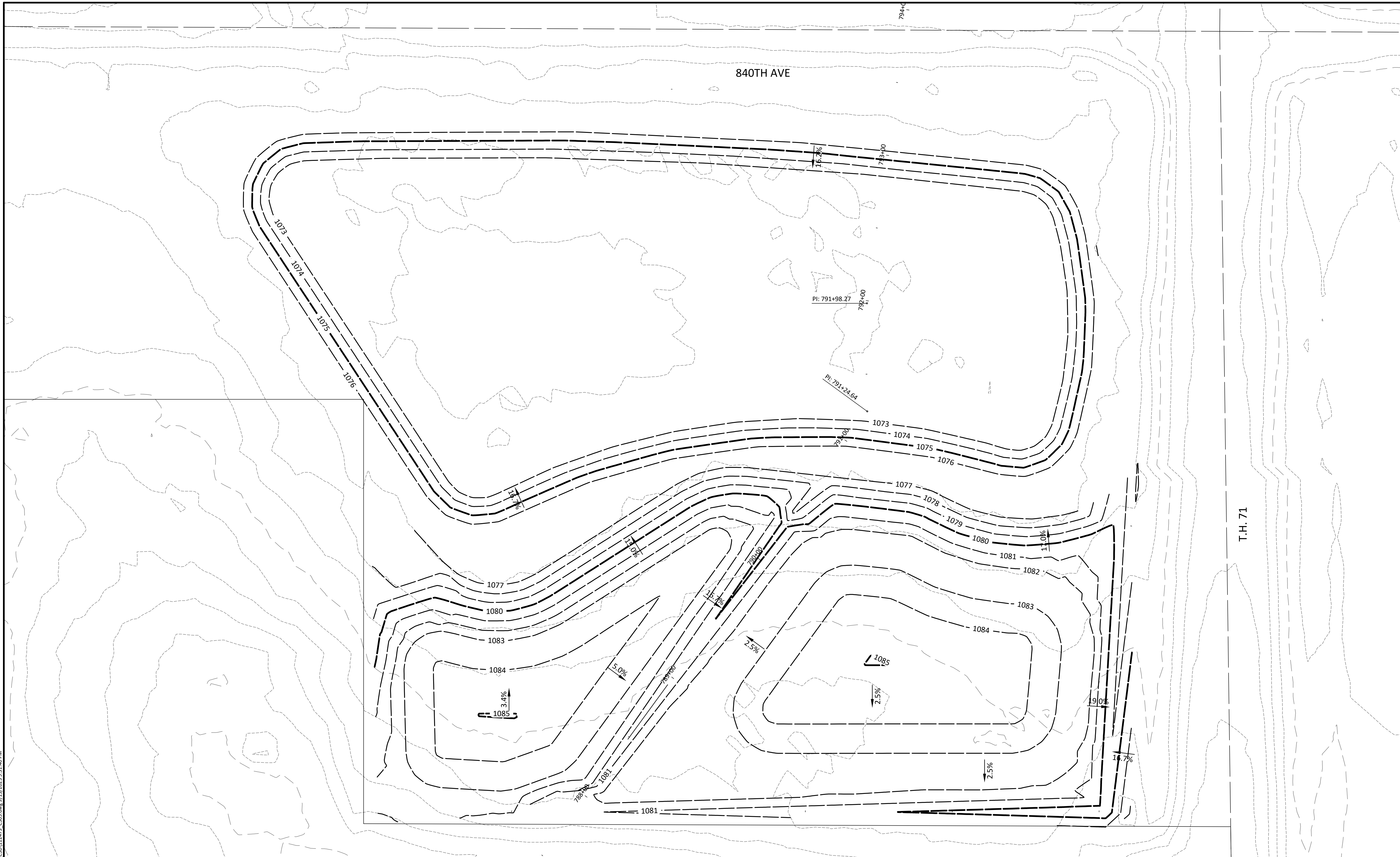

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RENVILLE COUNTY, MINNESOTA

CD 59 IMPROVEMENTS

POND 2 GRADING PLAN

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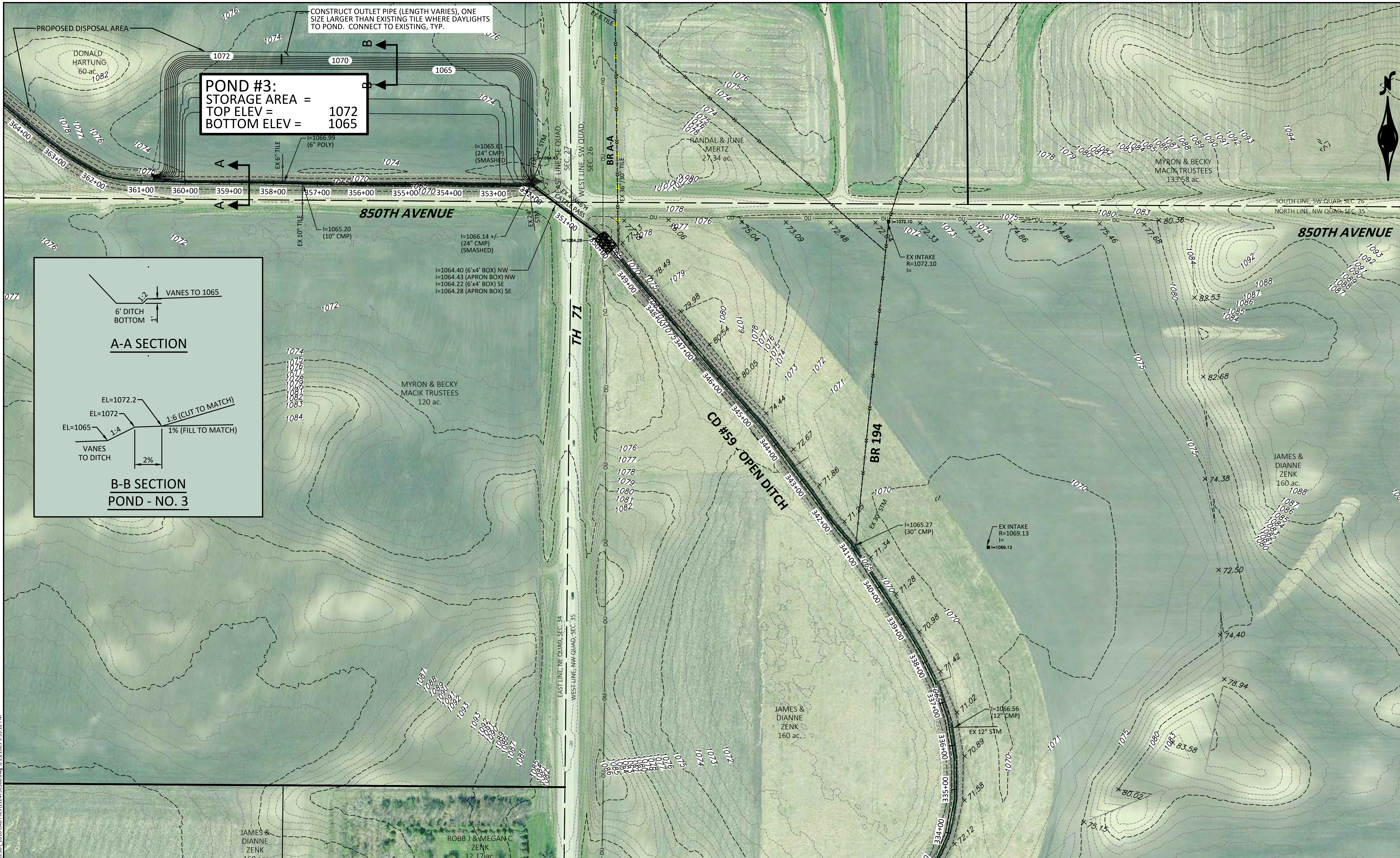

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RENVILLE COUNTY, MINNESOTA
CD 59 IMPROVEMENTS
POND 3 GRADING PLAN

SHEET C3.07

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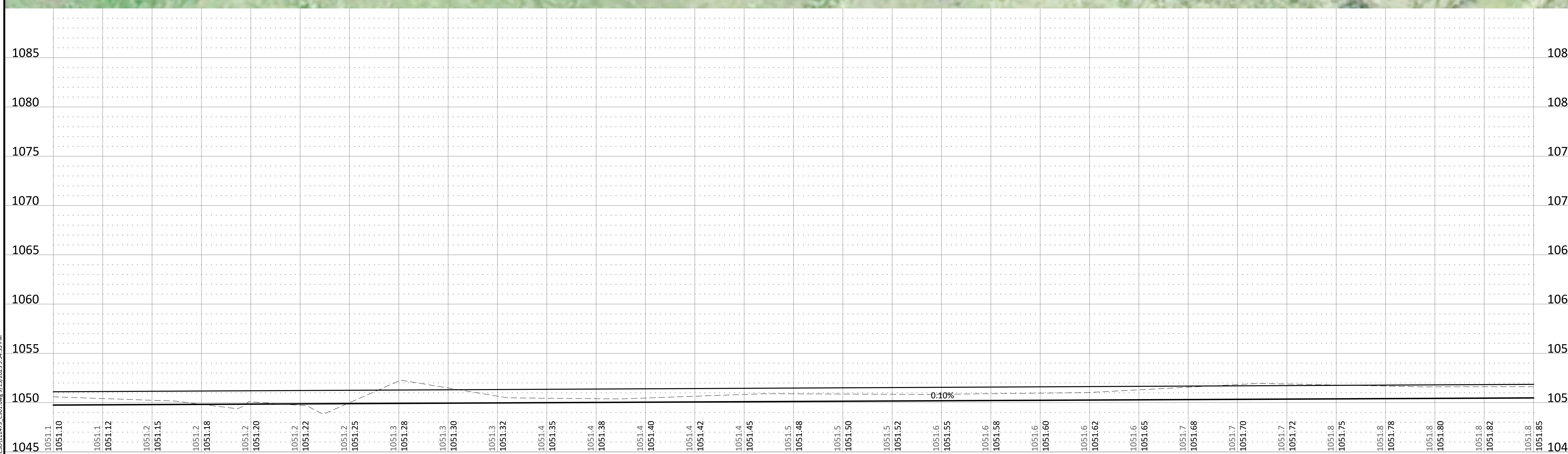

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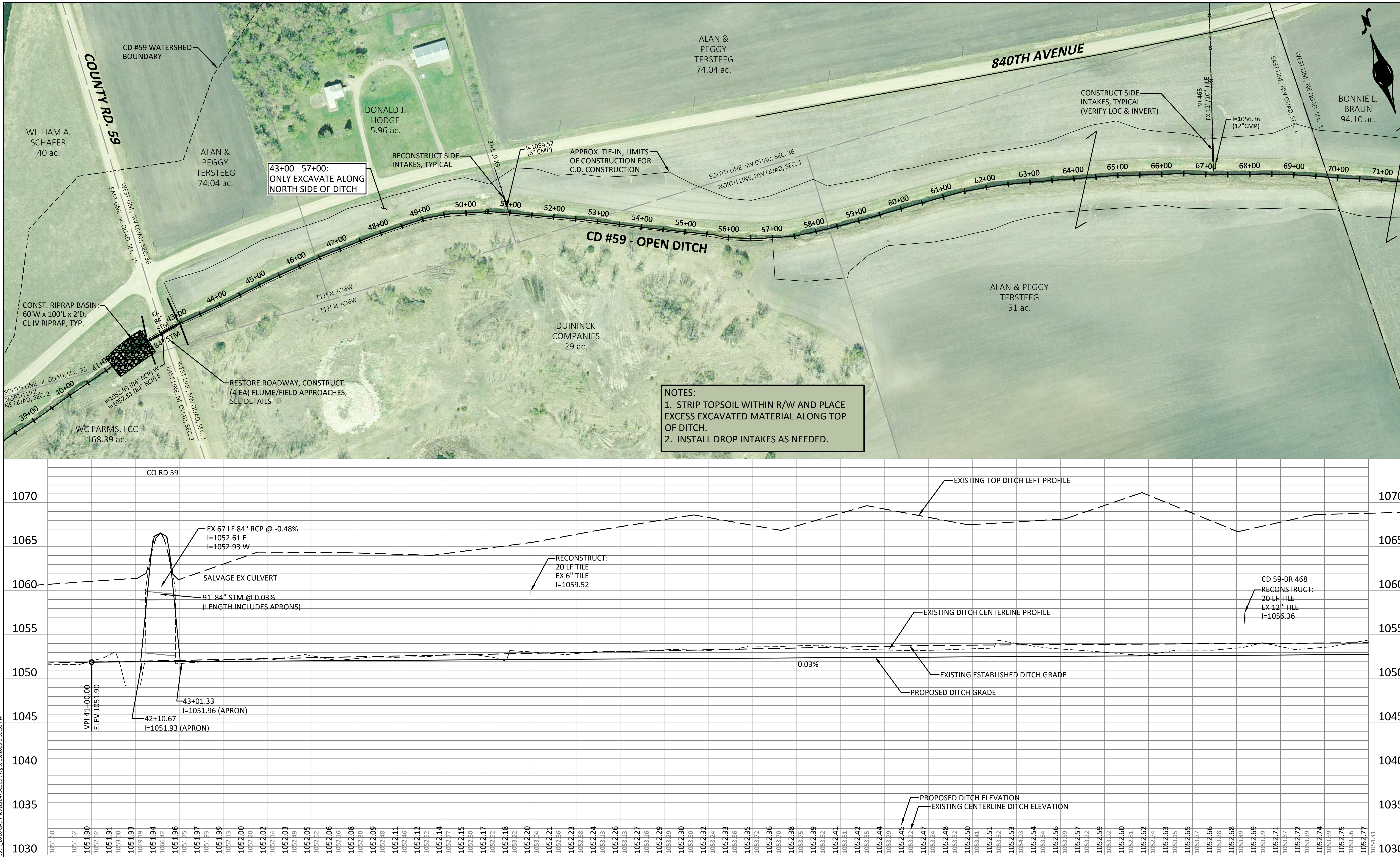
SHEET C5.01



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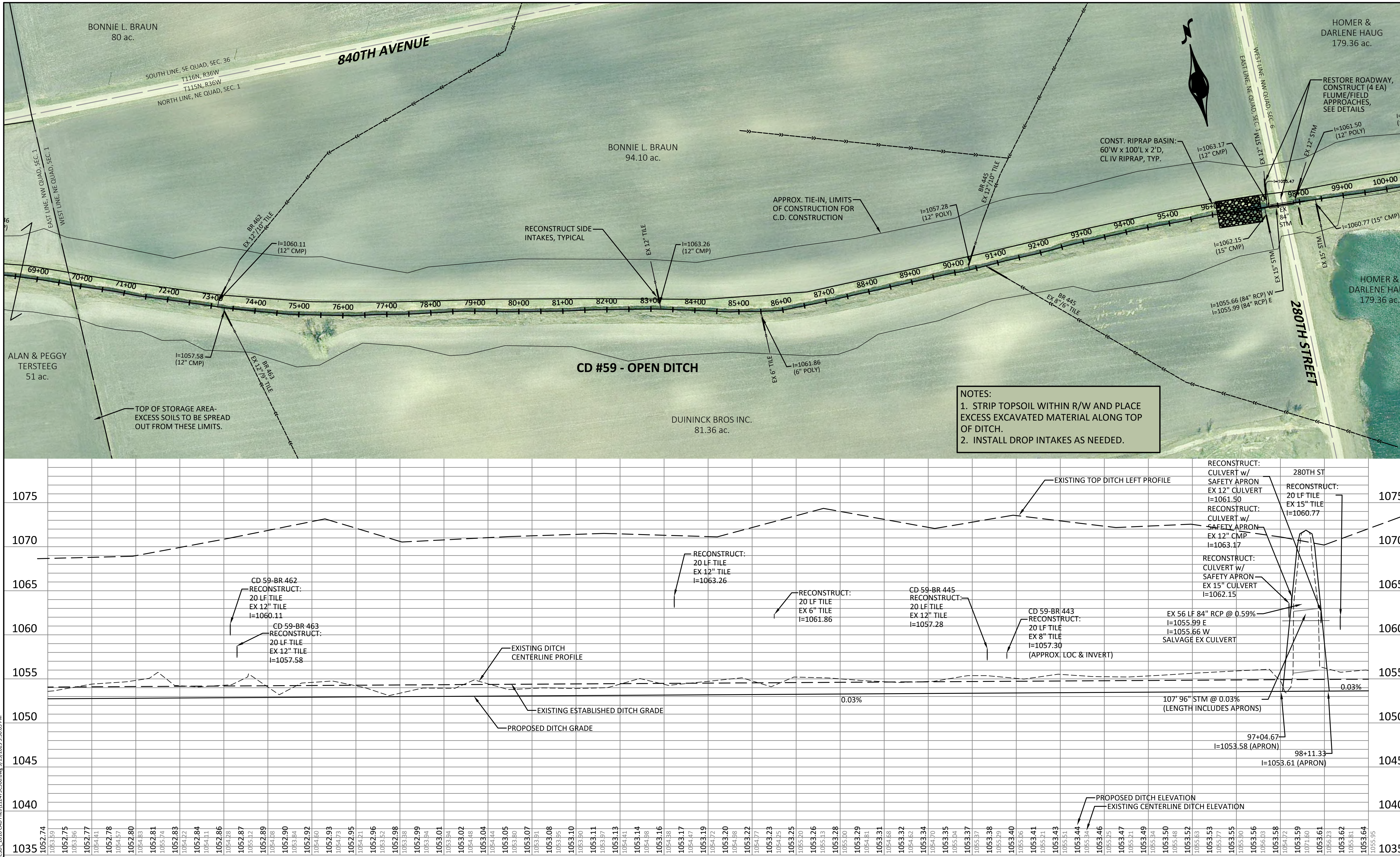

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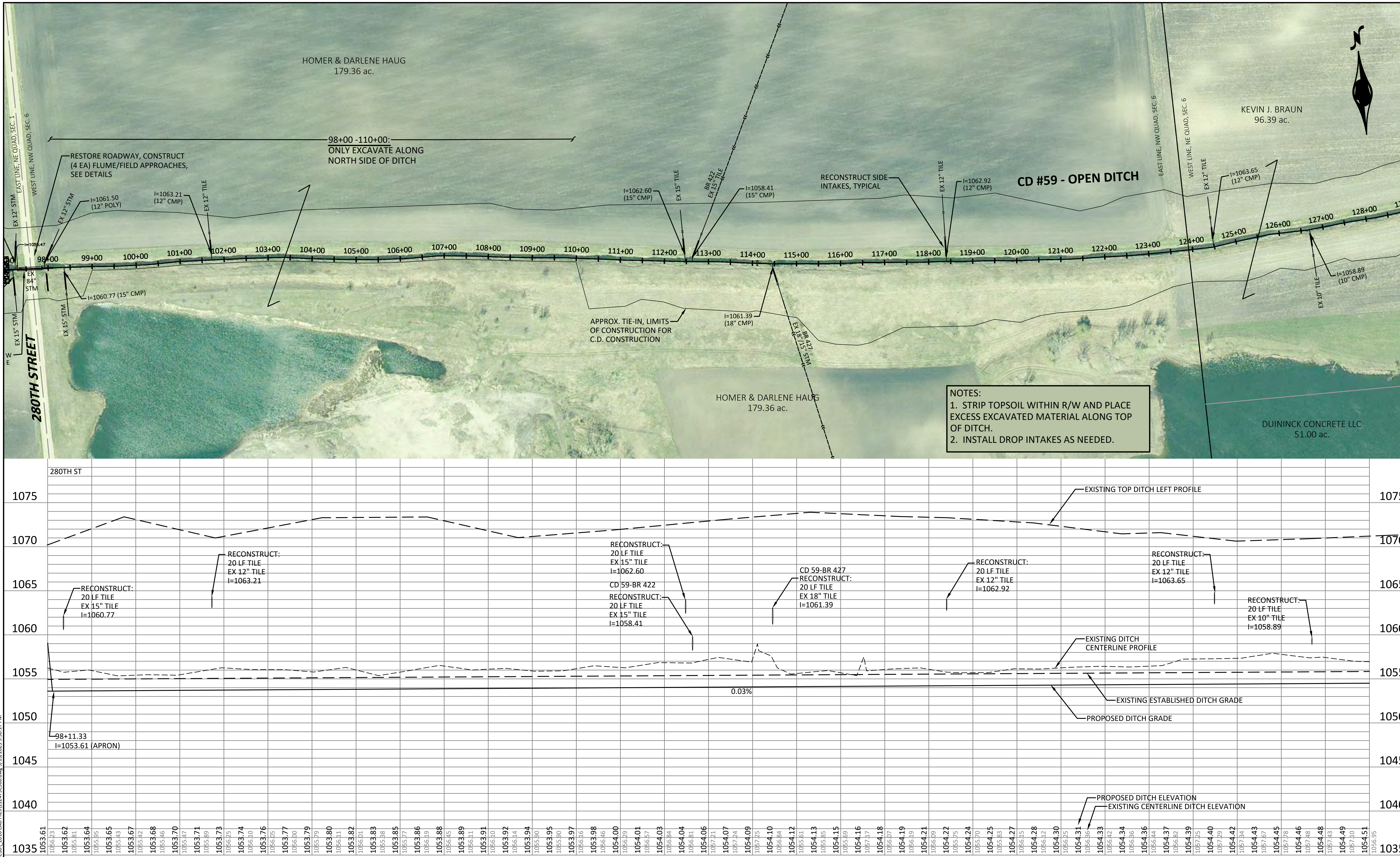

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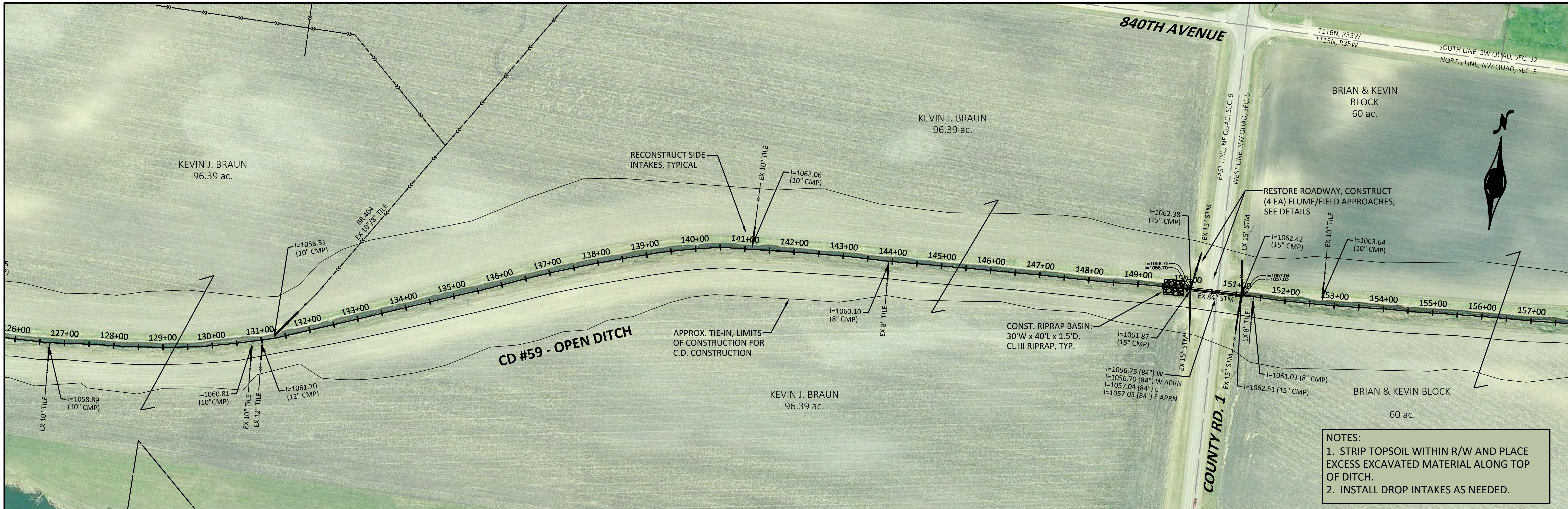

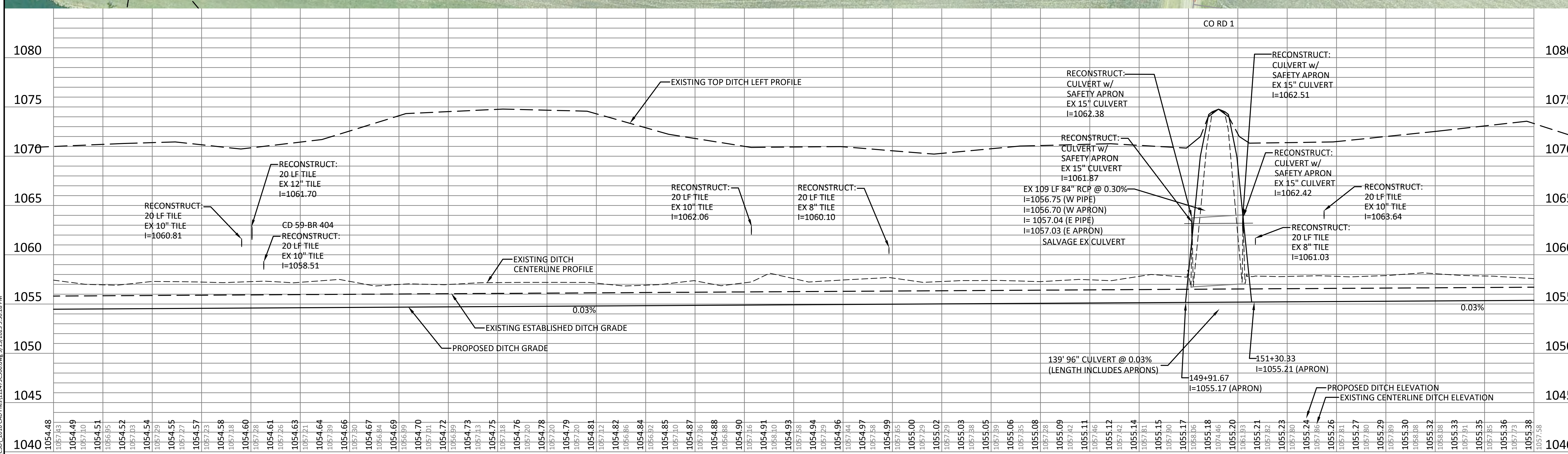

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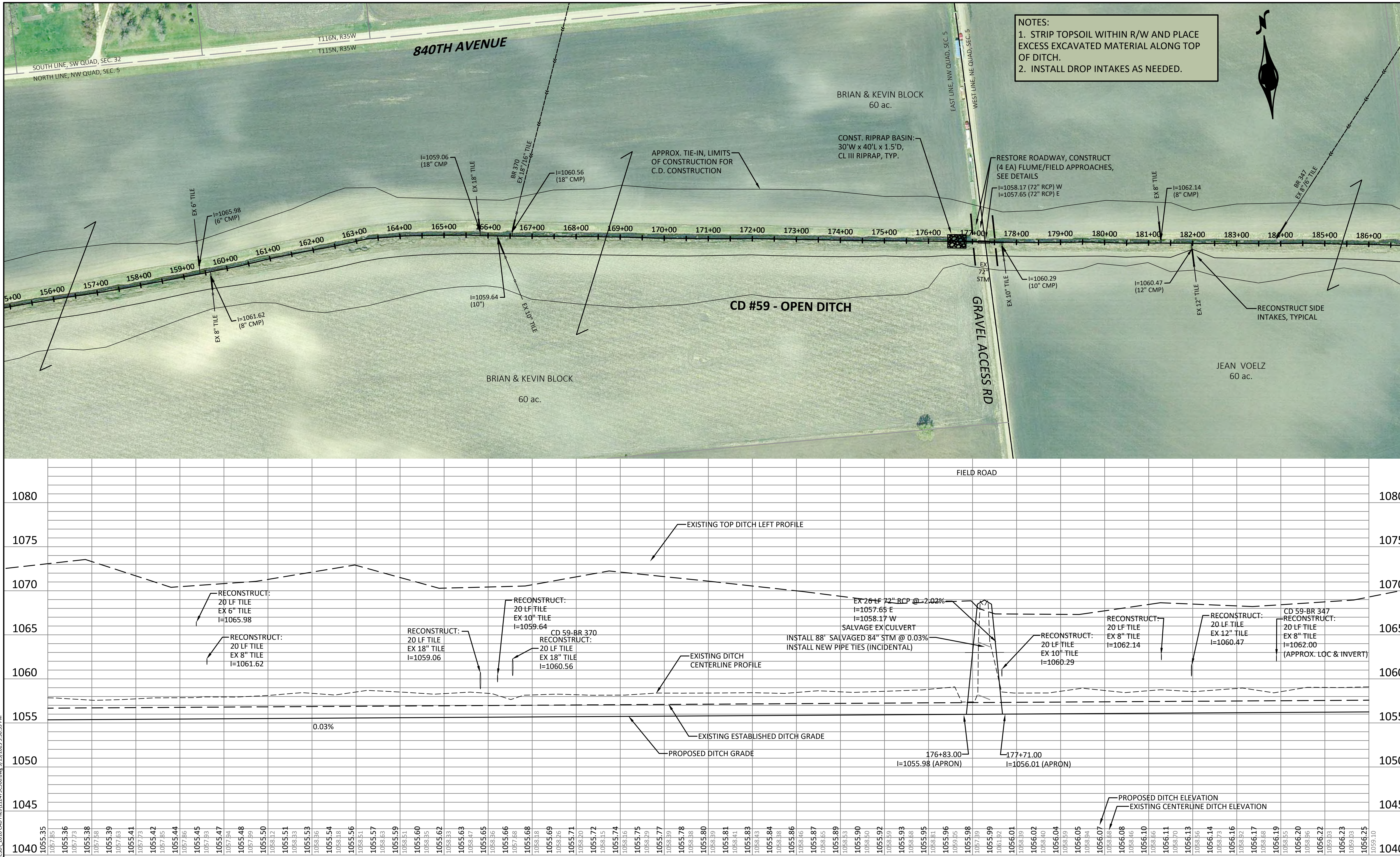

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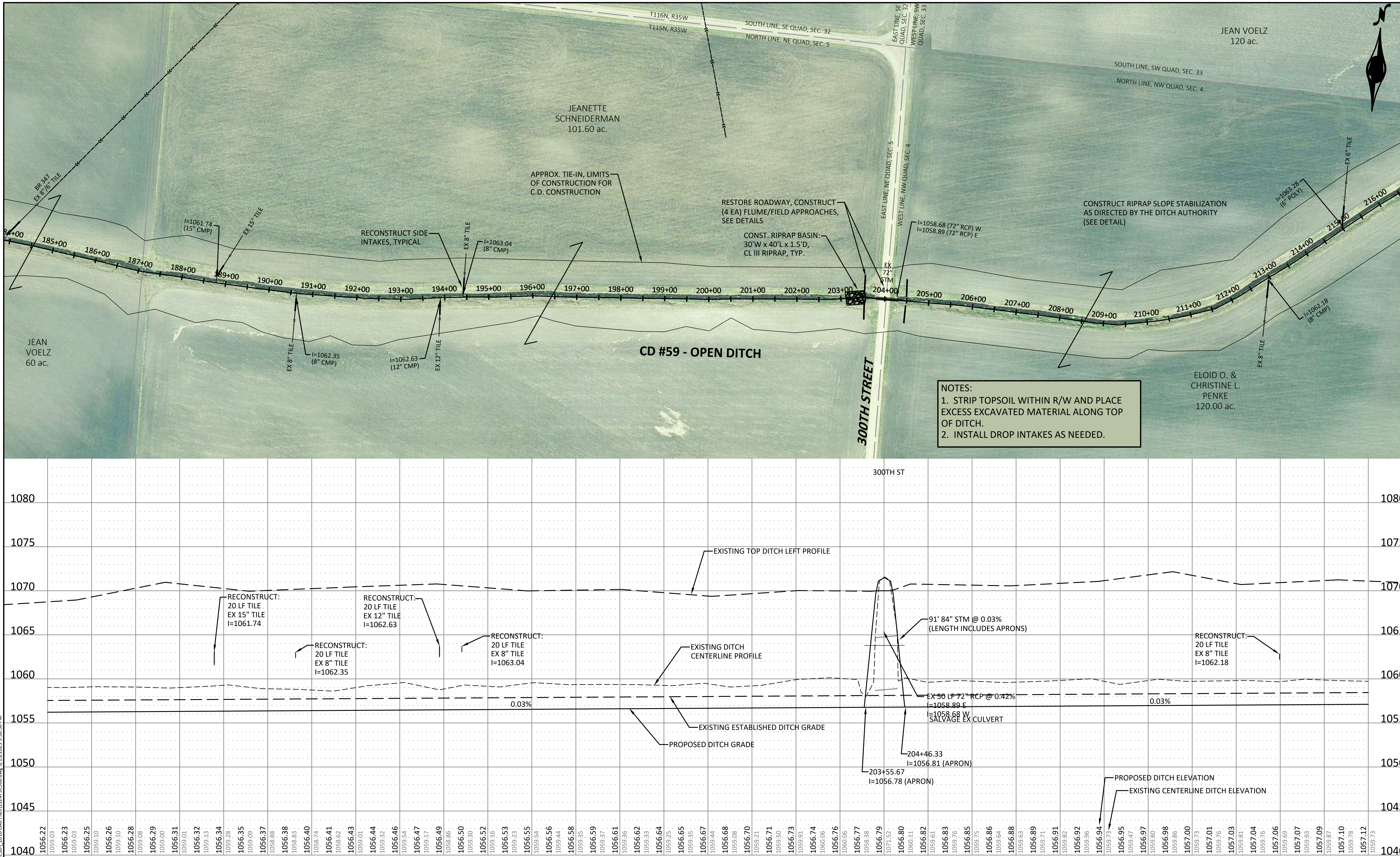

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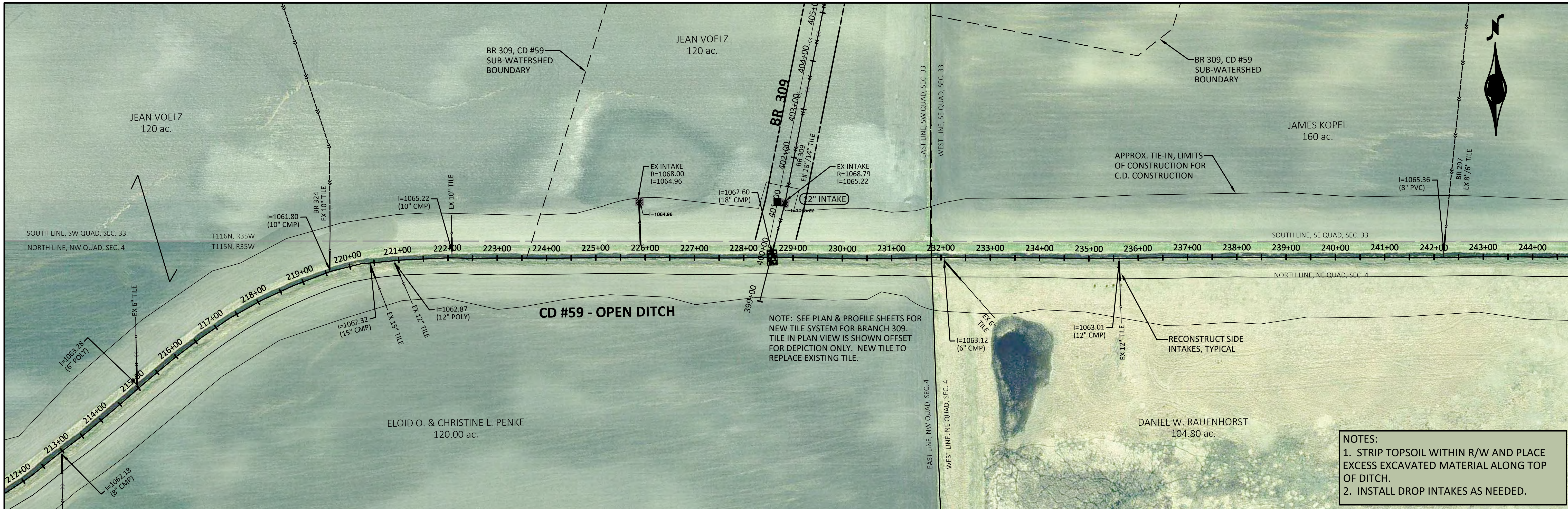

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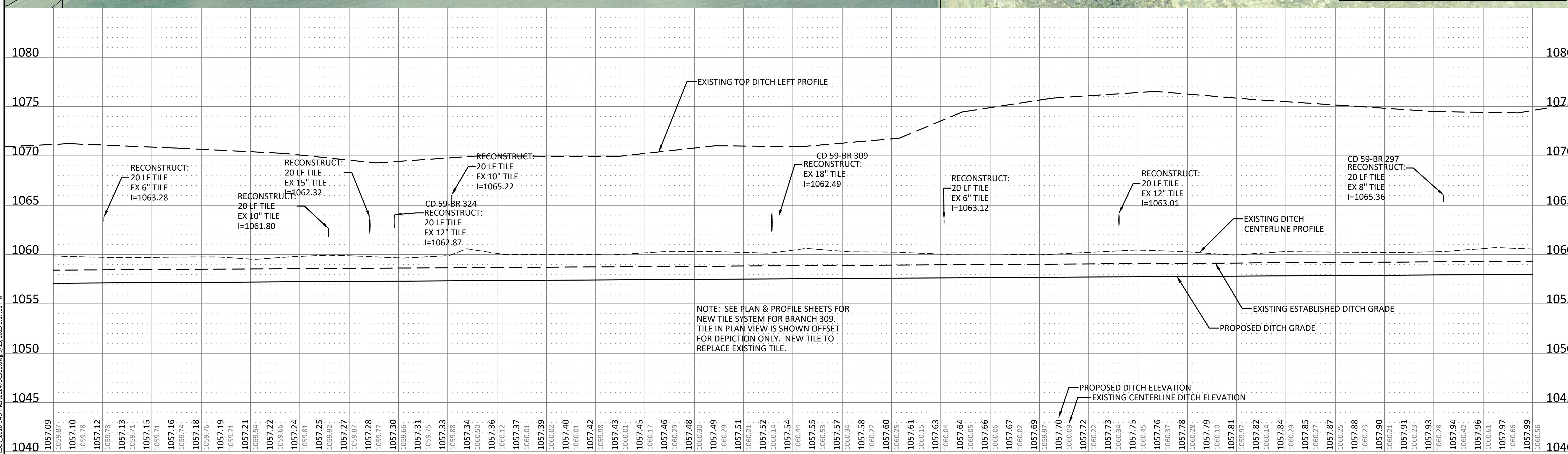

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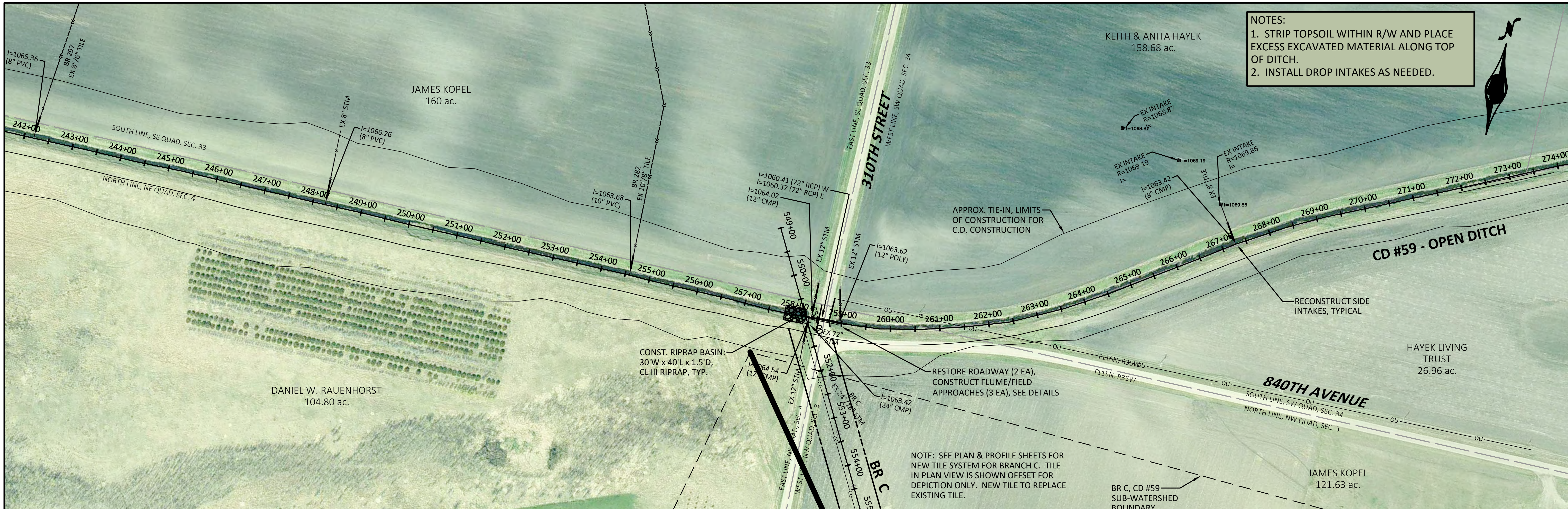

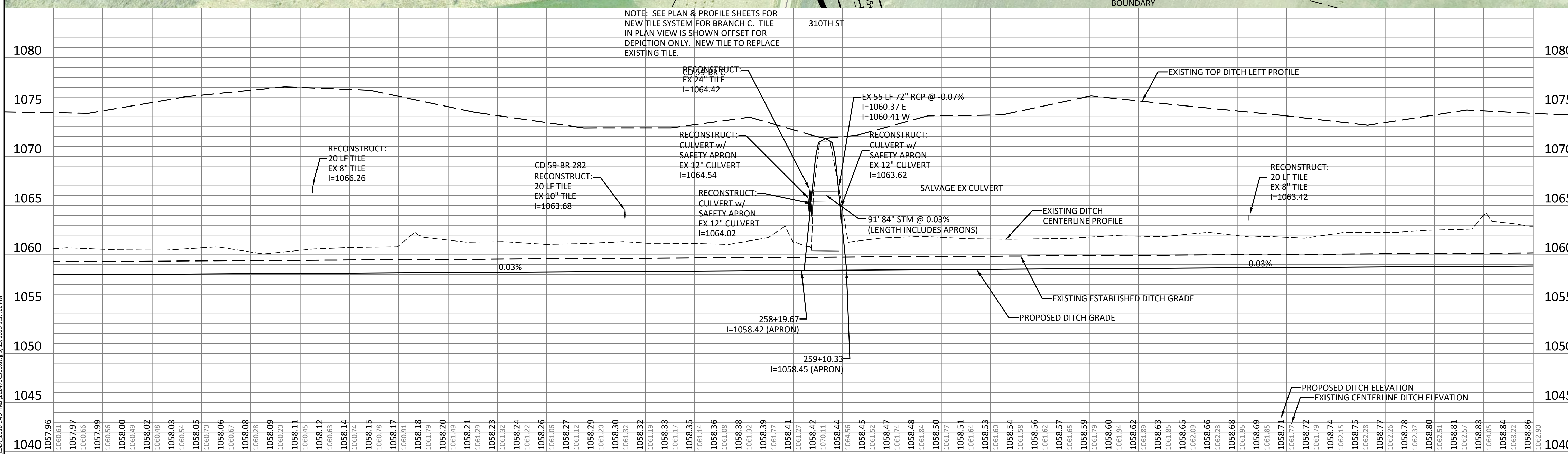

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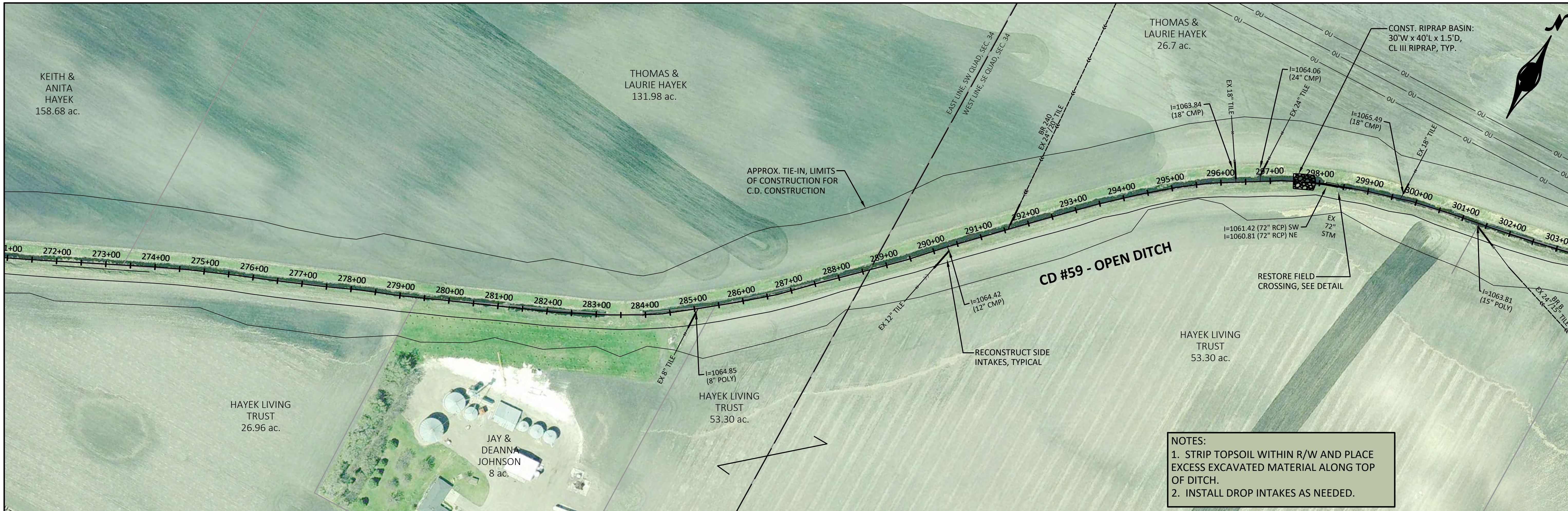

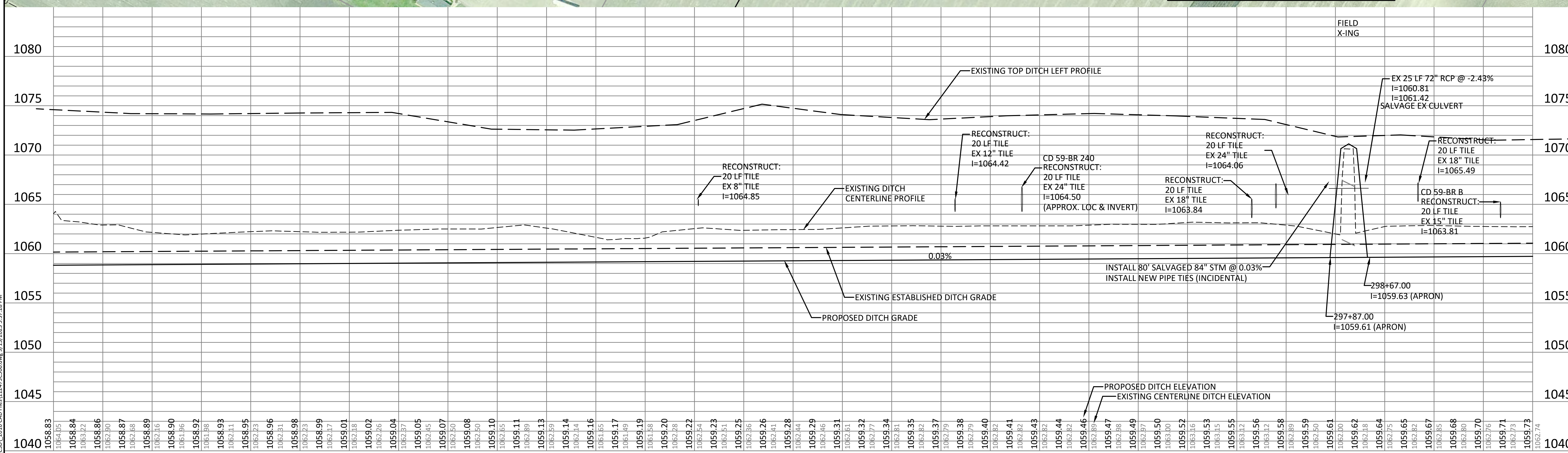

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RENVILLE COUNTY, MINNESOTA

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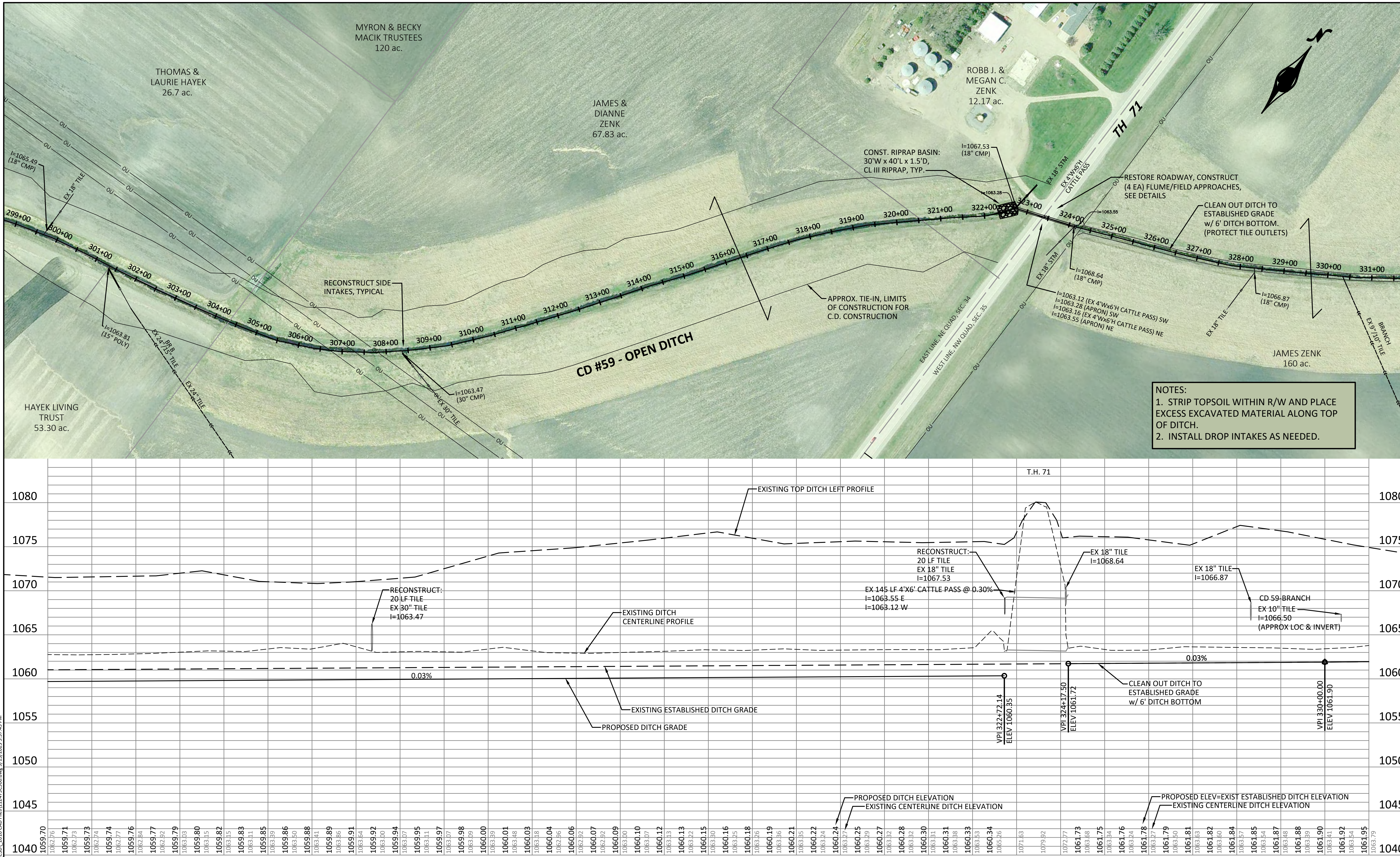

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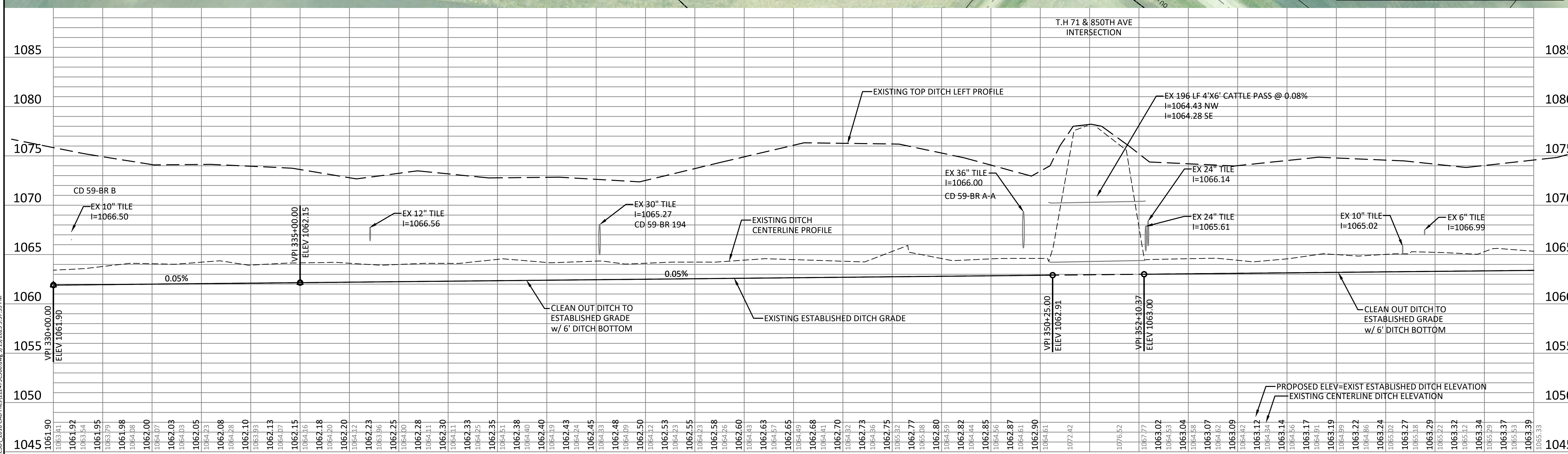

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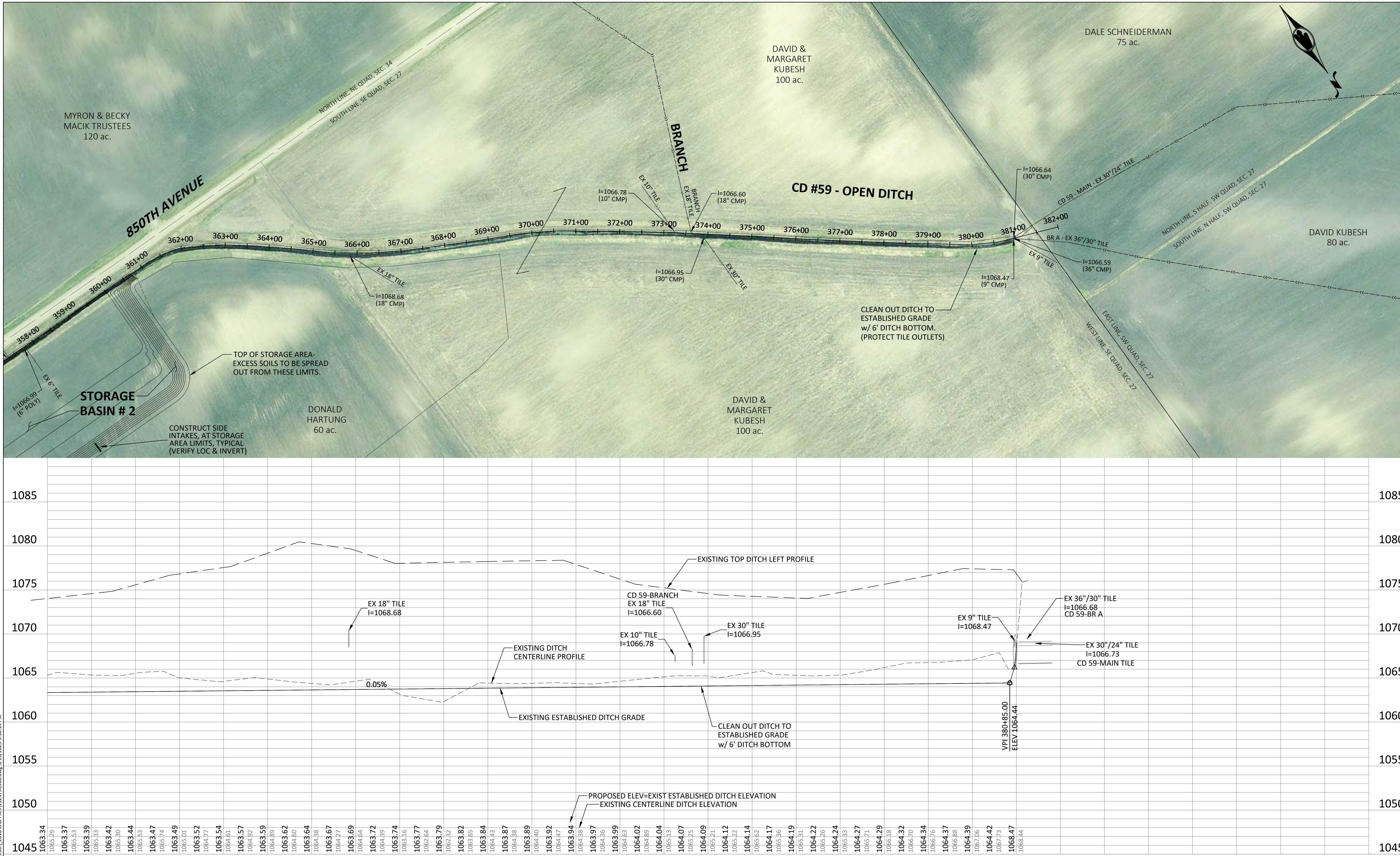

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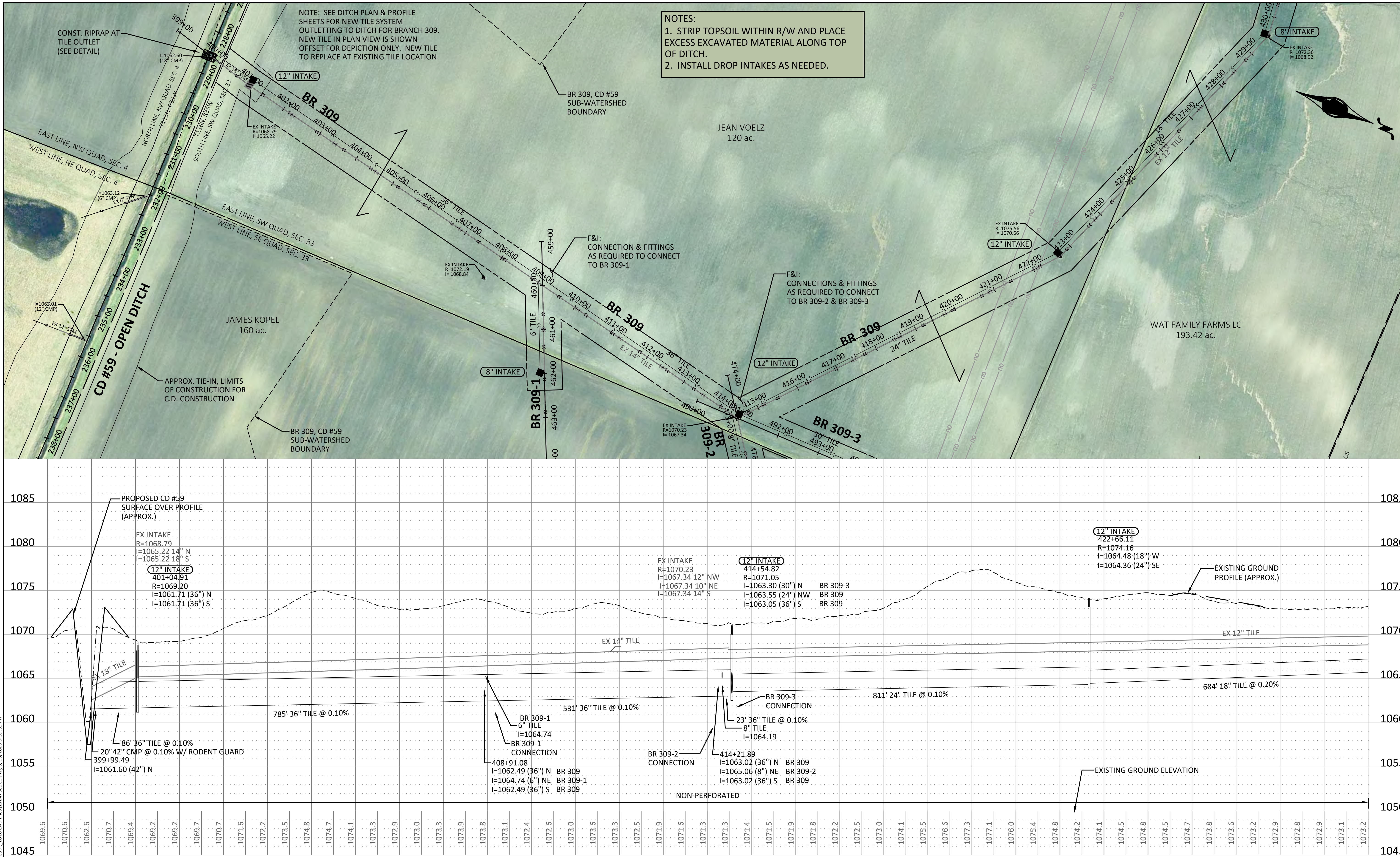

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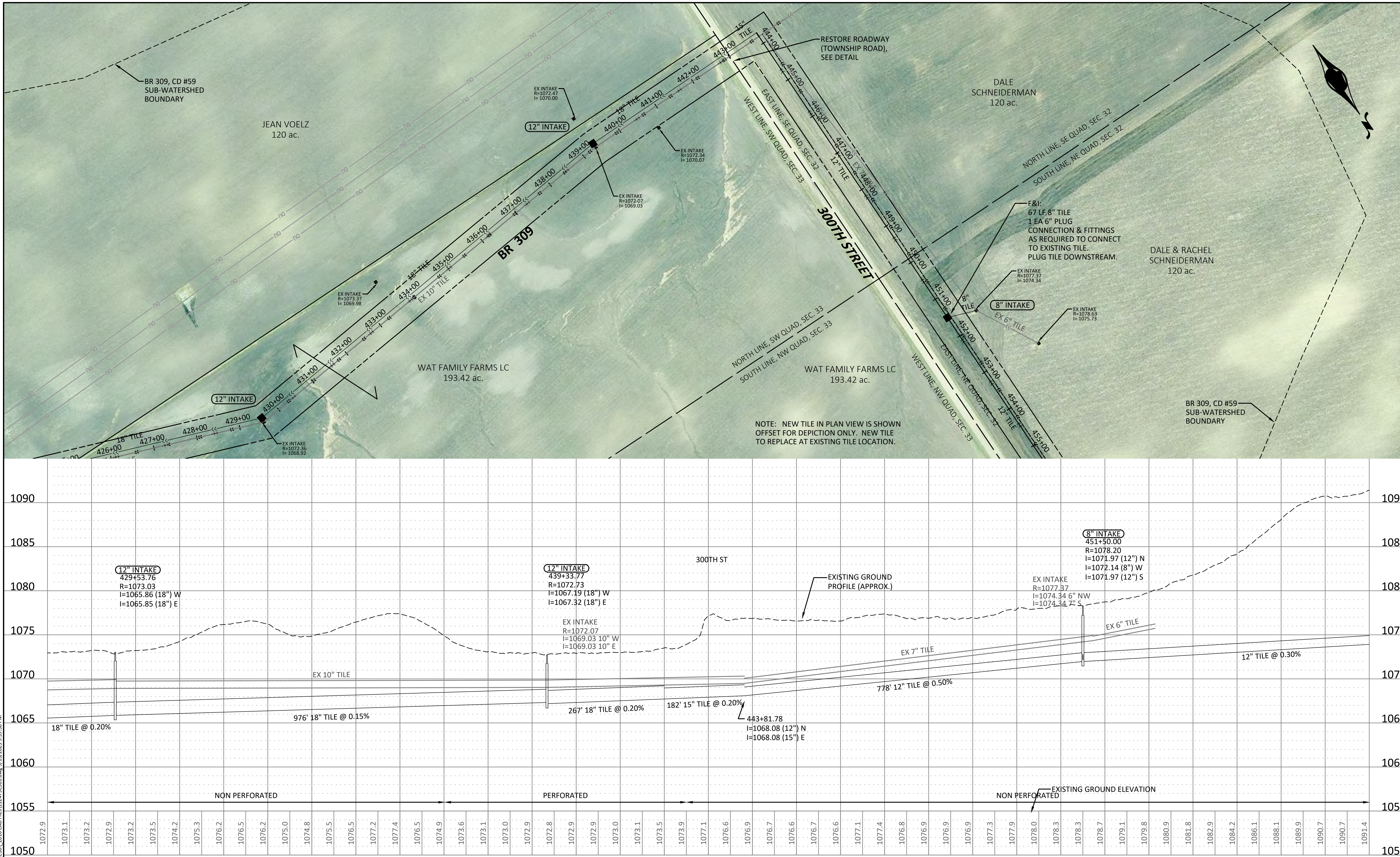

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SHAUN P. LUKER

LIC. NO. 48756 DATE MM/DD/YYYY

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Phone: (507) 794-5541
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RENVILLE COUNTY, MINNESOTA

CD 59 IMPROVEMENTS

BR 309 - STORM SEWER PLAN & PROFILE

STA 428+00 - STA 458+00

SHEET C5.22

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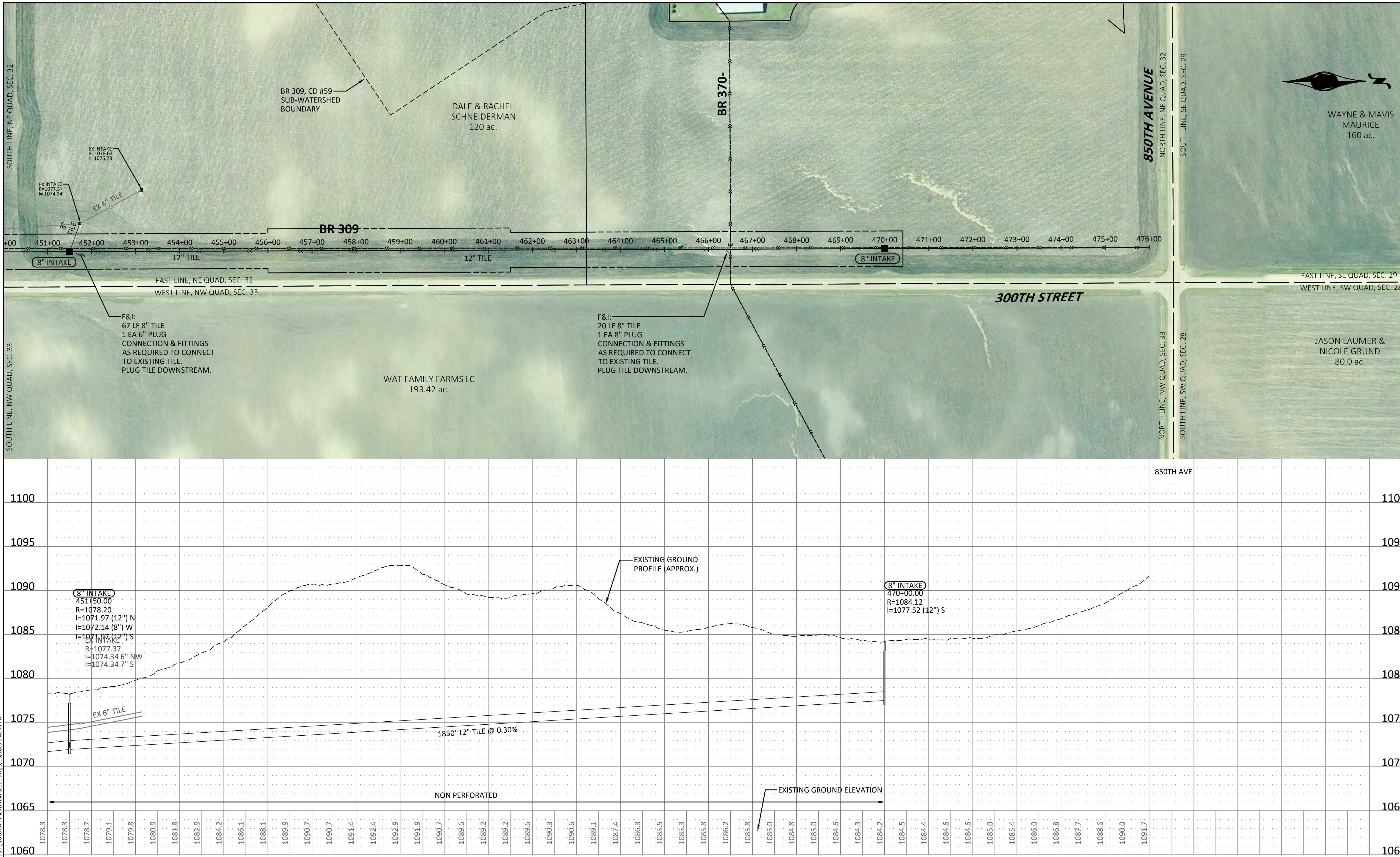

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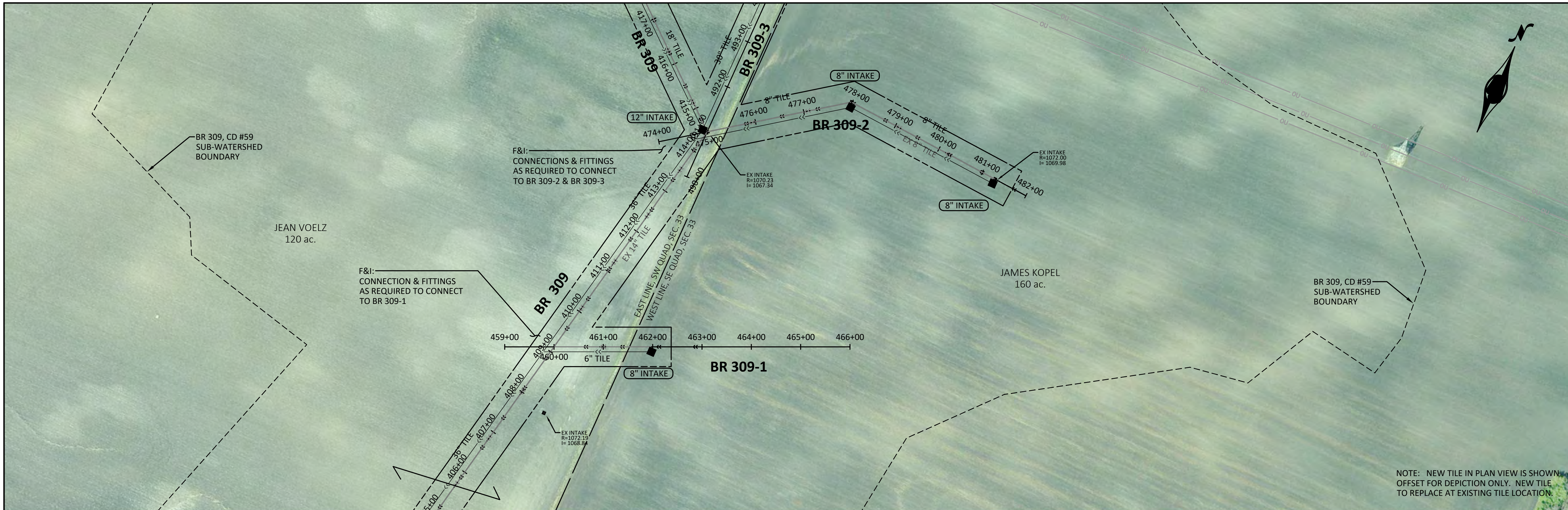

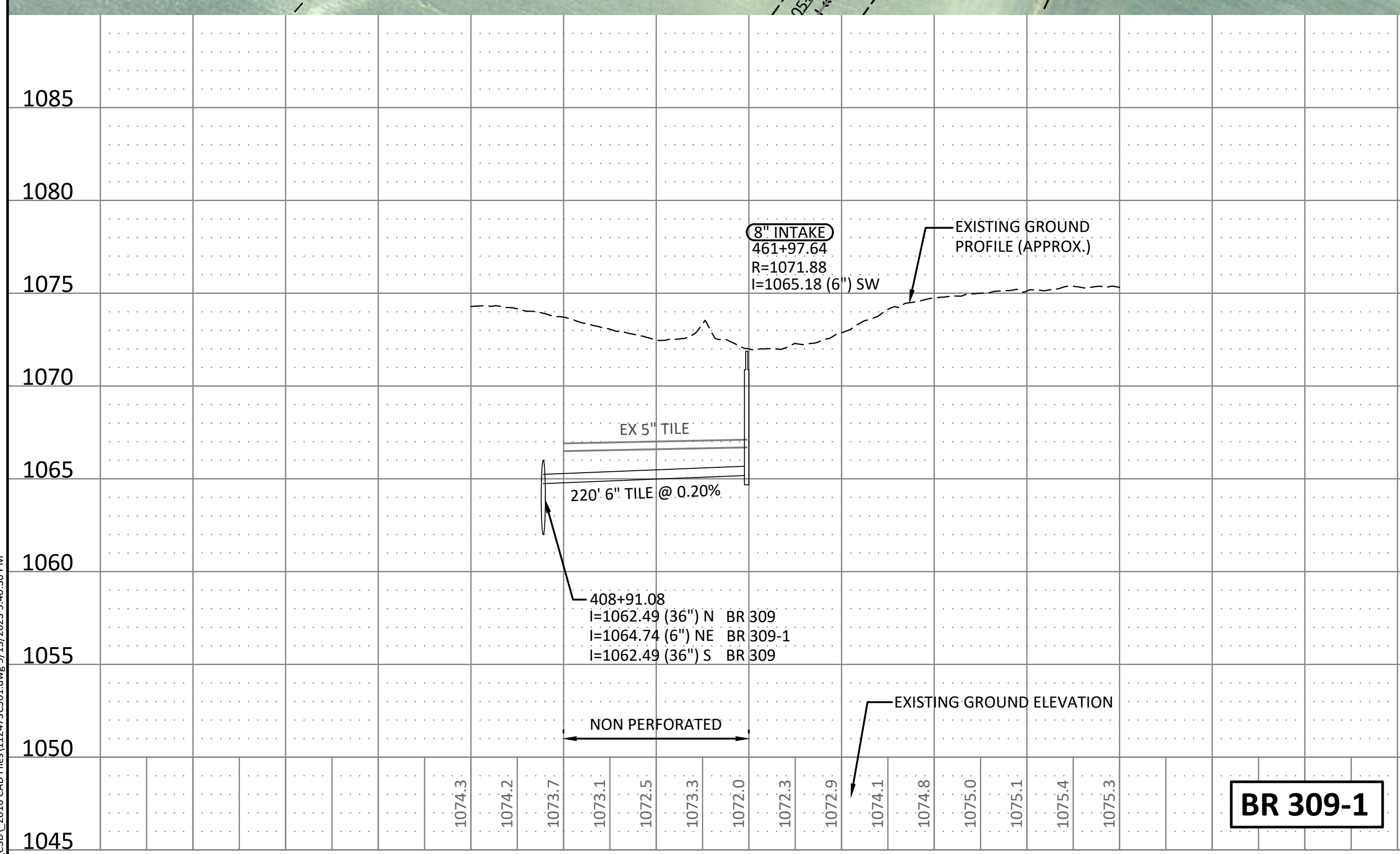

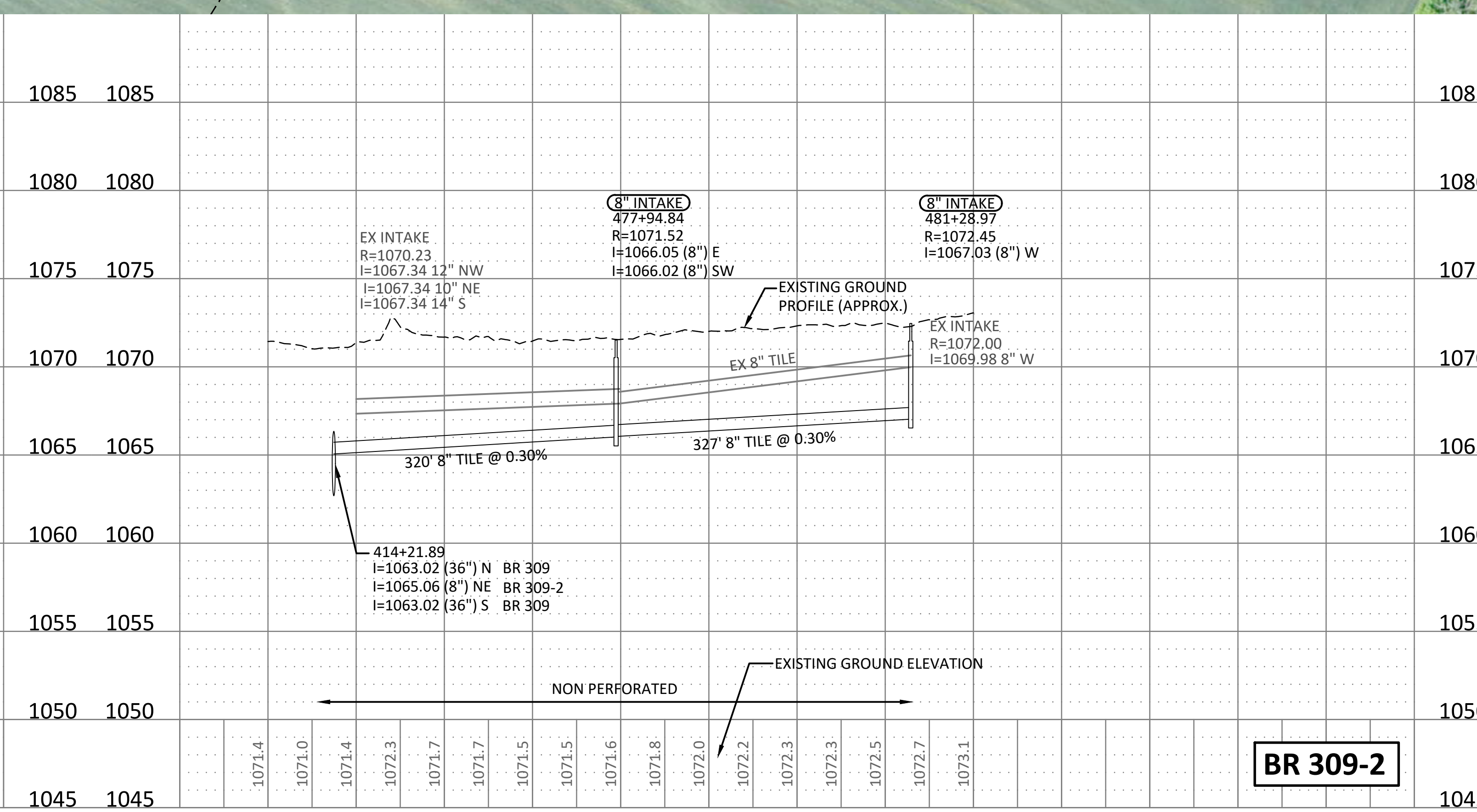

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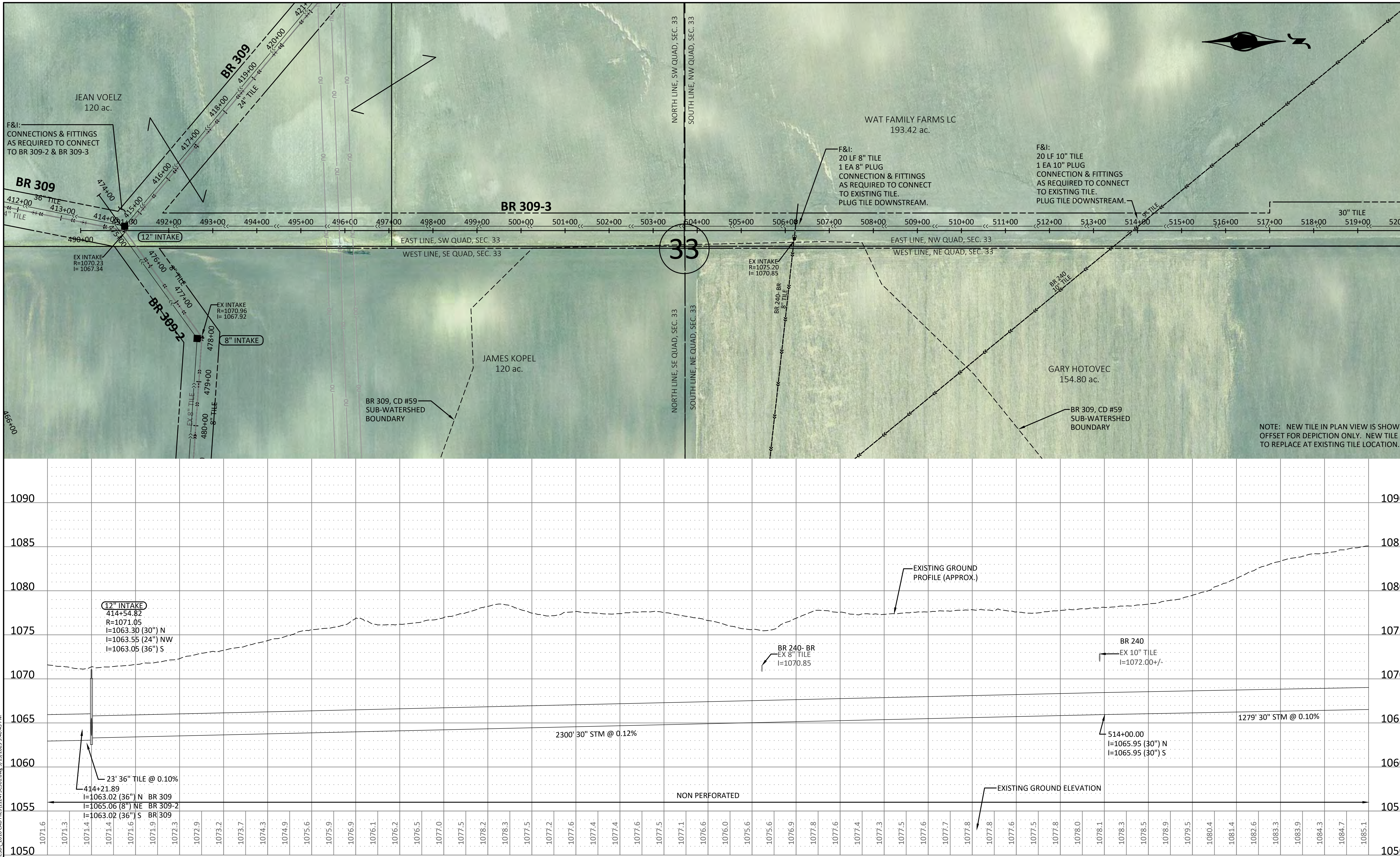

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STA 490+00 - STA 520+00

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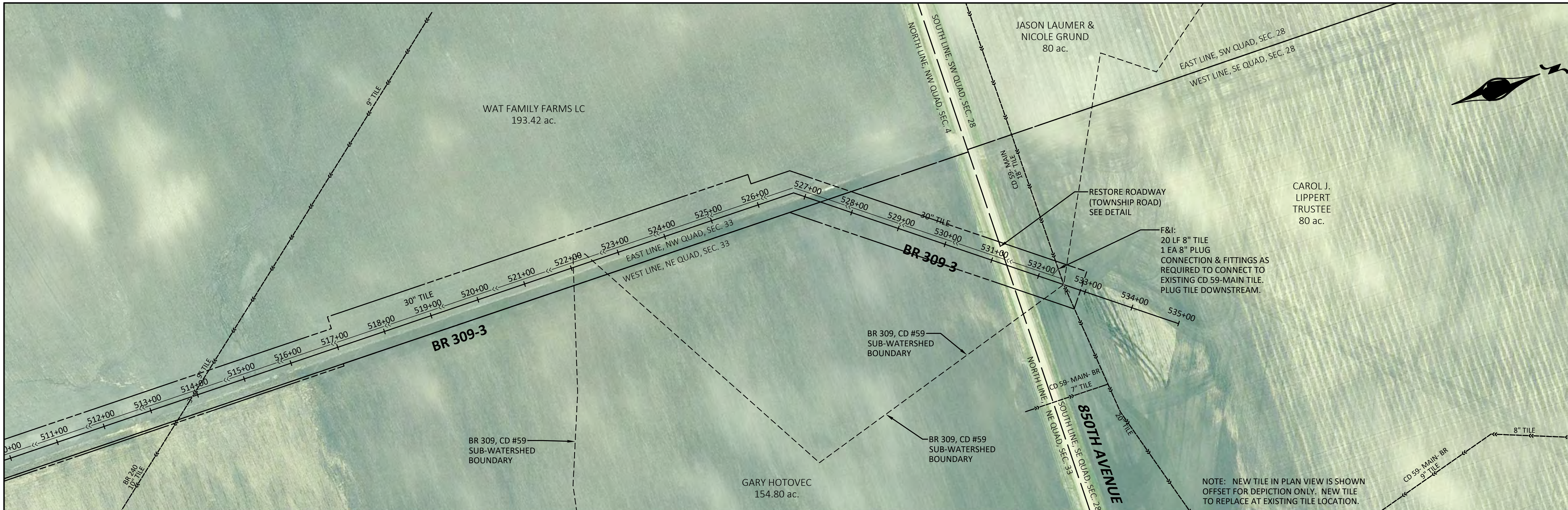

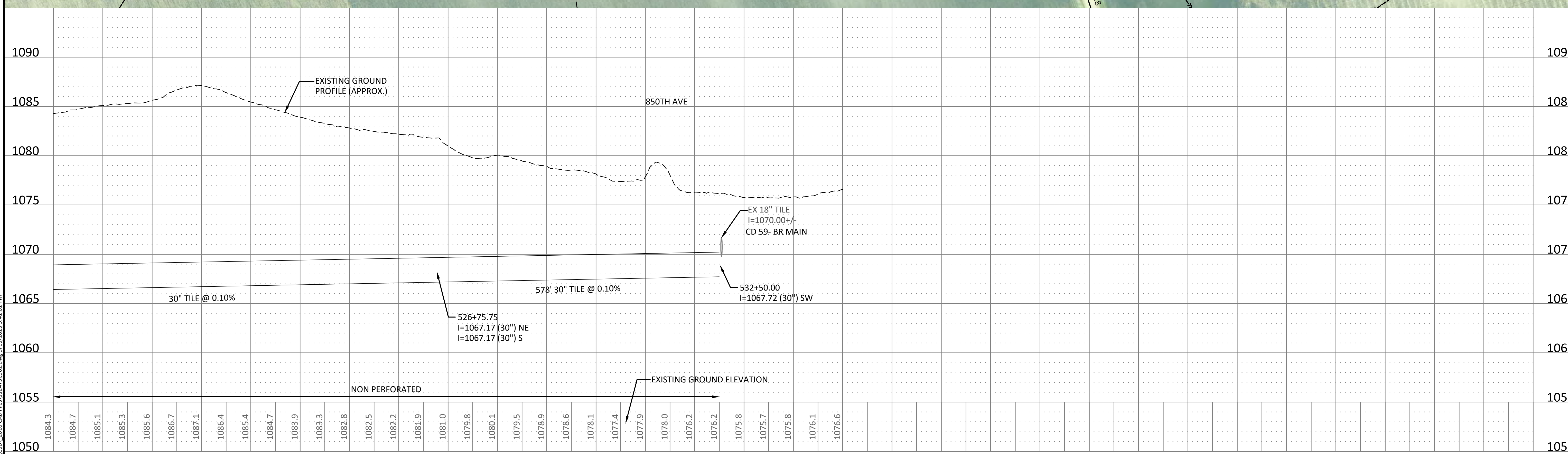

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RENVILLE COUNTY, MINNESOTA

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BR 309 - STORM SEWER PLAN & PROFILE

STA 519+00 - STA 549+00

SHEET C5.26

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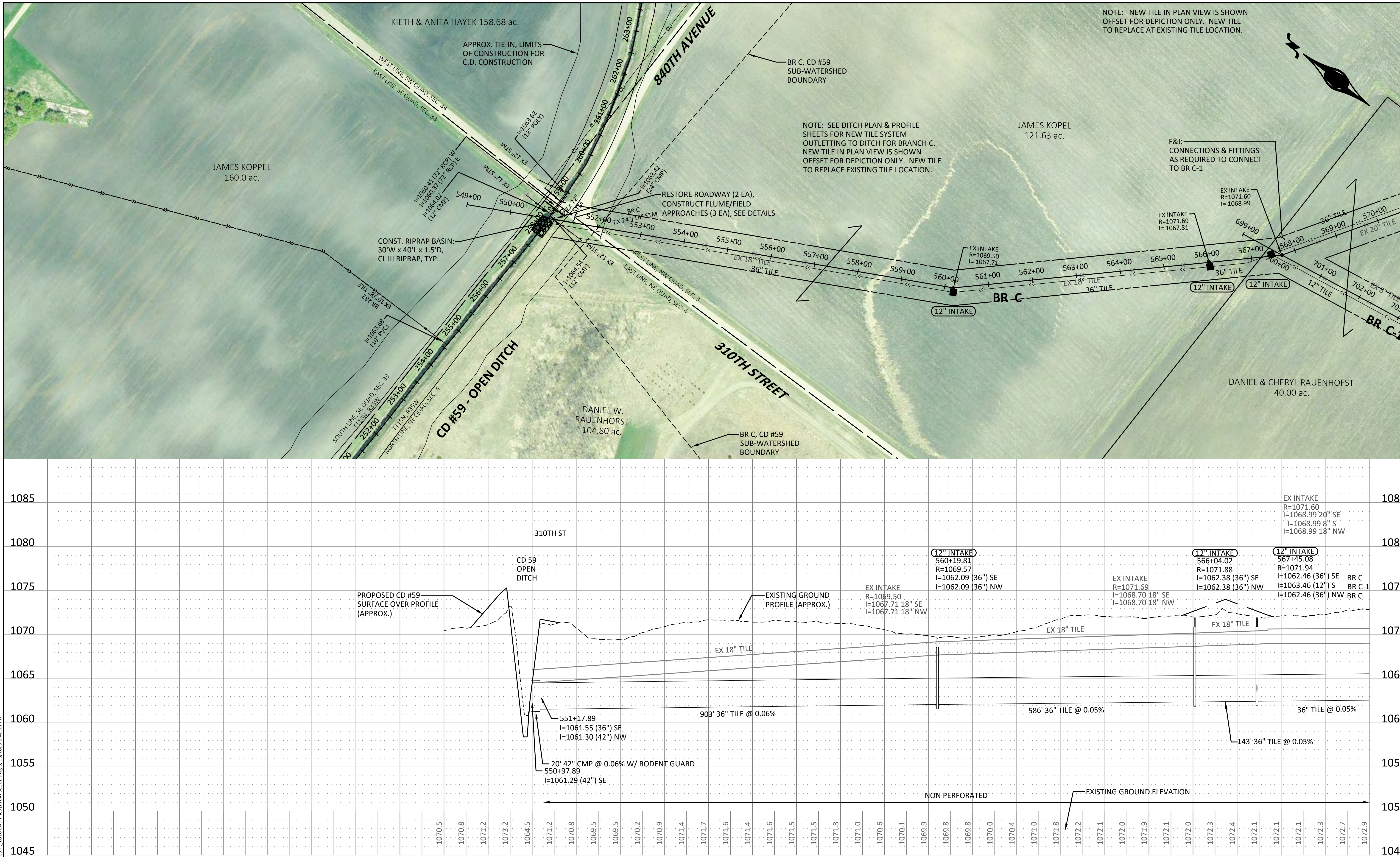

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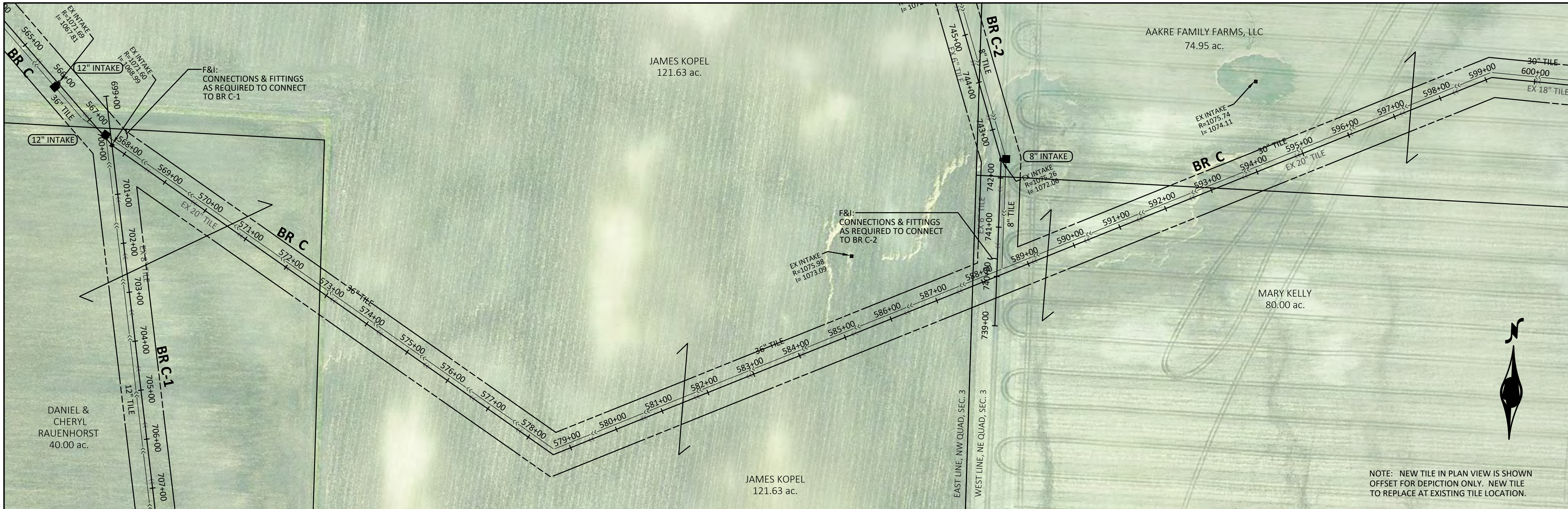

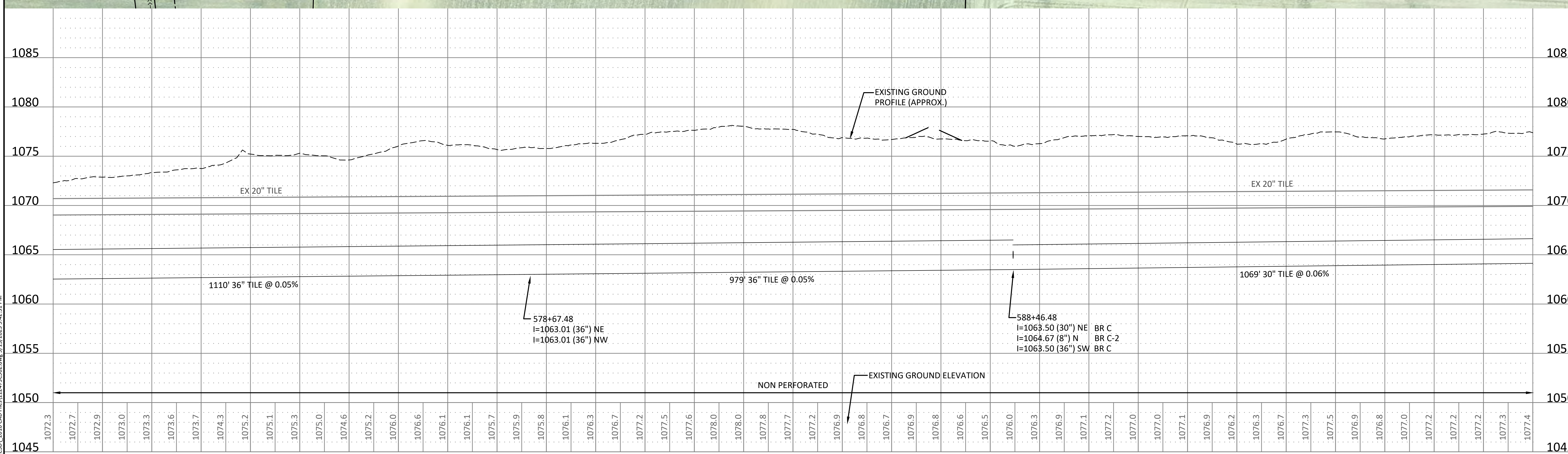

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RENVILLE COUNTY, MINNESOTA

CD 59 IMPROVEMENTS

BR C - STORM PLAN & PROFILE

SAT 569+00 - STA 599+00

SHEET C5.32

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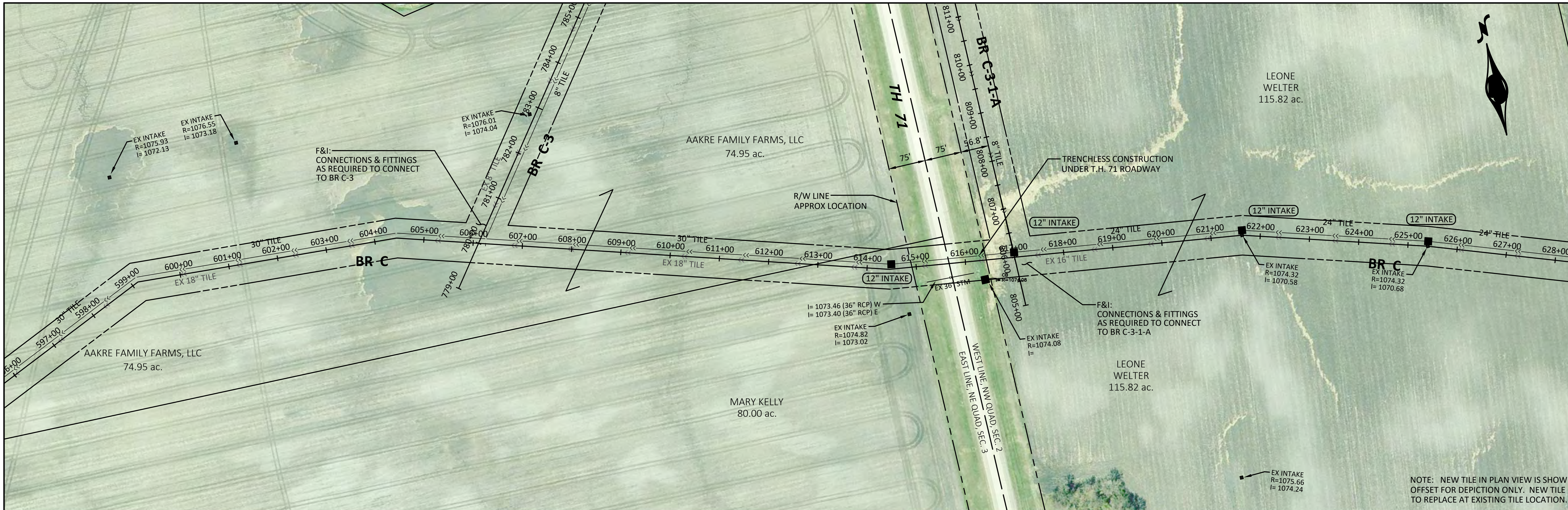

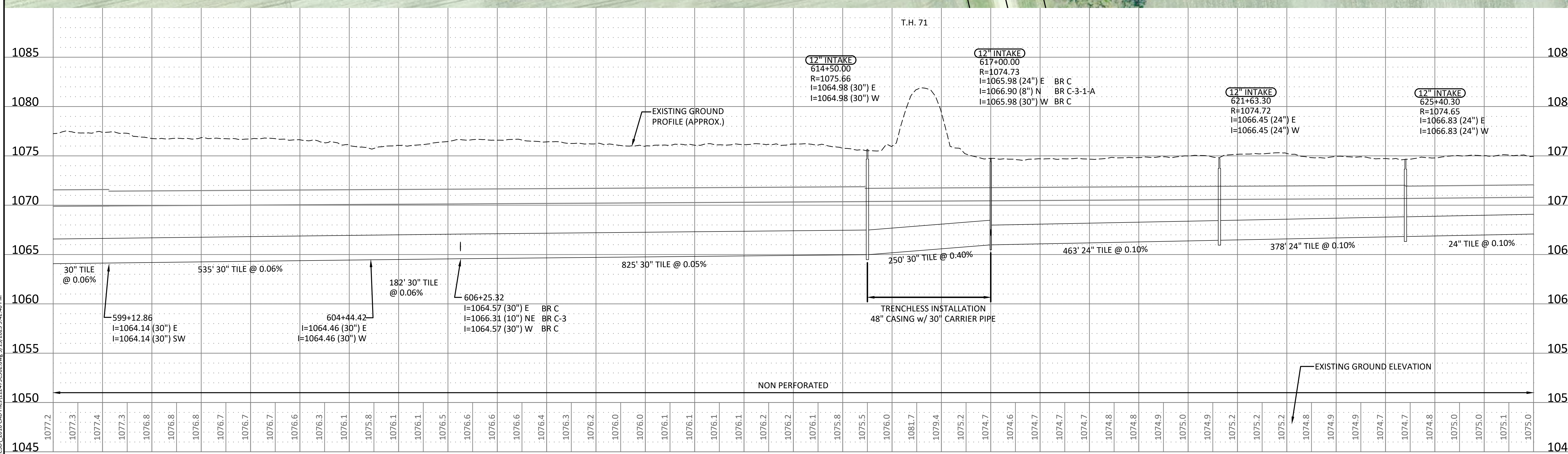

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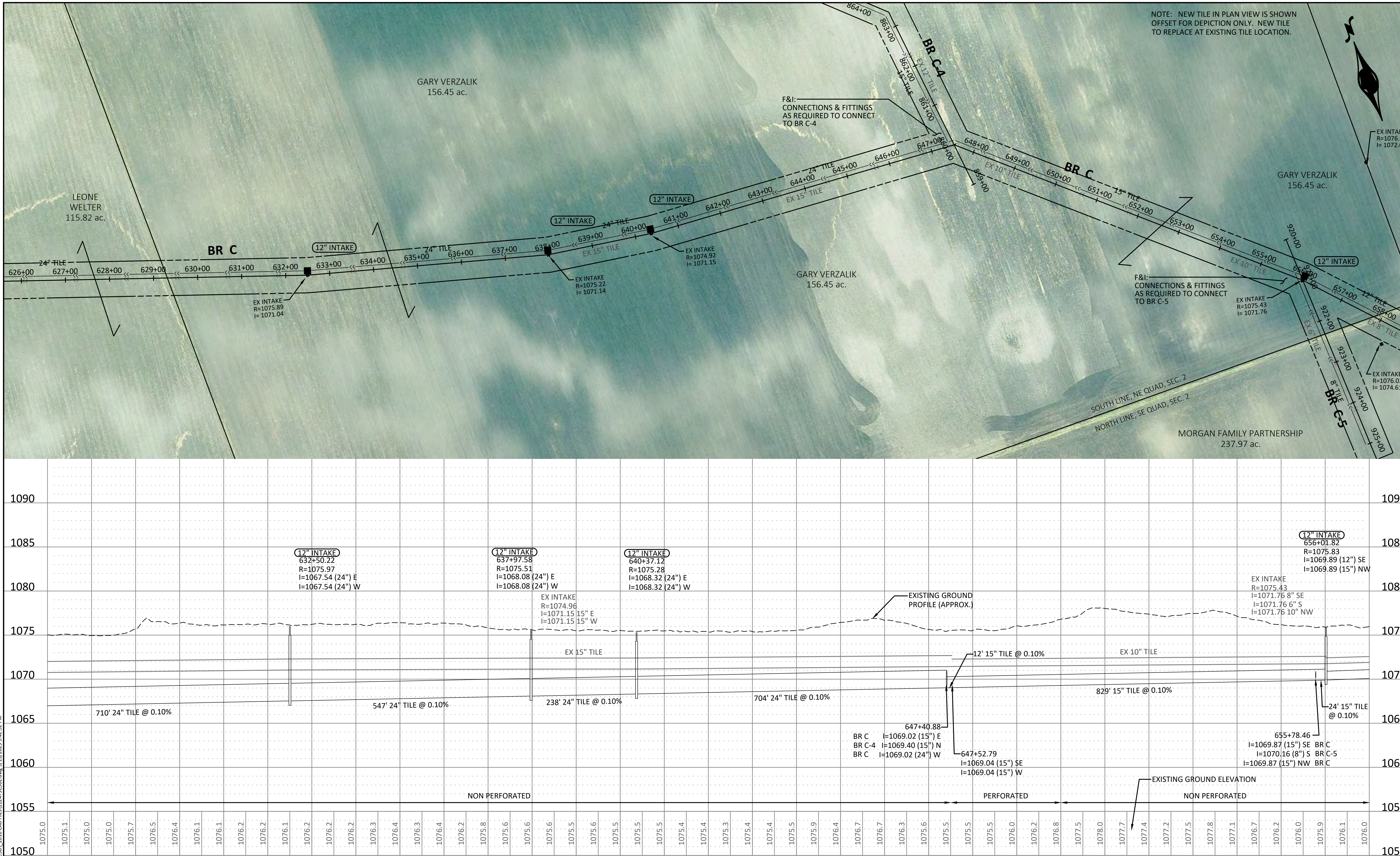

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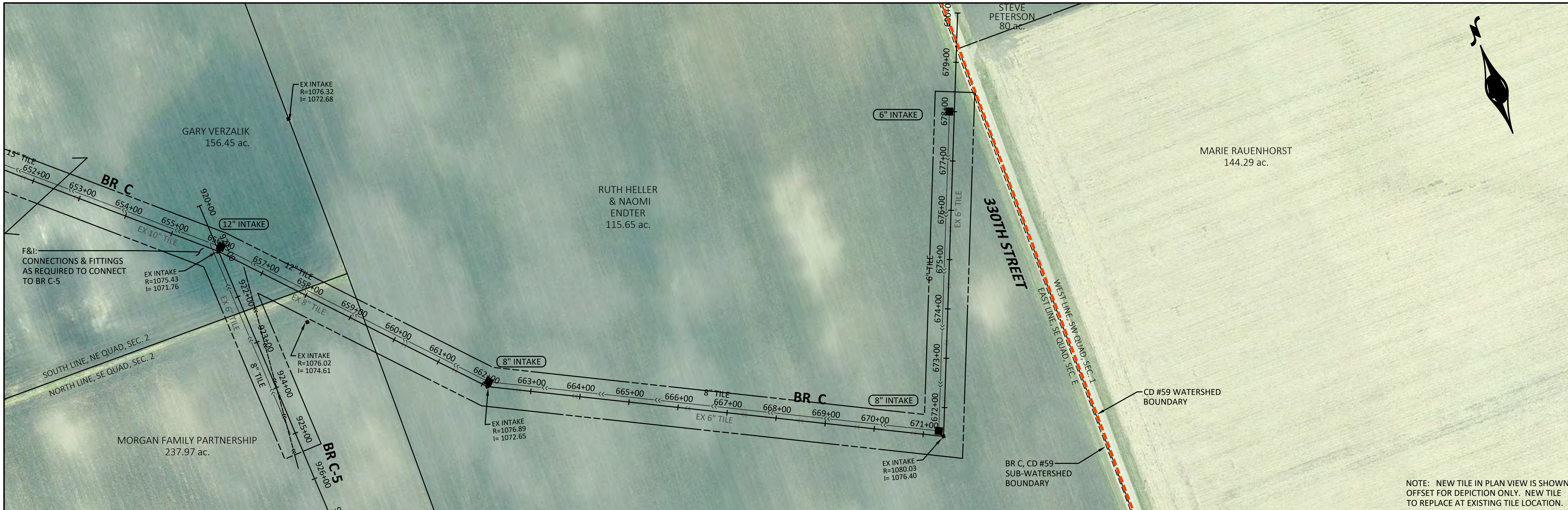

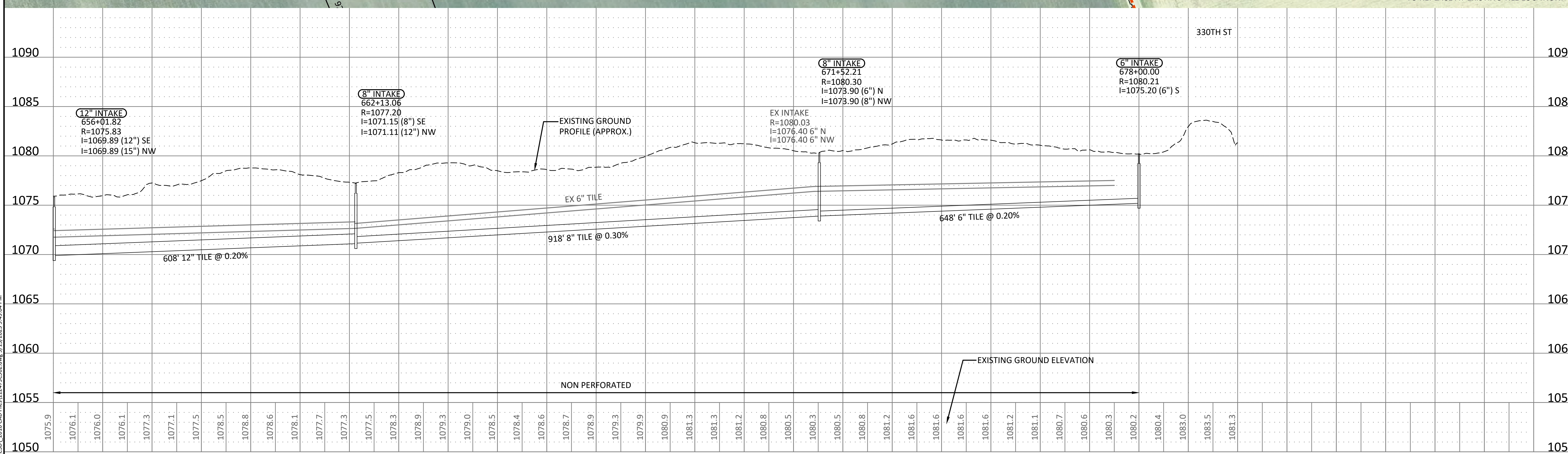

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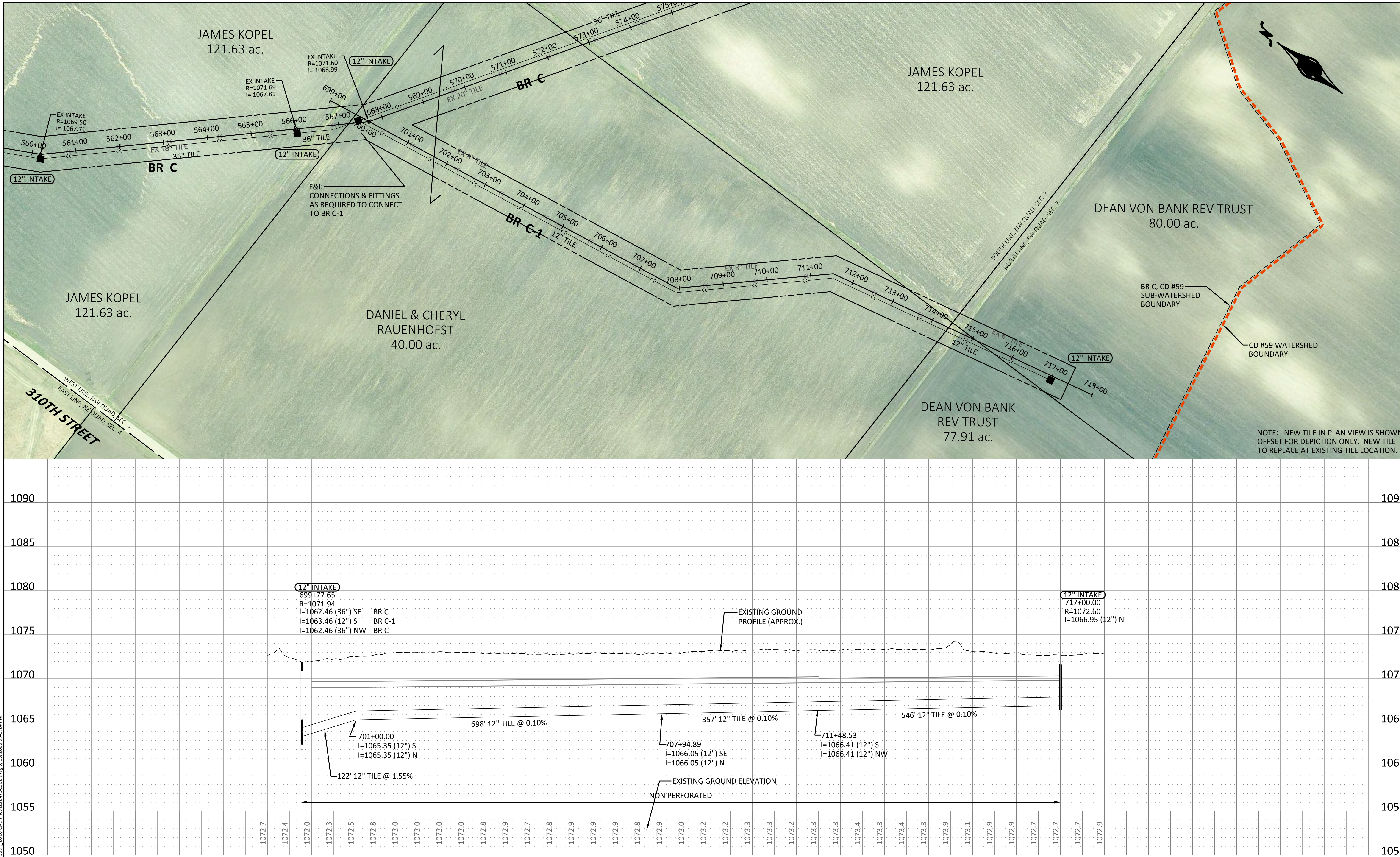

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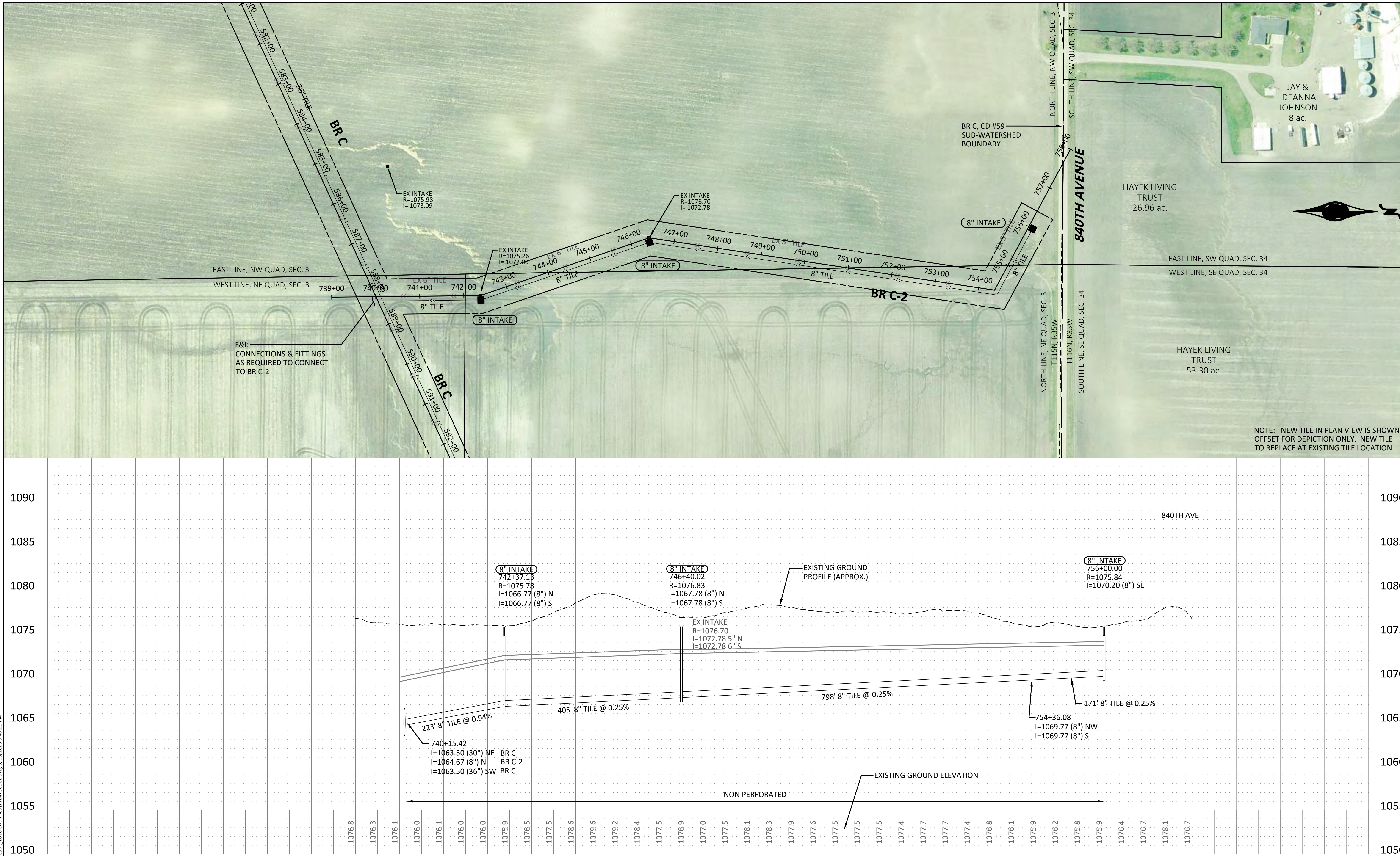

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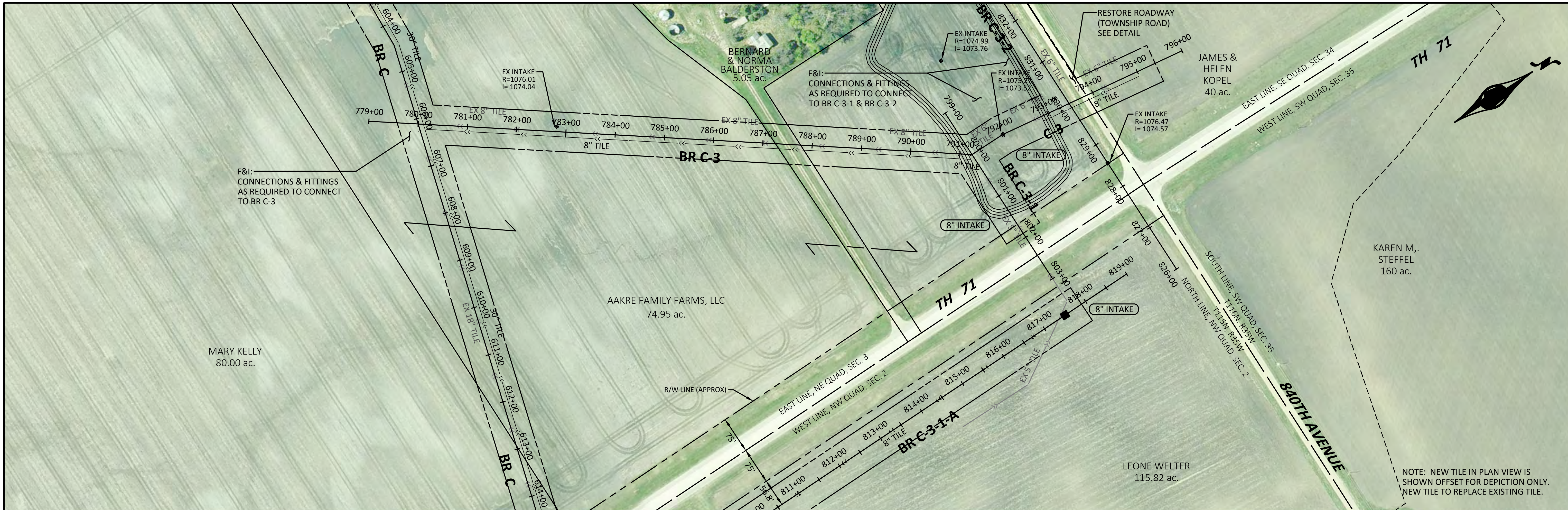

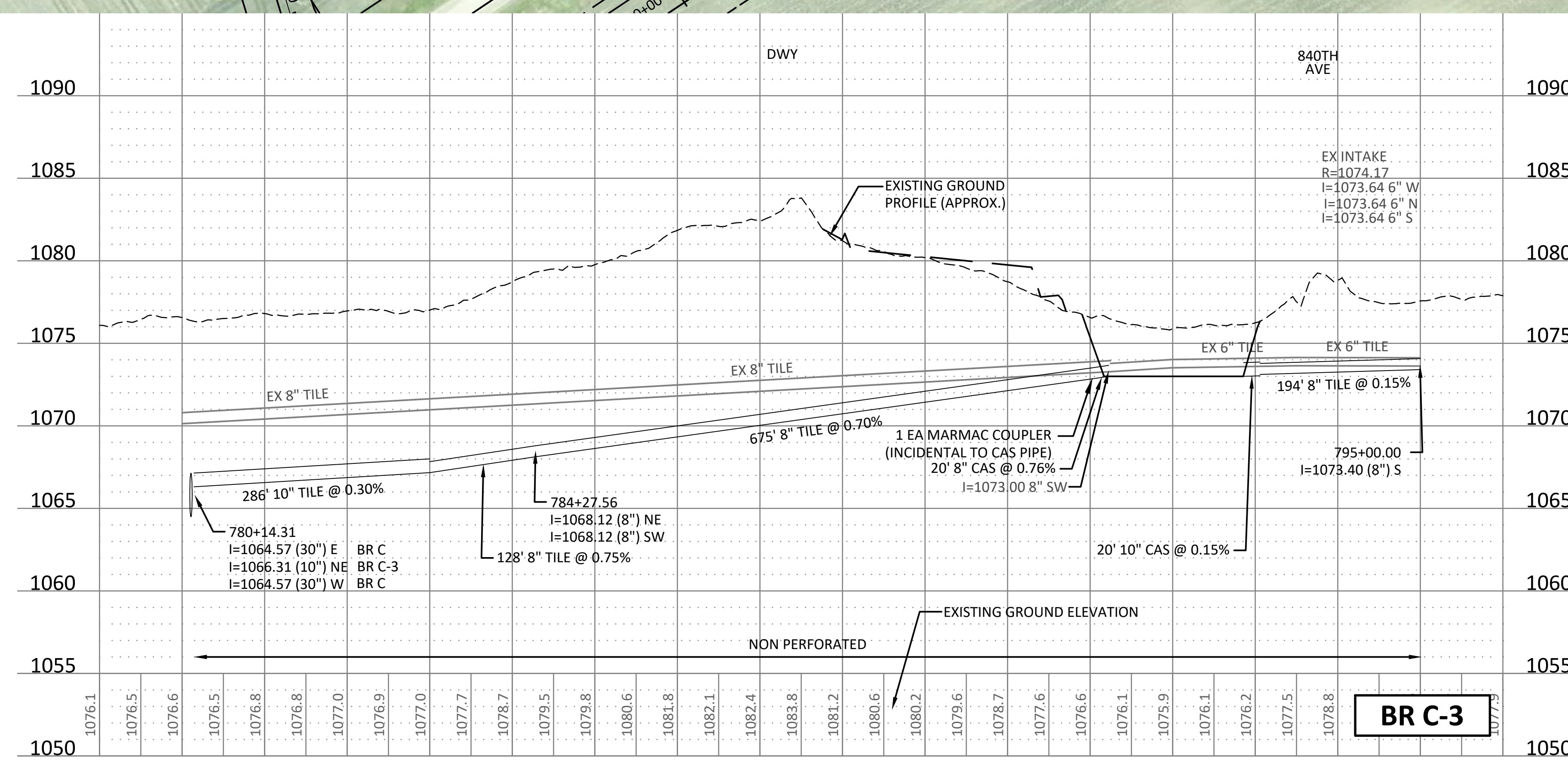

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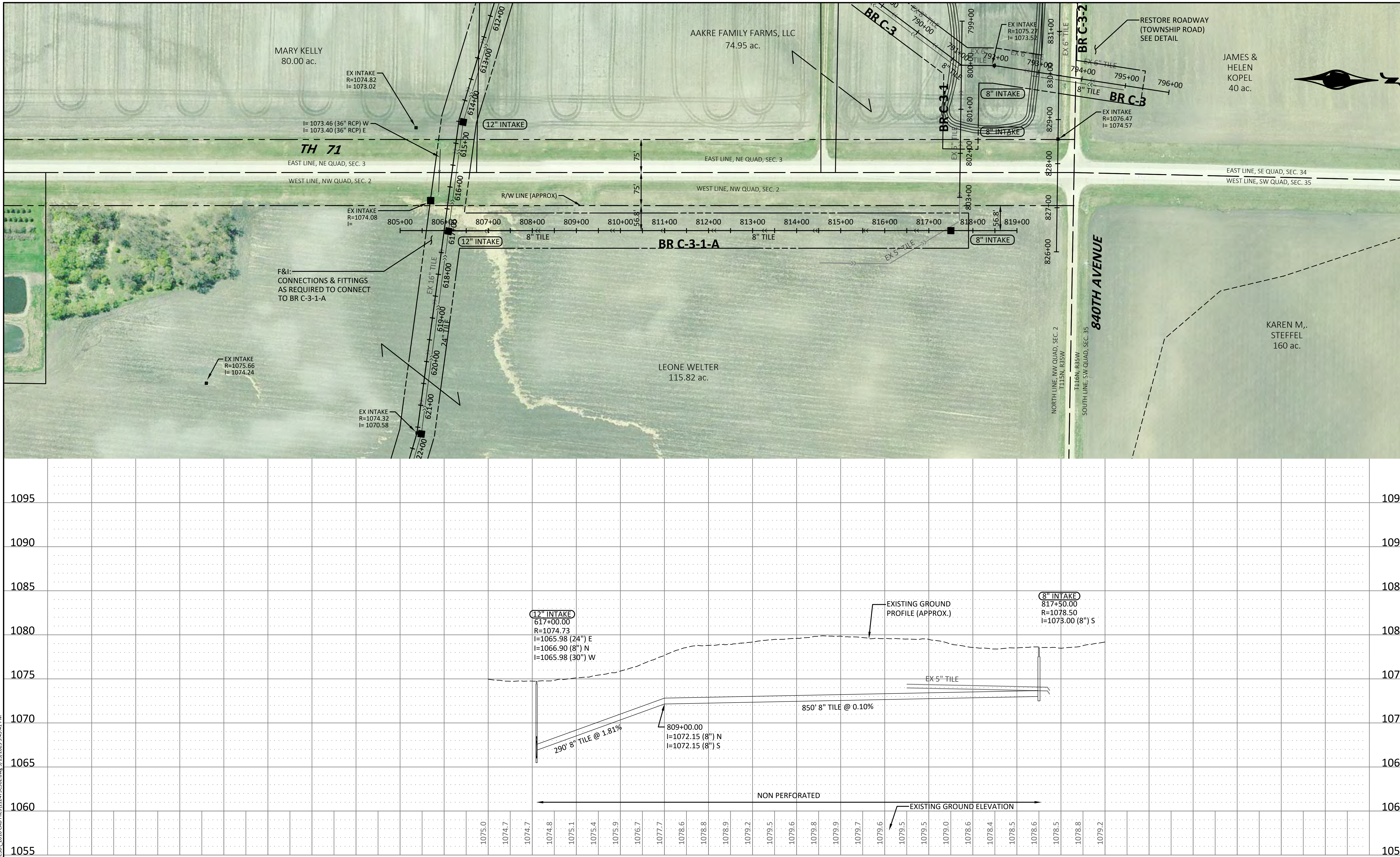

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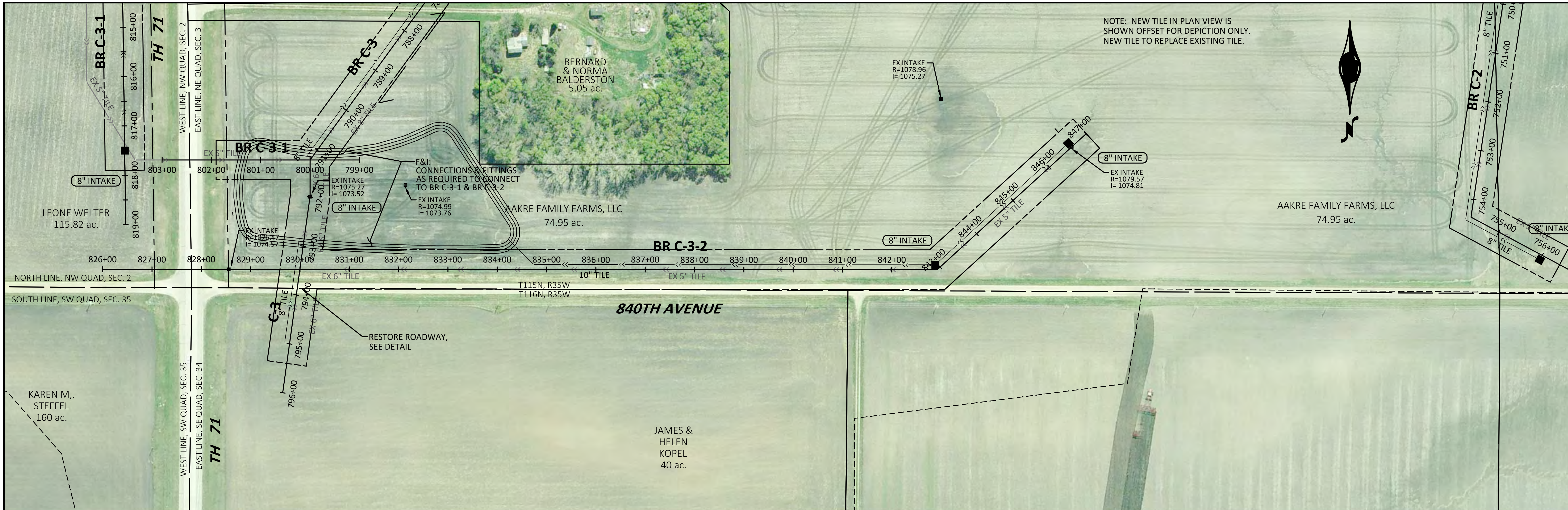

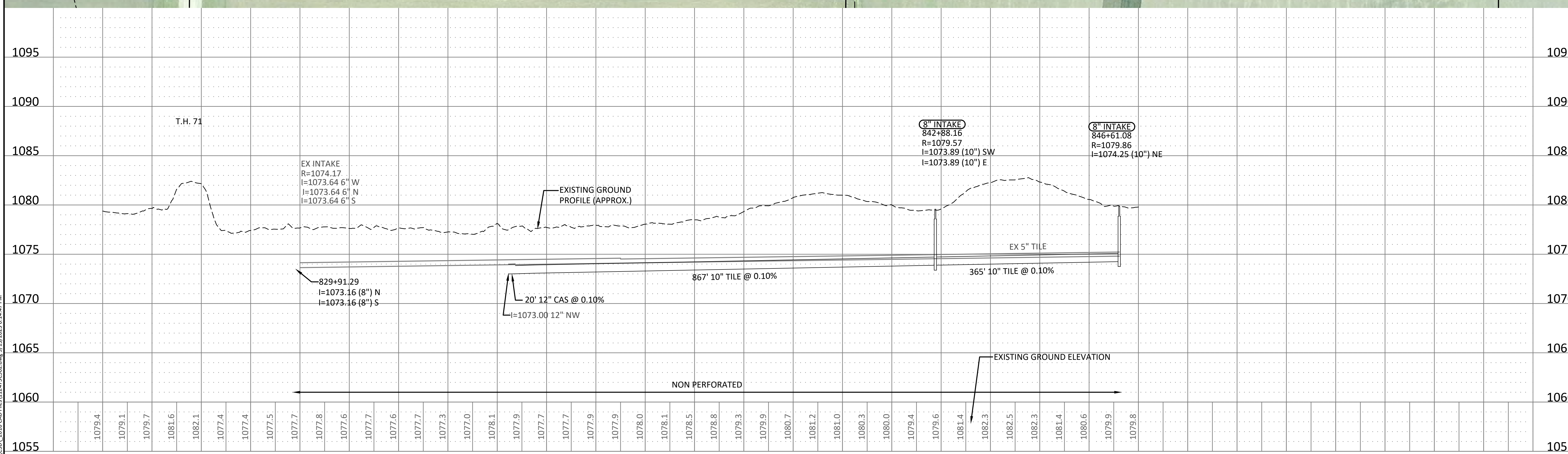

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BR C - STORM PLAN & PROFILE

STA 825+00 - STA 855+00

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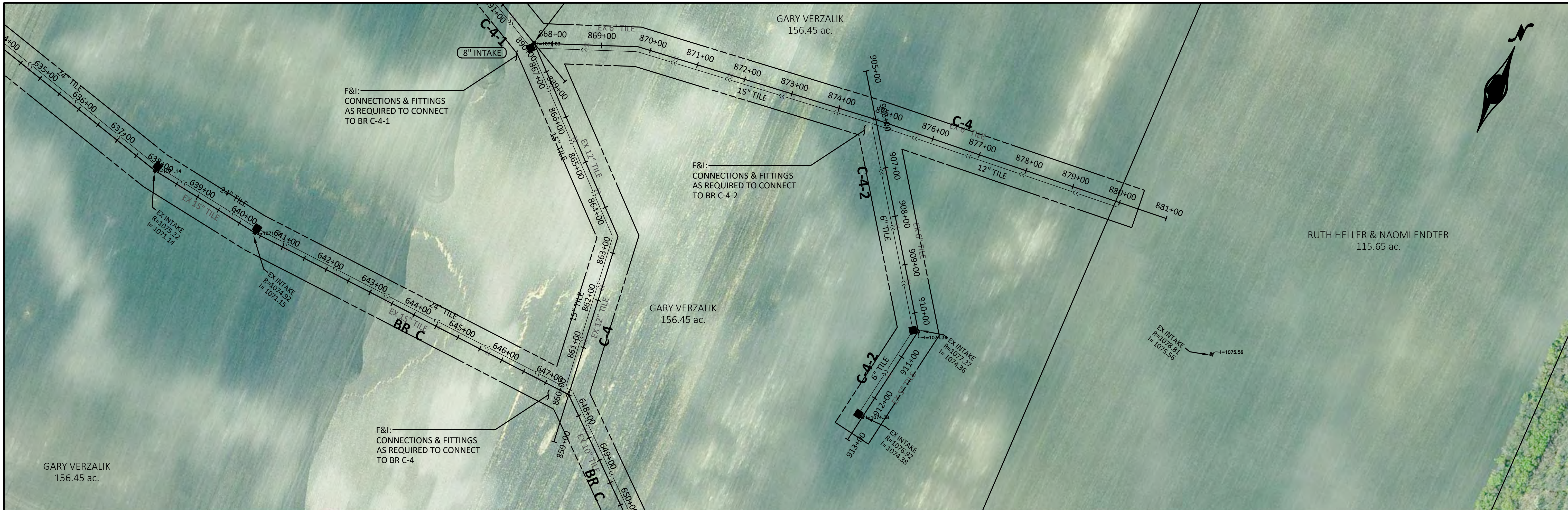

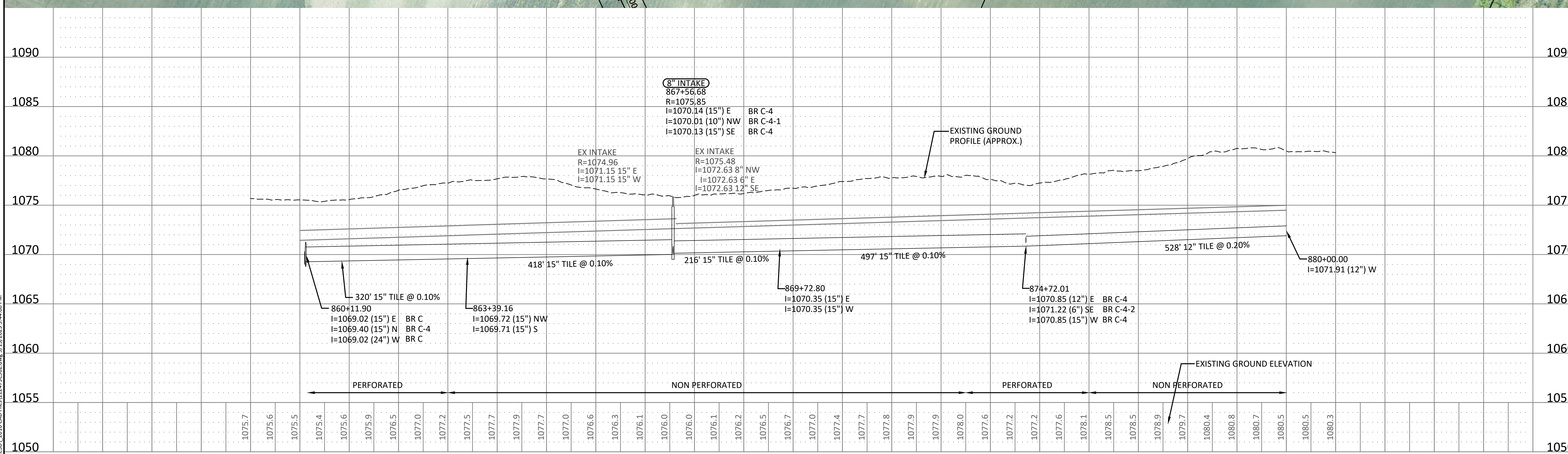

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VERT. 0 5 10 SCALE FEET

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SHAUN P. LUKER

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CLIENT PROJ. NO. S15.112473				

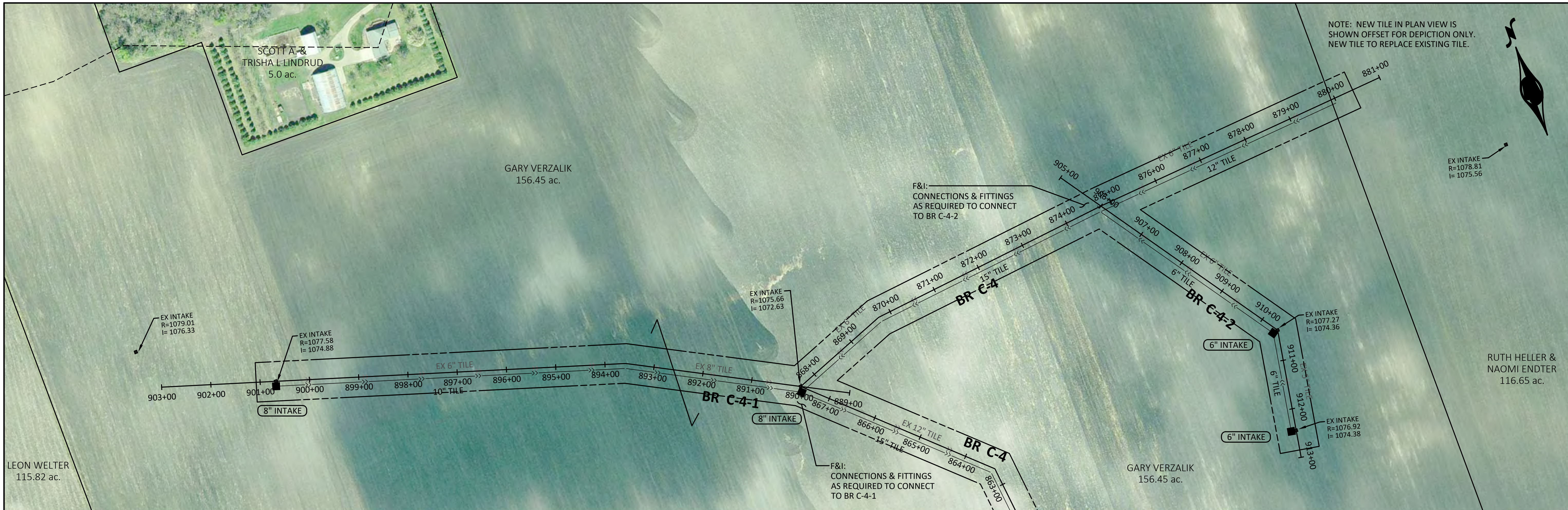
RENVILLE COUNTY, MINNESOTA

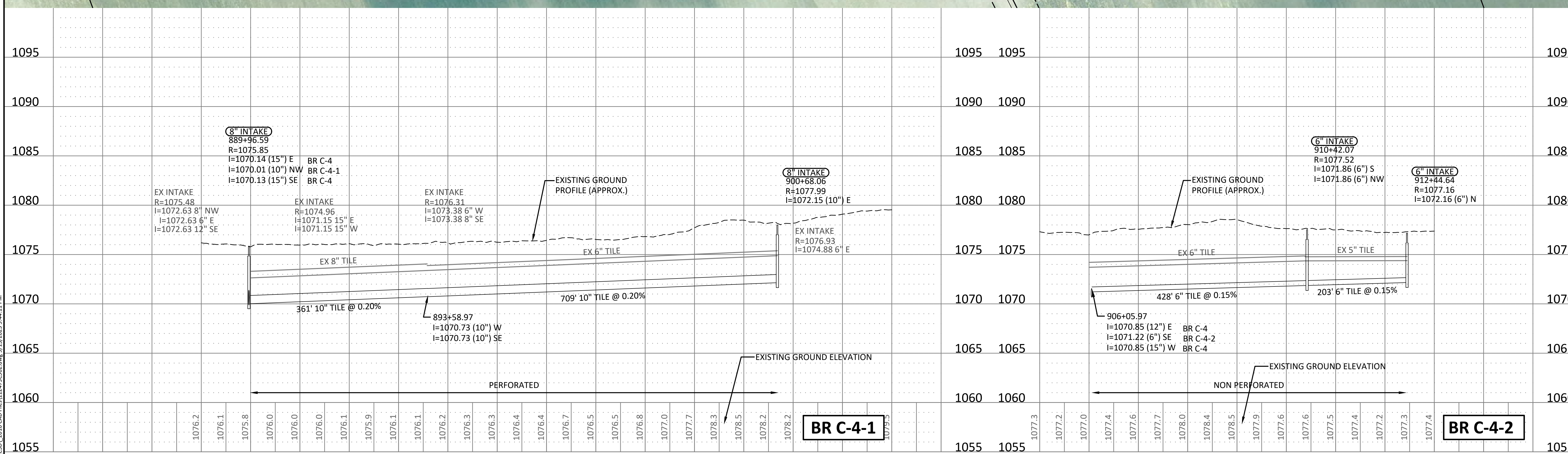
CD 59 IMPROVEMENTS

BR C - STORM PLAN & PROFILE

STA 855+00 - STA 885+00

SHEET C5.41





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SHEET C5.42

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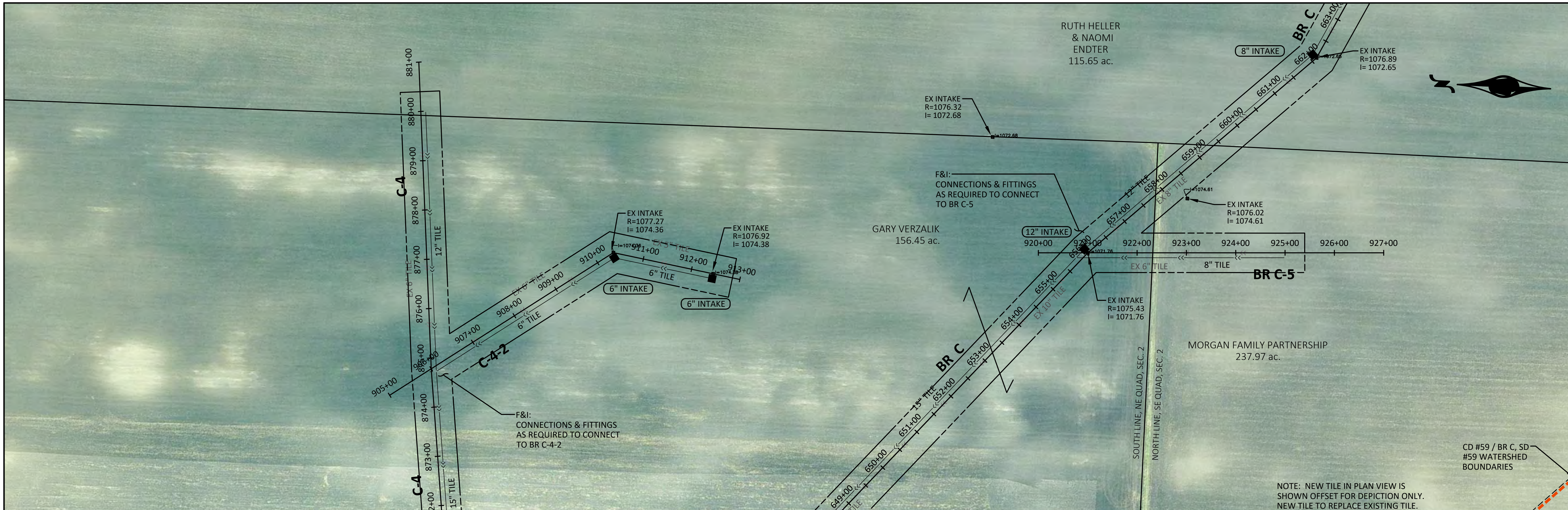

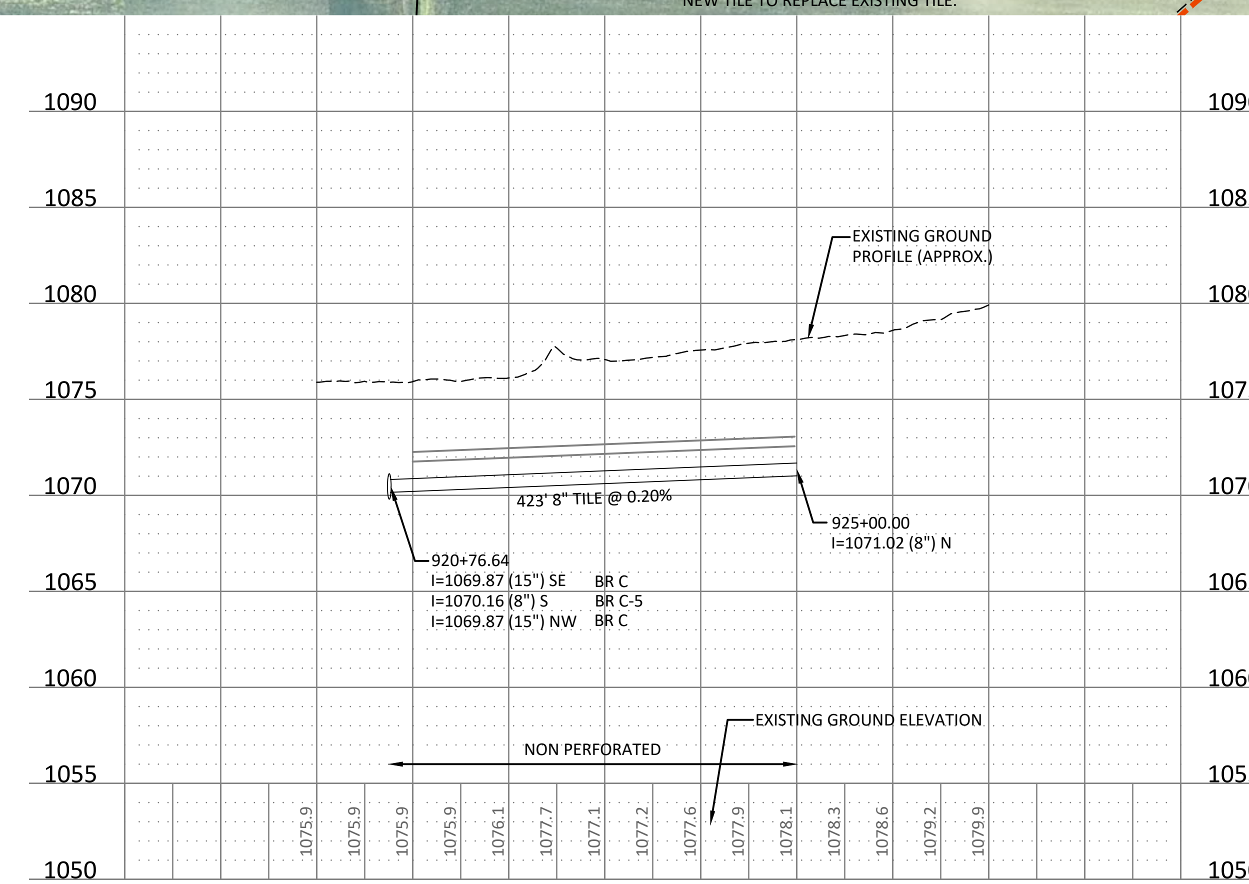

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SHEET C5.43

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CD 59 POND 1

PLAN & OVERVIEW

SHEET C5.51

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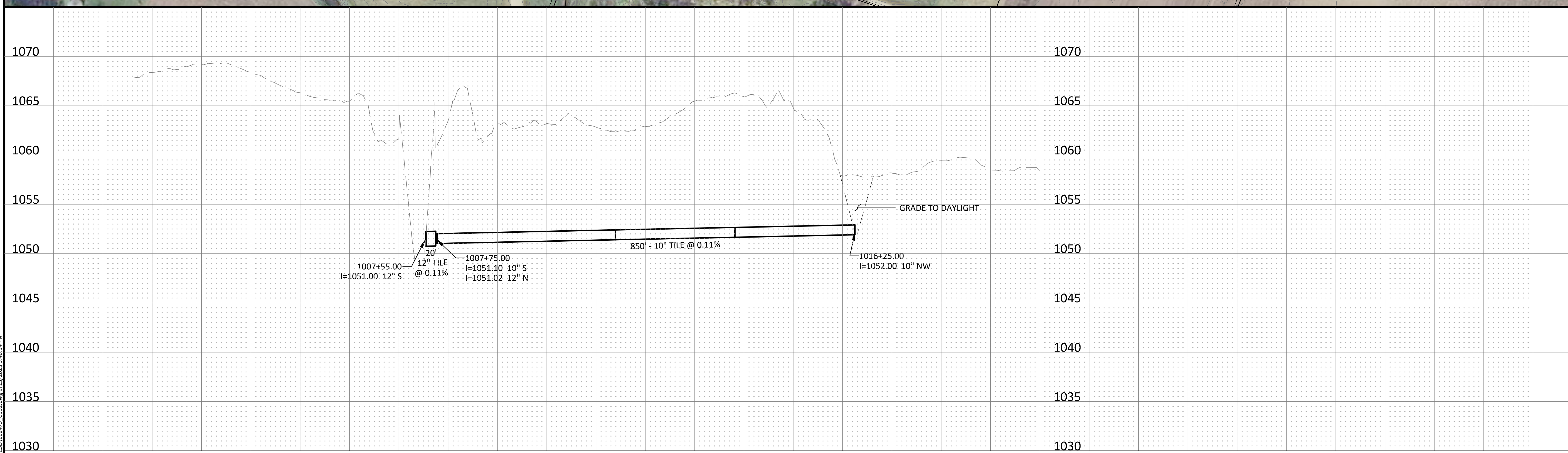

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CD 59 POND 1
OUTLET PLAN & PROFILE

SHEET C5.52

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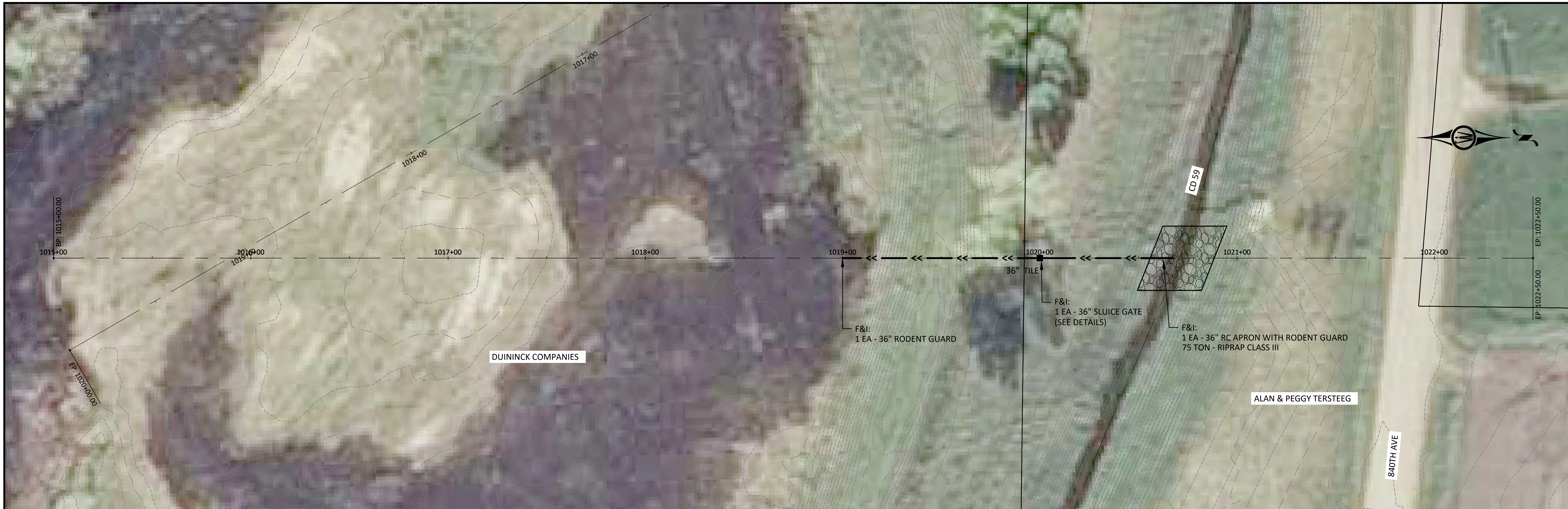

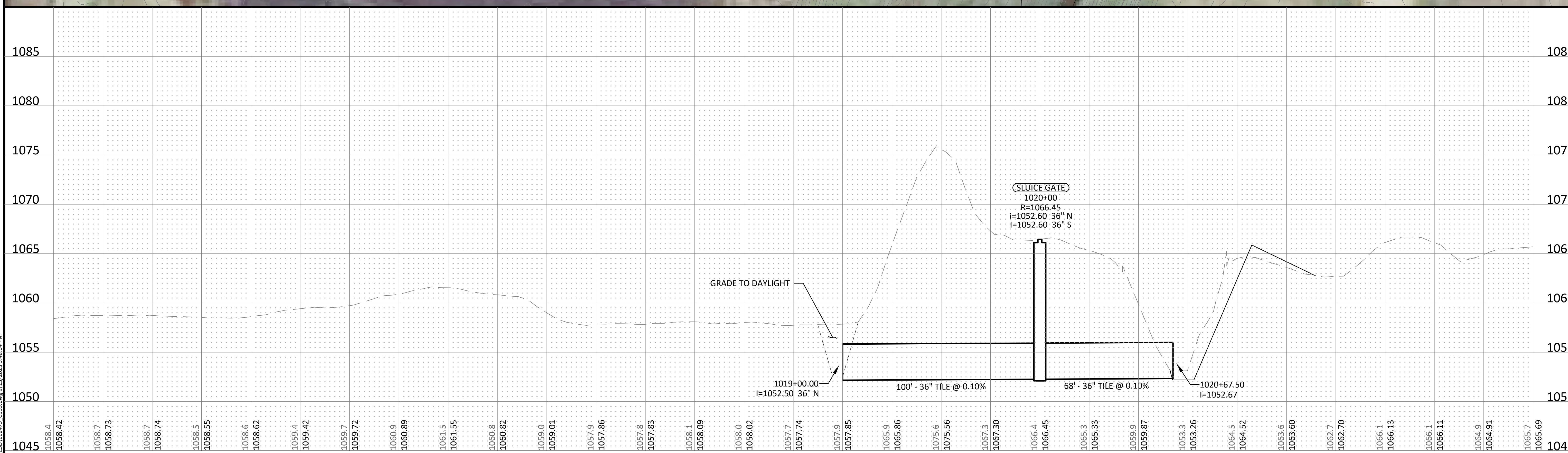

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INLET PLAN & PROFILE

SHEET C5.53

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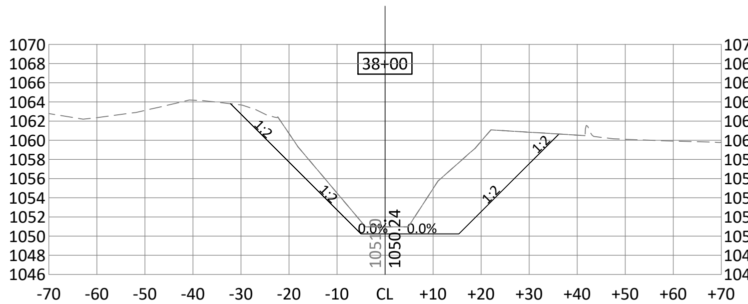

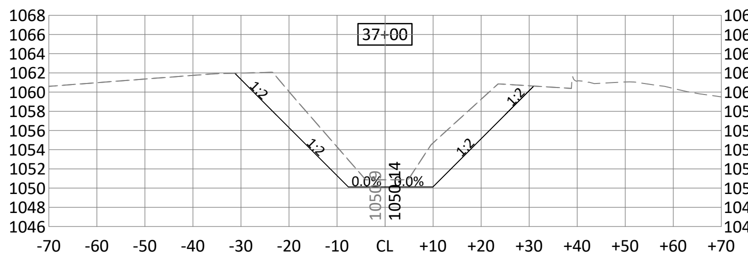

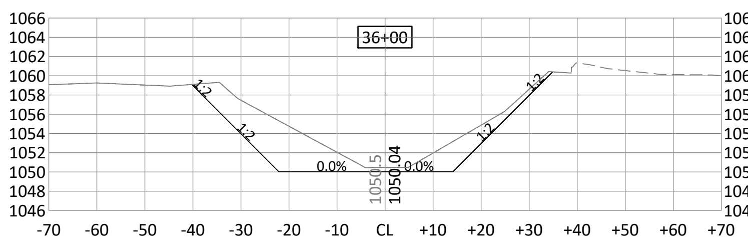

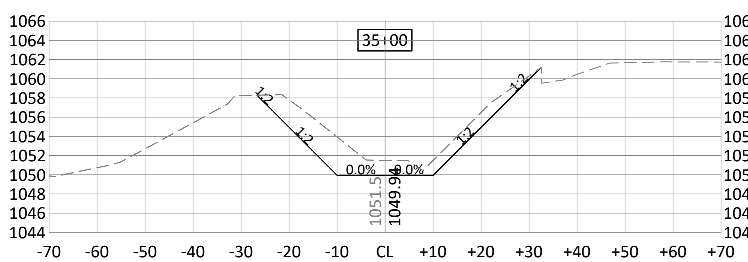

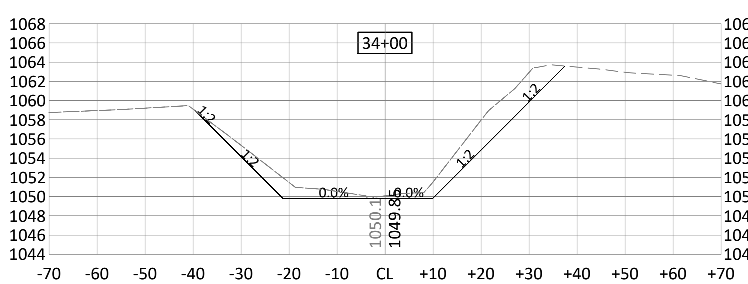

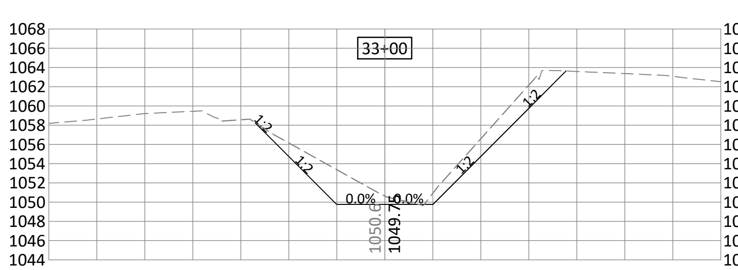

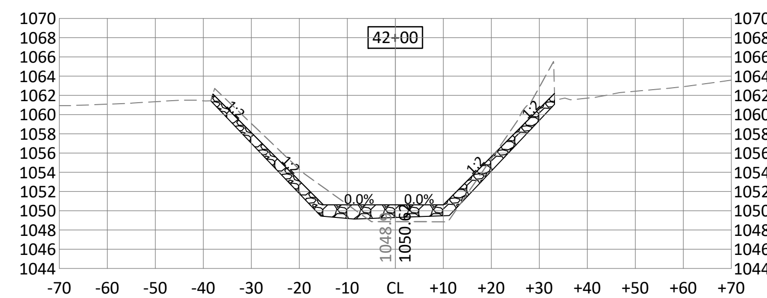

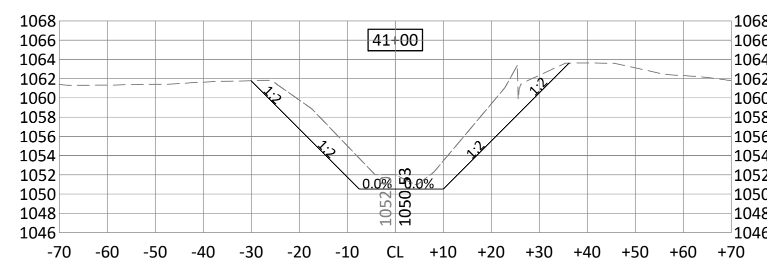

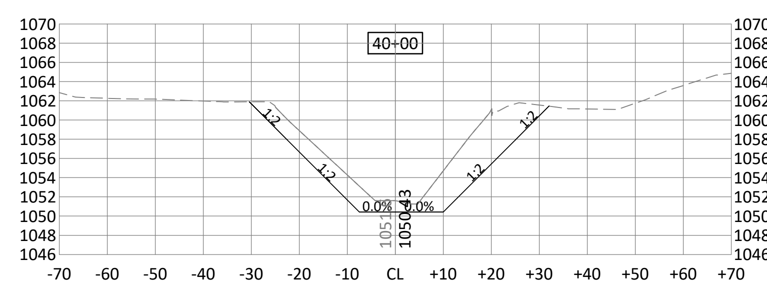

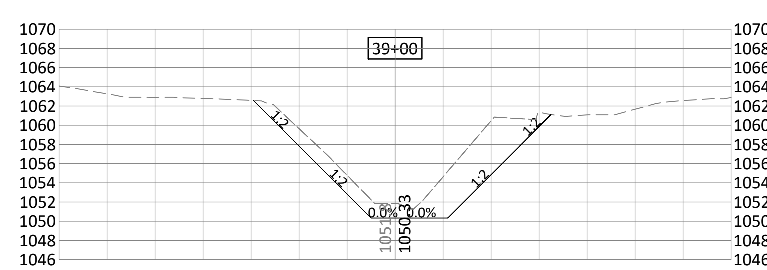

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SHAUN P. LUKER

LIC. NO. 48756 DATE MM/DD/YYYY

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CROSS SECTIONS
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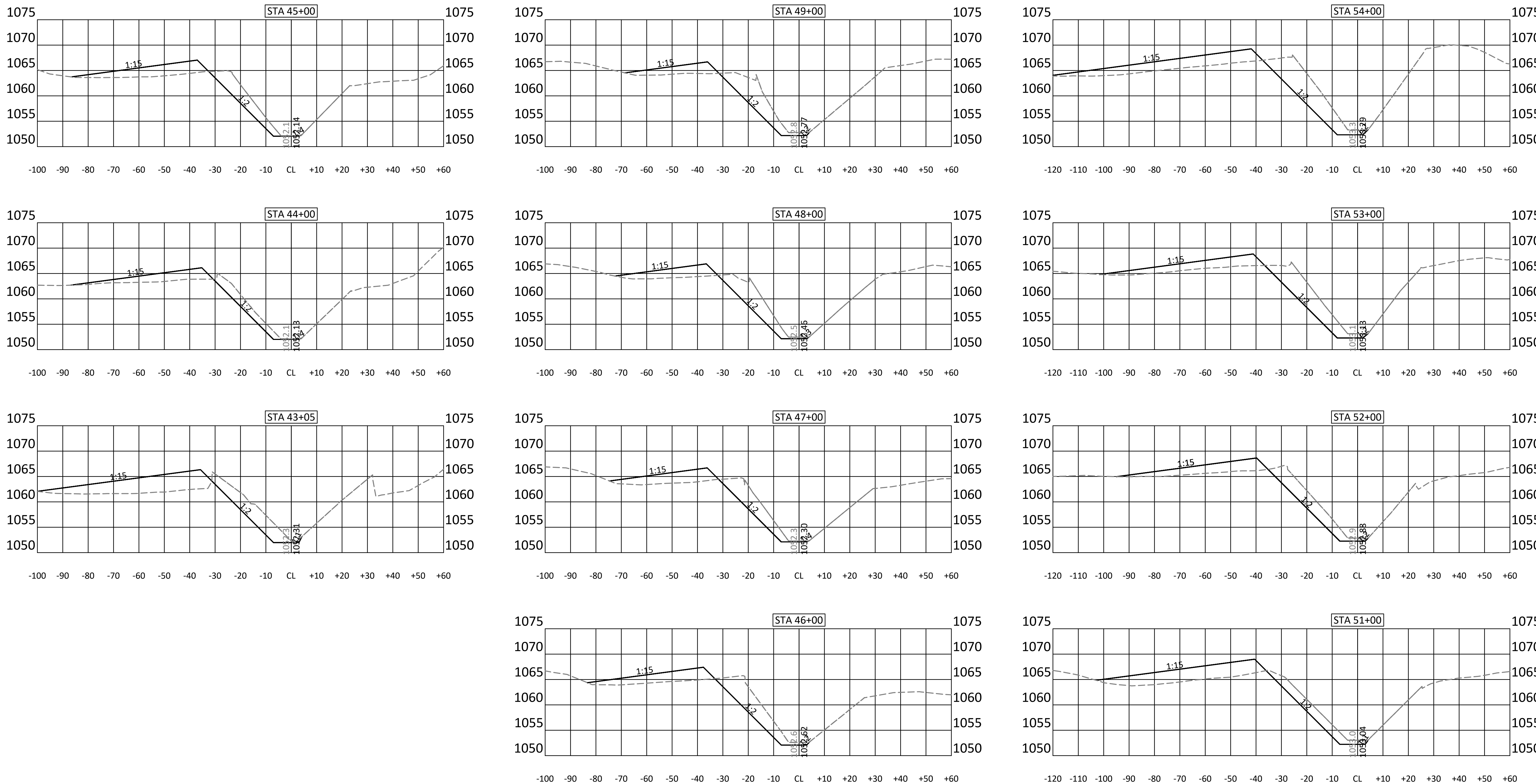
SHEET C9.01



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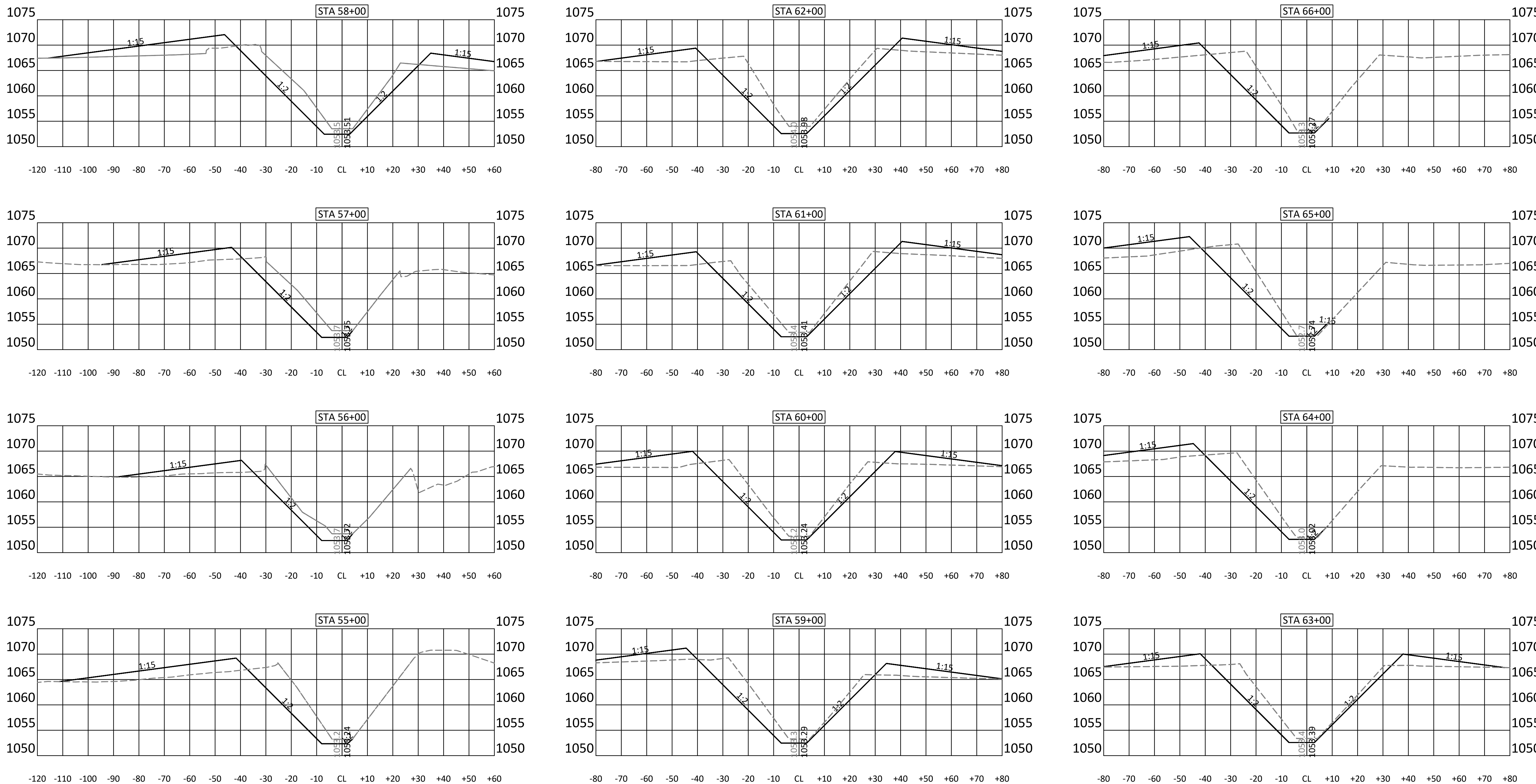
SHEET C9.02

NOTE: STORAGE POND #1 - RIGHT & LEFT SIDES.
SEE SHEETS IN SECTION C3.



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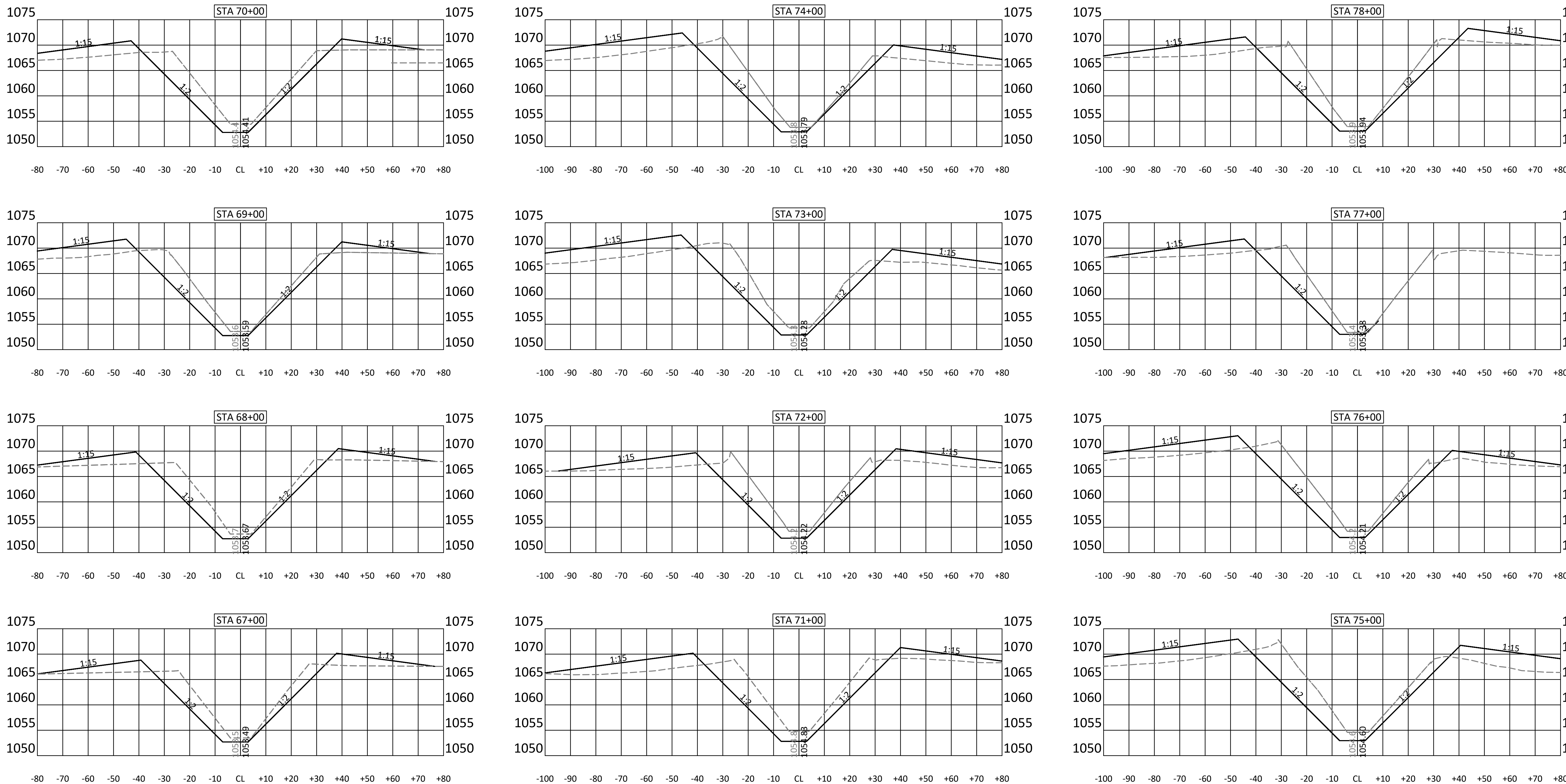
SHEET
C9.03

** NOTE: TERSTEEG STORAGE POND - RIGHT & LEFT SIDES. SEE SHEETS IN SECTION C3.



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SHEET C9.04

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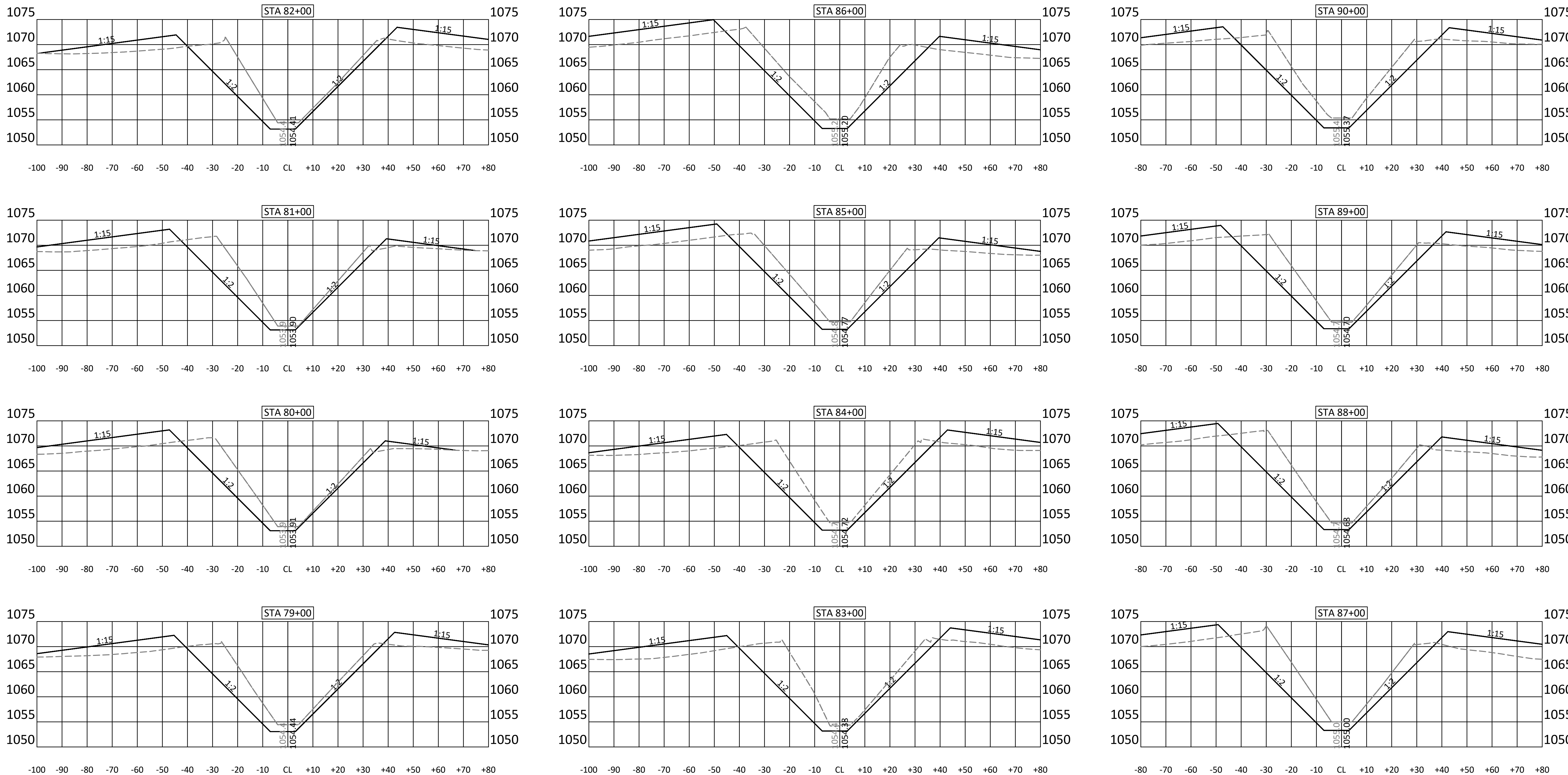

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SHEET C9.05

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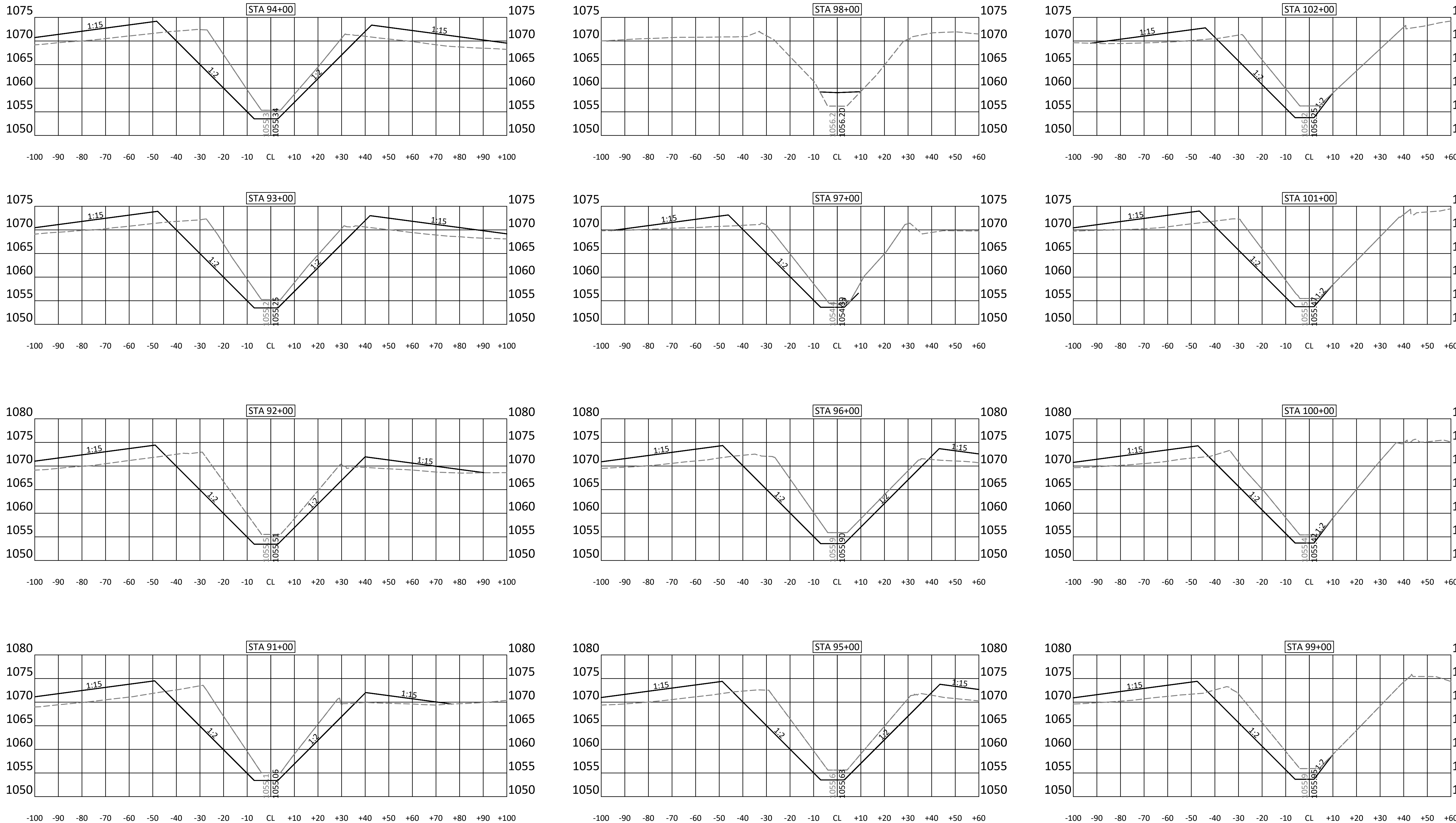

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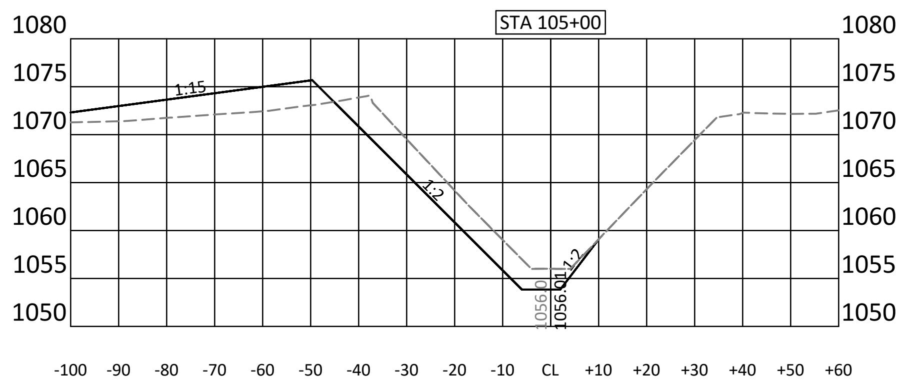
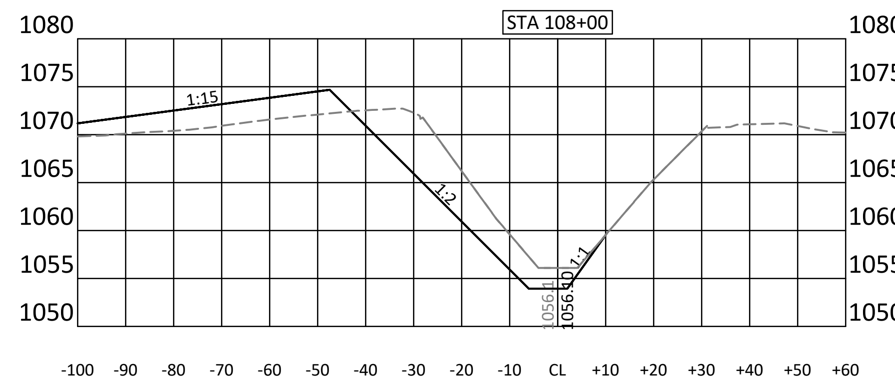
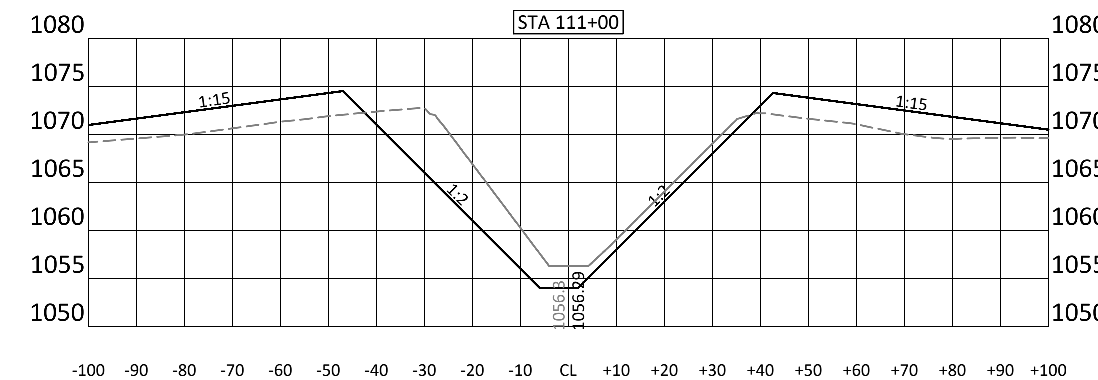
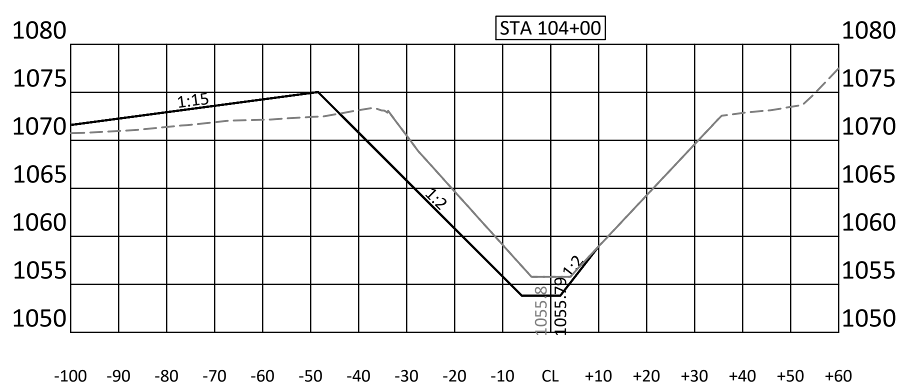
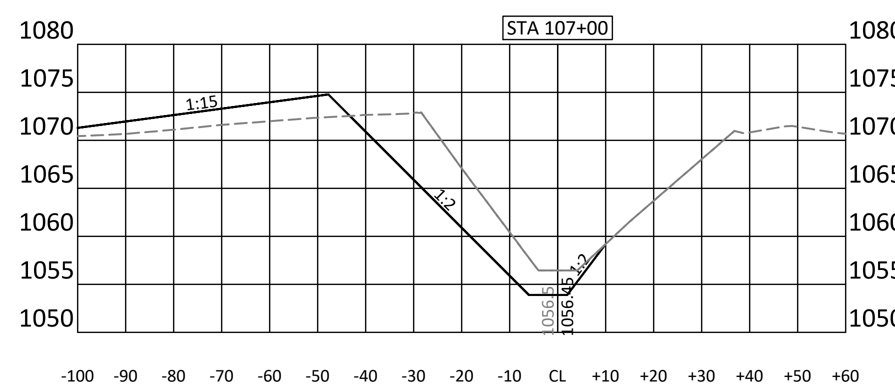
SHEET
C9.06

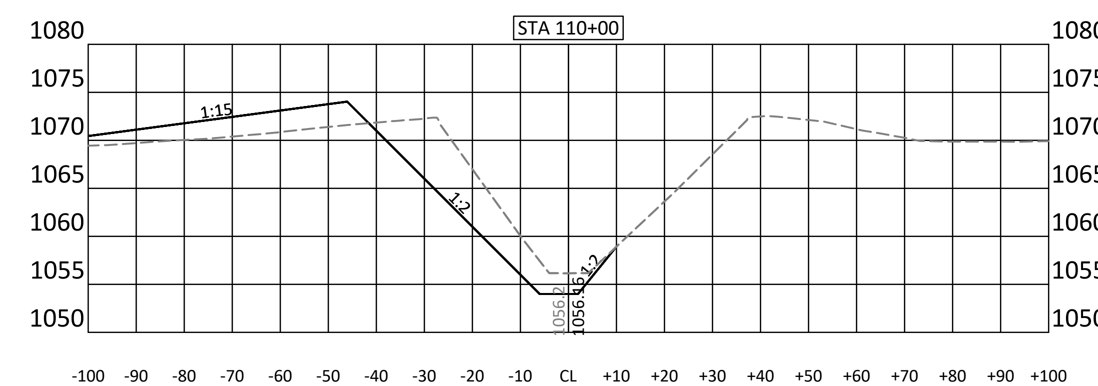


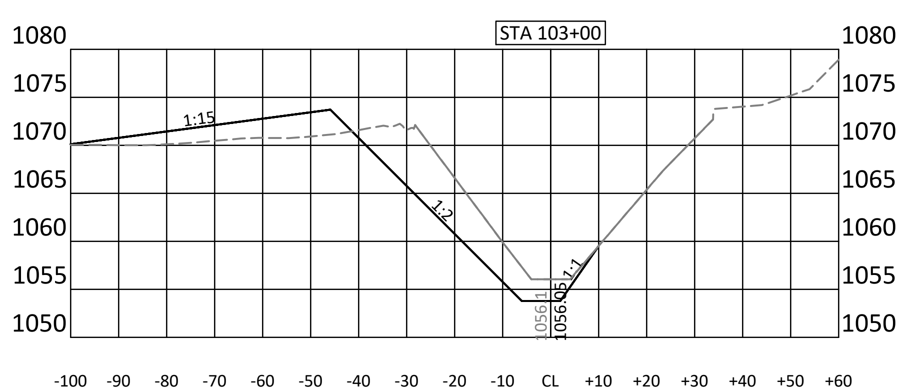


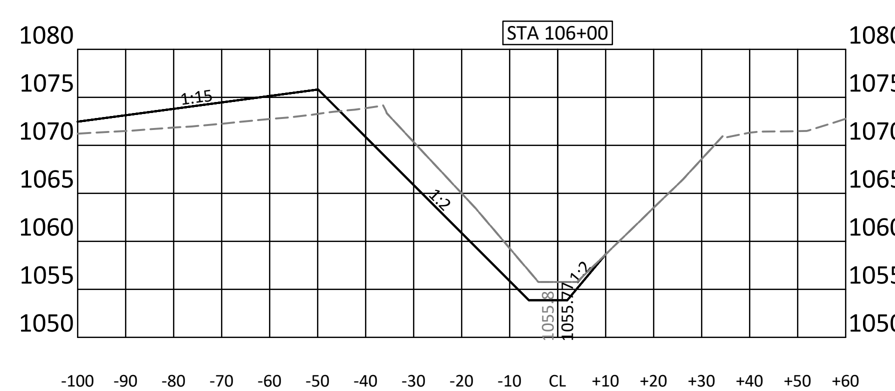


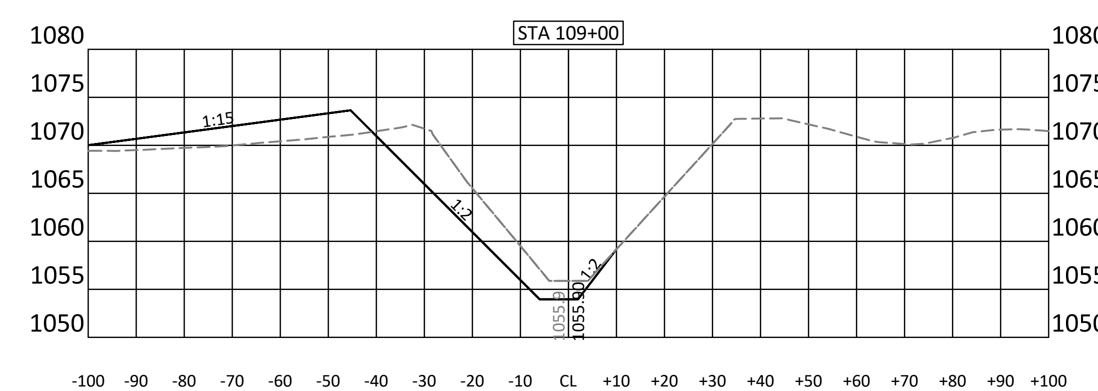












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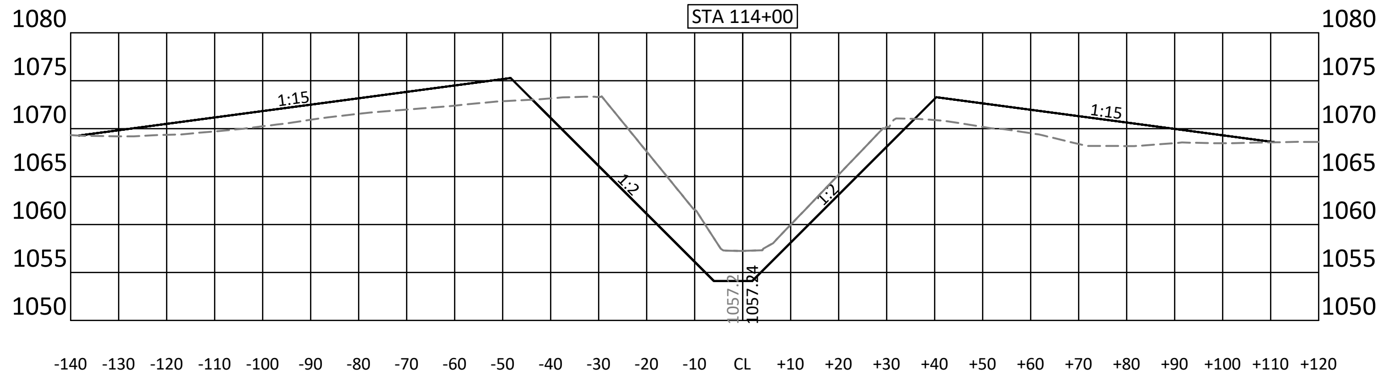
C9.07

STA 114+00



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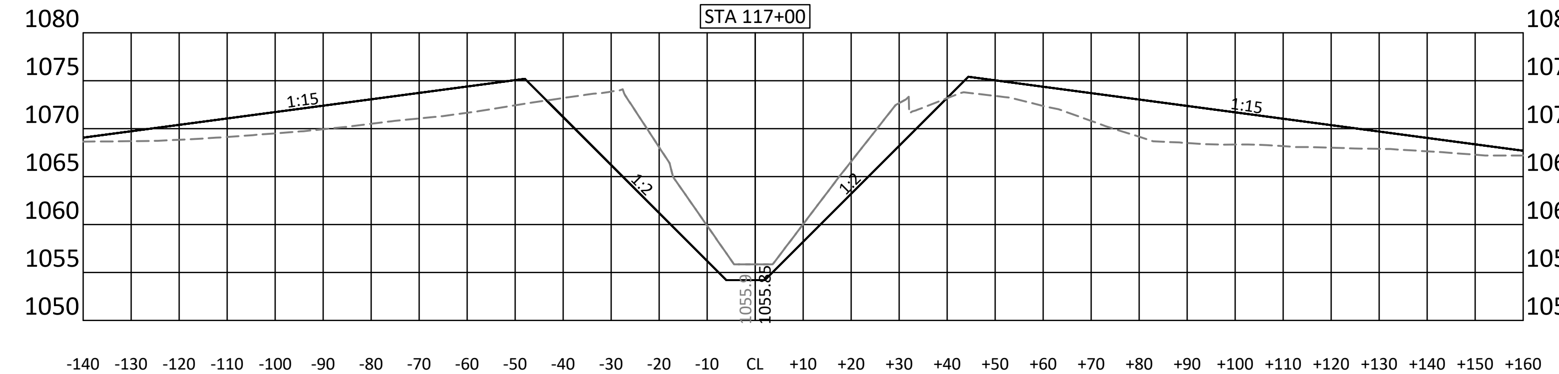

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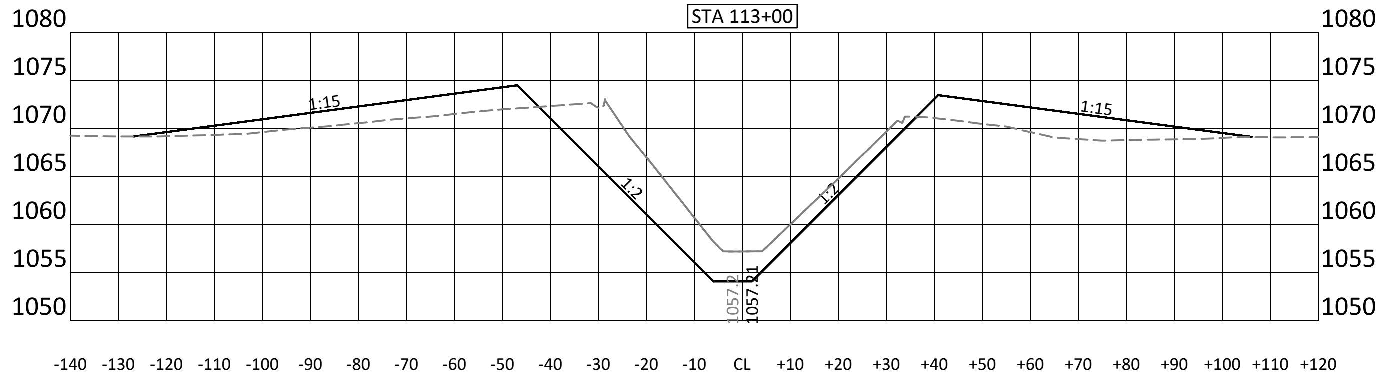

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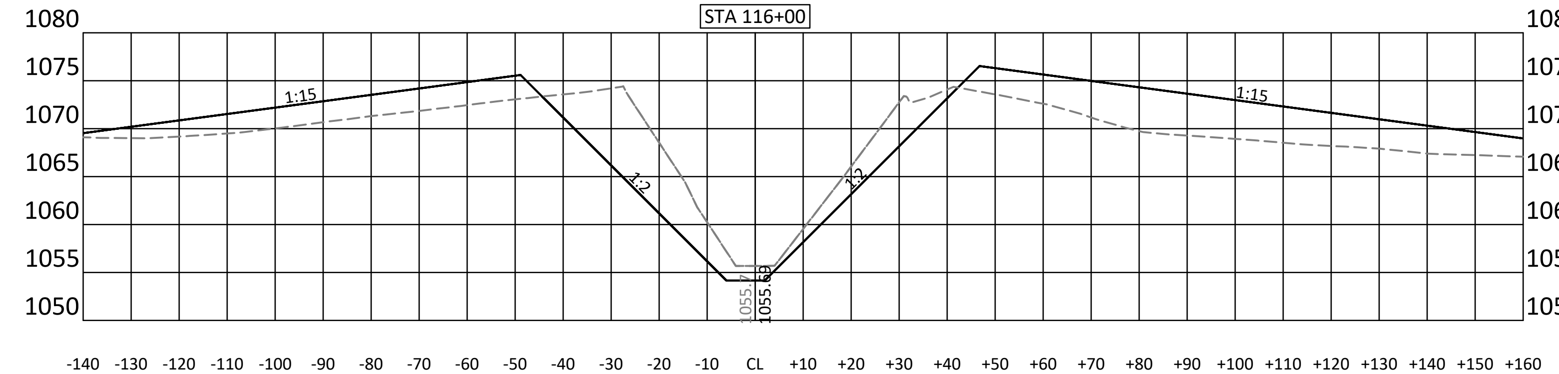

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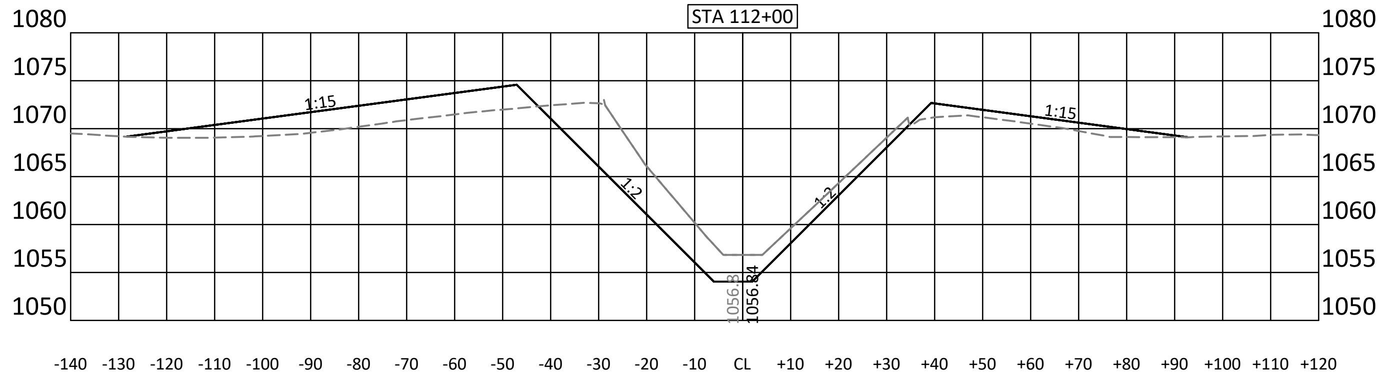

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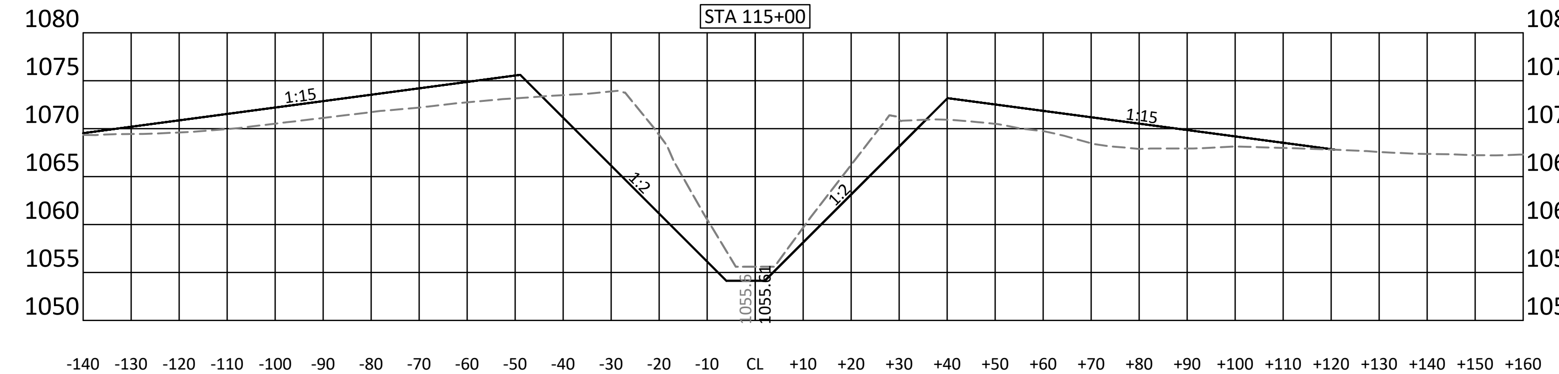

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SHAUN P. LUKER
LIC. NO. 48756 DATE MM/DD/YYYY

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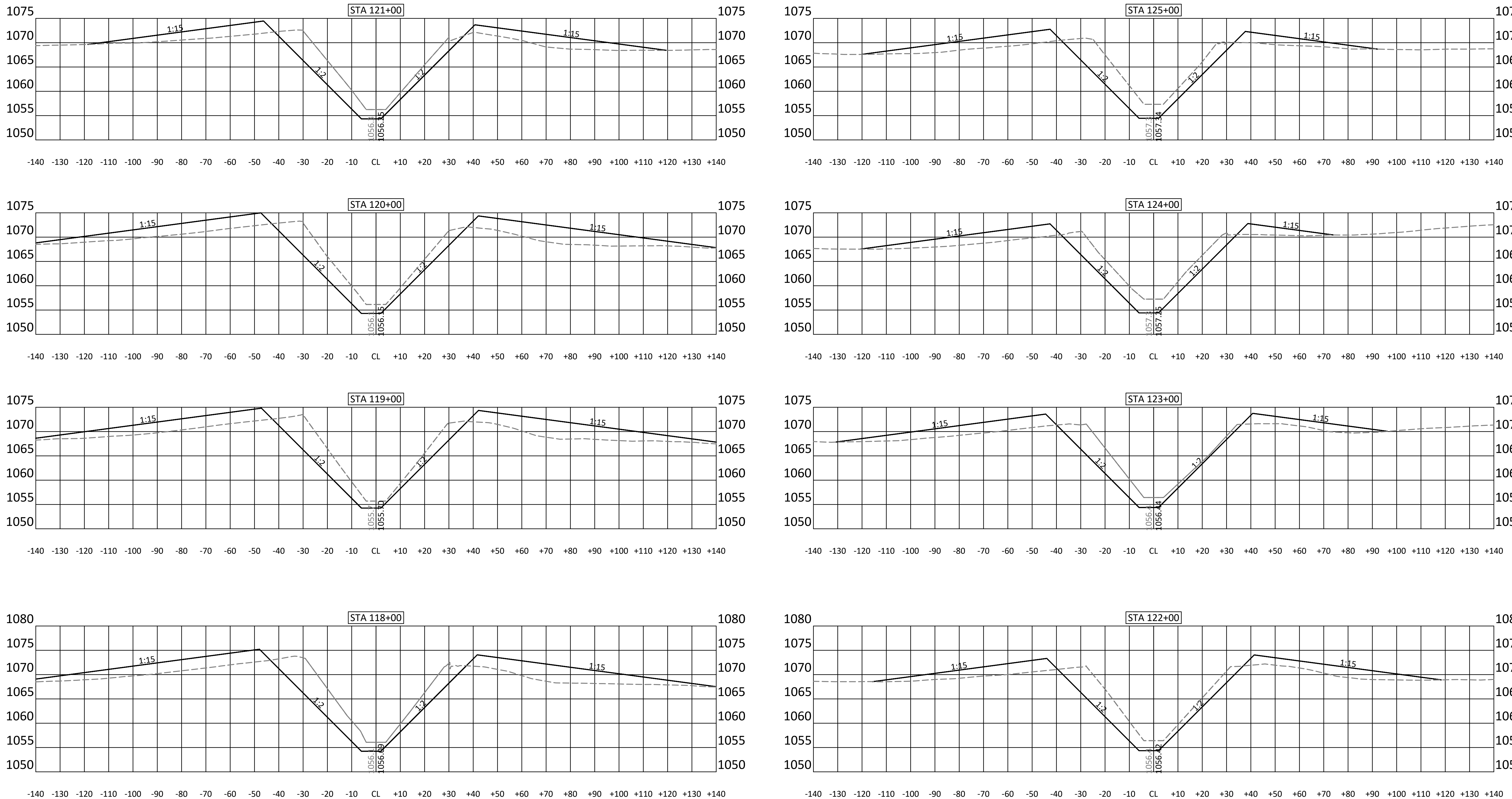
CD 59 IMPROVEMENTS
CROSS SECTIONS
STA 112+00 - STA 117+00

SHEET
C9.08



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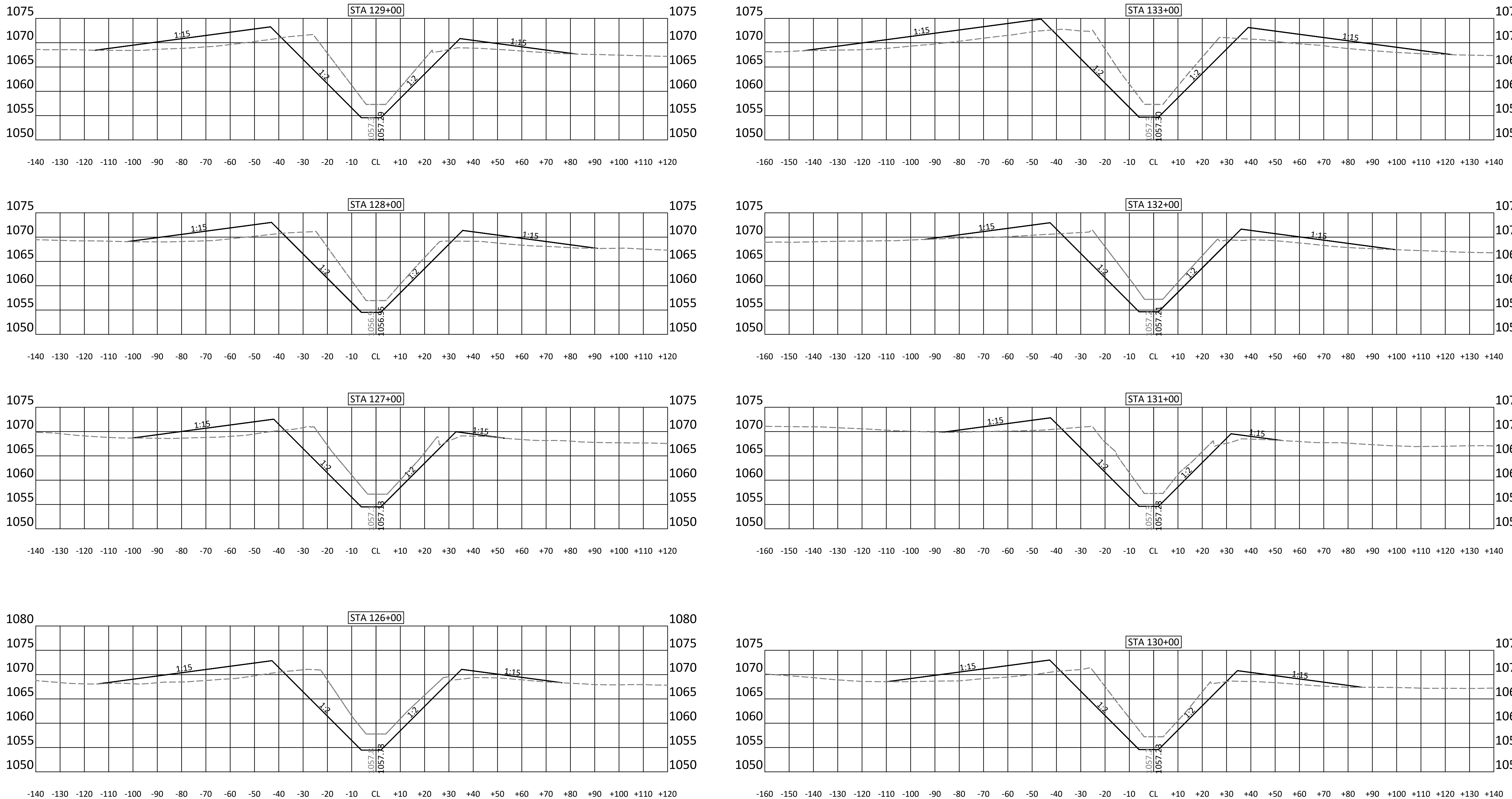
CROSS SECTIONS
STA 118+00 - STA 125+00

SHEET C9.09



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CD 59 IMPROVEMENTS

CROSS SECTIONS

STA 126+00 - STA 133+00

SHEET C9.10

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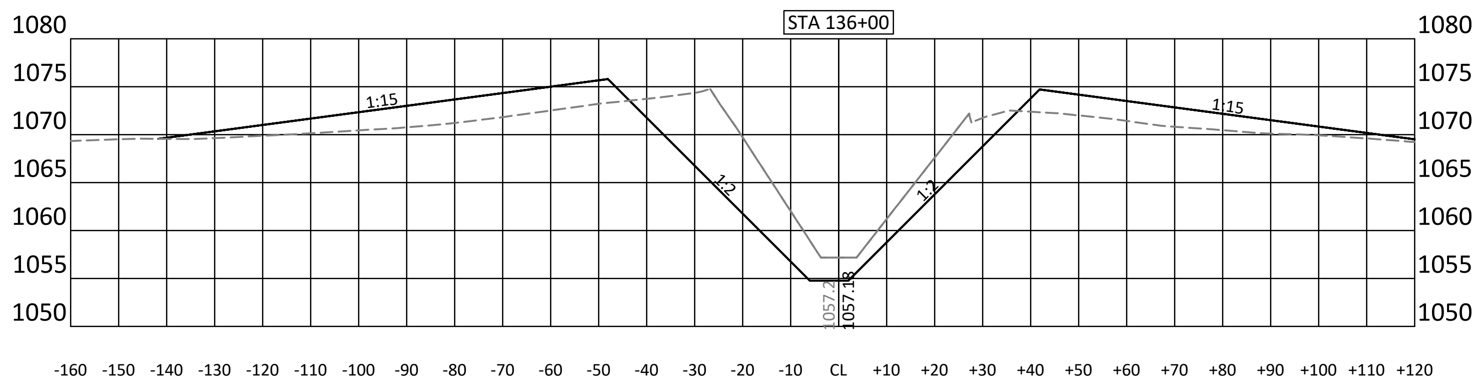

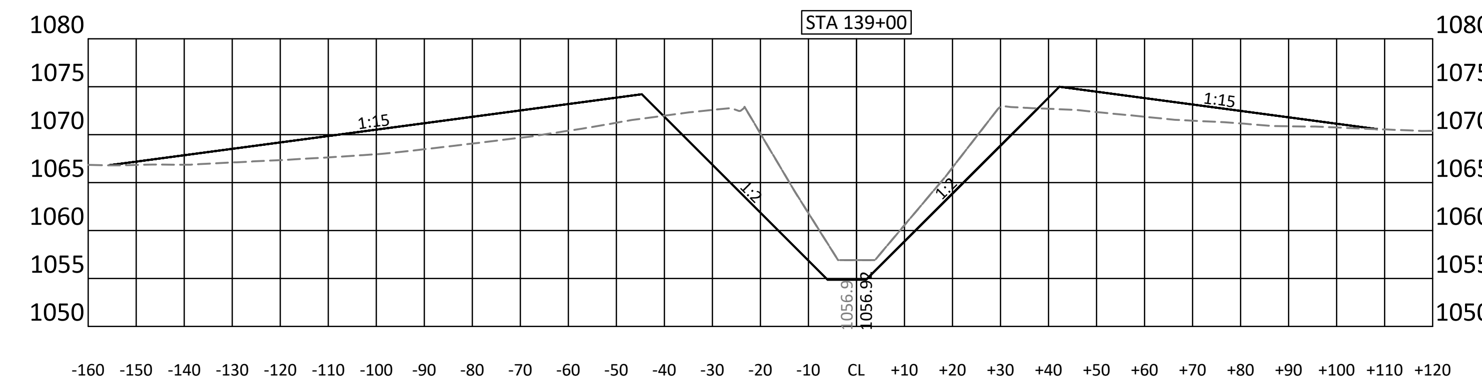

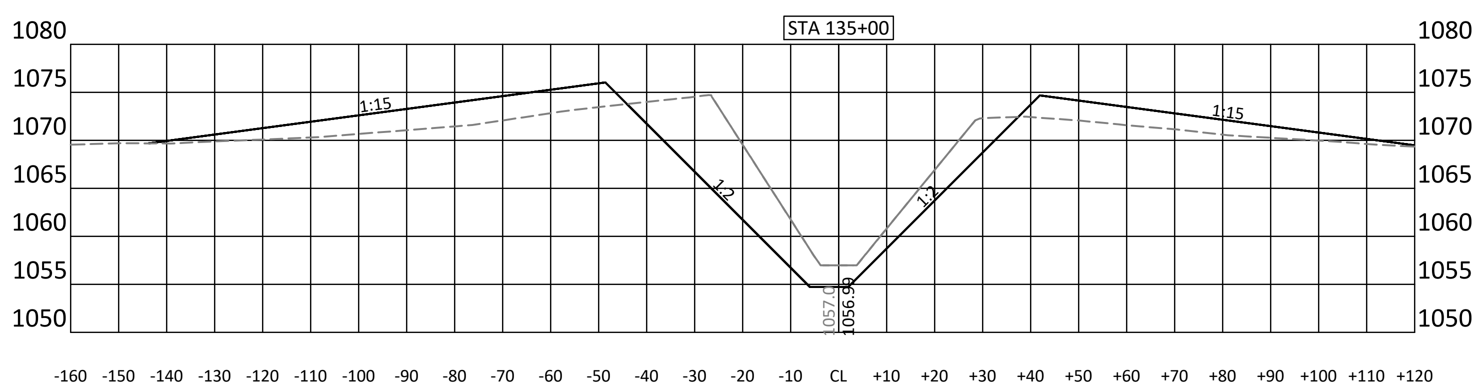

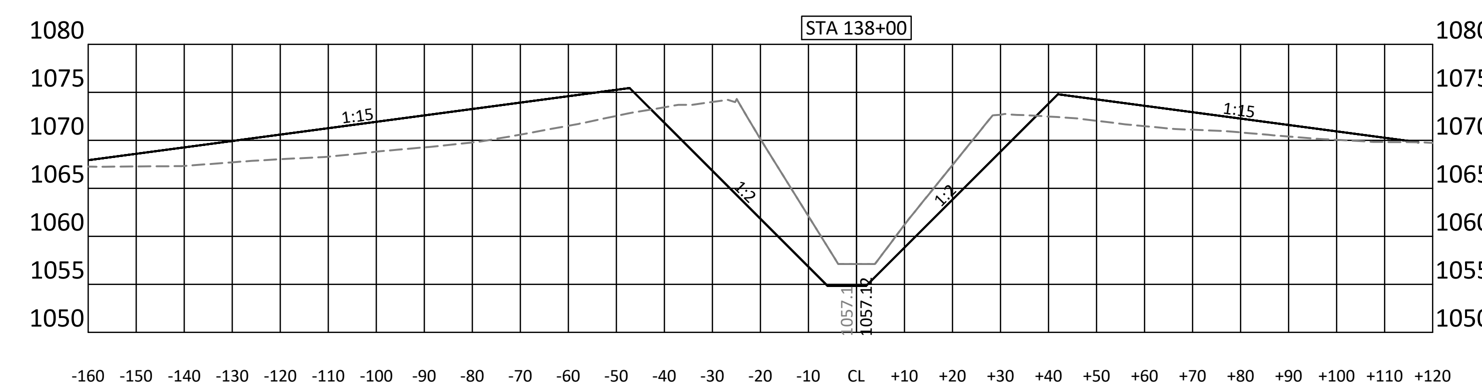

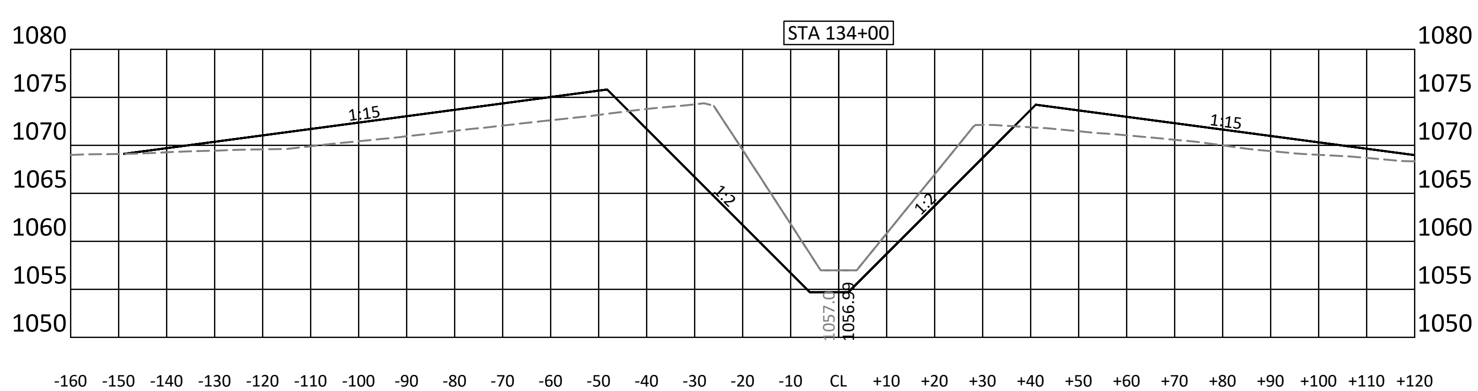

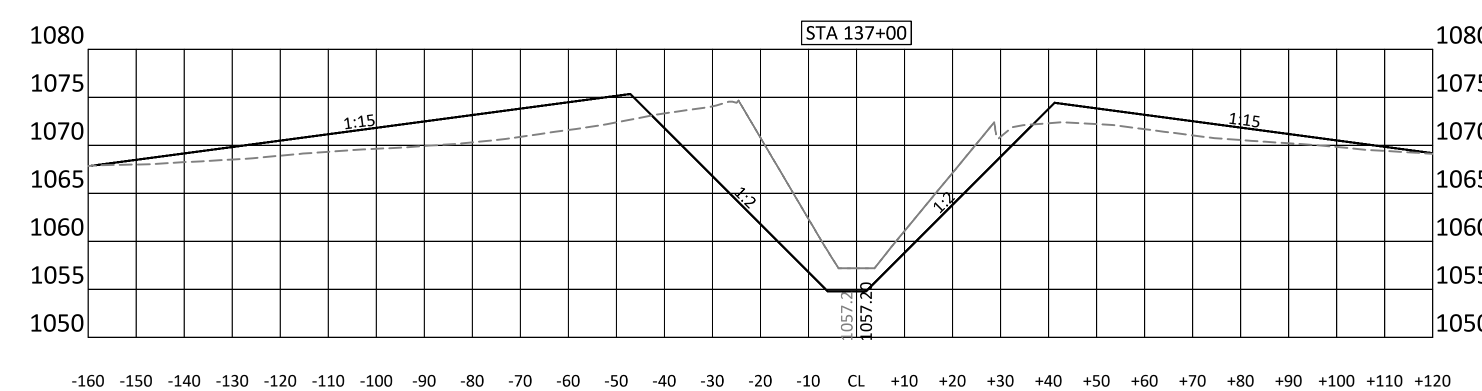

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RENVILLE COUNTY, MINNESOTA

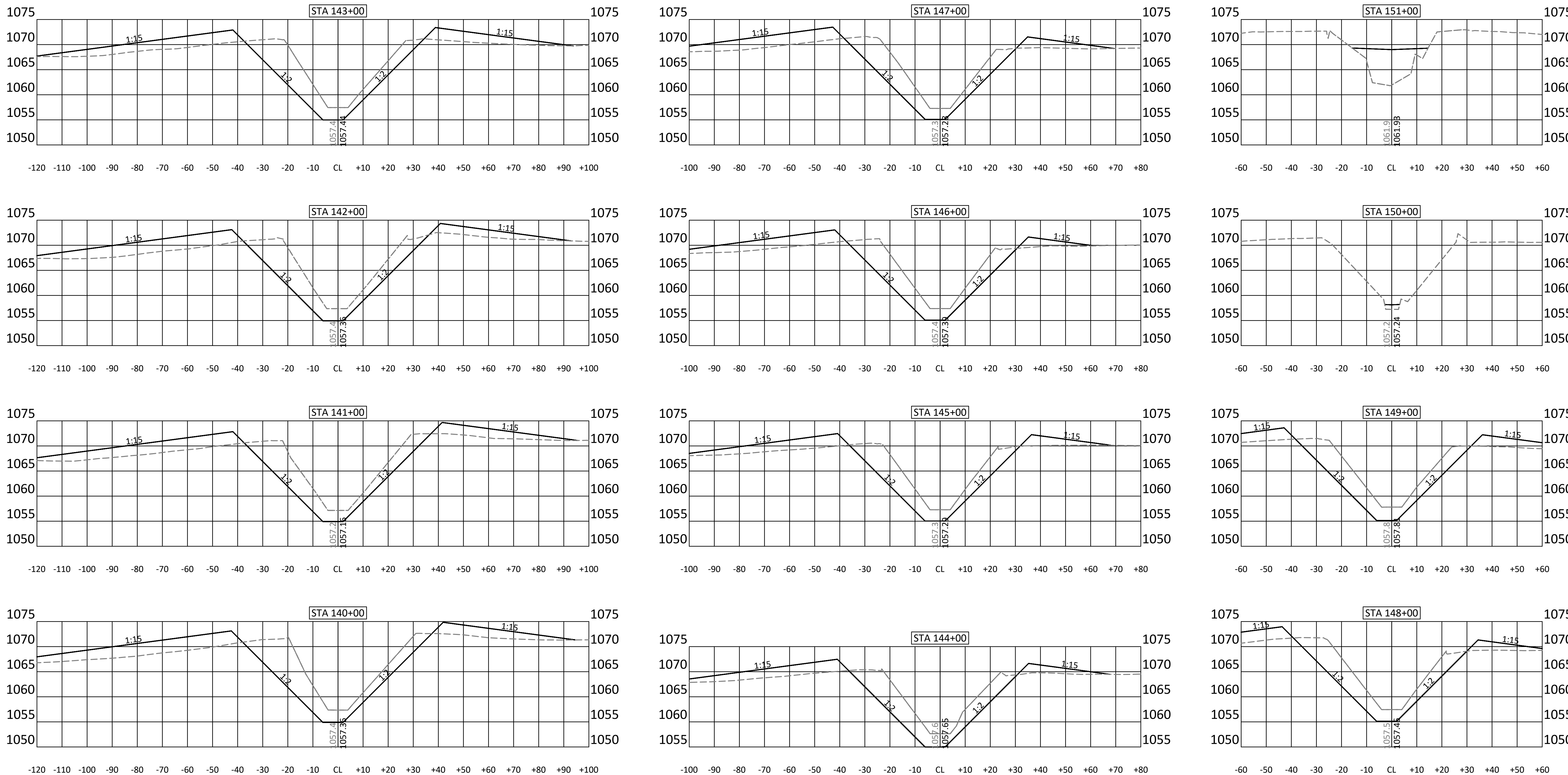
CD 59 IMPROVEMENTS

CROSS SECTIONS

STA 134+00 - STA 139+00

SHEET

C9.11



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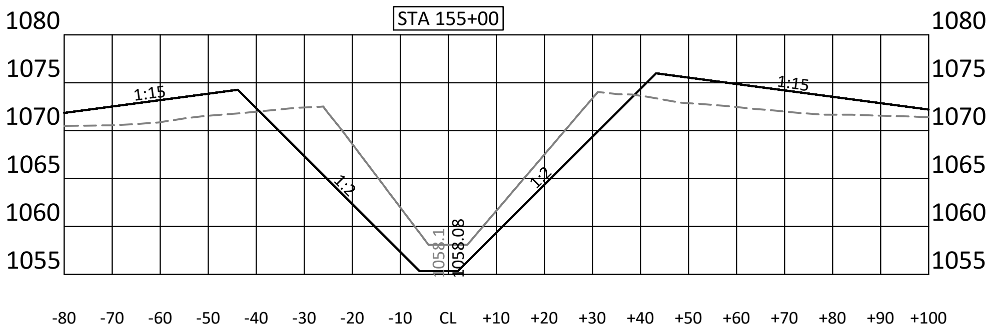

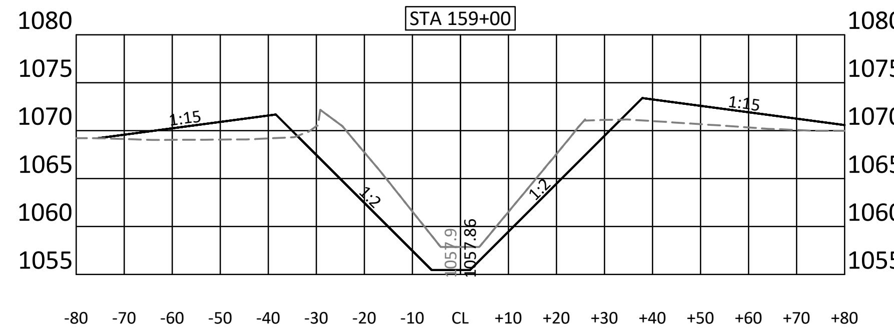

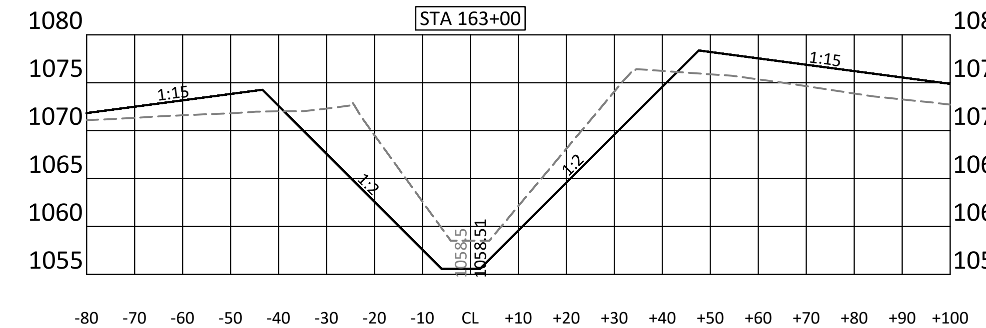

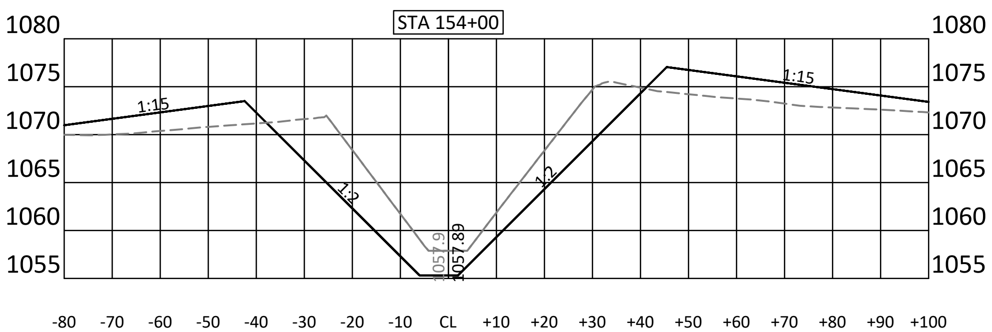

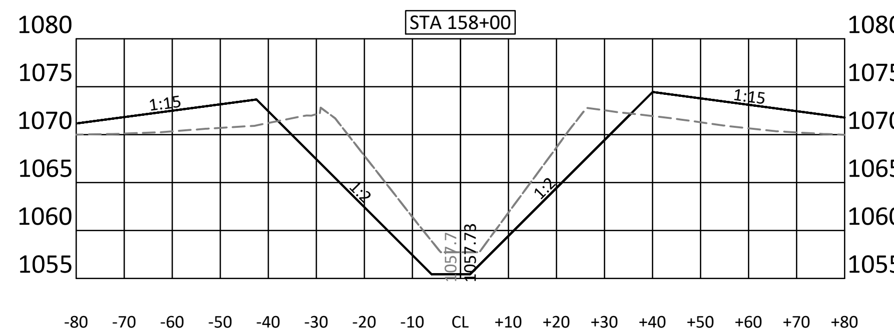

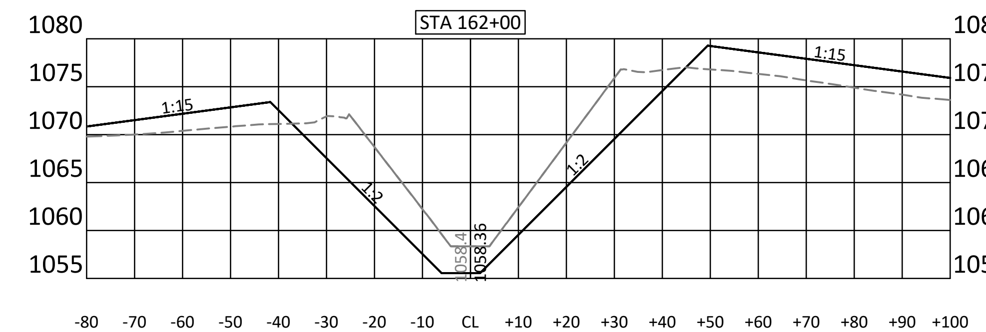

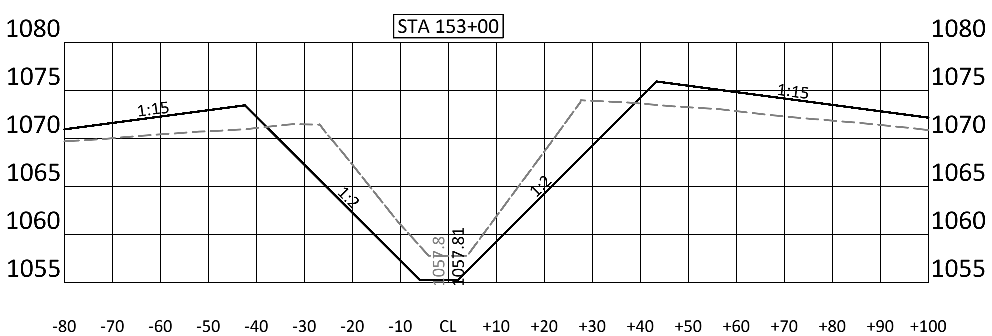

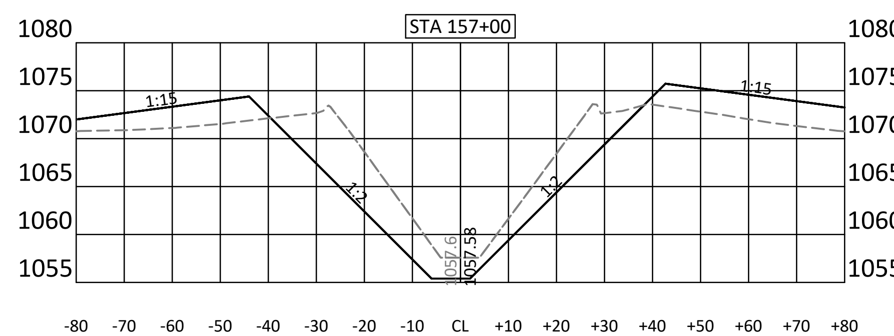

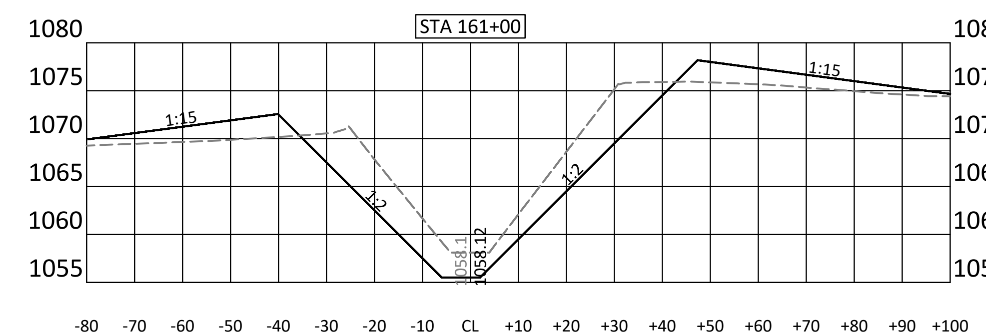

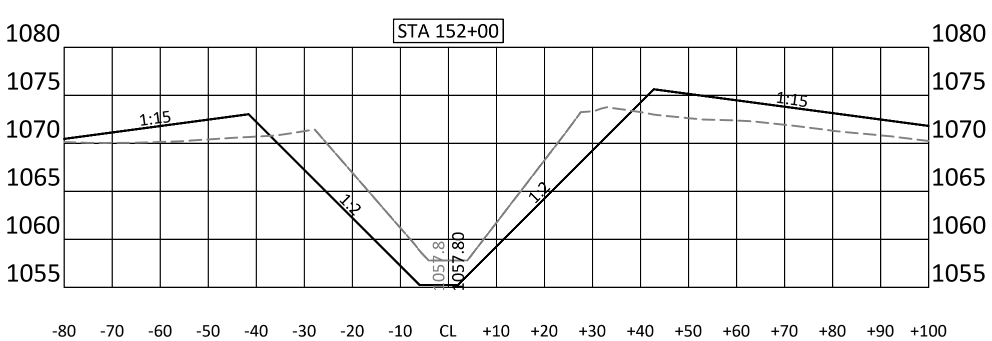

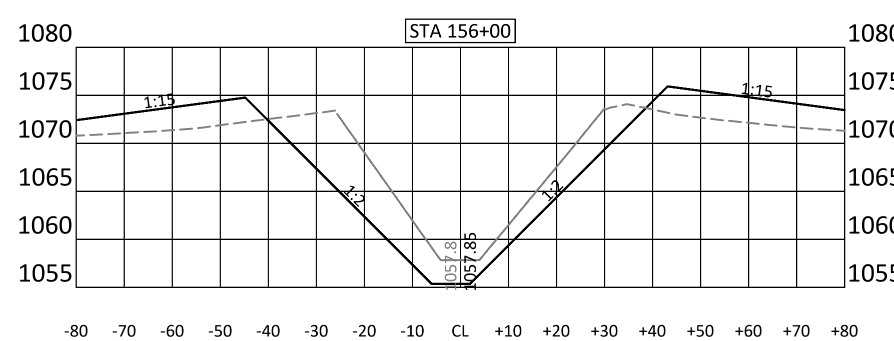

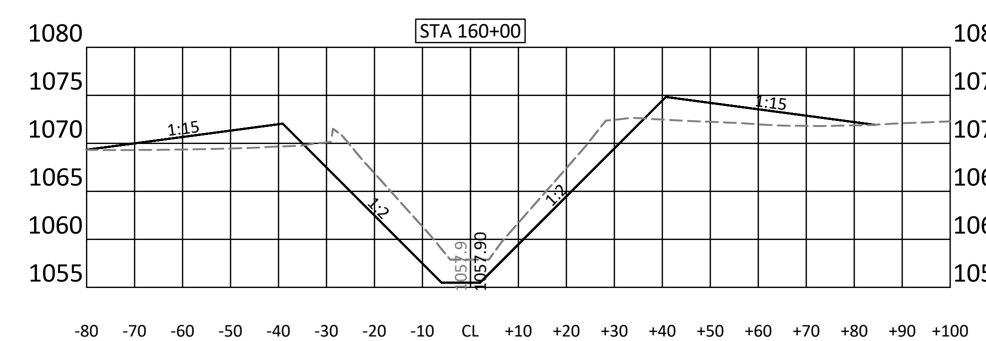

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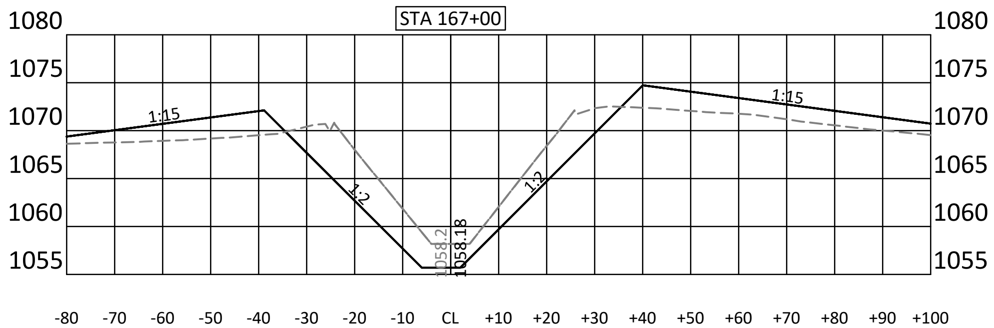
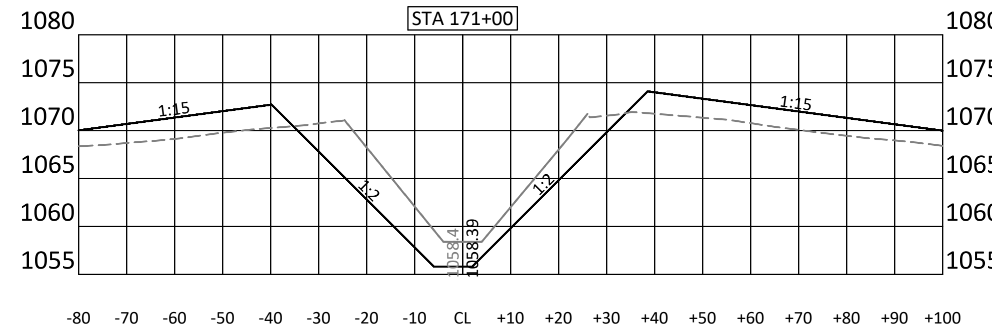
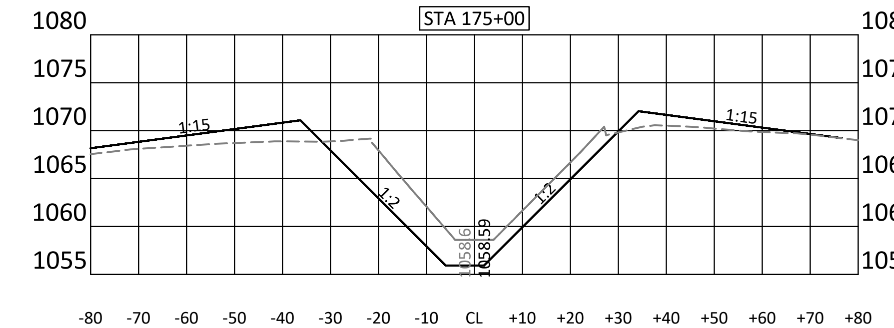
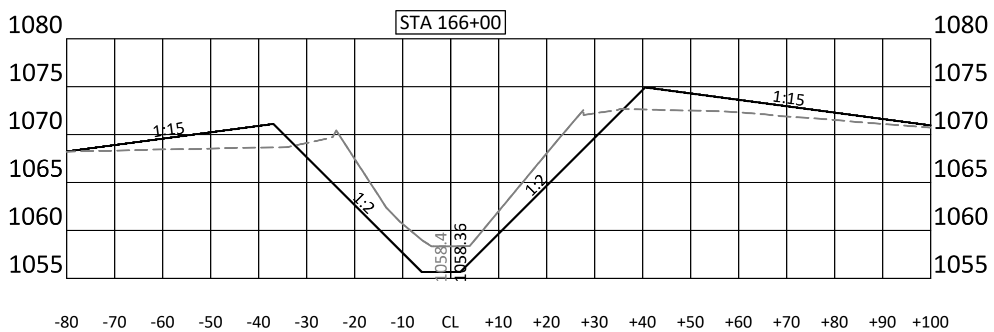
CROSS SECTIONS
STA 152+00 - STA 163+00

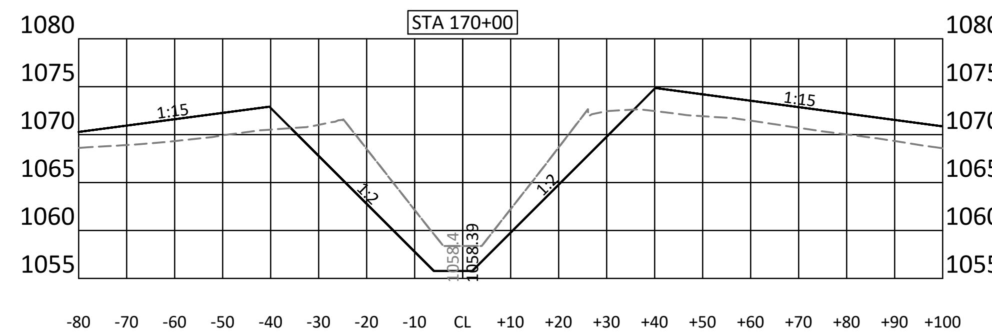
SHEET
C9.13

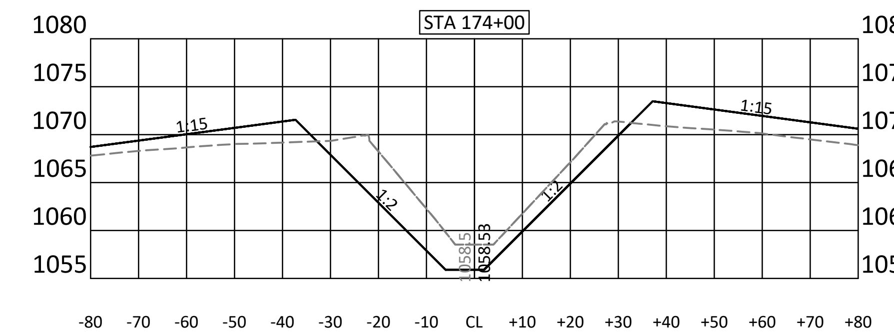


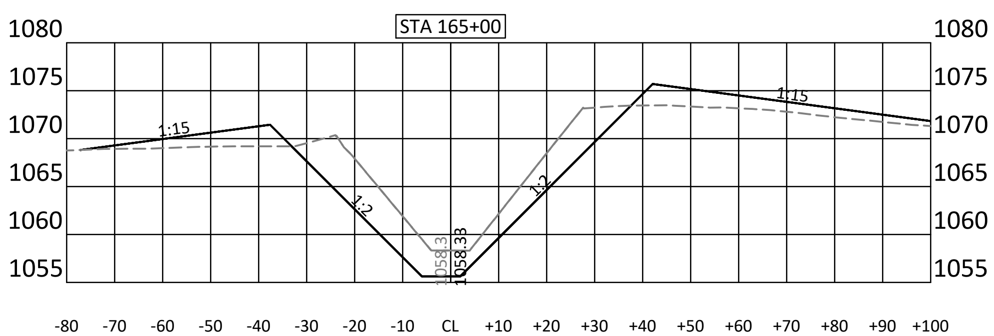


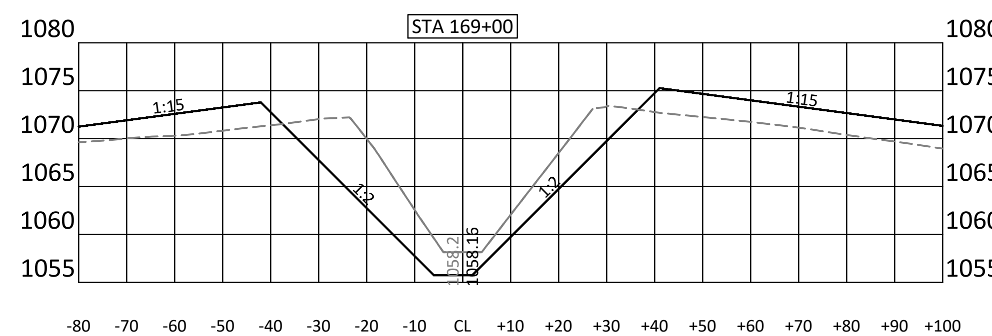


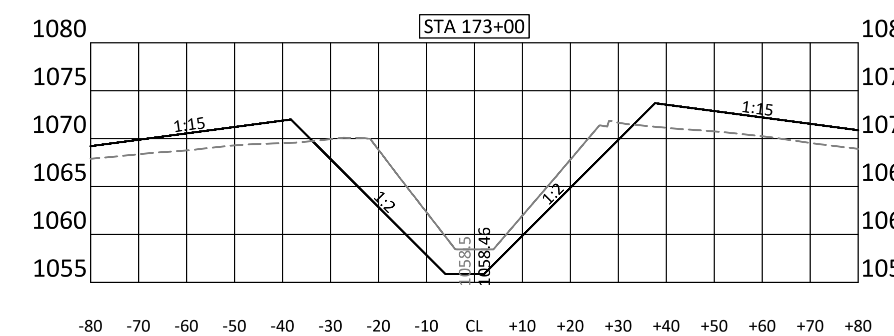


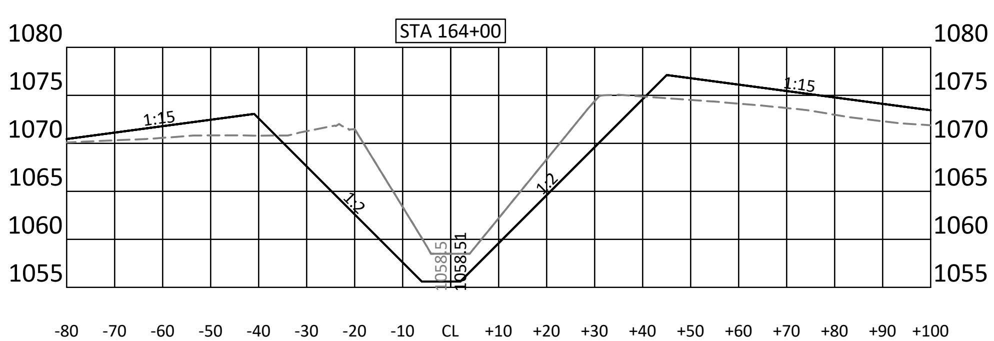


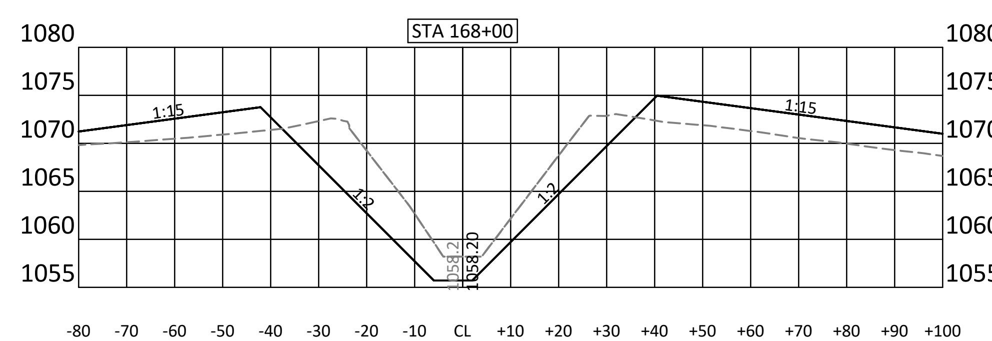


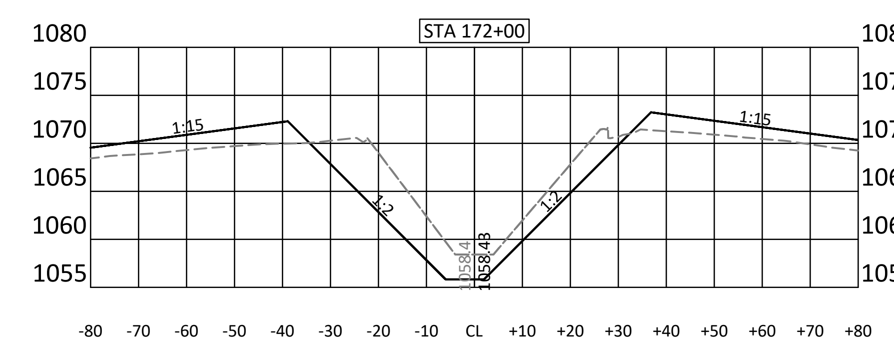












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SHAUN P. LUKER
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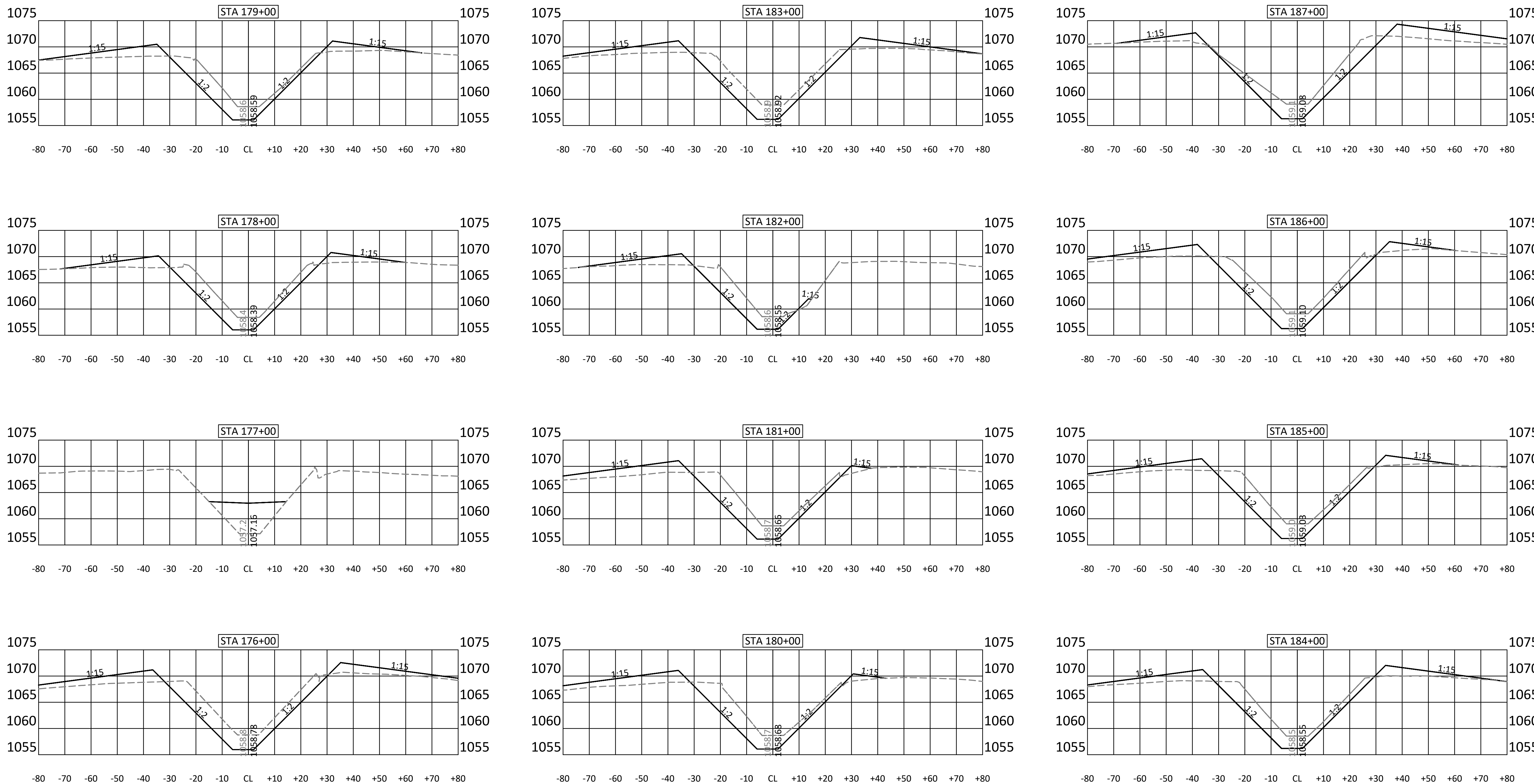
SHEET C9.14



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RENVILLE COUNTY, MINNESOTA

CD 59 IMPROVEMENTS

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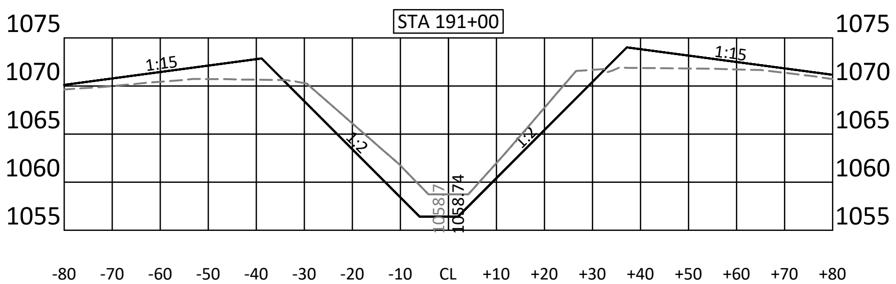

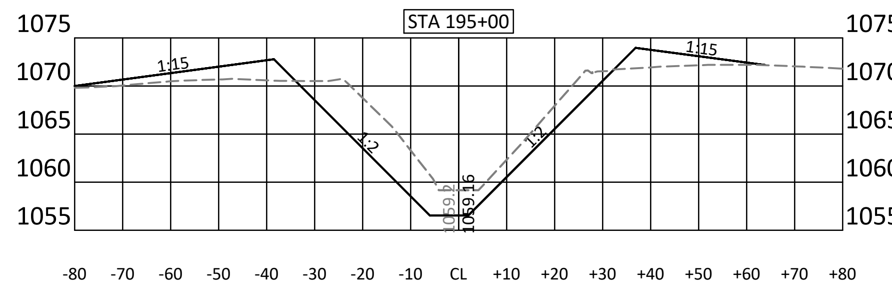

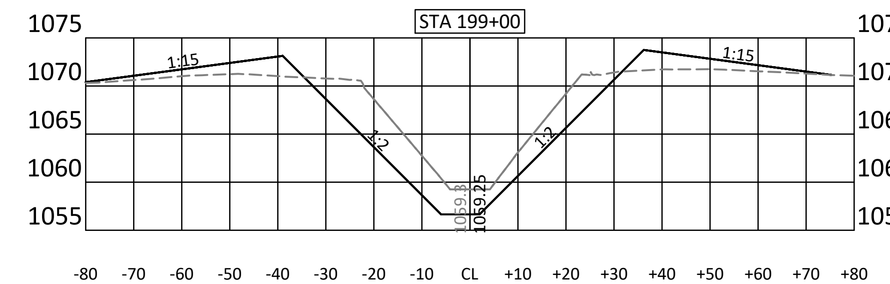

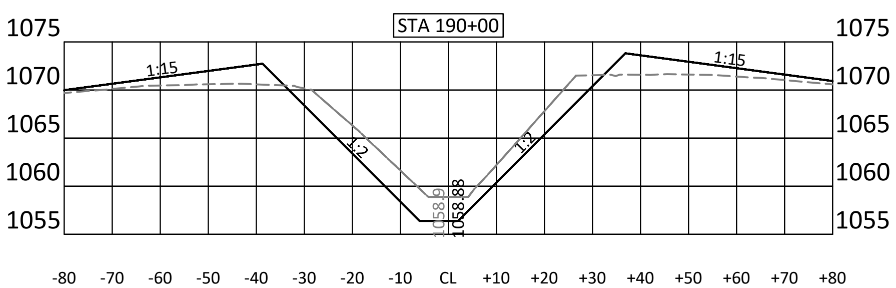

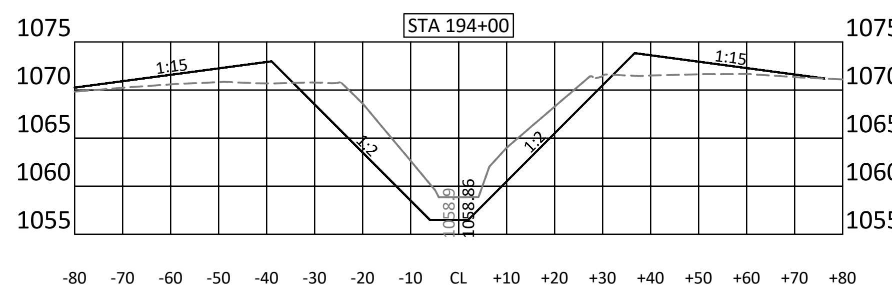

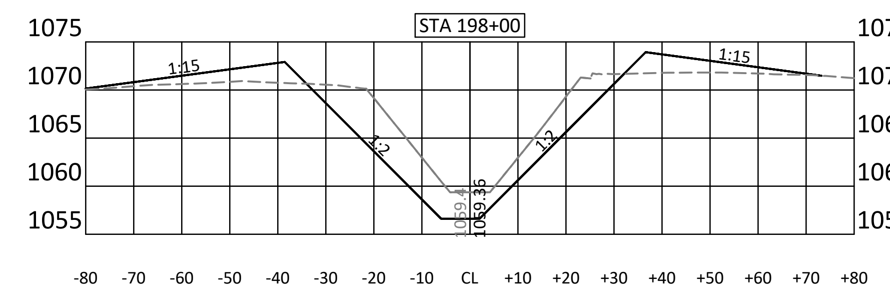

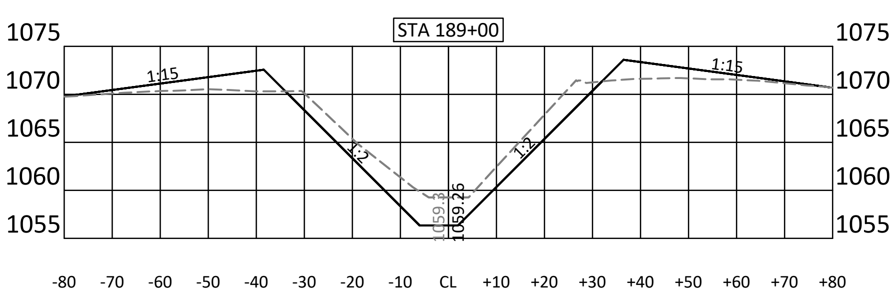

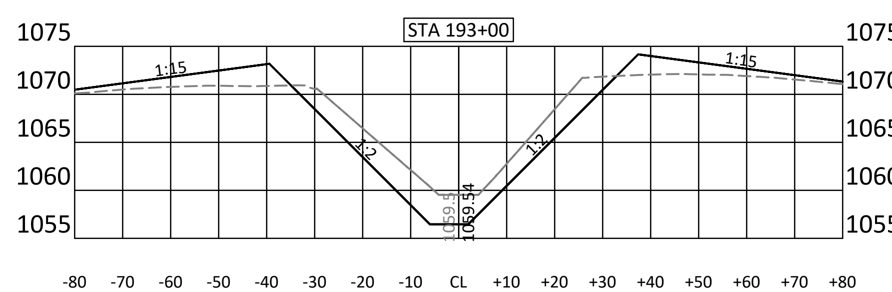

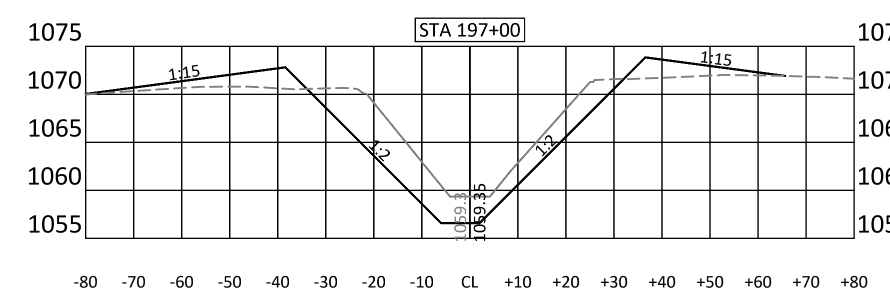

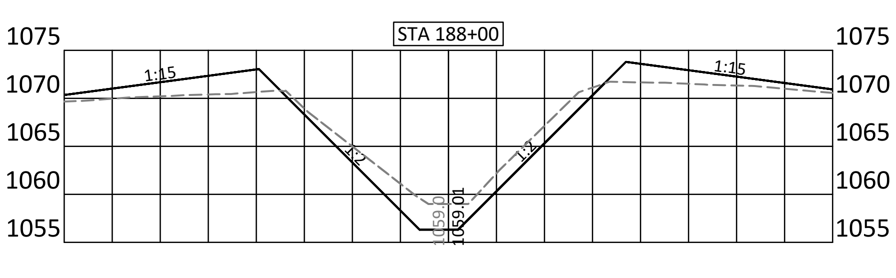

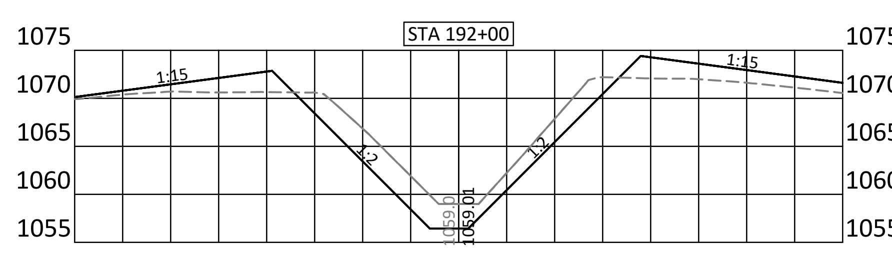

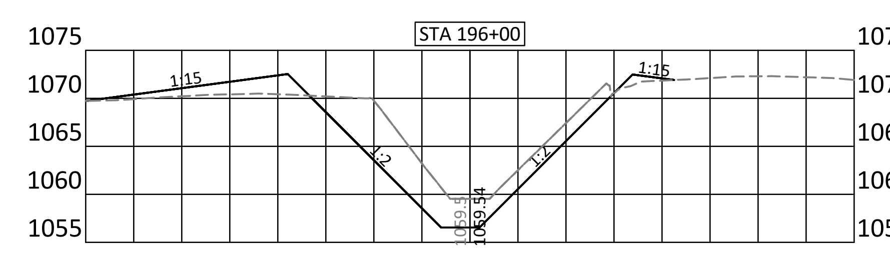

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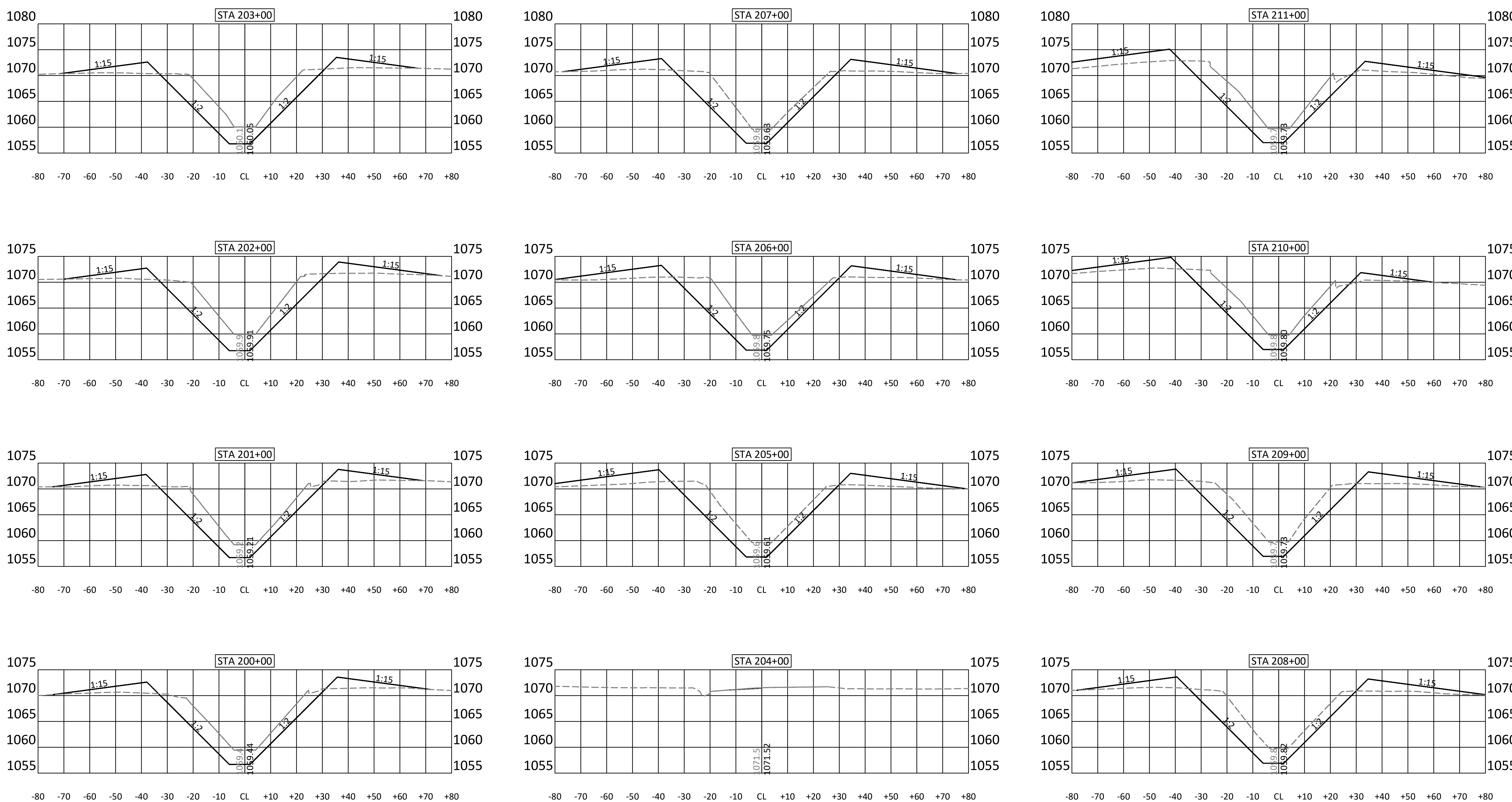

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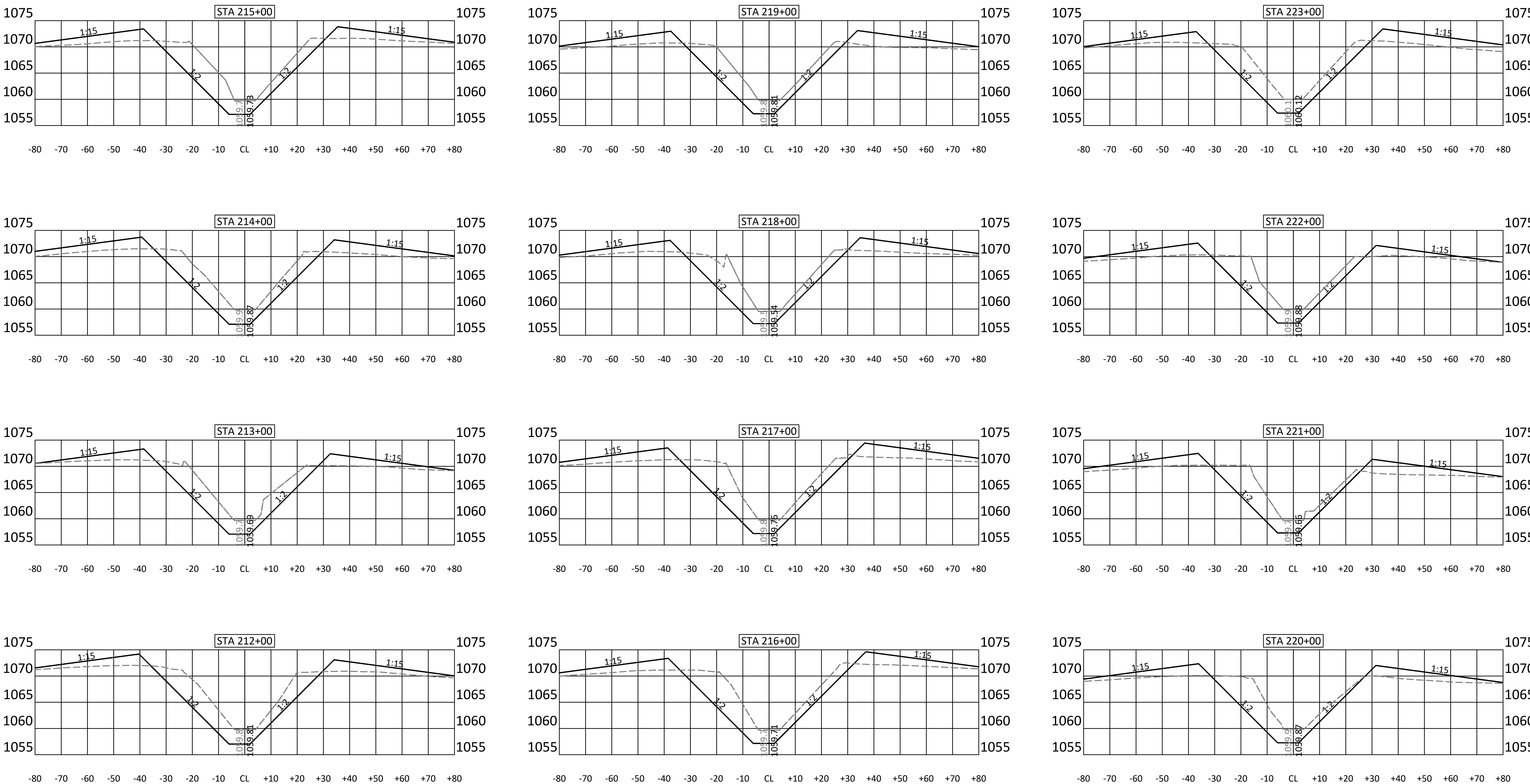

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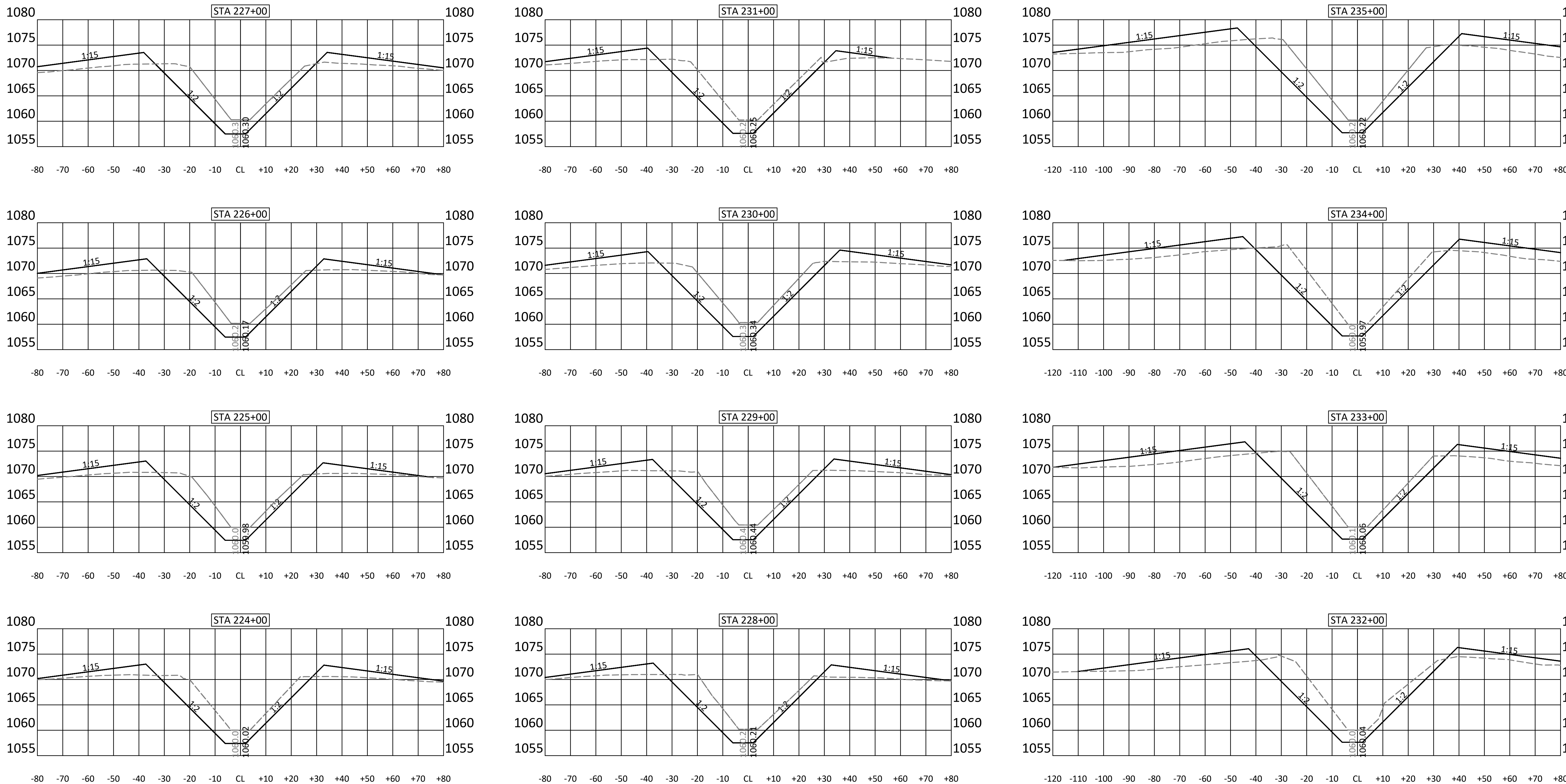

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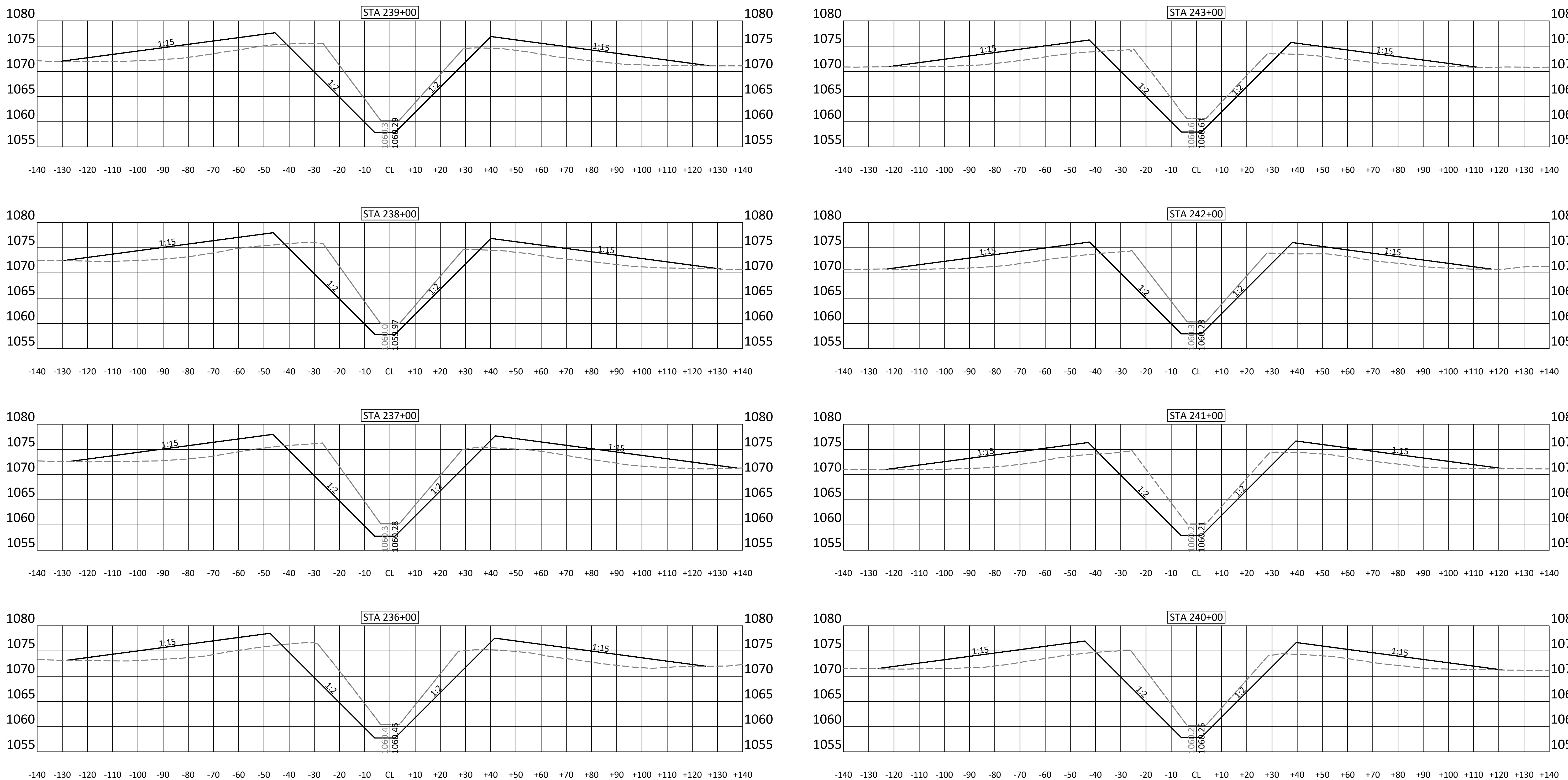

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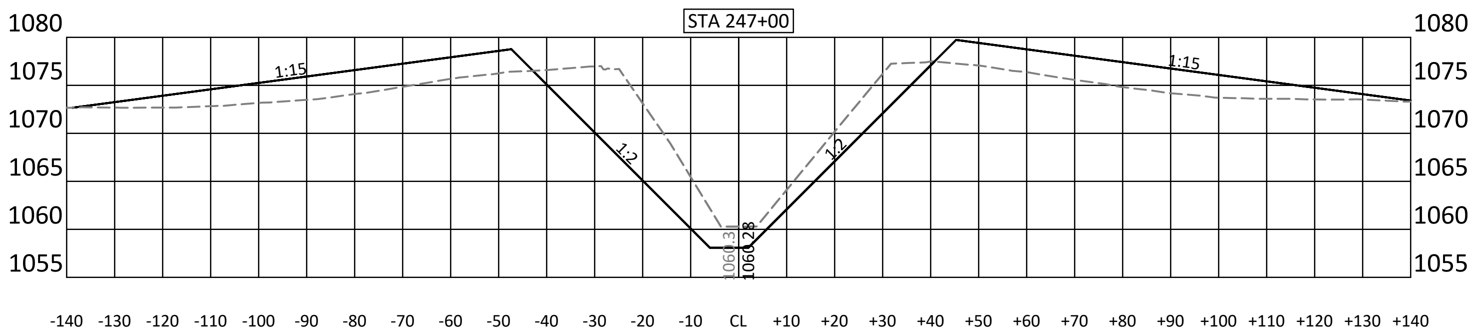

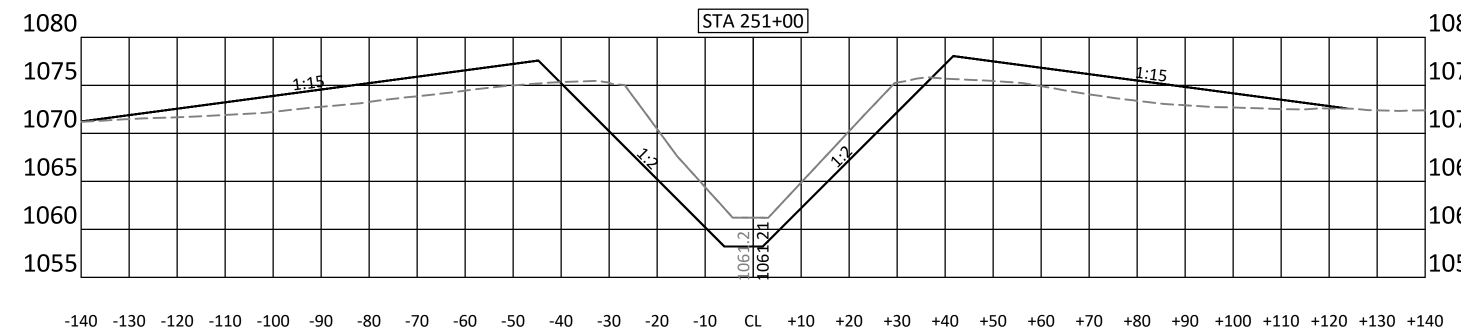

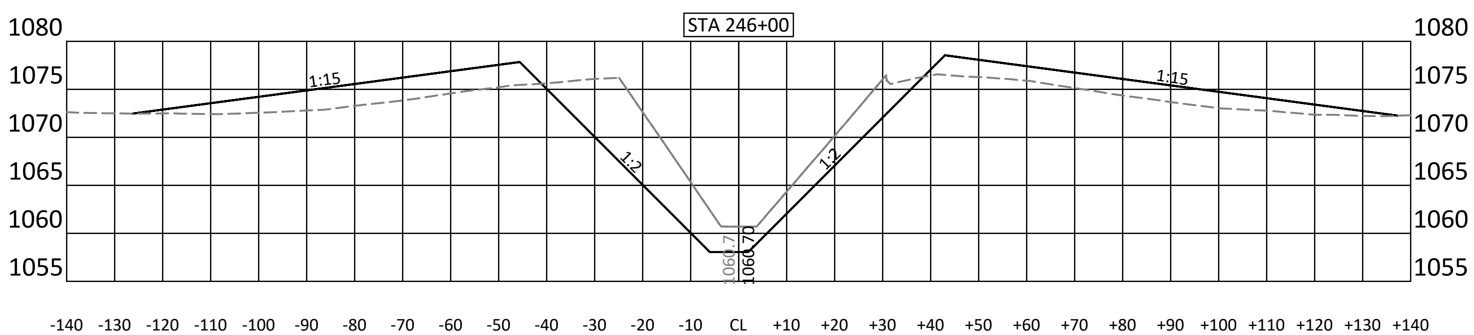

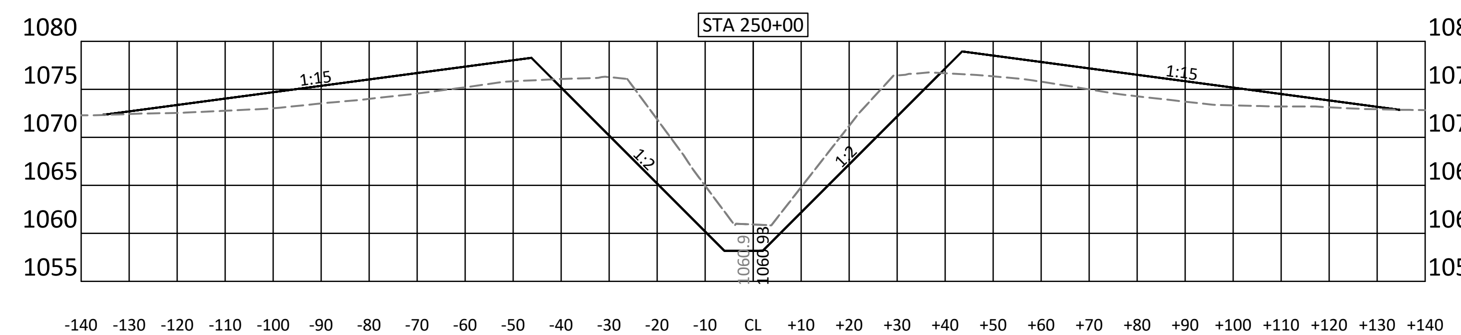

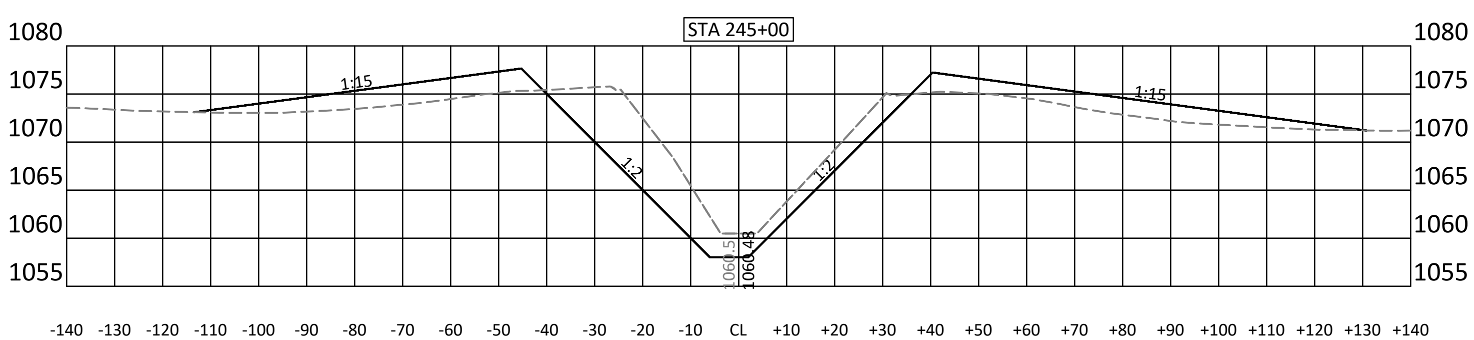

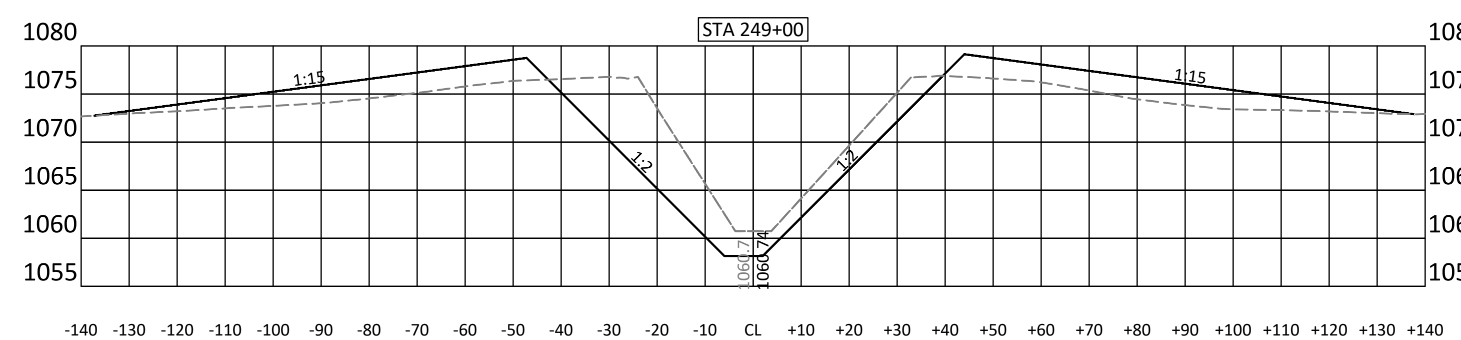

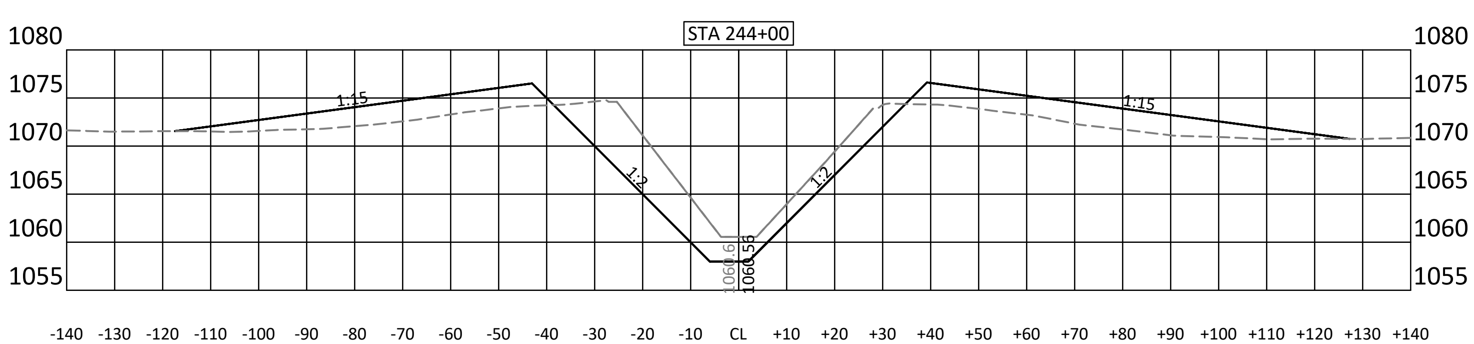

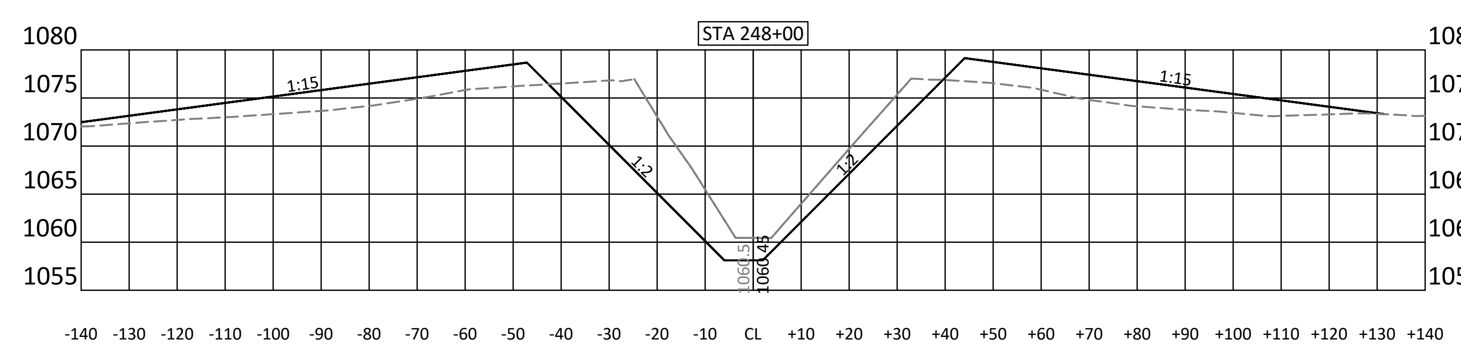

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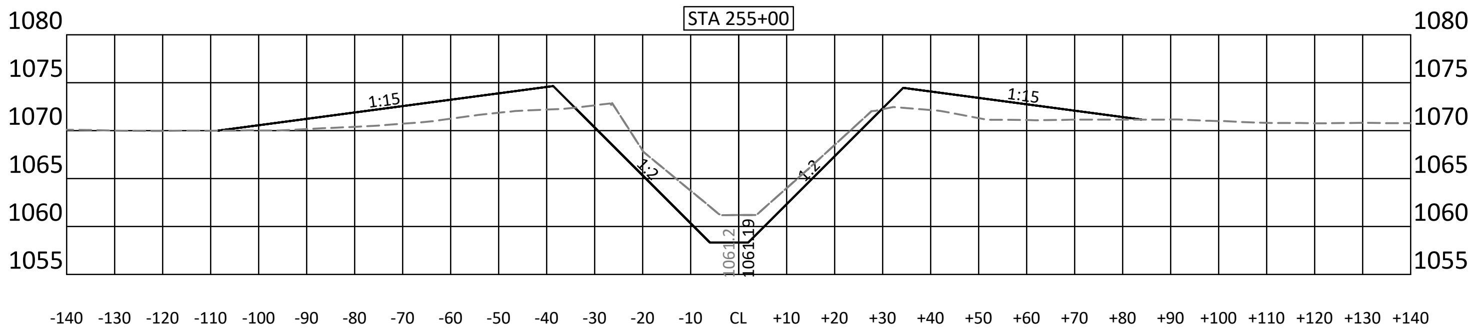

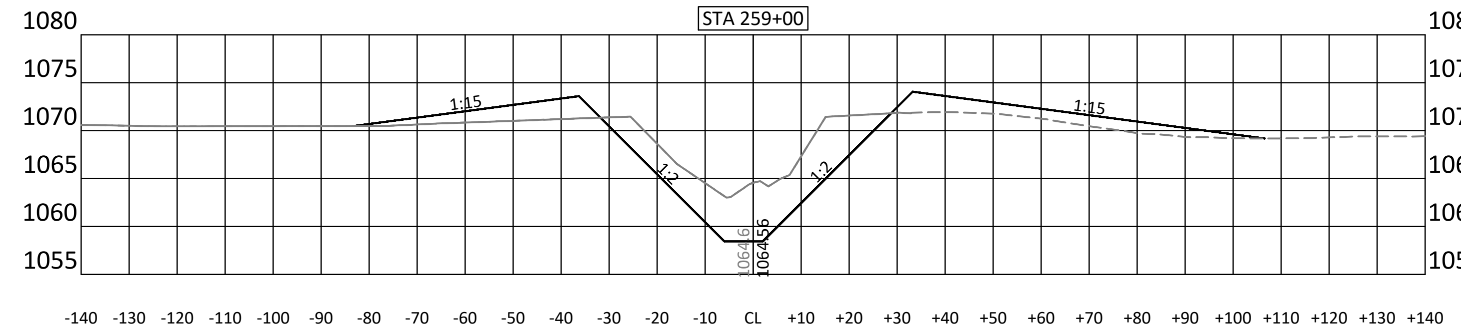

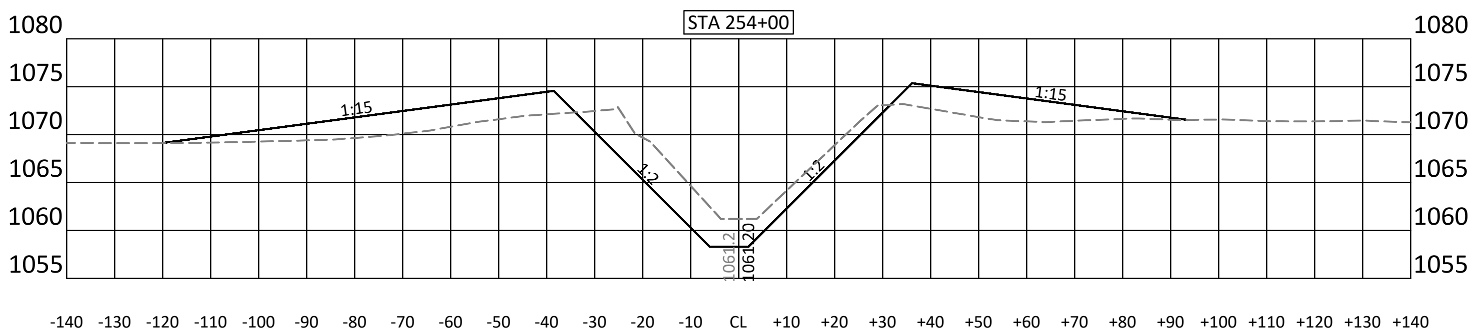

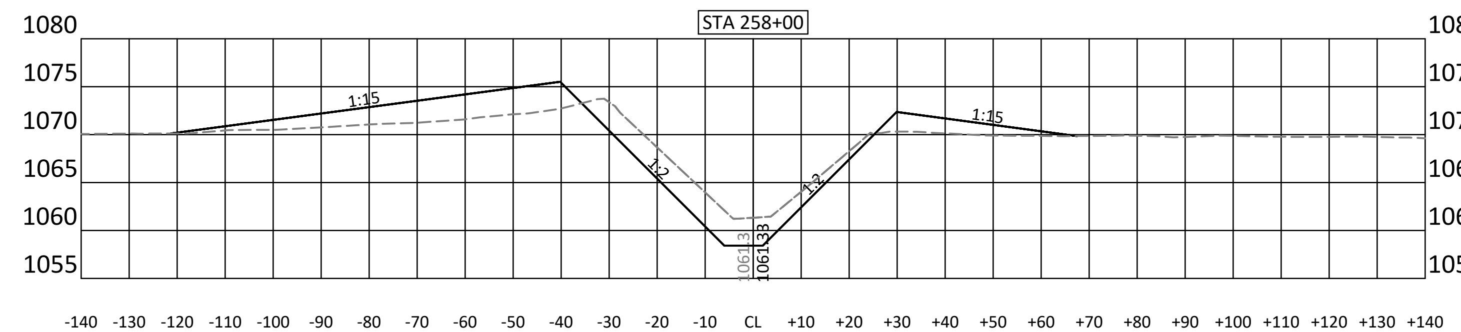

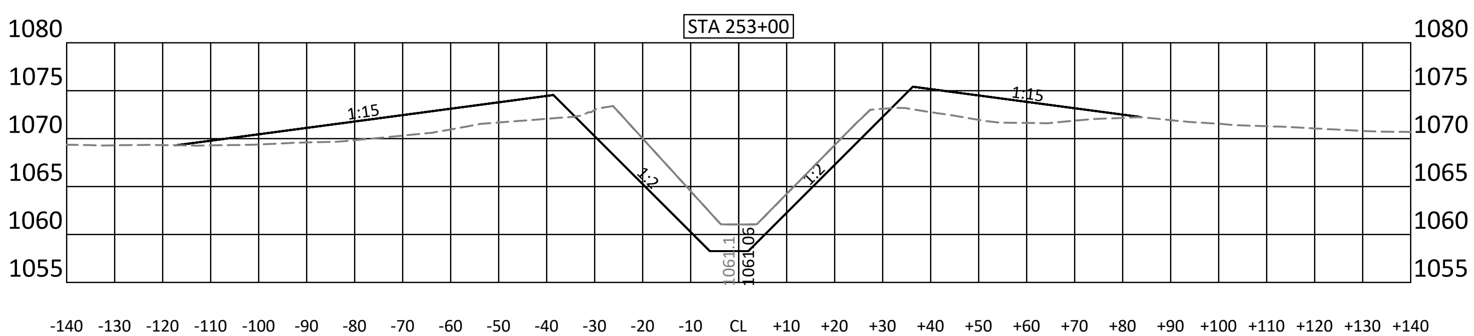

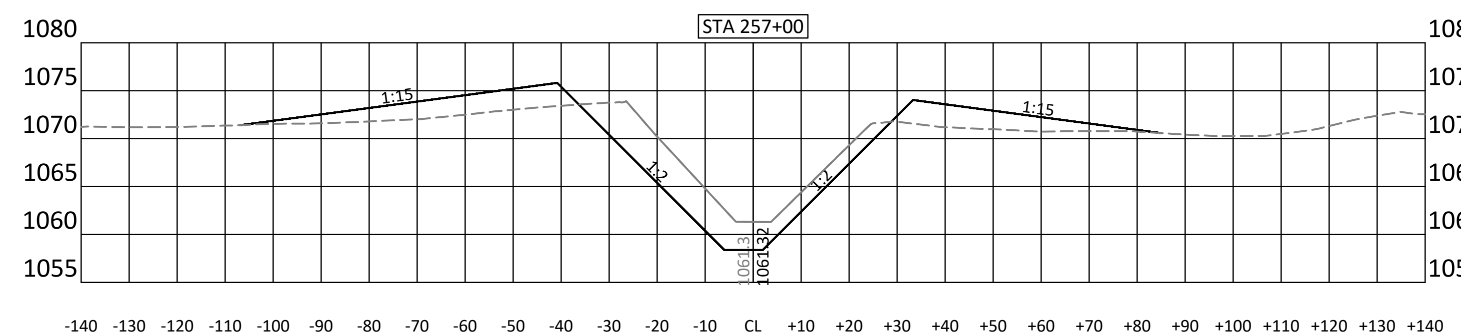

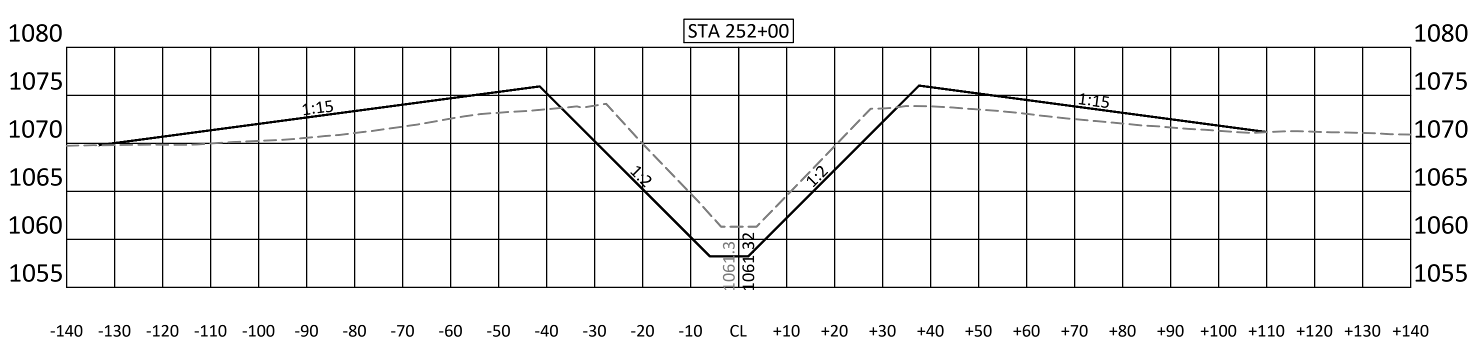

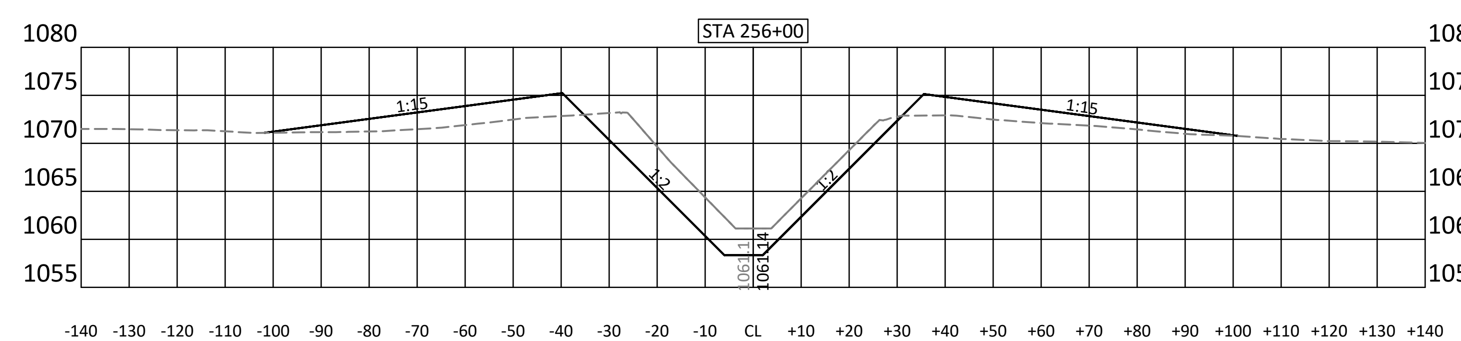

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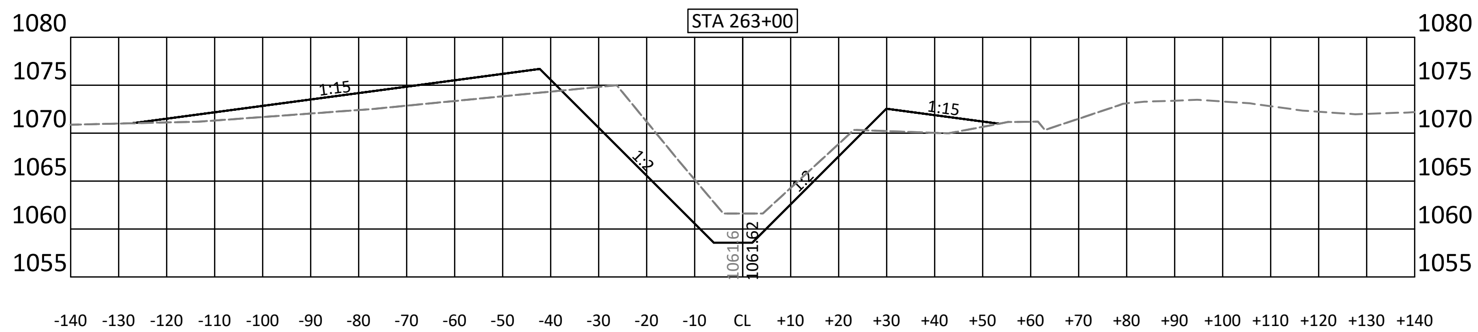

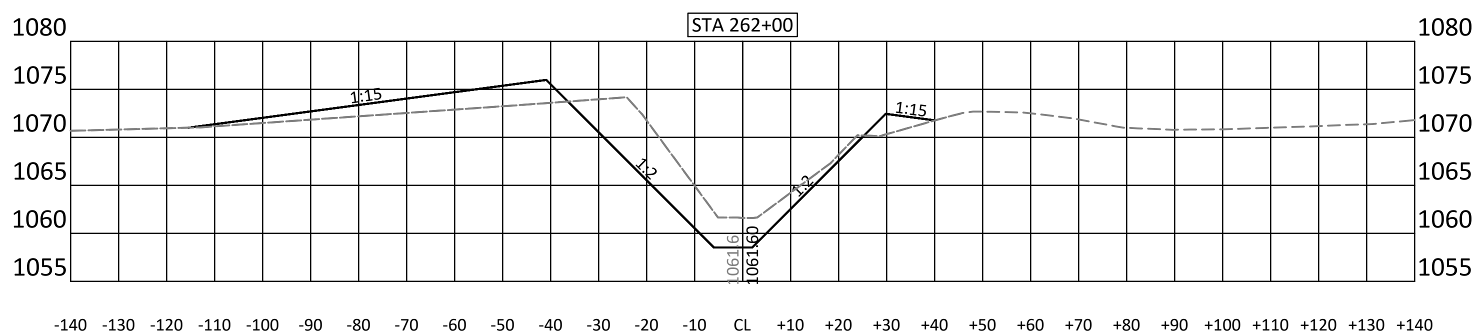

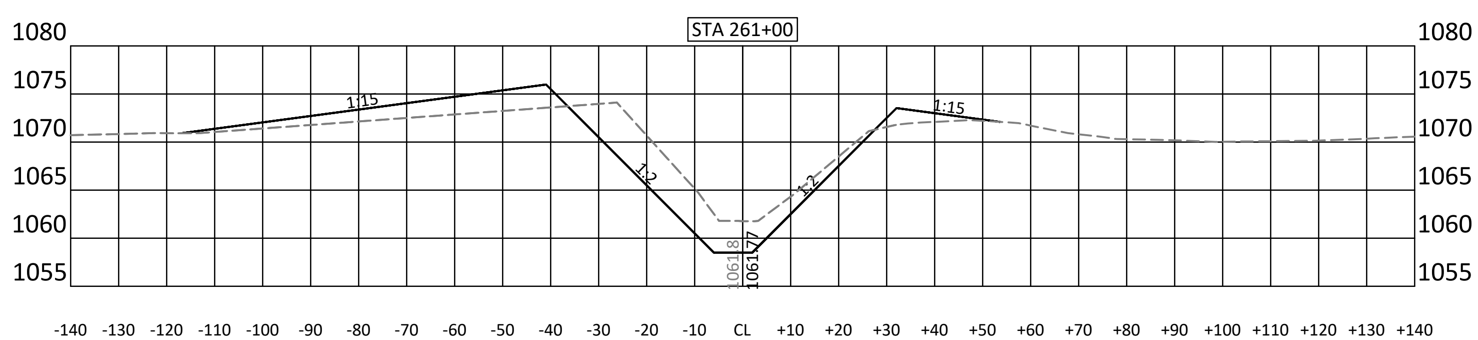

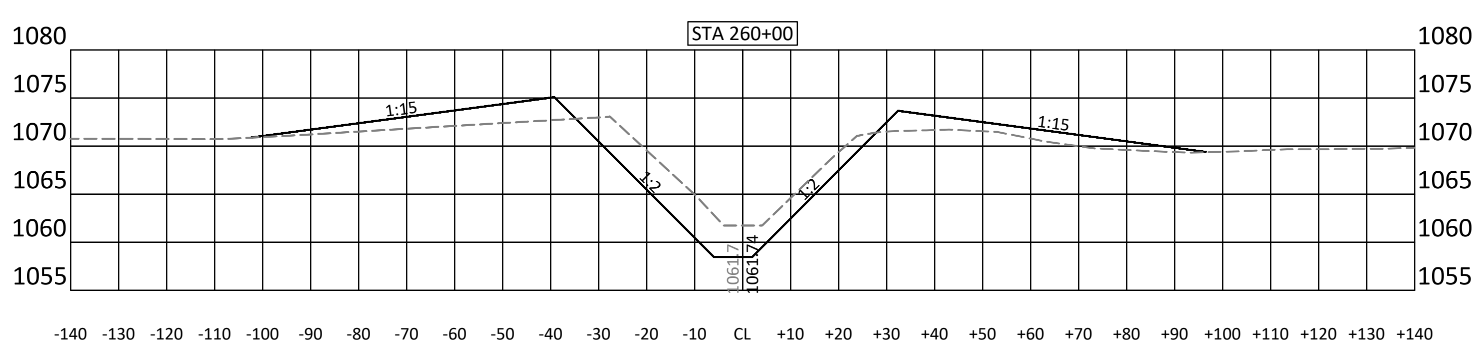

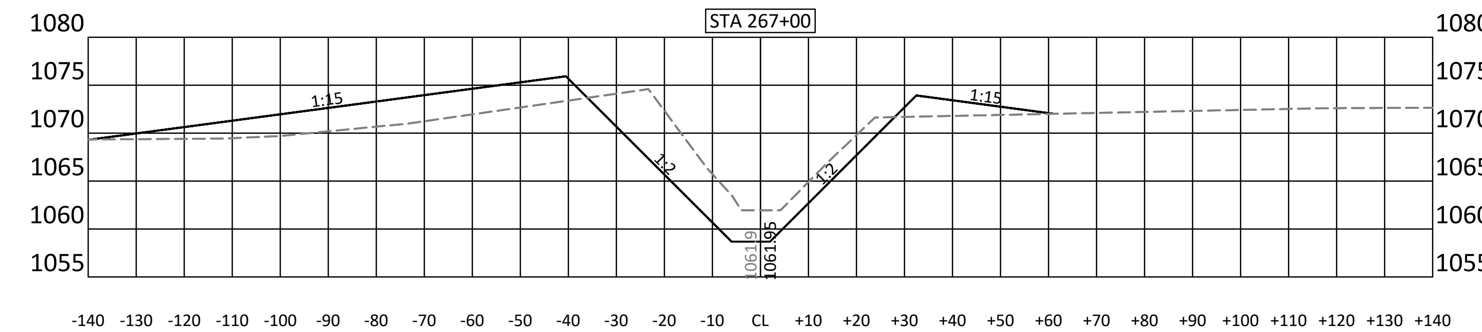

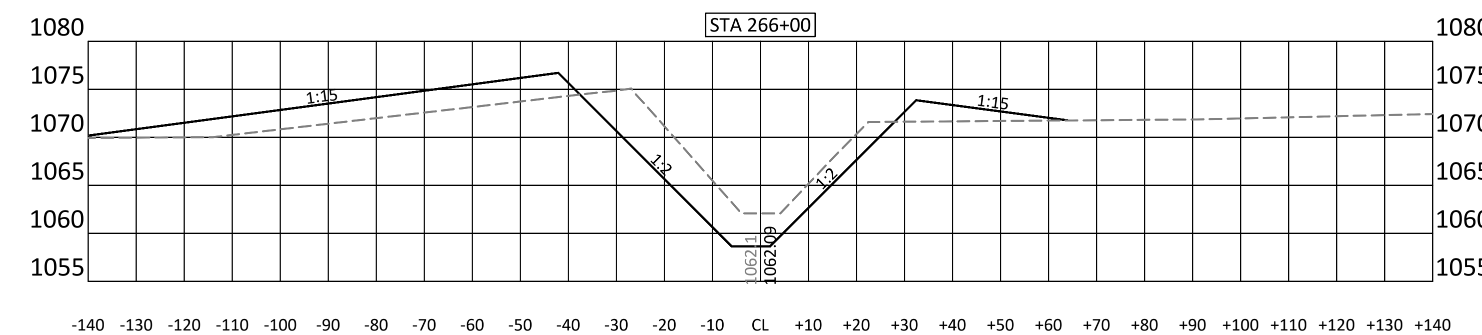

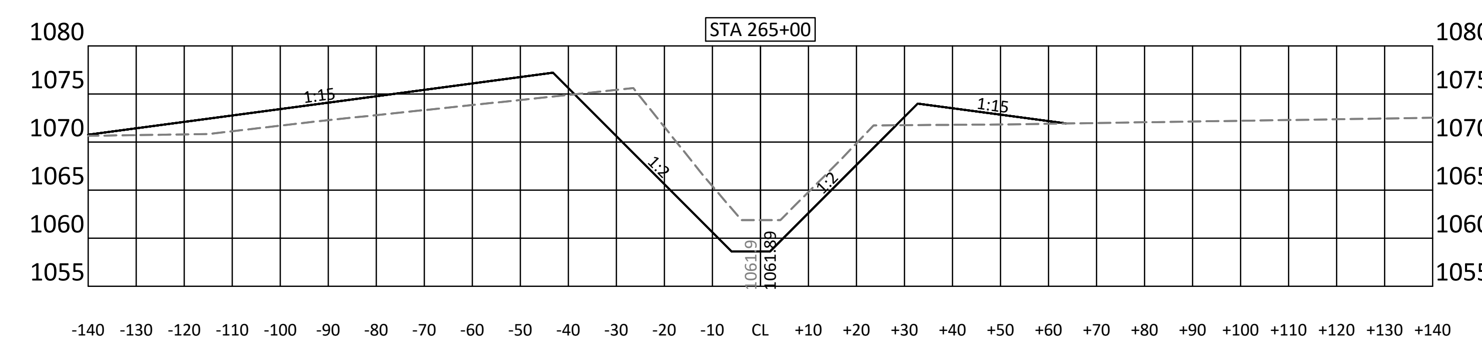

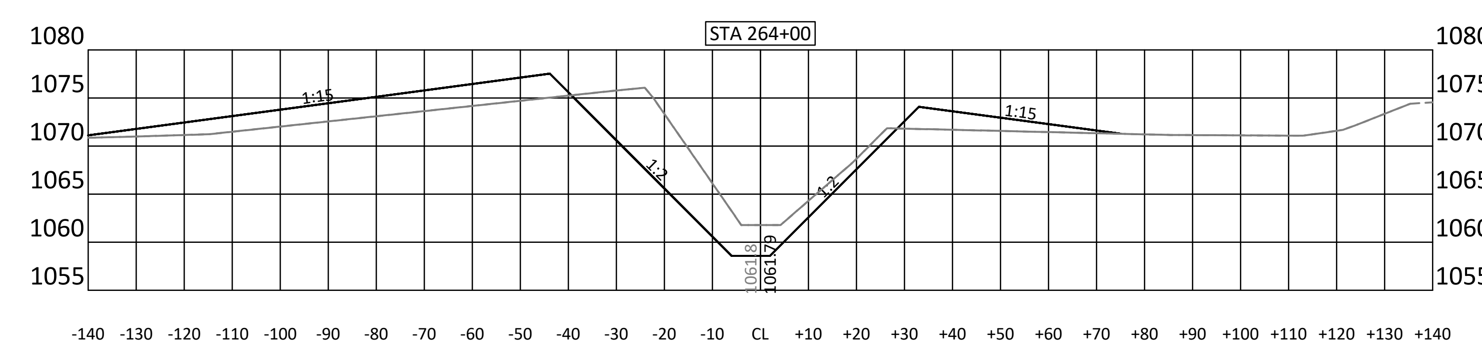

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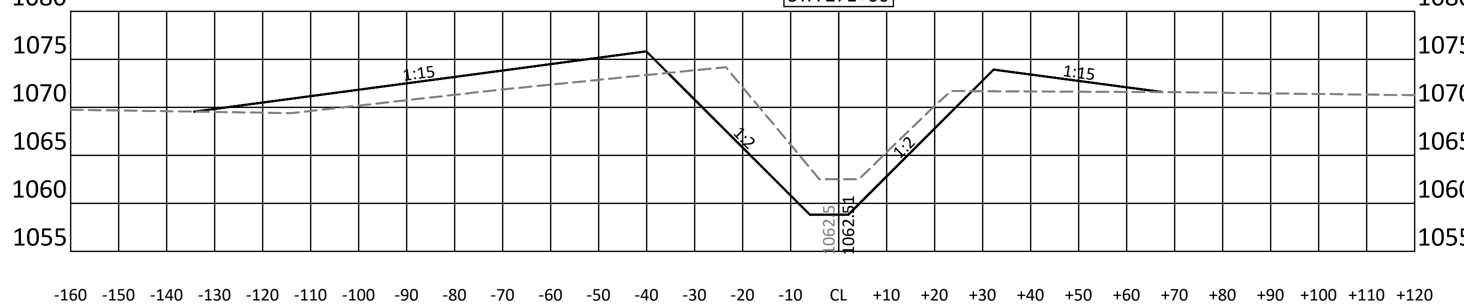

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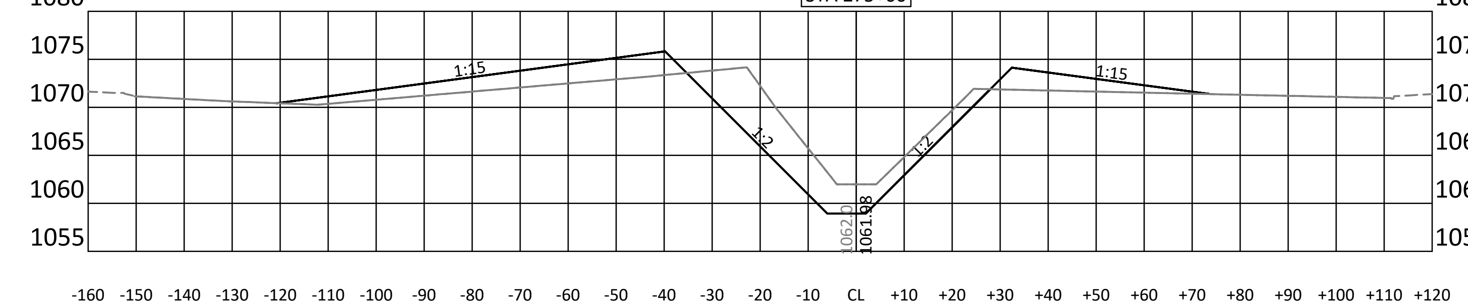

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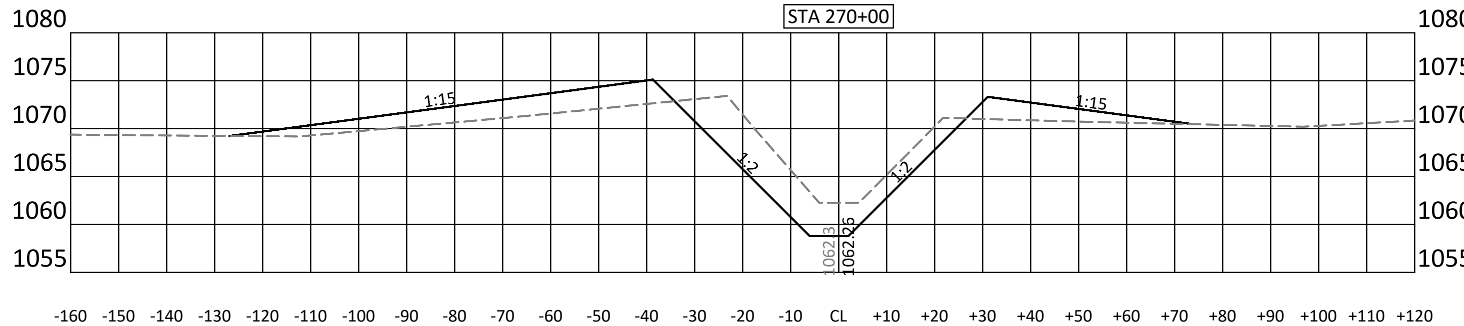

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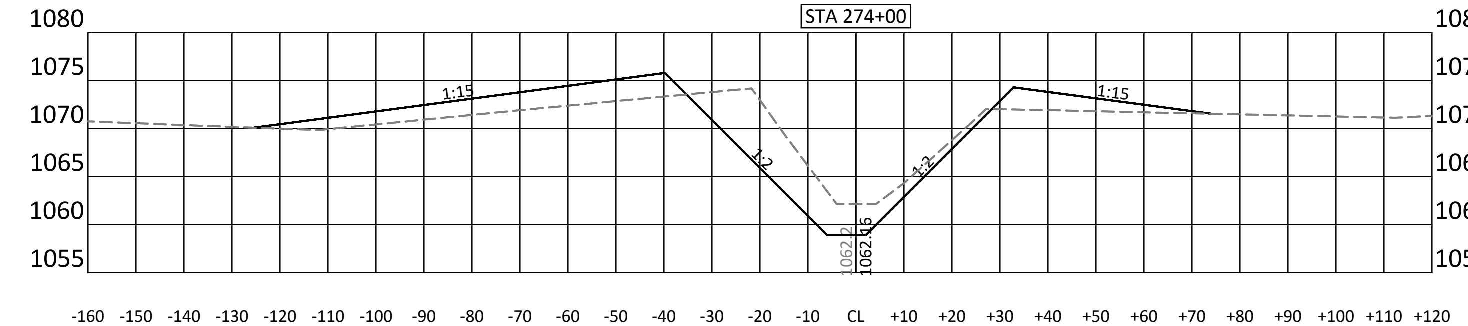

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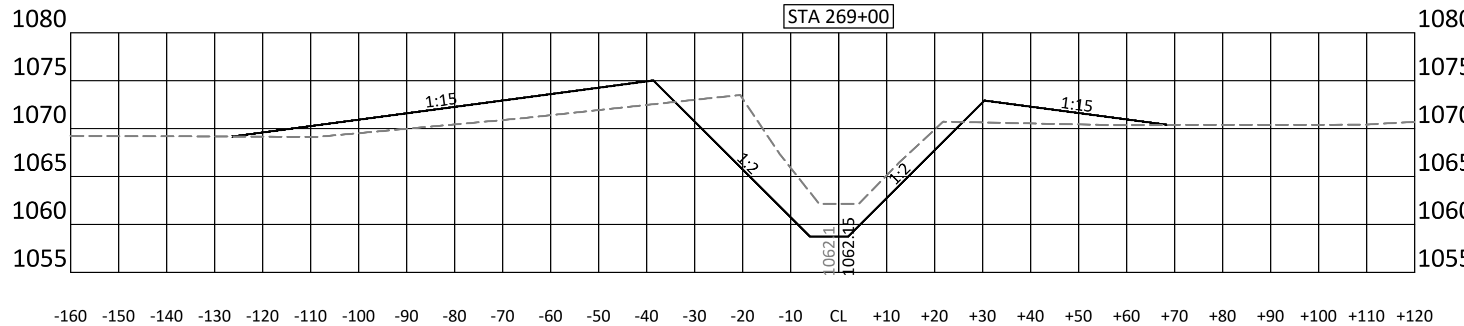

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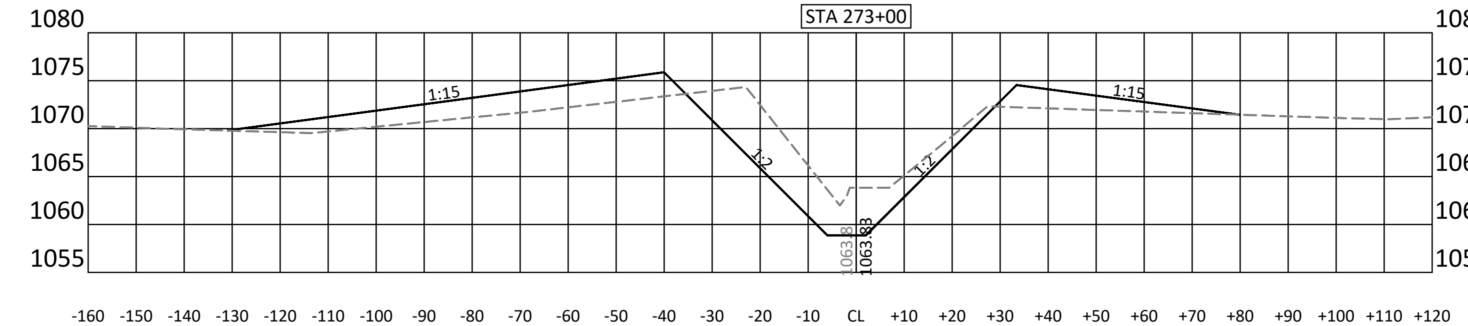

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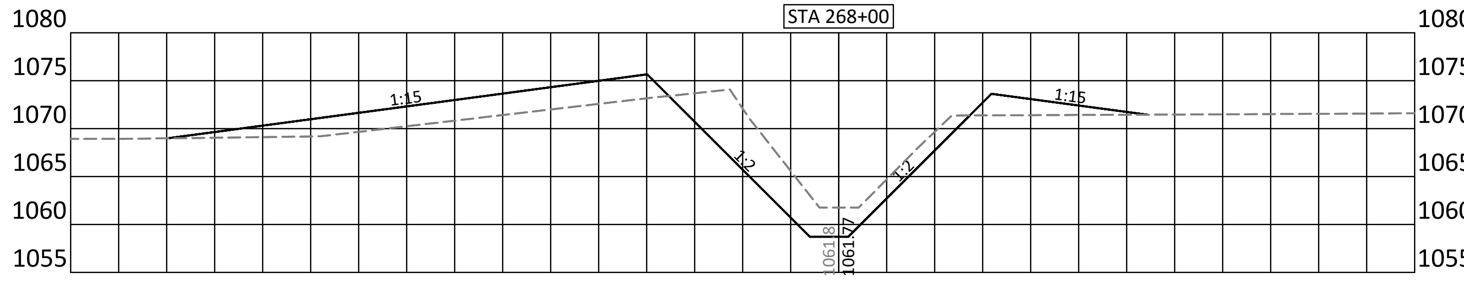

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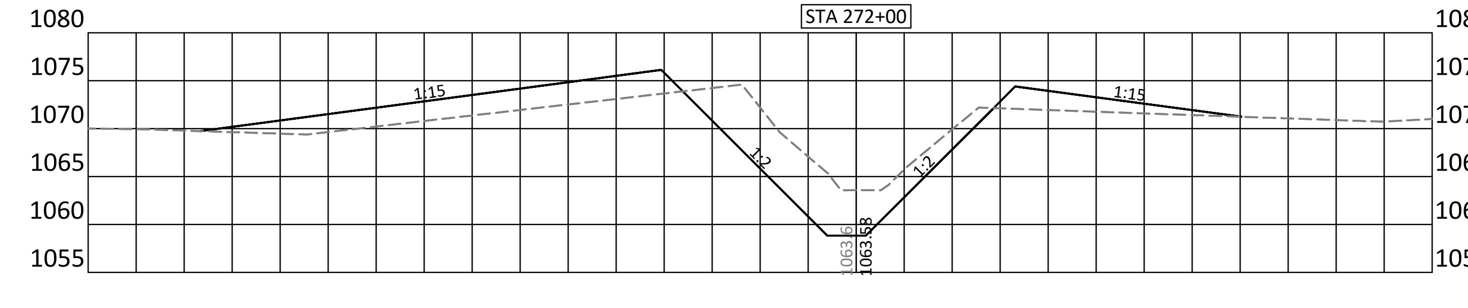

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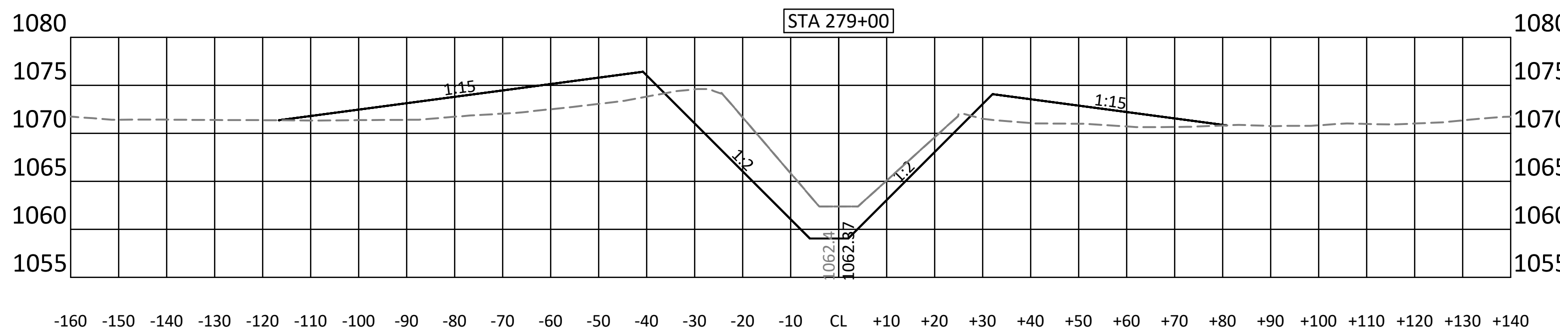

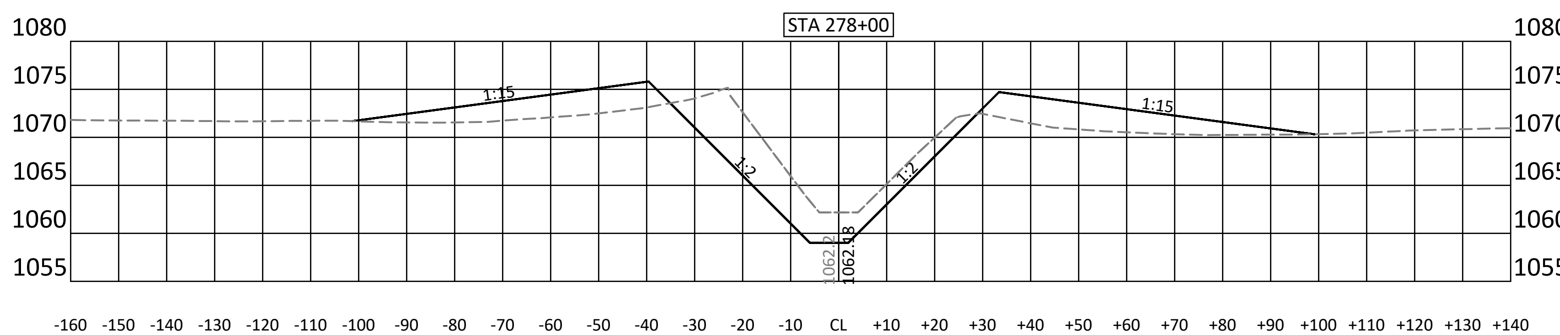

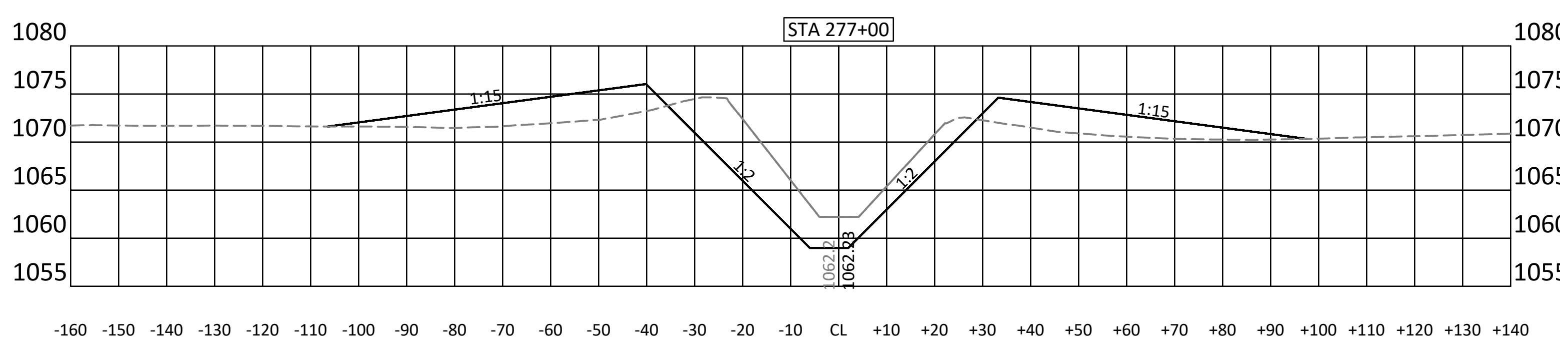

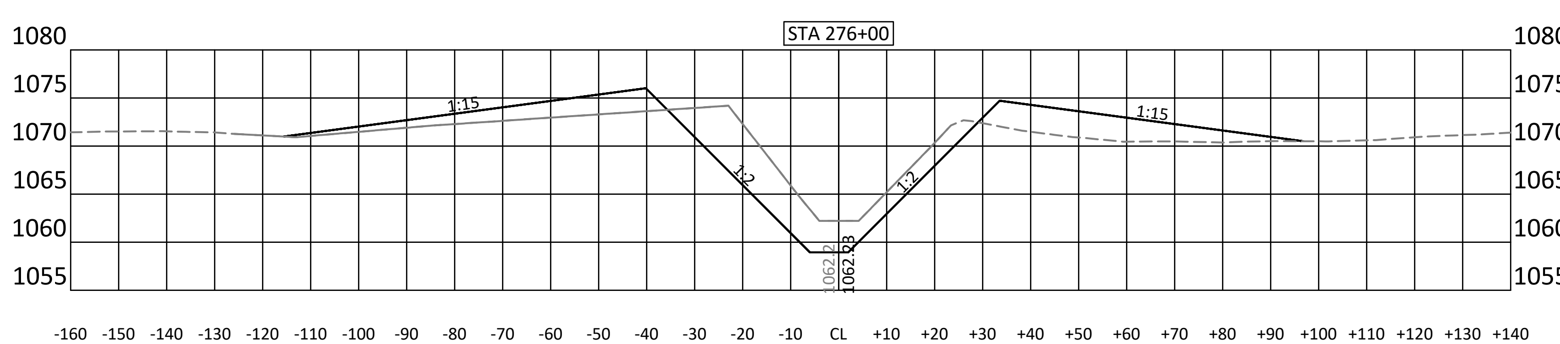

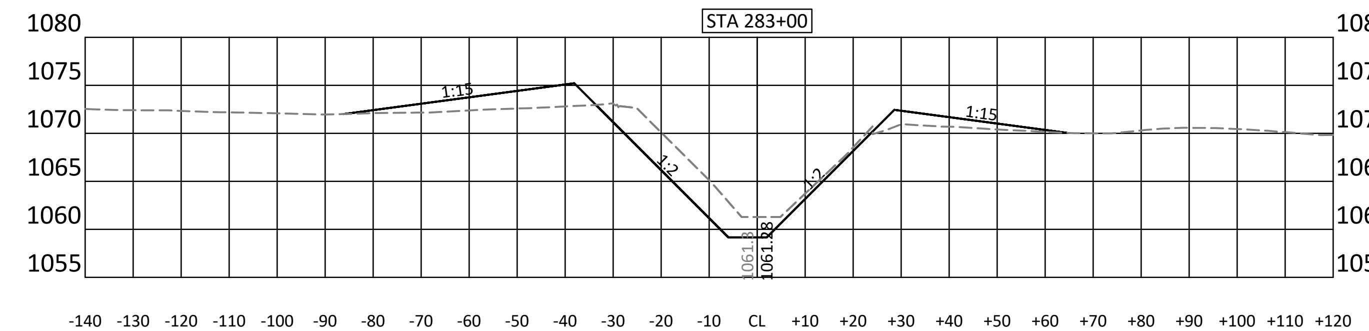

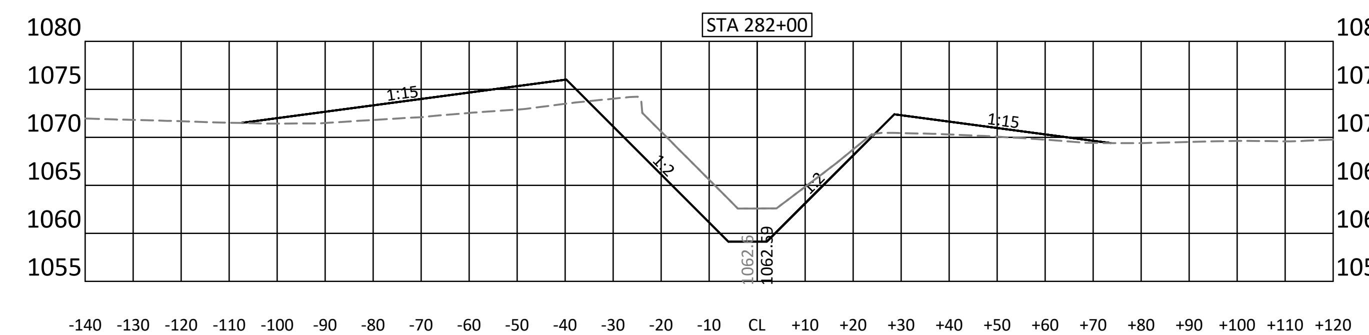

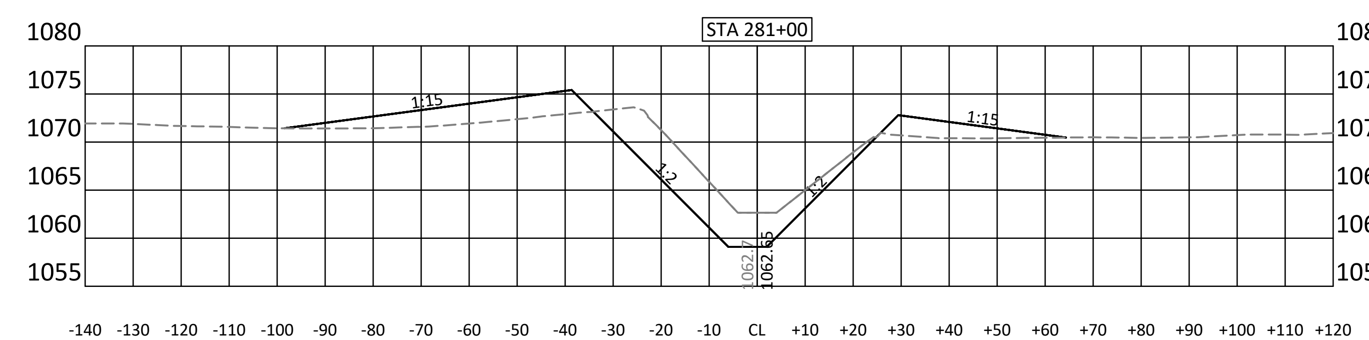

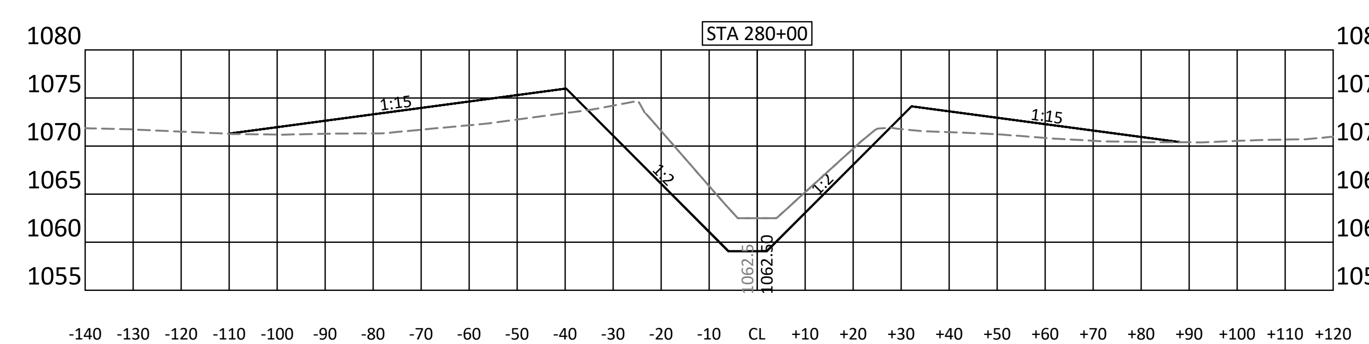

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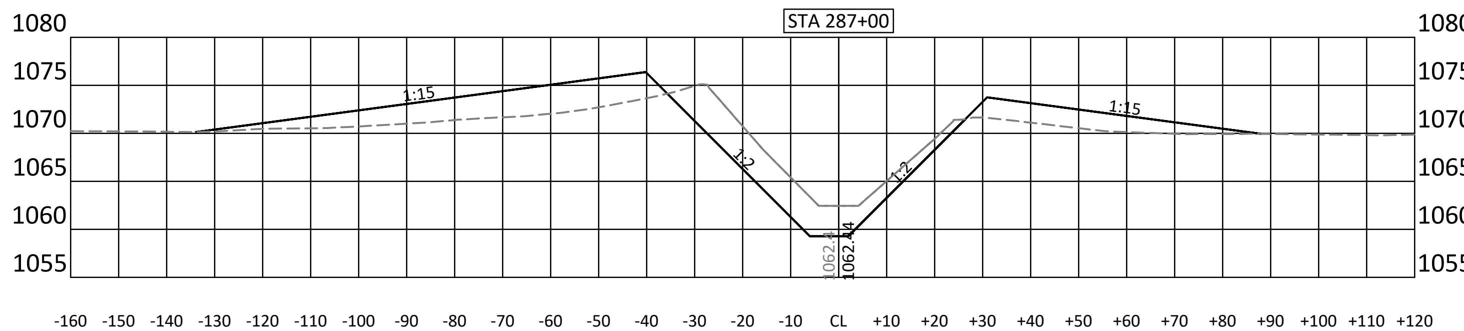

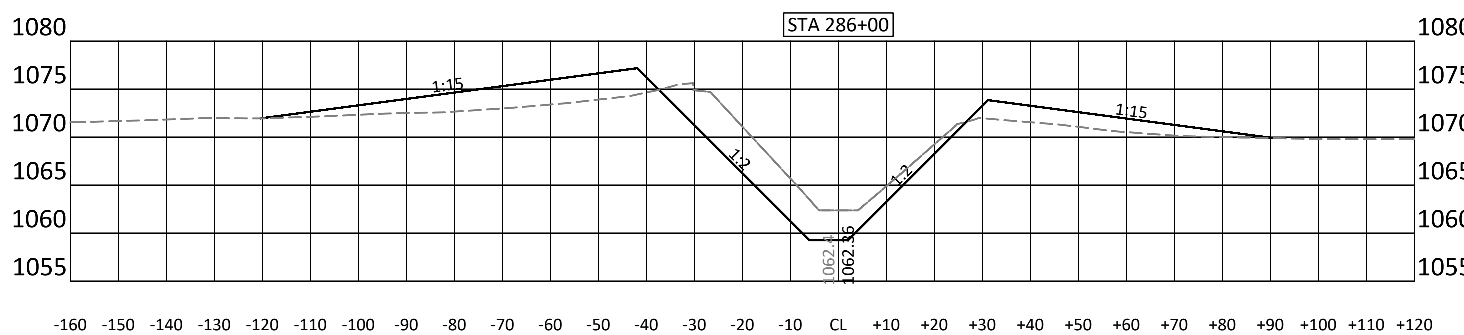

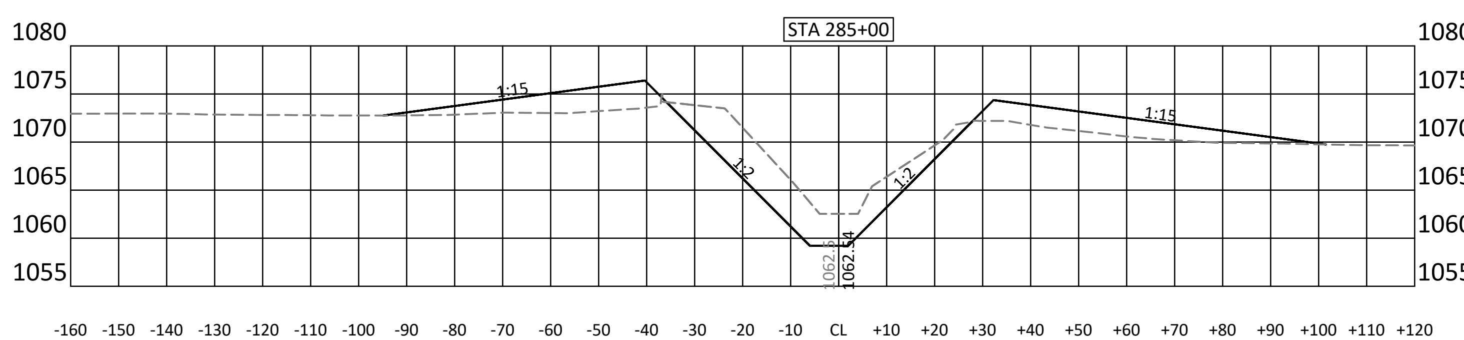

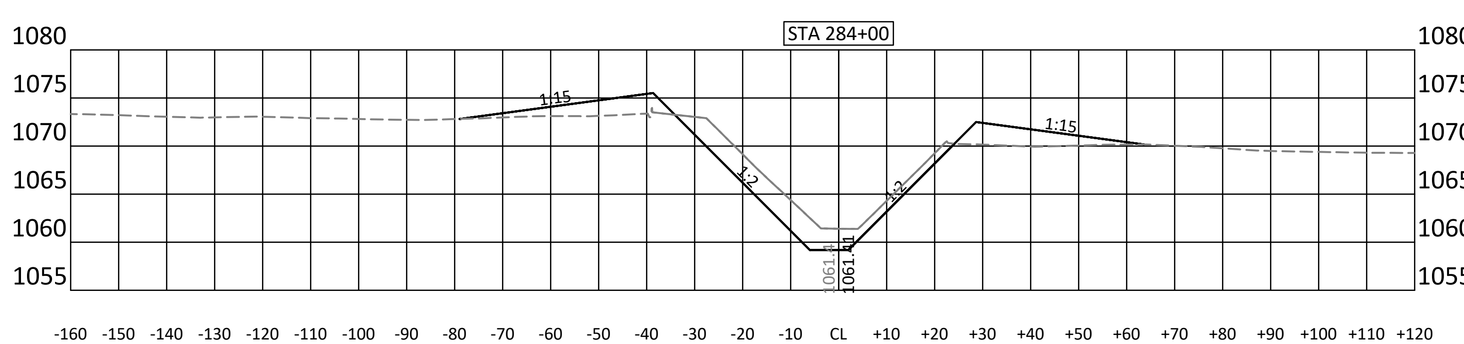

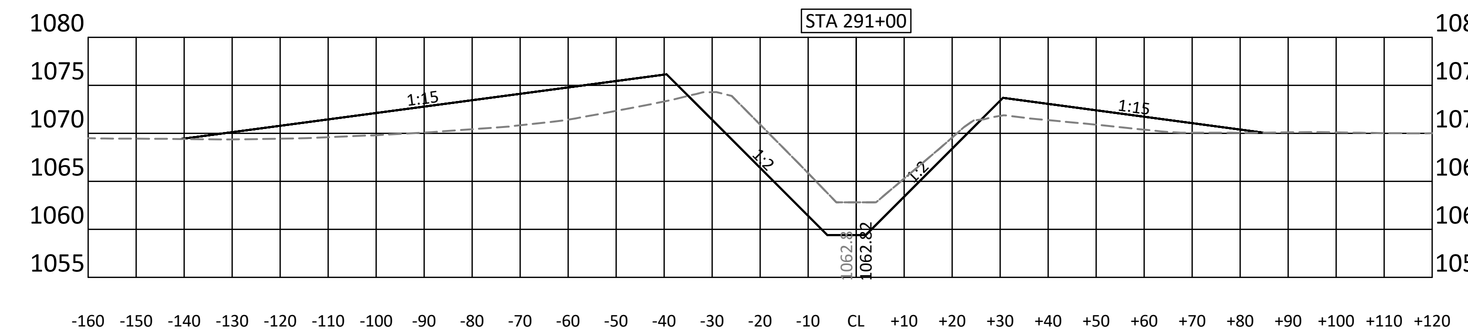

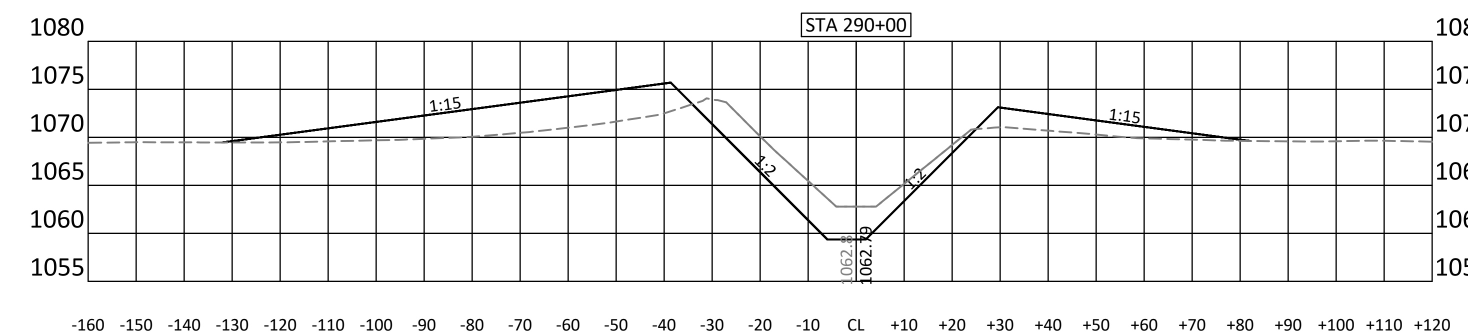

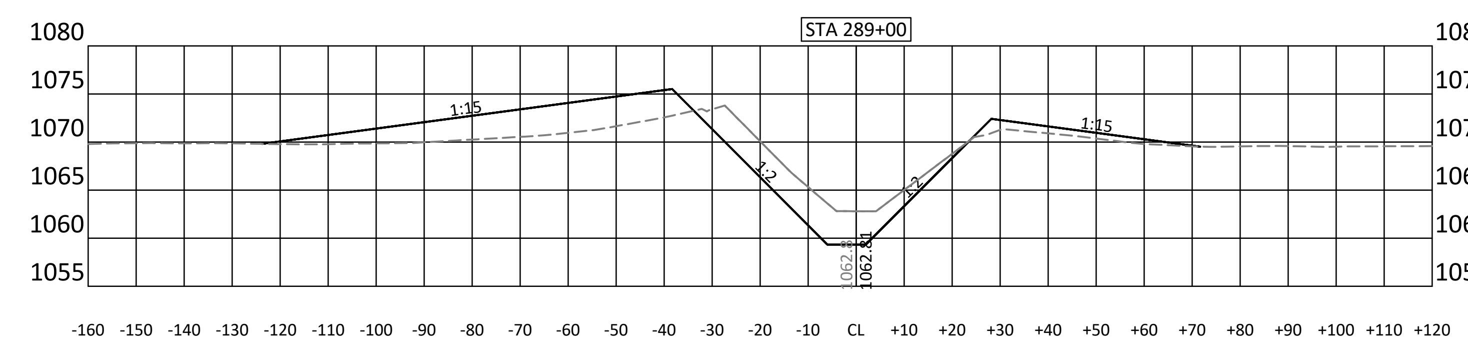

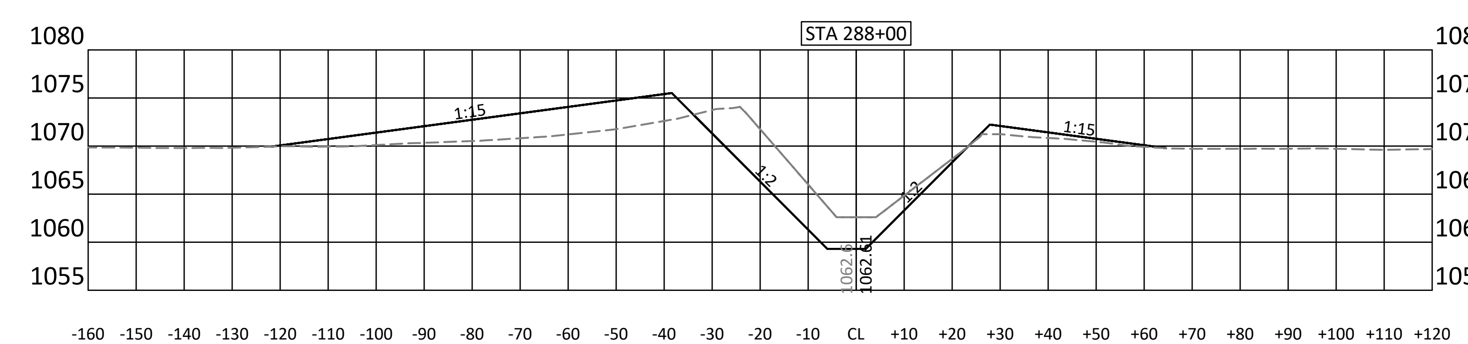

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PRELIMINARY
NOT FOR CONSTRUCTION

SHAUN P. LUKER
LIC. NO. 48756 DATE MM/DD/YYYY

BOLTON & MENK
1243 CEDAR STREET NE
SLEEPY EYE, MINNESOTA 56085
Phone: (507) 794-5541
Email: SleepyEye@bolton-menk.com
www.bolton-menk.com

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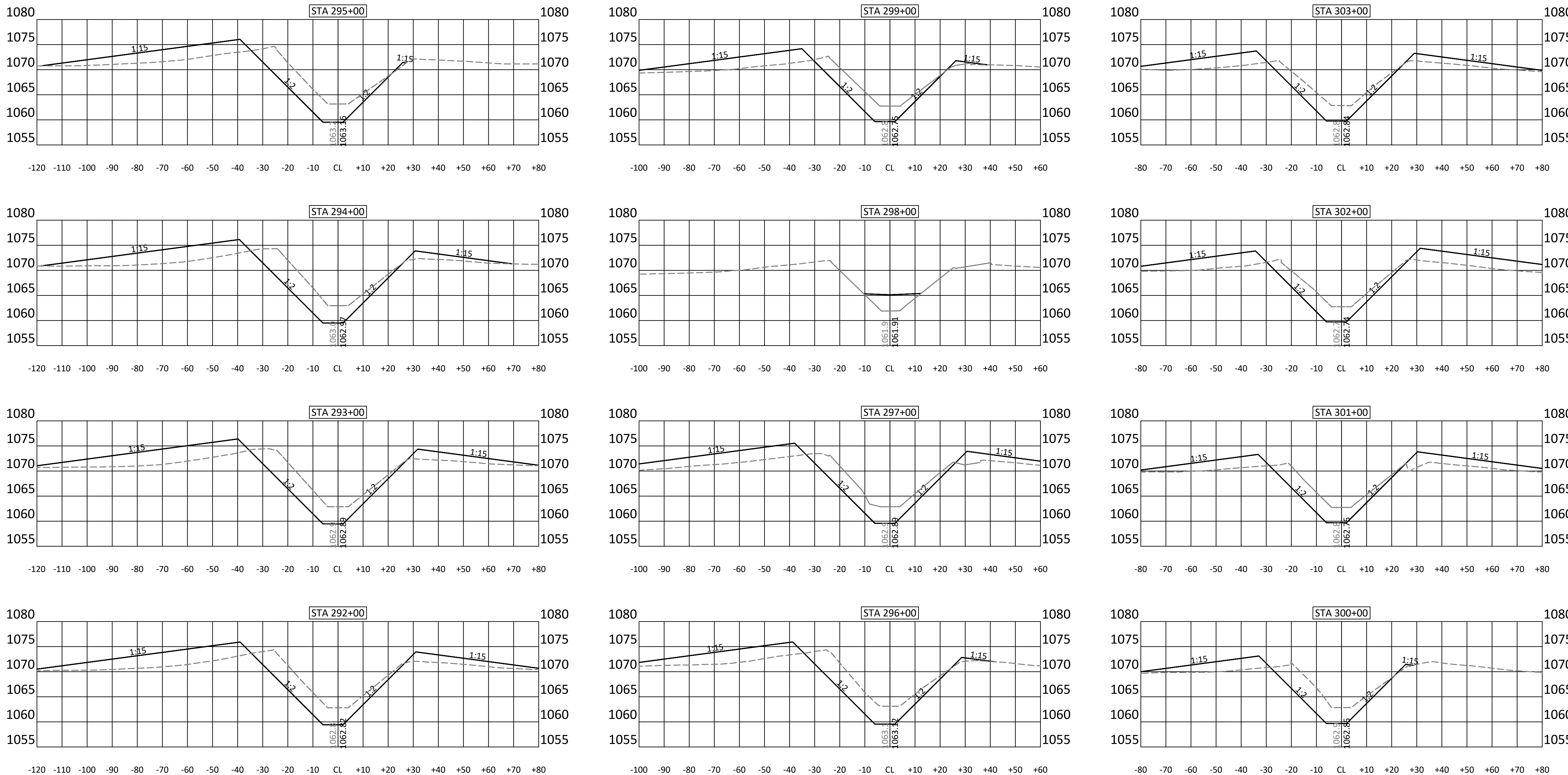
SHEET C9.26



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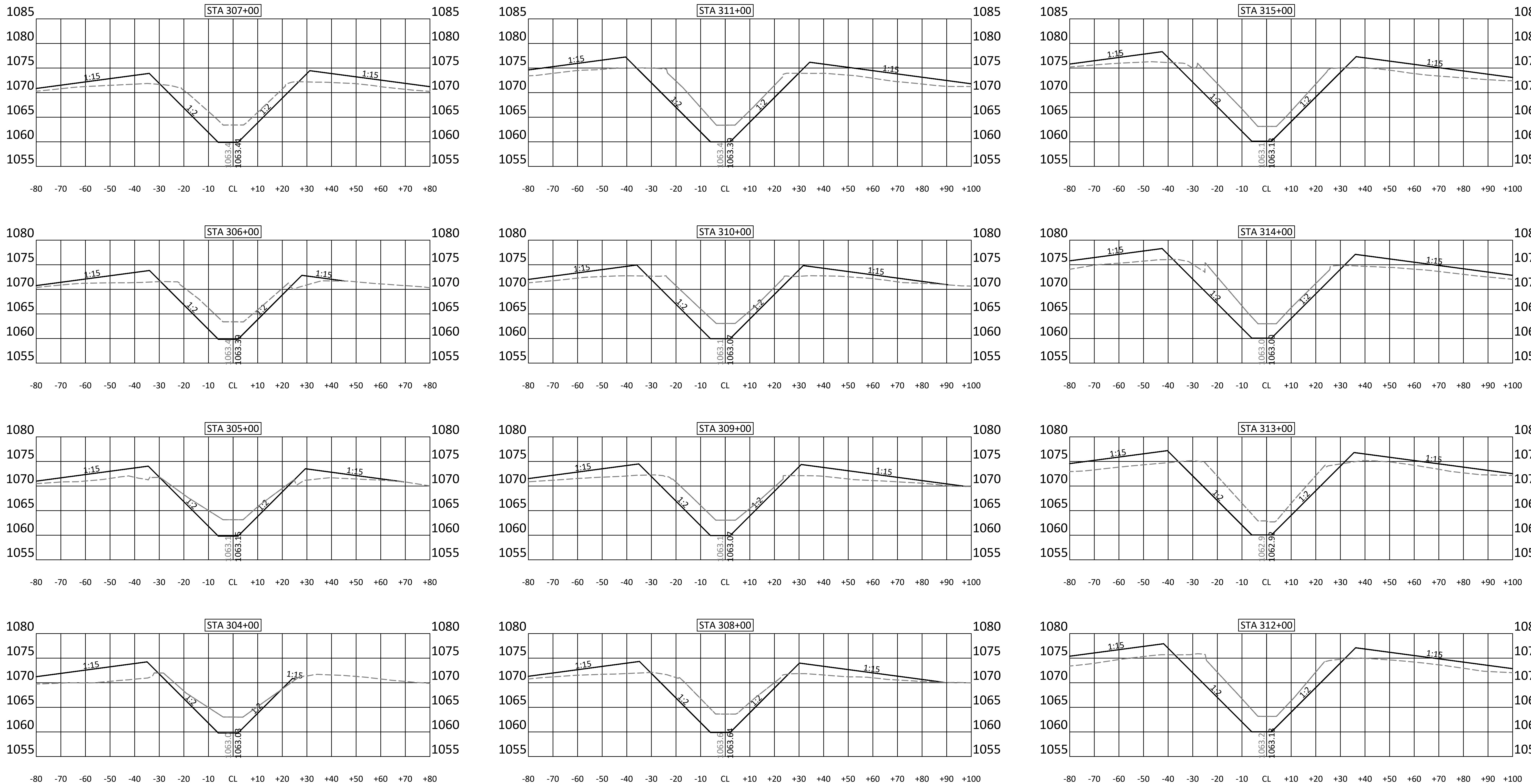

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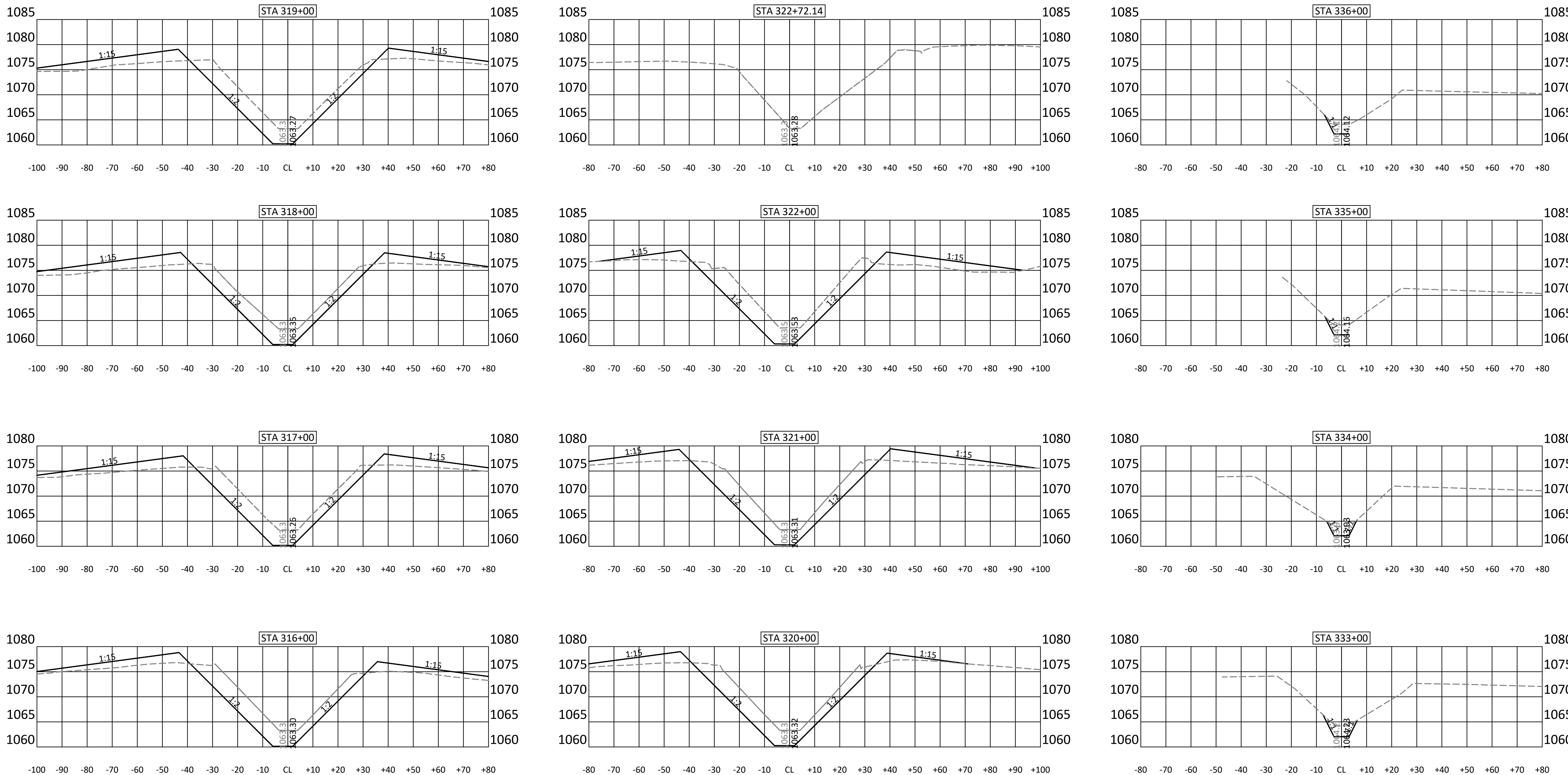
SHEET
C9.28

** NOTE: STORAGE POND #2- RIGHT SIDE ONLY.
SEE SHEETS IN SECTION C3.



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SHEET C9.29

** NOTE: STORAGE POND #2- RIGHT SIDE ONLY.
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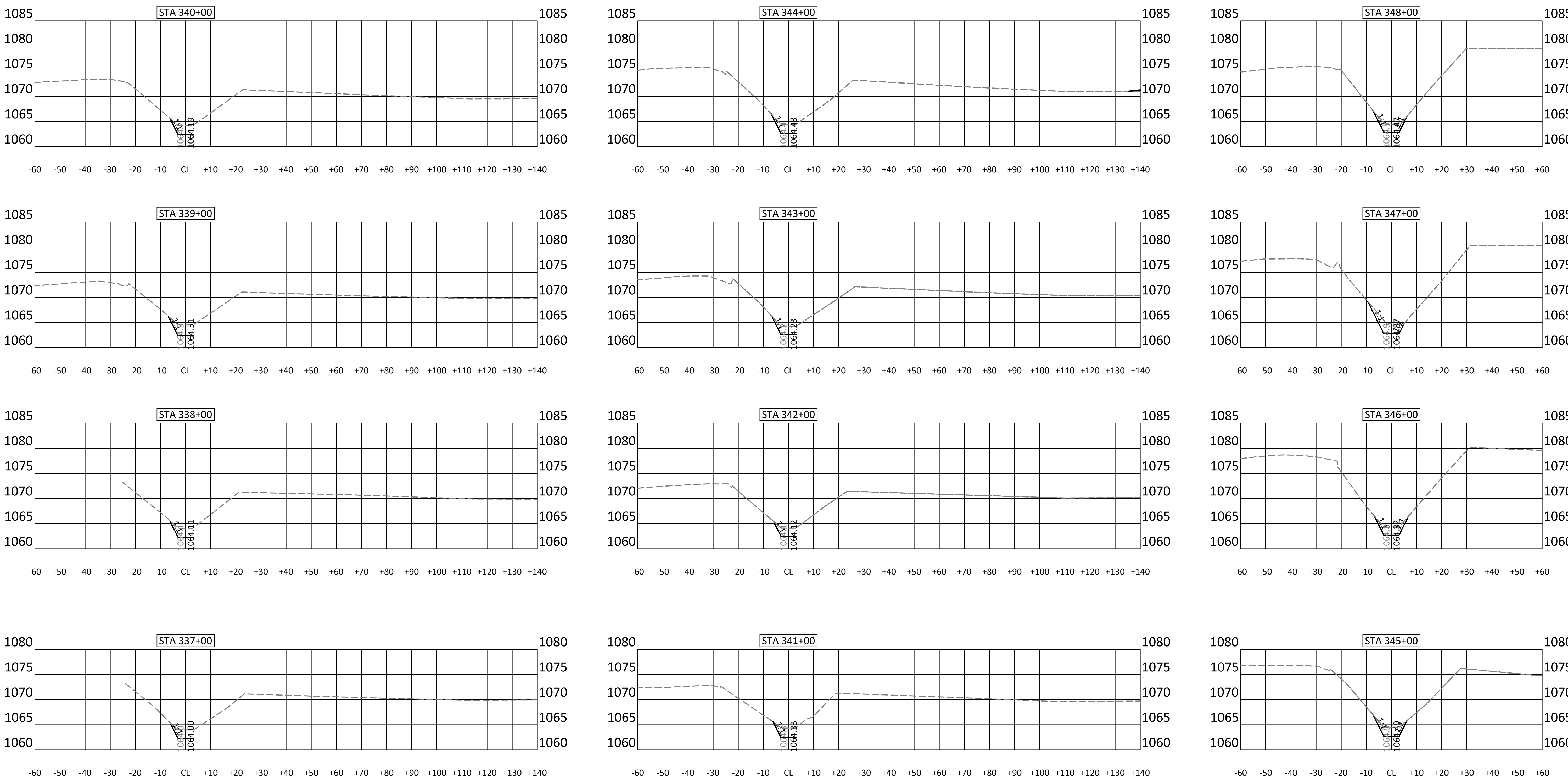

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SHEET
C9.30

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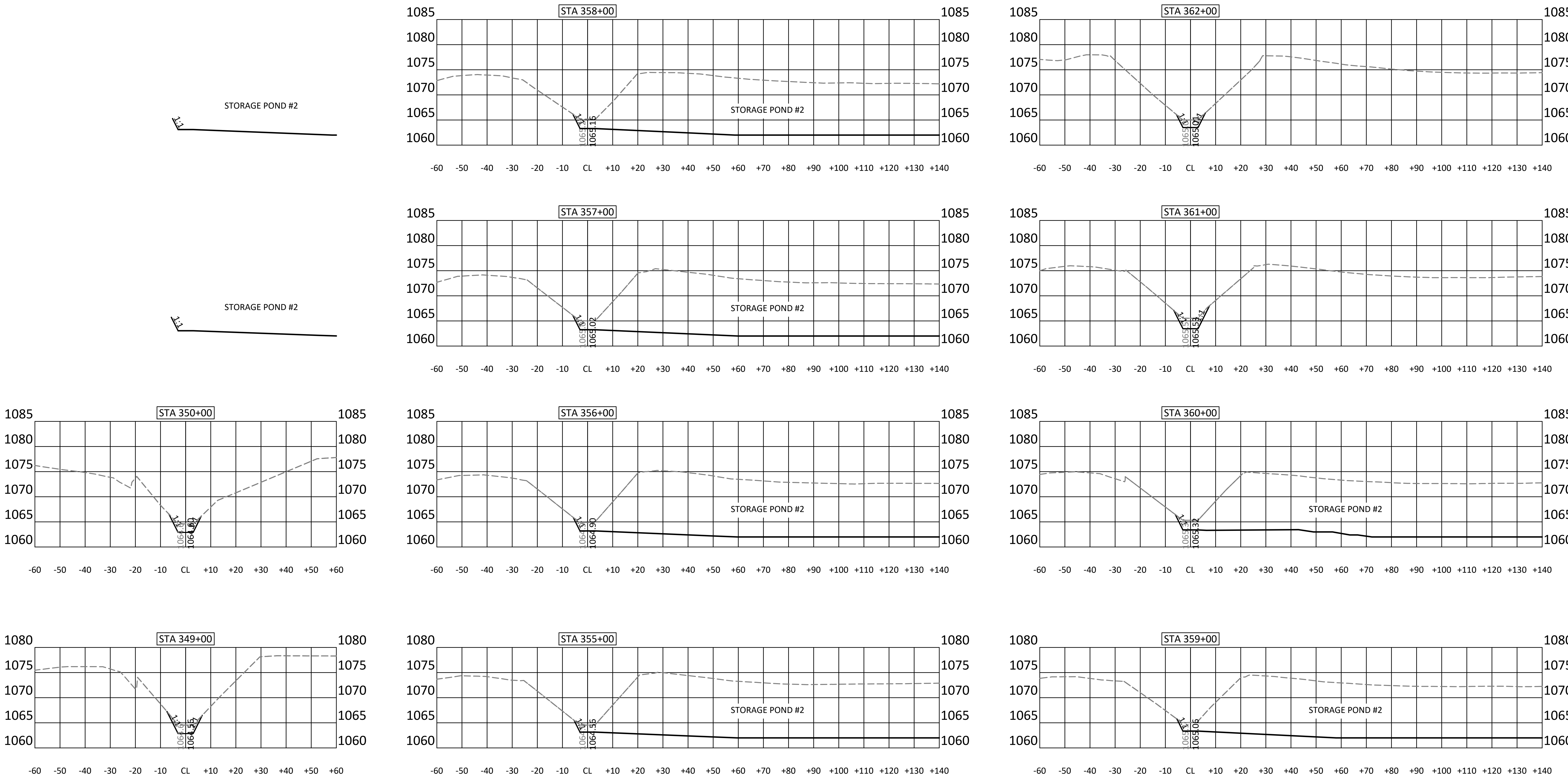

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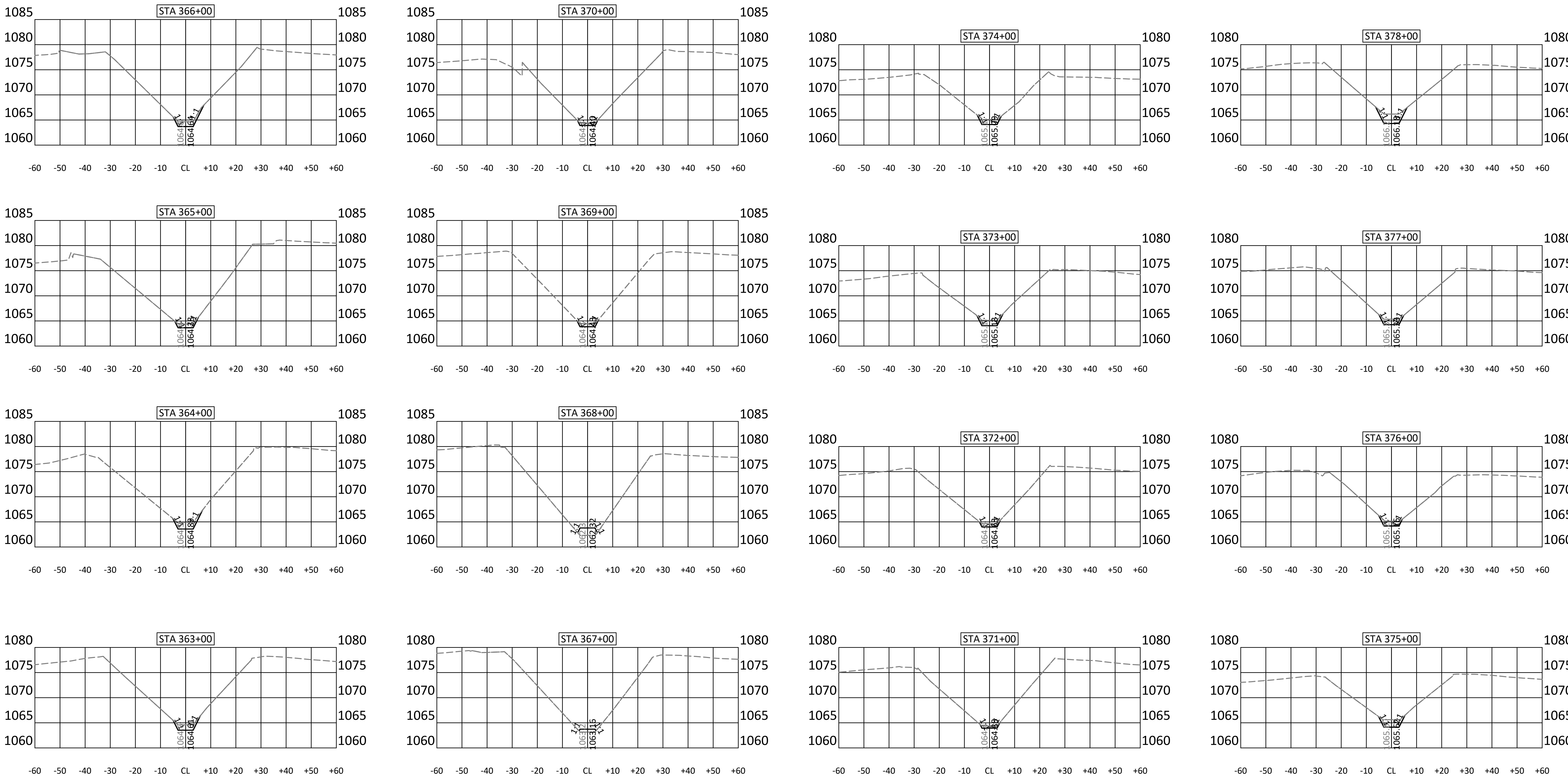

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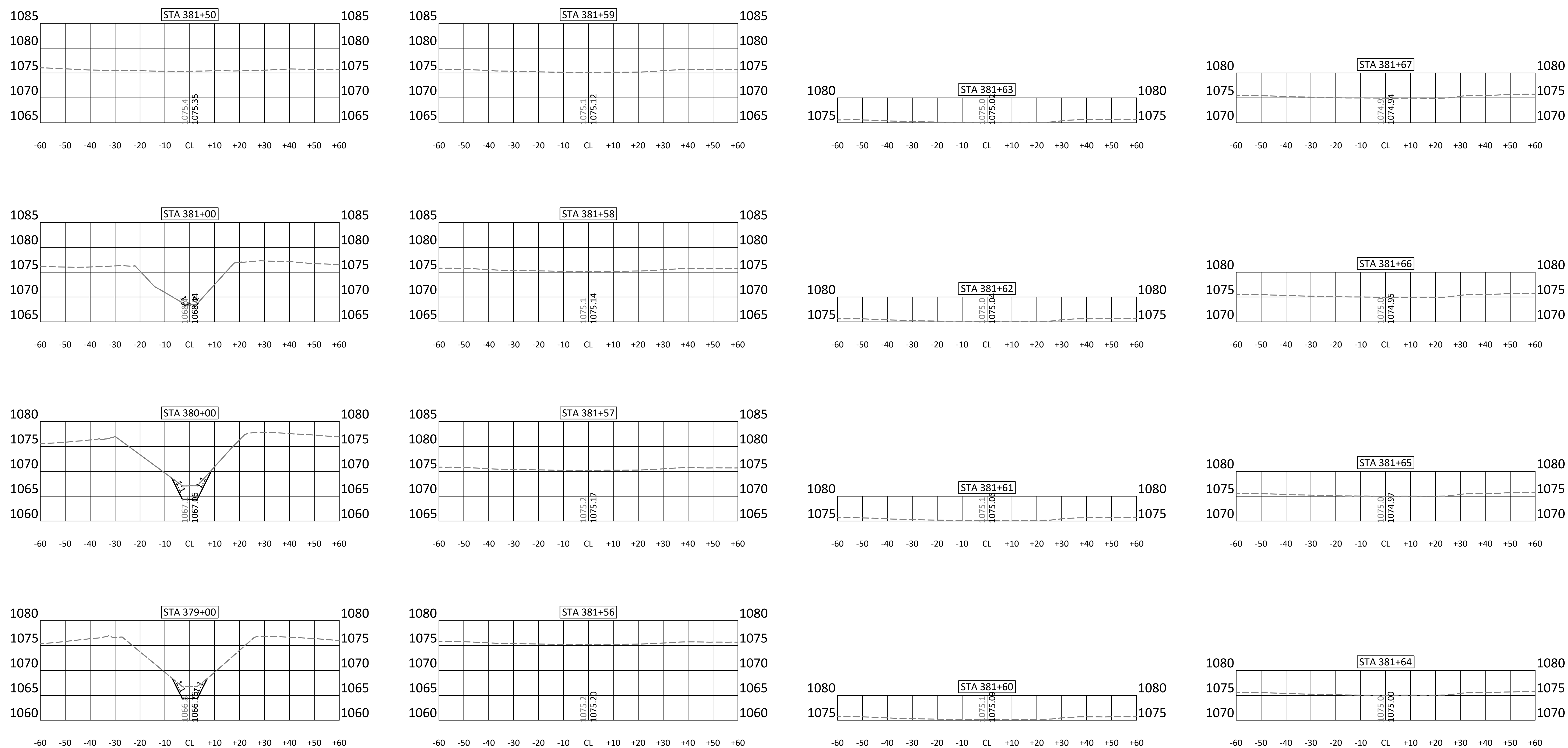

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EXHIBIT 2: PETITION FOR CD 59 IMPROVEMENT

STATE OF MINNESOTA
COUNTY OF RENVILLE

In Re:

Renville County Ditch No. 59,
Renville County, Minnesota.

PETITION FOR IMPROVEMENT OF DRAINAGE SYSTEM

TO: THE RENVILLE COUNTY BOARD OF COMMISSIONERS, ACTING AS DRAINAGE AUTHORITY FOR RENVILLE COUNTY DITCH NO. 59;

Petitioners respectfully represent, state and request the following:

1. Jurisdiction.

The undersigned Petitioners constitute: (1) at least 26% of the owners of the property affected by the proposed improvement; (2) at least 26% of the owners of property that the proposed improvement passes over; (3) the owners of at least 26% of the property area affected by the proposed improvement; or (4) the owners of at least 26% of the property area that the proposed improvement passes over.

2. Designation of Drainage System.

This Petition requests the improvement of the drainage system known by and designated as County Ditch No. 59 located in Renville County, Minnesota.

3. Need for Improvement.

The drainage system has insufficient capacity or needs enlarging or extending to furnish sufficient capacity or a better outlet.

4. Description of Proposed Improvement.

Attached as **Exhibit A** is a map which shows the general location of the proposed improvement. Exhibit A also depicts the approximate watershed limits in the area of the proposed improvement, the parcels over which the proposed improvement will pass, and the approximate location of the properties affected by the proposed improvement. The proposed improvement would include improvement of the Main Ditch, Branch C and various sub-branches thereof as identified below, and Branch 309 and various sublaterals thereof as designated below. The general location of the Main Ditch, Branch C and its sublaterals and Branch 309 and its sublaterials are, to the best of Petitioners' information, depicted on the attached Exhibit A.

The proposed improvement would be constructed in Sections 1 and 2 of Township 115 North, Range 36 West (Emmet Township), Sections 2, 3, 4, 5, and 6 of Township 115 North, Range 35 West (Troy Township), Sections 35 and 36 of Township 116 North, Range 36 West (Crooks Township), and Sections 27, 28, 32, 33, 34, and 35 of Township 116 North, Range 35 West (Winfield Township), all in Renville County, Minnesota.

The starting point and general course of the proposed improvement are as follows:

<u>Main Ditch</u>
Beginning at the outlet of the Main open ditch in the Southeast Quarter of Section 2, Township 115 North, Range 36 West, said point of beginning being approximately 2,240 feet north and 1,400 feet west of the Southeast Corner of said Section 2; thence northerly and northeasterly along the Main ditch across the Southeast and Northeast Quarters of said Section 2 and the Southeast Quarter of Section 35, Township 116 North, Range 36 West to the east line of said Section 35, said point being approximately 60 feet north of the Southeast Corner of said Section 35; thence easterly across the Southwest Quarter of Section 36-116-36, the North Half of Section 1-115-36, the North Half of Sections 6, 5, and 4 of Township 115 North, Range 35 West to the Northeast Corner of said Section 4; thence northeasterly across the Southwest, Southeast and Northeast Quarter of Section 34-116-35 and the Northwest Quarter of Section 35-116-35 to the Northwest Corner of said Section 35; thence northwesterly across the Southeast Quarter of Section 27-116-35 to the north-south ¼ line, said point being approximately 1,150 feet north of the South Quarter Corner and there terminating.

<u>Branch C</u>
Beginning at the outlet of the Branch C tile into the Main open ditch in the Northeast Quarter of the Northeast Quarter of Section 4, Township 115 North, Range 35 West, said point of beginning being approximately 130 feet west and 130 feet south of the Northeast Corner of said Section 4, thence southeasterly and easterly generally following the current alignment of Branch C of County Ditch 59, across the Northeast Quarter of the Northeast Quarter of Section 4, across the West Half and the Southeast Quarter of the Northwest Quarter of Section 3, across the North Half of the Northeast Quarter of Section 3, across the South Half of the Northwest Quarter of Section 2, across the Southwest Quarter of the Northeast Quarter of Section 2; and into the Northeast Quarter of the Southeast Quarter of Section 2 and there terminating, said point of termination being about 110 feet west and 30 feet south of the east Quarter Corner of said Section 2.

<u>Branch C-1</u>
Beginning at the outlet of the Branch C-1 tile into the Branch C tile in the Southwest Quarter of the Northwest Quarter of Section 3, Township 115 North, Range 35 West, said point of beginning being approximately 1,150 feet east and 1,740 feet south of the Northwest Corner of said Section 3, thence southerly and southeasterly generally following the current alignment of Branch C-1 of County Ditch 59, across the South Half of the Northwest Quarter of Section 3, and into the Northeast Quarter of the Southwest Quarter of Section 3 and there terminating, said point of termination being

approximately 1,400 feet east and 270 feet south of the west Quarter Corner of said Section 3.

Branch C-2
Beginning at the outlet of the Branch C-2 tile into the Branch C tile in the Northwest Quarter of the Northeast Quarter of Section 3, Township 115 North, Range 35 West, said point of beginning being approximately 2,520 feet west and 1,280 feet south of the Northeast Corner of said Section 3, thence northerly generally following the current alignment of Branch C-2 of County Ditch 59 across the Northwest Quarter of the Northeast Quarter of Section 3; and into the Northeast Quarter of the Northwest Quarter of Section 3 and there terminating, said point of termination being approximately 2,580 feet east and 90 feet south of the Northwest Corner of said Section 3.

Branch C-3
Beginning at the outlet of the Branch C-3 tile into the Branch C tile in the Northeast Quarter of the Northeast Quarter of Section 3, Township 115 North, Range 35 West, said point of beginning being approximately 600 feet west and 1,070 feet south of the Northeast Corner of said Section 3, thence northeasterly generally following the current alignment of Branch C-3 of County Ditch 59 across the Northeast Quarter of the Northeast Quarter of Section 3; and into the Southeast Quarter of the Southeast Quarter of Section 34, Township 116 North, Range 35 West, said point of termination being approximately 200 feet west and 110 feet north of the Southeast Corner of said Section 34.

Branch C-3-1
Beginning at the outlet of the Branch C-3-1 tile into the Branch C-3 tile in the Northeast Quarter of the Northeast Quarter of Section 3, Township 115 North, Range 35 West, said point of beginning being approximately 280 feet west and 400 feet south of the Northeast Corner of said Section 3, thence easterly and southeasterly generally following the current alignment of Branch C-3-1 of County Ditch 59 across the Northeast Quarter of the Northeast Quarter of Section 3; and into the Northwest Quarter of the Northwest Quarter of Section 2 and there terminating, said point of termination being approximately 540 feet east and 670 feet south of the Northwest Corner of said Section 2.

Branch C-3-2
Beginning at the outlet of the Branch C-3-2 tile into the Branch C-3 tile in the Northeast Quarter of the Northeast Quarter of Section 3, Township 115 North, Range 35 West, said point of beginning being approximately 240 feet west and 30 feet south of the Northeast Corner of said Section 3, thence westerly generally following the current alignment of Branch C-3-2 of County Ditch 59 across the North Half of the Northeast Quarter of Section 3 and there terminating, said point of termination being approximately 1,960 feet west and 220 feet south of the Northeast Corner of said Section 3.

Branch C-4

Beginning at the outlet of the Branch C-4 tile into the Branch C tile in the Southwest Quarter of the Northeast Quarter of Section 2, Township 115 North, Range 35 West, said point of beginning being approximately 2,210 feet west and 1,680 feet south of the Northeast Corner of said Section 2, thence northerly and easterly generally following the current alignment of Branch C-4 of County Ditch 59 across the West Half of the Northeast Quarter of Section 2; and into the Northeast Quarter of the Northeast Quarter of Section 2 and there terminating, said point of termination being 1,120 feet west and 910 feet south of the Northeast Corner of said Section 2.

Branch C-4-1

Beginning at the outlet of the Branch C-4-1 tile into the Branch C-4 tile in the Northwest Quarter of the Northeast Quarter of Section 2, Township 115 North, Range 35 West, said point of beginning being approximately 2,210 feet west and 1,030 feet south of the Northeast Corner of said Section 2, thence northwesterly generally following the current alignment of Branch C-4-1 of County Ditch 59 across the Northwest Quarter of the Northeast Quarter of Section 2; and into the Northeast Quarter of the Northwest Quarter of Section 2 and there terminating, said point of termination being approximately 1,990 feet east and 770 feet south of the Northwest Corner of said Section 2

Branch C-4-2

Beginning at the outlet of the Branch C-4-2 tile into the Branch C-4 tile in the Northwest Quarter of the Northeast Quarter of Section 2, Township 115 North, Range 35 West, said point of beginning being approximately 1,530 feet west and 870 feet south of the Northeast Corner of said Section 2, thence southeasterly generally following the current alignment of Branch C-4-2 of County Ditch 59 across the Northwest Quarter of the Northeast Quarter of Section 2 and there terminating, said point of termination being approximately 1,400 feet west and 1,360 feet south of the Northeast Corner of said Section 2.

Branch C-5

Beginning at the outlet of the Branch C-5 tile into the Branch C tile in the Southwest Quarter of the Northeast Quarter of Section 2, Township 115 North, Range 35 West, said point of beginning being approximately 1,480 feet west and 2,540 feet south of the Northeast Corner of said Section 2, thence southerly generally following the current alignment of Branch C-5 of County Ditch 59 across the Southwest Quarter of the Northeast Quarter of Section 2; and into the Northwest Quarter of the Southeast Quarter of Section 2 and there terminating, said point of termination being approximately 1,550 feet west and 2,440 feet north of the Southeast Corner of said Section 2.

Branch 309

Beginning at the outlet of the Branch 309 tile into the Main open ditch in the Northeast Quarter of the Northwest Quarter of Section 4, Township 115 North, Range 35 West, said point of beginning being approximately 2,200 feet east and 60 feet south of the Northwest Corner of said Section 4, thence northerly and westerly generally following the current alignment of Branch 309 of County Ditch 59 across the Northeast Quarter of the Northwest Quarter of Section 4, across the East Half and the Northwest Quarter of the Southwest Quarter of Section 33, Township 116 North, Range 35 West, across the Northeast Quarter of the Southeast Quarter of Section 32, and into the Southeast Quarter of the Northeast Quarter of Section 32 and there terminating, said point of termination being approximately 100 feet west and 1,960 feet south of the Northeast Corner of said Section 32.

Branch 309-1
Beginning at the outlet of the Branch 309-1 tile into the Branch 309 tile in the Southeast Quarter of the Southwest Quarter of Section 33, Township 116 North, Range 35 West, said point of beginning being approximately 2,340 feet east and 560 feet north of the Southwest Corner of said Section 33, thence northeasterly generally following the current alignment of Branch 309-1 of County Ditch 59 across the Southeast Quarter of the Southwest Quarter of Section 4, and into the Southwest Quarter of the Southeast Quarter of Section 33 and there terminating, said point of termination being approximately 2,550 feet west and 770 feet north of the Southeast Corner of said Section 33.

Branch 309-2
Beginning at the outlet of the Branch 309-2 tile into the Branch 309 tile in the Northeast Quarter of the Southwest Quarter of Section 33, Township 116 North, Range 35 West, said point of beginning being approximately 2,550 feet east and 1,440 feet north of the Southwest Corner of said Section 33, thence northeasterly generally following the current alignment of Branch 309-2 of County Ditch 59 across the Northeast Quarter of the Southwest Quarter of Section 33, and into the Northwest Quarter of the Southeast Quarter of Section 33 and there terminating, said point of termination being approximately 1,790 feet west and 1,810 feet north of the Southeast Corner of said Section 33.

Branch 309-3
Beginning at the outlet of the Branch 309-3 tile into the Branch 309 tile in the Northeast Quarter of the Southwest Quarter of Section 33, Township 116 North, Range 35 West, said point of beginning being approximately 2,550 feet east and 1,440 feet north of the Southwest Corner of said Section 33, thence northerly across the Northeast Quarter of the Southwest Quarter of Section 33, across the East Half of the Northwest Quarter of Section 33, then northeasterly across the Northeast Quarter of the Northwest Quarter of Section 33, across the Northwest Quarter of the Northeast Quarter of Section 33, and into the Southwest Quarter of the Southeast Quarter of Section 28 and there terminating, said point of termination being approximately 2,350 feet west and 110 feet north of the Southeast Corner of said Section 28.

Set forth on **Exhibit B** is a list of the 40-acre tracts or government lots that the proposed improvement would pass over, together with the names and addresses of the owners of those tracts.

5. **Public Utility and Health.**

The proposed improvement will be of public utility and will promote the public health.

6. **Agreement by Petitioners.**

The undersigned Petitioners have been informed and understand that they may not withdraw as a petitioner at any time after this Petition is accepted by the drainage authority, except with the written consent of all other Petitioners on the filed Petition. Also, the undersigned Petitioners acknowledge and agree that they will pay all costs and expenses that may be incurred if the improvement proceedings are dismissed.

7. **Cost Bond.**

One or more petitioners shall cause a bond to be filed in the amount of at least $10,000.00 payable to the drainage authority. The bond will be conditioned to pay the costs incurred if the proceedings are dismissed or if a contract is not awarded to construct the proposed improvement described in the petition.

WHEREFORE, the Petitioners respectfully request the following:

a. That the drainage authority accept this Petition, review it and determine that it is legally adequate; and

b. That the drainage authority appoint an engineer for purposes of the proposed improvement and direct the engineer to prepare an engineer's preliminary report for the proposed improvement, including allowing the engineer to analyze other potential routes for the proposed improvement.

Dated this 14th day of December, 2016.

Jeff C. Braegelmann

Jeff C. Braegelmann #174701
jbraegelmann@gislason.com
GISLASON & HUNTER LLP
Attorneys for Petitioners
2700 South Broadway
P. O. Box 458
New Ulm, MN 56073-0458
Phone: 507-354-3111

[Signature Pages to Follow]

SIGNATURE PAGE FOR
PETITION FOR IMPROVEMENT TO COUNTY DITCH NO. 59
(RENVILLE COUNTY, MINNESOTA)

Name of Petitioner(s) (please print or type):

Gary Verzalik

Ownership (check one):

__X__ Individual
_____ Co-Owners (# of co-owners: __)
_____ Partner (name of partnership: ____________________)
_____ Corporation or limited liability company (name of corporation or LLC: ____________________)
_____ Trust (complete name of trust: ____________________)
_____ Other (explanation: ____________________)

Statement of Authority:

The undersigned states and represents that if he or she is executing in a representative capacity, he or she has the authority to execute on behalf of the respective partnership, corporation, limited liability company, trust or other such entity.

The above-named Petitioner(s) owns the following tract(s) which the proposed improvement will pass over or which is affected by the proposed improvement.

Tract Description	Section	Township	Range
SE¼ NW¼	2	115	35
SW¼ NE¼	2	115	35
NW¼ NE¼	2	115	35
Part of the NE¼ NW¼	2	115	35

Dated: 11-16-2016

Gary Verzalik
Gary Verzalik

SIGNATURE PAGE FOR
PETITION FOR IMPROVEMENT TO COUNTY DITCH NO. 59
(RENVILLE COUNTY, MINNESOTA)

Name of Petitioner(s) (please print or type):

Carol J. Lippert

Ownership (check one):

_____ Individual
_____ Co-Owners (# of co-owners: __)
_____ Partner (name of partnership:____________________)
_____ Corporation or limited liability company (name of corporation or LLC: ____)
__X_ Trust (complete name of trust: ____)
_____ Other (explanation: ____)

Statement of Authority:

The undersigned states and represents that if he or she is executing in a representative capacity, he or she has the authority to execute on behalf of the respective partnership, corporation, limited liability company, trust or other such entity.

The above-named Petitioner(s) owns the following tract(s) which the proposed improvement will pass over or which is affected by the proposed improvement.

Tract Description	Section	Township	Range
SW¼ SE¼	28	116	35

Dated: 11-14-2016

Carol J. Lippert, Trustee
Carol J. Lippert, Trustee

SIGNATURE PAGE FOR
PETITION FOR IMPROVEMENT TO COUNTY DITCH NO. 59
(RENVILLE COUNTY, MINNESOTA)

Name of Petitioner(s) (please print or type):

Aakre Family Farms, LLC

Ownership (check one):

_____ Individual
_____ Co-Owners (# of co-owners: __)
_____ Partner (name of partnership: ________________________________)
__X__ Corporation or limited liability company (name of corporation or LLC: Aakre Family Farms, LLC ________________________________)
_____ Trust (complete name of trust: ________________________________)
_____ Other (explanation: ________________________________)

Statement of Authority:

The undersigned states and represents that if he or she is executing in a representative capacity, he or she has the authority to execute on behalf of the respective partnership, corporation, limited liability company, trust or other such entity.

The above-named Petitioner(s) owns the following tract(s) which the proposed improvement will pass over or which is affected by the proposed improvement.

Tract Description	Section	Township	Range
NW¼ NE¼	3	115	35
Part of the NE¼ NE¼	3	115	35

Dated: 11-9-16

Sally J. Aakre
Sally Jo Aakre ~~Wilson~~

SIGNATURE PAGE FOR
PETITION FOR IMPROVEMENT TO COUNTY DITCH NO. 59
(RENVILLE COUNTY, MINNESOTA)

Name of Petitioner(s) (please print or type):

Wat Family Farms LC

Ownership (check one):

____ Individual
____ Co-Owners (# of co-owners: __)
X Partner (name of partnership: Wat Family Farms LC)
____ Corporation or limited liability company (name of corporation or LLC: ____________)
____ Trust (complete name of trust: ____________)
____ Other (explanation: ____________)

Statement of Authority:

The undersigned states and represents that if he or she is executing in a representative capacity, he or she has the authority to execute on behalf of the respective partnership, corporation, limited liability company, trust or other such entity.

The above-named Petitioner(s) owns the following tract(s) which the proposed improvement will pass over or which is affected by the proposed improvement.

Tract Description	Section	Township	Range
Part of NE¼ SW¼	33	116	35
Part of NW¼ SW¼	33	116	35
SE¼ NW¼	33	116	35
Part of NE¼ NW¼	33	116	35

WAT FAMILY FARMS LLC

Dated: 11/9/16

Edward Mitchell

EDWARD D. MITCHELL,
MANAGER OF DEVON LC, MANAGER

1415 E. MAIN STREET
RICHMOND, VA 23219

SIGNATURE PAGE FOR
PETITION FOR IMPROVEMENT TO COUNTY DITCH NO. 59
(RENVILLE COUNTY, MINNESOTA)

Name of Petitioner(s) (please print or type):

James Zenk

Ownership (check one):

__X__ Individual
_____ Co-Owners (# of co-owners: __)
_____ Partner (name of partnership: ______________________________)
_____ Corporation or limited liability company (name of corporation or LLC: ______________________________)
_____ Trust (complete name of trust: ______________________________)
_____ Other (explanation: ______________________________)

Statement of Authority:

The undersigned states and represents that if he or she is executing in a representative capacity, he or she has the authority to execute on behalf of the respective partnership, corporation, limited liability company, trust or other such entity.

The above-named Petitioner(s) owns the following tract(s) which the proposed improvement will pass over or which is affected by the proposed improvement.

Tract Description	Section	Township	Range
SW¼ NW¼	35	116	35
NW¼ NW¼	35	116	35

Dated: Dec. ~~8~~ 1, 2016

James Zenk

James Zenk

SIGNATURE PAGE FOR
PETITION FOR IMPROVEMENT TO COUNTY DITCH NO. 59
(RENVILLE COUNTY, MINNESOTA)

Name of Petitioner(s) (please print or type):

James Zenk
Dianne Zenk

Ownership (check one):

_____ Individual
__X__ Co-Owners (# of co-owners: 2)
_____ Partner (name of partnership: ________________________________)
_____ Corporation or limited liability company (name of corporation or LLC: ________________________________)
_____ Trust (complete name of trust: ________________________________)
_____ Other (explanation: ________________________________)

Statement of Authority:

The undersigned states and represents that if he or she is executing in a representative capacity, he or she has the authority to execute on behalf of the respective partnership, corporation, limited liability company, trust or other such entity.

The above-named Petitioner(s) owns the following tract(s) which the proposed improvement will pass over or which is affected by the proposed improvement.

Tract Description	Section	Township	Range
NE¼ SE¼	34	116	35
Part of SE¼ NE¼	34	116	35

Dated: Dec. 1, 2016 ________________ James Zenk
James Zenk

Dated: 12-1-16 ________________ Dianne Zenk
Dianne Zenk

2044183.1

SIGNATURE PAGE FOR
PETITION FOR IMPROVEMENT TO COUNTY DITCH NO. 59
(RENVILLE COUNTY, MINNESOTA)

Name of Petitioner(s) (please print or type):

Daniel W. Rauenhorst
Cheryl Rauenhorst

Ownership (check one):

_____ Individual
__X__ Co-Owners (# of co-owners: 2)
_____ Partner (name of partnership: ____________________)
_____ Corporation or limited liability company (name of corporation or LLC: ____________________)
_____ Trust (complete name of trust: ____________________)
_____ Other (explanation: ____________________)

Statement of Authority:

The undersigned states and represents that if he or she is executing in a representative capacity, he or she has the authority to execute on behalf of the respective partnership, corporation, limited liability company, trust or other such entity.

The above-named Petitioner(s) owns the following tract(s) which the proposed improvement will pass over or which is affected by the proposed improvement.

Tract Description	Section	Township	Range
SW¼ NW¼	3	115	35

Dated: 12-3-16   Daniel W. Rauenhorst
Daniel W. Rauenhorst

Dated: 12-3-16   Cheryl L Rauenhorst
Cheryl Rauenhorst

SIGNATURE PAGE FOR
PETITION FOR IMPROVEMENT TO COUNTY DITCH NO. 59
(RENVILLE COUNTY, MINNESOTA)

Name of Petitioner(s) (please print or type):

Daniel W. Rauenhorst

Ownership (check one):

__X__ Individual
_____ Co-Owners (# of co-owners: __)
_____ Partner (name of partnership: ____________________)
_____ Corporation or limited liability company (name of corporation or LLC: ____________________)
_____ Trust (complete name of trust: ____________________)
_____ Other (explanation: ____________________)

Statement of Authority:

The undersigned states and represents that if he or she is executing in a representative capacity, he or she has the authority to execute on behalf of the respective partnership, corporation, limited liability company, trust or other such entity.

The above-named Petitioner(s) owns the following tract(s) which the proposed improvement will pass over or which is affected by the proposed improvement.

Tract Description	Section	Township	Range
NW¼ NE¼	4	115	35
NE¼ NE¼	4	115	35

Dated: 12-3-16

Daniel W Rauenhorst
Daniel W. Rauenhorst

SIGNATURE PAGE FOR
PETITION FOR IMPROVEMENT TO COUNTY DITCH NO. 59
(RENVILLE COUNTY, MINNESOTA)

Name of Petitioner(s) (please print or type):

Robb J. Zenk
Megan C. Zenk

Ownership (check one):

_____ Individual
__X__ Co-Owners (# of co-owners: 2)
_____ Partner (name of partnership: ______________________________)
_____ Corporation or limited liability company (name of corporation or LLC: ______________________________)
_____ Trust (complete name of trust: ______________________________)
_____ Other (explanation: ______________________________)

Statement of Authority:

The undersigned states and represents that if he or she is executing in a representative capacity, he or she has the authority to execute on behalf of the respective partnership, corporation, limited liability company, trust or other such entity.

The above-named Petitioner(s) owns the following tract(s) which the proposed improvement will pass over or which is affected by the proposed improvement.

Tract Description	Section	Township	Range
Part of SE¼ NE¼	34	116	35

Dated: 12-8-16 ______________________________
Robb J. Zenk

Dated: 12/8/16 ______________________________
Megan C. Zenk

2044183.1

SIGNATURE PAGE FOR
PETITION FOR IMPROVEMENT TO COUNTY DITCH NO. 59
(RENVILLE COUNTY, MINNESOTA)

Name of Petitioner(s) (please print or type):

Ruth Heller
Naomi Endter

Ownership (check one):

_____ Individual
__X__ Co-Owners (# of co-owners: 2)
_____ Partner (name of partnership: ______________________________)
_____ Corporation or limited liability company (name of corporation or LLC: ______________________________)
_____ Trust (complete name of trust: ______________________________)
_____ Other (explanation: ______________________________)

Statement of Authority:

The undersigned states and represents that if he or she is executing in a representative capacity, he or she has the authority to execute on behalf of the respective partnership, corporation, limited liability company, trust or other such entity.

The above-named Petitioner(s) owns the following tract(s) which the proposed improvement will pass over or which is affected by the proposed improvement.

Tract Description	Section	Township	Range
NE¼ SE¼	2	115	35
SE¼ NE¼	2	115	35
Part of NE¼ NE¼	2	115	35

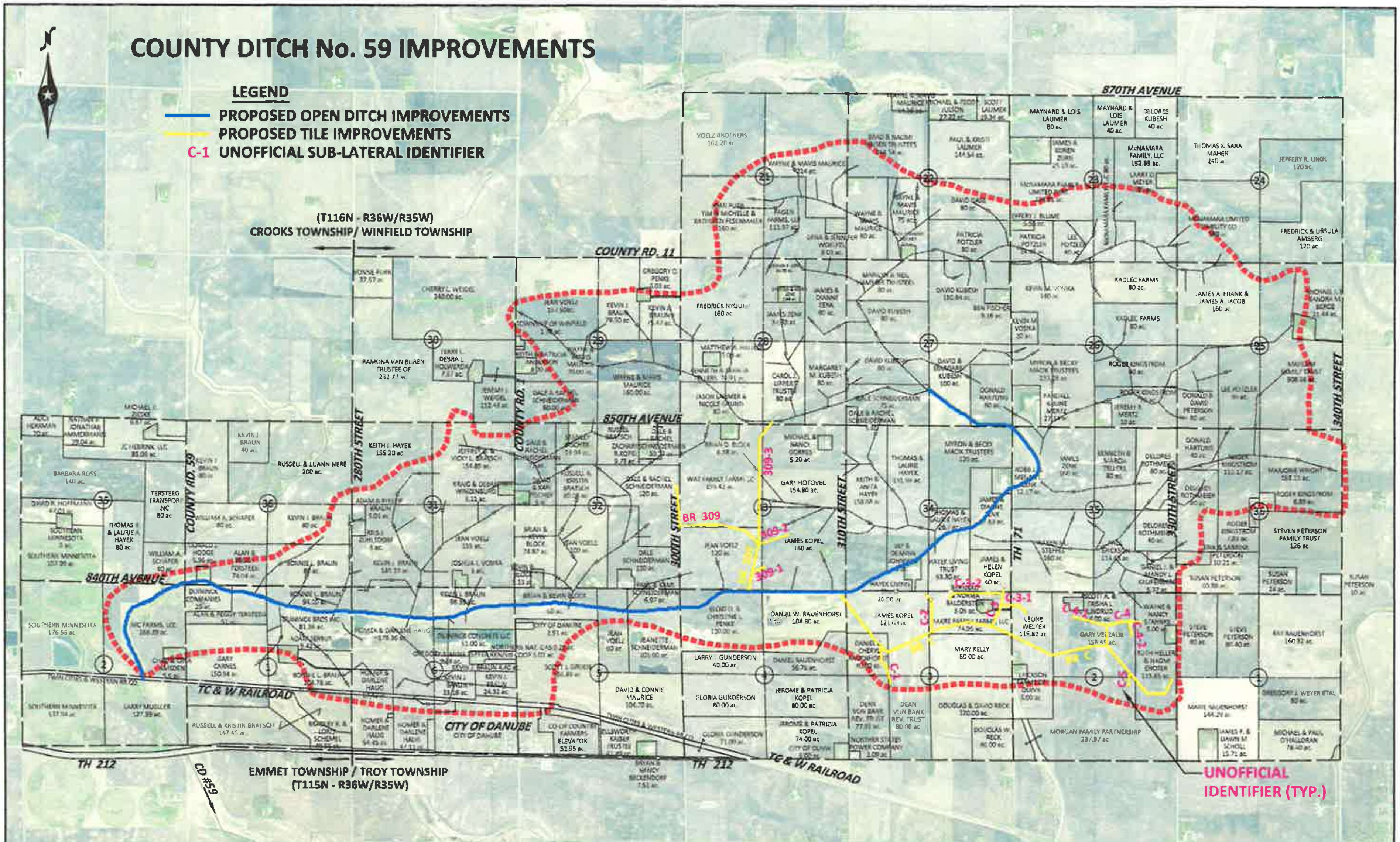
Dated: 11/15/2016

Ruth Heller & Naomi Endter
By: Roger Heller, Power of Attorney

2044183.1

EXHIBIT A

[Map – attached]



BOLTON & MENK, INC.
Consulting Engineers & Surveyors
MANKATO, MN FAIRMONT, MN SLEEPY EYE, MN BURNSVILLE, MN WILLMAR, MN
CHASKA, MN RAMSEY, MN MAPLEWOOD, MN BAXTER, MN ROCHESTER, MN
AMES, IA SPENCER, IA DES MOINES, IA FARGO, ND

RENVILLE COUNTY, MINNESOTA
COUNTY DITCH No. 59
PETITION FOR IMPROVEMENT

SEPTEMBER, 2016

EXHIBIT A

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EXHIBIT B

[Tract Descriptions - attached]

	Location	Owner	Address	PID No.	Description	Section	Township	Range
1	Main Ditch	Larry Mueller	26826 US Hwy 212, Danube, MN 56230	10-00070-00	NW 1/4 SE 1/4	2	115	36
2	Main Ditch	WC Farms, LLC	18105 31st Ave. N, Plymouth, MN 55447	10-00060-00	SW 1/4 NE 1/4	2	115	36
3	Main Ditch	WC Farms, LLC	18105 31st Ave. N, Plymouth, MN 55447	10-00060-00	NW 1/4 NE 1/4	2	115	36
4	Main Ditch	WC Farms, LLC	18105 31st Ave. N, Plymouth, MN 55447	10-00060-00	NE 1/4 NE 1/4	2	115	36
5	Main Ditch	William A. Schafer	84213 270th St., Renville, MN 56284	09-00480-00	SE 1/4 SE 1/4	35	116	36
6	Main Ditch	Alan & Peggy Tersteeg	PO Box 163, Olivia, MN 56277	09-00500-00	Pt SW 1/4 SW 1/4	36	116	36
7	Main Ditch	Donald J Hodge	110 Chestnut Ave SE., Renville, MN 56284	09-00570-00	Pt SW 1/4 SW 1/4	36	116	36
8	Main Ditch	Duininck Brothers, Inc.	PO Box 208, Prinsburg, MN 56281	10-00050-00	Pt NW 1/4 NW 1/4	1	115	36
9	Main Ditch	Alan & Peggy Tersteeg	PO Box 163, Olivia, MN 56277	10-00040-00	Pt NE 1/4 NW 1/4	1	115	36
10	Main Ditch	Duininck Brothers, Inc.	PO Box 208, Prinsburg, MN 56281	10-00050-00	Pt NE 1/4 NE 1/4	1	115	36
11	Main Ditch	Bonnie L. Braun	80197 Co Rd 1, Danube, MN 56230	10-00020-00	Pt NW 1/4 NE 1/4	1	115	36
12	Main Ditch	Bonnie L. Braun	80197 Co Rd 1, Danube, MN 56230	10-00020-00	Pt NE 1/4 NE 1/4	1	115	36
13	Main Ditch	Duininck Brothers, Inc.	PO Box 208, Prinsburg, MN 56281	10-00021-00	Pt NW 1/4 NE 1/4	1	115	36
14	Main Ditch	Duininck Brothers, Inc.	PO Box 208, Prinsburg, MN 56281	10-00021-00	Pt NE 1/4 NE 1/4	1	115	36
15	Main Ditch	Homer & Darlene Haug	PO Box 356, Danube, MN 56230	24-00170-00	NW 1/4 NW 1/4	6	115	35
16	Main Ditch	Homer & Darlene Haug	PO Box 356, Danube, MN 56230	24-00170-00	NE 1/4 NW 1/4	6	115	35
17	Main Ditch	Kevin J. Braun	80197 Co. Rd 1, Danube, MN 56230	24-00160-00	NW 1/4 NE 1/4	6	115	35
18	Main Ditch	Kevin J. Braun	80197 Co. Rd 1, Danube, MN 56230	24-00160-00	NE 1/4 NE 1/4	6	115	35
19	Main Ditch	Brian Block & Kevin Block	30325 850th Ave., Danube, MN 56230	24-00130-00	NW 1/4 NW 1/4	5	115	35
20	Main Ditch	Brian Block & Kevin Block	30325 850th Ave., Danube, MN 56230	24-00130-00	NE 1/4 NW 1/4	5	115	35
21	Main Ditch	Jean Voelz	29438 840th Ave., Danube MN 56230	24-00110-00	Pt NW 1/4 NE 1/4	5	115	35
22	Main Ditch	Jeanette Schneiderman	29688 840th Ave., Danube, MN 56230	24-00120-00	Pt NW 1/4 NE 1/4	5	115	35
23	Main Ditch	Jeanette Schneiderman	29688 840th Ave., Danube, MN 56230	24-00120-00	NE 1/4 NE 1/4	5	115	35
24	Main Ditch	Eloid O & Christine Penke	29677 800th Avenue, Danube, MN 56230	24-00100-00	NW 1/4 NW 1/4	4	115	35
25	Main Ditch; Branch 309	Eloid O & Christine Penke	29677 800th Avenue, Danube, MN 56230	24-00100-00	NE 1/4 NW 1/4	4	115	35
26	Main Ditch; Branch 309; Branch 309-1	Jean Voelz	29438 840th Ave., Danube, MN 56230	27-01040-00	SE 1/4 SW 1/4	33	116	35
27	Main Ditch; Branch 309-1	James Kopel & Kathy Dillon Tr of Helen Kopel	1107 Park Ave. W, Olivia, MN 56277	27-01060-00	SW 1/4 SE 1/4	33	116	35
28	Main Ditch	James Kopel & Kathy Dillon Tr of Helen Kopel	1107 Park Ave. W, Olivia, MN 56277	27-01060-01	SE 1/4 SE 1/4	33	116	35
29	Main Ditch	Daniel W. Rauenhorst	81961 320th St., Olivia, MN 56277	24-00041-00	NW 1/4 NE 1/4	4	115	35
30	Main Ditch; Branch C	Daniel W. Rauenhorst	81961 320th St., Olivia, MN 56277	24-00041-00	NE 1/4 NE 1/4	4	115	35
31	Main Ditch; Branch C	James Kopel & Kathy Dillon Tr of Helen Kopel	1107 Park Ave. W, Olivia, MN 56277	24-00010-00	NW 1/4 NW 1/4	3	115	35
32	Main Ditch	Keith J. & Anita M. Hayek	1422 University Ave. NE, Minneapolis, MN 55413	27-01070-00	Pt SW 1/4 SW 1/4	34	116	35
33	Main Ditch	Hayek Living Trust c/o Mark & Ruth Hayek	3300 149th Ave., Ham Lake, MN 55304	27-01750-00	Pt SW 1/4 SW 1/4	34	116	35
34	Main Ditch	Hayek Living Trust c/o Mark & Ruth Hayek	3300 149th Ave., Ham Lake, MN 55304	27-01750-00	Pt SE 1/4 SW 1/4	34	116	35
35	Main Ditch	Jay L. & Deannea L. Johnson	31406 840th Ave., Olivia, MN 56277	27-01101-00	Pt SE 1/4 SW 1/4	34	116	35
36	Main Ditch	Thomas R. and Laurie A. Hayek	26158 Co. Rd. 4, Renville, MN 56284	27-01100-00	Pt SE 1/4 SW 1/4	34	116	35
37	Main Ditch	Hayek Living Trust c/o Mark & Ruth Hayek	3300 149th Ave., Ham Lake, MN 55304	27-01751-00	SW 1/4 SE 1/4	34	116	35
38	Main Ditch	Hayek Living Trust c/o Mark & Ruth Hayek	3300 149th Ave., Ham Lake, MN 55304	27-01751-00	Pt NW 1/4 SE 1/4	34	116	35
39	Main Ditch	Thomas R. and Laurie A. Hayek	26158 Co. Rd. 4, Renville, MN 56284	27-01102-00	Pt NW 1/4 SE 1/4	34	116	35
40	Main Ditch	James & Dianne Zenk	84691 US Hwy 71, Danube, MN 56230	27-01770-00	NE 1/4 SE 1/4	34	116	35
41	Main Ditch	James & Dianne Zenk	84691 US Hwy 71, Danube, MN 56230	27-01770-00	Pt. SE 1/4 NE 1/4	34	116	35
42	Main Ditch	Robb J. & Megan C. Zenk	84691 US Hwy 71, Danube, MN 56230	27-01771-00	Pt. SE 1/4 NE 1/4	34	116	35
43	Main Ditch	James Zenk	84691 US Hwy 71, Danube, MN 56230	27-01800-00	SW 1/4 NW 1/4	35	116	35
44	Main Ditch	James Zenk	84691 US Hwy 71, Danube, MN 56230	27-01800-00	NW 1/4 NW 1/4	35	116	35

	Location	Owner	Address	PID No.	Description	Section	Township	Range
45	Main Ditch	Donald L. Hartung	14941 St. Hwy 4, Cosmos, MN 56228	27-01730-00	SE 1/4 SE 1/4	27	116	35
46	Main Ditch	David & Margaret Kubesh	85554 310th St., Danube, MN 56230	27-01720-00	SW 1/4 SE 1/4	27	116	35
47	Branch C; Branch C-1	Daniel & Cheryl Rauenhorst	81961 320th St., Olivia, MN 56277	24-00030-00	SW 1/4 NW 1/4	3	115	35
48	Branch C	James Kopel & Kathy Dillon Tr of Helen Kopel	1107 Park Ave. W, Olivia, MN 56277	24-00010-00	SE 1/4 NW 1/4	3	115	35
49	Branch C; Branch C-2; Branch C-3-2	Aakre Family Farms, LLC C/O Sally Jo Aakre	80664 350th St., Olivia, MN 56277	24-01130-00	NW 1/4 NE 1/4	3	115	35
50	Branch C; Branch C-3; Branch C-3-1; Branch C-3-2	Aakre Family Farms, LLC C/O Sally Jo Aakre	80664 350th St., Olivia, MN 56277	24-01130-00	Pt. NE 1/4 NE 1/4	3	115	35
51	Branch C; Branch C-3-1;	Leone Welter C/O Virginia Hartmann	331 2nd Ave. SW, Forest Lake, MN 55025	24-01110-00	NW 1/4 NW 1/4	2	115	35
52	Branch C	Leone Welter C/O Virginia Hartmann	331 2nd Ave. SW, Forest Lake, MN 55025	24-01110-00	Pt SW 1/4 NW 1/4	2	115	35
53	Branch C	Gary Verzalik	15937 Cascade Path, Rosemount, MN 55068	24-01090-00	SE 1/4 NW 1/4	2	115	35
54	Branch C; Branch C-4; Branch C-5	Gary Verzalik	15937 Cascade Path, Rosemount, MN 55068	24-01090-00	SW 1/4 NE 1/4	2	115	35
55	Branch C	Ruth Heller & Naomi Endter, TR C/O Roger Heller	PO Box 26, Olivia, MN 56277	24-01100-00	NE 1/4 SE 1/4	2	115	35
56	Branch C-1	Dean Von Bank & Susan Von Bank Revocable Trust	725 Forrest Road, Glenview, IL 60025	24-00020-00	NE 1/4 SW 1/4	3	115	35
57	Branch C-3	Bernard & Norma Balderston	509 10th St. S, Olivia, MN 56277	24-01131-00	Pt. NE 1/4 NE 1/4	3	115	35
58	Branch C-3	James & Helen Kopel	1107 Park Ave W, Olivia, MN 56277	27-01780-00	SE 1/4 SE 1/4	34	116	35
59	Branch C-4; Branch C-4-1; Branch C-4-2	Gary Verzalik	15937 Cascade Path, Rosemount, MN 55068	24-01090-00	NW 1/4 NE 1/4	2	115	35
60	Branch C-4	Ruth Heller & Naomi Endter, TR C/O Roger Heller	PO Box 26, Olivia, MN 56277	24-01100-00	Pt NE 1/4 NE 1/4	2	115	35
61	Branch C-4-1	Gary Verzalik	15937 Cascade Path, Rosemount, MN 55068	24-01090-00	Pt NE 1/4 NW 1/4	2	115	35
62	Branch C-5	Morgan Family Partnership C/O Patrick & Rita Morgan	PO Box 107, Elmore, MN 56027	24-01120-00	NW 1/4 SE 1/4	2	115	35
63	Branch 309; Branch 309-2; Branch 309-3	Jean Voelz	29438 840th Ave., Danube, MN 56230	27-01040-00	Pt. NE 1/4 SW 1/4	33	116	35
64	Branch 309; Branch 309-3	Wat Family Farms LC	PO Box 377, Richmond, VA 23218	27-01030-00	Pt. NE 1/4 SW 1/4	33	116	35
65	Branch 309	Wat Family Farms LC	PO Box 377, Richmond, VA 23218	27-01030-00	Pt. NW 1/4 SW 1/4	33	116	35
66	Branch 309	Dale & Rachel Schneiderman	31034 850th Ave., Danube, MN 56230	27-00981-00	NE 1/4 SE 1/4	32	116	35
67	Branch 309	Dale & Rachel Schneiderman	31034 850th Ave., Danube, MN 56230	27-00981-00	SE 1/4 NE 1/4	32	116	35
68	Branch 309-2	James Kopel & Kathy Dillon Tr of Helen Kopel	1107 Park Ave. W., Olivia, MN 56277	27-01060-00	NW 1/4 SE 1/4	33	116	35
69	Branch 309-3	Wat Family Farms LC	PO Box 377, Richmond, VA 23218	27-01030-00	SE 1/4 NW 1/4	33	116	35
70	Branch 309-3	Wat Family Farms LC	PO Box 377, Richmond, VA 23218	27-01030-00	Pt. NE 1/4 NW 1/4	33	116	35
71	Branch 309-3	Gary Hotovec ETAL	87308 US Hwy 71, Danube, MN 56230	27-01050-00	NW 1/4 NE 1/4	33	116	35
72	Branch 309-3	Carol J. Lippert, Trustee	89118 Co. Rd 1, Danube, MN 56230	27-00801-00	SW 1/4 SE 1/4	28	116	35

EXHIBIT 3: PRELIMINARY COST ESTIMATE

ENGINEER'S ESTIMATE

IMPROVEMENT OF MAIN OPEN DITCH, BRANCH 309 & BRANCH C
RENVILLE COUNTY DITCH NO. 59
BMI PROJECT NO. S15.112473

BOLTON & MENK
Real People. Real Solutions.

Date: 9/14/2023

Item No.	Item	Estimated Quantity	Unit	Unit Price	Total Amount
BASE BID					
1	Mobilization & Traffic Control	1	LUMP SUM	$110,000.00	$110,000.00
2	Exploratory Excavation	200	HOUR	$200.00	$40,000.00
3	Common Excavation, Open Ditch (P)	210000	CU YD	$2.50	$525,000.00
4	Common Excavation, Storage Basin (P)	87500	CU YD	$7.00	$612,500.00
5	Common Borrow (P)	2350	CU YD	$7.00	$16,450.00
6	Ditch Cleanout	55	STATION	$200.00	$11,000.00
7	Salvage Pipe Culvert	388	LIN FT	$15.00	$5,820.00
8	Wearing Course Mixture (SPWEA230B)	110	TON	$110.00	$12,100.00
9	Non-wearing Course Mixture (SPNWB230B)	110	TON	$110.00	$12,100.00
10	Aggregate Surfacing, Class 1	110	TON	$20.00	$2,200.00
11	Aggregate Base, Class 5	900	TON	$25.00	$22,500.00
12	Pipe Bedding Material	3000	TON	$25.00	$75,000.00
13	6" Tile Inlet	10	EACH	$400.00	$4,000.00
14	8" Tile Inlet	36	EACH	$450.00	$16,200.00
15	10" Tile Inlet	10	EACH	$550.00	$5,500.00
16	12" Tile Inlet	31	EACH	$600.00	$18,600.00
17	15" Tile Inlet	5	EACH	$900.00	$4,500.00
18	18" Tile Inlet	5	EACH	$1,200.00	$6,000.00
19	4" Single Wall Drain Tile	300	LIN FT	$6.00	$1,800.00
20	6" Drain Tile	1710	LIN FT	$8.00	$13,680.00
21	8" Drain Tile	6060	LIN FT	$10.00	$60,600.00
22	10" Drain Tile	3660	LIN FT	$12.00	$43,920.00
23	12" Drain Tile	5590	LIN FT	$16.00	$89,440.00
24	15" Drain Tile	2130	LIN FT	$20.00	$42,600.00
25	18" Drain Tile	2530	LIN FT	$25.00	$63,250.00
26	24" Drain Tile	3895	LIN FT	$30.00	$116,850.00
27	30" Drain Tile	7070	LIN FT	$40.00	$282,800.00
28	36" Drain Tile	5165	LIN FT	$50.00	$258,250.00
29	36" RC Drain	168	LIN FT	$250.00	$42,000.00
30	6" CS Drain Tile Outlet Pipe w Rodent Guard	200	LIN FT	$18.00	$3,600.00
31	8" CS Drain Tile Outlet Pipe w Rodent Guard	320	LIN FT	$20.00	$6,400.00
32	10" CS Drain Tile Outlet Pipe w Rodent Guard	320	LIN FT	$24.00	$7,680.00
33	12" CS Drain Tile Outlet Pipe w Rodent Guard	340	LIN FT	$28.00	$9,520.00
34	15" CS Drain Tile Outlet Pipe w Rodent Guard	200	LIN FT	$35.00	$7,000.00
35	18" CS Drain Tile Outlet Pipe w Rodent Guard	200	LIN FT	$40.00	$8,000.00
36	24" CS Drain Tile Outlet Pipe w Rodent Guard	60	LIN FT	$50.00	$3,000.00
37	30" CS Drain Tile Outlet Pipe w Rodent Guard	20	LIN FT	$75.00	$1,500.00
38	42" CS Drain Tile Outlet Pipe w Rodent Guard	40	LIN FT	$100.00	$4,000.00
39	48" Steel Pipe (Jack and Bore)	250	LIN FT	$1,000.00	$250,000.00
40	15" CS Pipe Culvert	920	LIN FT	$40.00	$36,800.00

ENGINEER'S ESTIMATE

IMPROVEMENT OF MAIN OPEN DITCH, BRANCH 309 & BRANCH C
RENVILLE COUNTY DITCH NO. 59
BMI PROJECT NO. S15.112473

Date: 9/14/2023

Item No.	Item	Estimated Quantity	Unit	Unit Price	Total Amount
41	15" CS Safety Apron	23	EACH	$300.00	$6,900.00
42	Install Pipe Culvert	168	LIN FT	$50.00	$8,400.00
43	36" RC Apron w Trash Rack	2	EACH	$2,500.00	$5,000.00
44	84" RC Pipe Culvert	228	LIN FT	$500.00	$114,000.00
45	96" RC Pipe Culvert	196	LIN FT	$600.00	$117,600.00
46	84" RC Pipe Apron	6	EACH	$4,000.00	$24,000.00
47	96" RC Pipe Apron	4	EACH	$5,000.00	$20,000.00
48	10" HDPE Check Valve	1	EACH	$2,500.00	$2,500.00
49	Sluice Gate	1	LUMP SUM	$15,000.00	$15,000.00
50	Random Riprap, Class II	800	TON	$50.00	$40,000.00
51	Random Riprap, Class III	780	TON	$55.00	$42,900.00
52	Random Riprap, Class IV	1500	TON	$65.00	$97,500.00
53	Filter Berm, Type 5	150	LIN FT	$50.00	$7,500.00
54	Storm Drain Inlet Protection	170	EACH	$100.00	$17,000.00
55	Sediment Control Log, Type Straw	5500	LIN FT	$3.00	$16,500.00
56	Immediate Ditch Slope Seeding	336	STATION	$100.00	$33,600.00
57	Type 1 Mulch	133	TON	$250.00	$33,250.00
58	Rapid Stabilization, Method 4	11300	SQ YD	$3.00	$33,900.00
59	Rapid Stabilization, Method 3	14	ACRES	$2,500.00	$35,000.00
60	STABILIZED CONSTRUCTION EXIT	1	LUMP SUM	$4,000.00	$4,000.00
				SUBTOTAL ESTIMATED CONSTRUCTION BID ITEMS:	**$3,526,710.00**
	Improvement of Open Ditch Right-of Way	15.92	ACRE	$15,000.00	$238,800.00
	Improvement of Pond Right-of Way	12.77	ACRE	$15,000.00	$191,550.00
	Improvement Pond #1	1	LUMP SUM	$60,000.00	$60,000.00
	Temporary Open Ditch Right-of-Way Damages	55.63	ACRE	$600.00	$33,378.00
	Temporary Pond Right-of-Way Damages	16.00	ACRE	$600.00	$9,600.00
	Temprorary Tile Right-of-Way Damages	67.25	ACRE	$600.00	$40,350.00
				SUBTOTAL:	$4,100,388.00
				10% CONTINGENCY:	$410,040.00
				TOTAL ESTIMATED CONSTRUCTION COST:	**$4,510,428.00**
				DESIGN, ADMINISTRATION AND CONSTRUCTION ENGINEERING:	$820,080.00
				TOTAL ESTIMATED PROJECT COST:	**$5,330,508.00**

ENGINEER'S ESTIMATE

IMPROVEMENT OF MAIN OPEN DITCH, BRANCH 309 & BRANCH C
RENVILLE COUNTY DITCH NO. 59
BMI PROJECT NO. S15.112473

BOLTON & MENK
Real People. Real Solutions.

Date: 9/14/2023

Item No.	Item	Estimated Quantity	Unit	Unit Price	Total Amount	Main Open Ditch		Online Storage #2		Retention Pond		Branch 309		Branch C	
						Qty.	Price	Qty.	Price	Qty.	Price	Qty.	Price	Qty.	Price
BASE BID															
1	Mobilization & Traffic Control	1	LUMP SUM	$110,000.00	$110,000.00	0.4	$44,000.00	0.1	$11,000.00	0.1	$11,000.00	0.1	$11,000.00	0.3	$33,000.00
2	Exploratory Excavation	200	HOUR	$200.00	$40,000.00	10	$2,000.00	5	$1,000.00	5	$1,000.00	60	$12,000.00	120	$24,000.00
3	Common Excavation, Open Ditch (P)	210000	CU YD	$2.50	$525,000.00	210000	$525,000.00								
4	Common Excavation, Storage Basin (P)	87500	CU YD	$7.00	$612,500.00			75000	$525,000.00					12500	$87,500.00
5	Common Borrow (P)	2350	CU YD	$7.00	$16,450.00							170	$1,190.00	2180	$15,260.00
6	Ditch Cleanout	55	STATION	$200.00	$11,000.00	55	$11,000.00								
7	Salvage Pipe Culvert	388	LIN FT	$15.00	$5,820.00	388	$5,820.00								
8	Wearing Course Mixture (SPWEA230B)	110	TON	$110.00	$12,100.00	110	$12,100.00								
9	Non-wearing Course Mixture (SPNWB230B)	110	TON	$110.00	$12,100.00	110	$12,100.00								
10	Aggregate Surfacing, Class 1	110	TON	$20.00	$2,200.00	110	$2,200.00								
11	Aggregate Base, Class 5	900	TON	$25.00	$22,500.00	800	$20,000.00					50	$1,250.00	50	$1,250.00
12	Pipe Bedding Material	3000	TON	$25.00	$75,000.00	1500	$37,500.00							1500	$37,500.00
13	6" Tile Inlet	10	EACH	$400.00	$4,000.00	5	$2,000.00							5	$2,000.00
14	8" Tile Inlet	36	EACH	$450.00	$16,200.00	15	$6,750.00					6	$2,700.00	15	$6,750.00
15	10" Tile Inlet	10	EACH	$550.00	$5,500.00	10	$5,500.00								
16	12" Tile Inlet	31	EACH	$600.00	$18,600.00	10	$6,000.00					5	$3,000.00	16	$9,600.00
17	15" Tile Inlet	5	EACH	$900.00	$4,500.00	5	$4,500.00								
18	18" Tile Inlet	5	EACH	$1,200.00	$6,000.00	5	$6,000.00								
19	4" Single Wall Drain Tile	300	LIN FT	$6.00	$1,800.00							100		200	
20	6" Drain Tile	1710	LIN FT	$8.00	$13,680.00	200	$1,600.00					60	$480.00	1450	$11,600.00
21	8" Drain Tile	6060	LIN FT	$10.00	$60,600.00	200	$2,000.00							5860	$58,600.00
22	10" Drain Tile	3660	LIN FT	$12.00	$43,920.00	200	$2,400.00			850	$10,200.00	210	$2,520.00	2400	$28,800.00
23	12" Drain Tile	5590	LIN FT	$16.00	$89,440.00	100	$1,600.00					2630	$42,080.00	2860	$45,760.00
24	15" Drain Tile	2130	LIN FT	$20.00	$42,600.00	100	$2,000.00					450	$9,000.00	1580	$31,600.00
25	18" Drain Tile	2530	LIN FT	$25.00	$63,250.00	100	$2,500.00					1680	$42,000.00	750	$18,750.00
26	24" Drain Tile	3895	LIN FT	$30.00	$116,850.00	40	$1,200.00					815	$24,450.00	3040	$91,200.00
27	30" Drain Tile	7070	LIN FT	$40.00	$282,800.00	40	$1,600.00					4160	$166,400.00	2870	$114,800.00
28	36" Drain Tile	5165	LIN FT	$50.00	$258,250.00							1435	$71,750.00	3730	$186,500.00
29	36" RC Drain Tile	168	LIN FT	$250.00	$42,000.00					168	$42,000.00				
30	6" CS Drain Tile Outlet Pipe w Rodent Guard	200	LIN FT	$18.00	$3,600.00	200	$3,600.00								
31	8" CS Drain Tile Outlet Pipe w Rodent Guard	320	LIN FT	$20.00	$6,400.00	300	$6,000.00					20	$400.00		
32	10" CS Drain Tile Outlet Pipe w Rodent Guard	320	LIN FT	$24.00	$7,680.00	300	$7,200.00					20	$480.00		
33	12" CS Drain Tile Outlet Pipe w Rodent Guard	340	LIN FT	$28.00	$9,520.00	300	$8,400.00			20	$560.00	20	$560.00		
34	15" CS Drain Tile Outlet Pipe w Rodent Guard	200	LIN FT	$35.00	$7,000.00	200	$7,000.00								
35	18" CS Drain Tile Outlet Pipe w Rodent Guard	200	LIN FT	$40.00	$8,000.00	200	$8,000.00								
36	24" CS Drain Tile Outlet Pipe w Rodent Guard	60	LIN FT	$50.00	$3,000.00	60	$3,000.00								
37	30" CS Drain Tile Outlet Pipe w Rodent Guard	20	LIN FT	$75.00	$1,500.00	20	$1,500.00								
38	42" CS Drain Tile Outlet Pipe w Rodent Guard	40	LIN FT	$100.00	$4,000.00							20	$2,000.00	20	$2,000.00
39	48" Steel Pipe (Jack and Bore)	250	LIN FT	$1,000.00	$250,000.00									250	$250,000.00
40	15" CS Pipe Culvert	920	LIN FT	$40.00	$36,800.00	920	$36,800.00								
41	15" CS Safety Apron	23	EACH	$300.00	$6,900.00	23	$6,900.00								
42	Install Pipe Culvert	168	LIN FT	$50.00	$8,400.00	168	$8,400.00								

ENGINEER'S ESTIMATE

IMPROVEMENT OF MAIN OPEN DITCH, BRANCH 309 & BRANCH C
RENVILLE COUNTY DITCH NO. 59
BMI PROJECT NO. S15.112473

BOLTON & MENK
Real People. Real Solutions.

Date: 9/14/2023

Item No.	Item	Estimated Quantity	Unit	Unit Price	Total Amount	Main Open Ditch		Online Storage #2		Retention Pond		Branch 309		Branch C	
						Qty.	Price	Qty.	Price	Qty.	Price	Qty.	Price	Qty.	Price
43	36" RC Apron w Trash Rack	2	Each	$2,500.00	$5,000.00					2	$5,000.00				
44	84" RC Pipe Culvert	228	LIN FT	$500.00	$114,000.00	228	$114,000.00								
45	96" RC Pipe Culvert	196	LIN FT	$600.00	$117,600.00	196	$117,600.00								
46	84" RC Pipe Apron	6	EACH	$4,000.00	$24,000.00	6	$24,000.00								
47	96" RC Pipe Apron	4	EACH	$5,000.00	$20,000.00	4	$20,000.00								
48	10" HDPE Check Valve	1	EACH	$2,500.00	$2,500.00					1	$2,500.00				
49	Sluice Gate	1	LUMP SUM	$15,000.00	$15,000.00					1	$15,000.00				
50	Random Riprap, Class II	800	TON	$50.00	$40,000.00	800	$40,000.00								
51	Random Riprap, Class III	780	TON	$55.00	$42,900.00	700	$38,500.00					40	$2,200.00	40	$2,200.00
52	Random Riprap, Class IV	1500	TON	$65.00	$97,500.00	1500	$97,500.00								
53	Filter Berm, Type 5	150	LIN FT	$50.00	$7,500.00	150	$7,500.00								
54	Storm Drain Inlet Protection	170	EACH	$100.00	$17,000.00	100	$10,000.00					20	$2,000.00	50	$5,000.00
55	Sediment Control Log, Type Straw	5500	LIN FT	$3.00	$16,500.00	5000	$15,000.00	250	$750.00	250	$750.00				
56	Immediate Ditch Slope Seeding	336	STATION	$100.00	$33,600.00	336	$33,600.00								
57	Mulch Type 1	133	TON	$250.00	$33,250.00							45	$11,250.00	88	$22,000.00
58	Rapid Stabilization, Method 4	11300	SQ YD	$3.00	$33,900.00	8000	$24,000.00	2500	$7,500.00	500	$1,500.00	100	$300.00	200	$600.00
59	Rapid Stabilization, Method 3	14	ACRES	$2,500.00	$35,000.00			5	$12,500.00	2	$5,000.00			7	$17,500.00
60	STABILIZED CONSTRUCTION EXIT	1	LUMP SUM	$4,000.00	$4,000.00	0.4	$1,600.00	0.1	$400.00	0.1	$400.00	0.1	$400.00	0.3	$1,200.00
	SUBTOTAL ESTIMATED CONSTRUCTION BID ITEMS:				**$3,526,710.00**		**$1,357,470.00**		**$558,150.00**		**$94,910.00**		**$409,410.00**		**$1,104,970.00**
	Improvement of Open Ditch Right-of Way	15.92	ACRE	$15,000.00	$238,800.00	15.92	$238,800.00								
	Improvement of Pond Right-of Way	12.77	ACRE	$15,000.00	$191,550.00			12.77	$191,550.00						
	Improvement Pond #1	1	LUMP SUM	$60,000.00	$60,000.00					1					
	Temporary Open Ditch Right-of-Way Damages	55.63	ACRE	$600.00	$33,378.00	55.63	$33,378.00								
	Temporary Pond Right-of-Way Damages	16	ACRE	$600.00	$9,600.00			16	$9,600.00						
	Temprorary Tile Right-of-Way Damages	67.25	ACRE	$600.00	$40,350.00							20.57	$12,342.00	46.68	$28,008.00
	SUBTOTAL:				$4,100,388.00		$1,629,648.00		$759,300.00		$94,910.00		$421,752.00		$1,132,978.00
	10% CONTINGENCY:				$410,040.00		$162,970.00		$75,930.00		$9,490.00		$42,180.00		$113,290.00
	TOTAL ESTIMATED CONSTRUCTION COST:				**$4,510,428.00**		**$1,792,618.00**		**$835,230.00**		**$104,400.00**		**$463,932.00**		**$1,246,268.00**
	DESIGN, ADMINISTRATION AND CONSTRUCTION ENGINEERING:				$820,080.00		$325,930.00		$151,860.00		$18,980.00		$84,350.00		$226,600.00
	TOTAL ESTIMATED PROJECT COST:				**$5,330,508.00**		**$2,118,548.00**		**$987,090.00**		**$123,380.00**		**$548,282.00**		**$1,472,868.00**

EXHIBIT 4: SEPARABLE MAINTENANCE

SEPERABLE MAINTENANCE

IMPROVEMENT OF MAIN OPEN DITCH, BRANCH 309 & BRANCH C
RENVILLE COUNTY DITCH NO. 59
BMI PROJECT NO. S15.112473

BOLTON & MENK
Real People. Real Solutions.

Date: 9/13/2023

Item No.	Item	Estimated Quantity	Unit	Unit Price	Total Amount	Main Open Ditch		Branch 309		Branch C	
						Qty.	Price	Qty.	Price	Qty.	Price
BASE BID											
1	Mobilization & Traffic Control	1	LUMP SUM	$60,000.00	$60,000.00	0.53	$31,800.00	0.09	$5,400.00	0.38	$22,800.00
2	Exploratory Excavation	50	HOUR	$200.00	$10,000.00	10	$2,000.00	20	$4,000.00	20	$4,000.00
3	Ditch Cleanout	336	STATION	$200.00	$67,200.00	336	$67,200.00				
4	Salvage Pipe Culvert	592	LIN FT	$15.00	$8,880.00	592	$8,880.00				
5	Wearing Course Mixture (SPWEA230B)	110	TON	$110.00	$12,100.00	110	$12,100.00				
6	Non-wearing Course Mixture (SPNWB230B)	110	TON	$110.00	$12,100.00	110	$12,100.00				
7	Aggregate Surfacing, Class 1	110	TON	$20.00	$2,200.00	110	$2,200.00				
8	Aggregate Base, Class 5	850	TON	$25.00	$21,250.00	800	$20,000.00			50	$1,250.00
9	Pipe Bedding Material	3025	TON	$25.00	$75,625.00	1500	$37,500.00	25	$625.00	1500	$37,500.00
10	6" Tile Inlet	12	EACH	$400.00	$4,800.00	5	$2,000.00	2	$800.00	5	$2,000.00
11	8" Tile Inlet	33	EACH	$450.00	$14,850.00	15	$6,750.00	3	$1,350.00	15	$6,750.00
12	10" Tile Inlet	12	EACH	$550.00	$6,600.00	10	$5,500.00	2	$1,100.00		
13	12" Tile Inlet	26	EACH	$600.00	$15,600.00	10	$6,000.00	1	$600.00	15	$9,000.00
14	15" Tile Inlet	5	EACH	$900.00	$4,500.00	5	$4,500.00				
15	18" Tile Inlet	5	EACH	$1,200.00	$6,000.00	5	$6,000.00				
16	6" Drain Tile	7995	LIN FT	$8.00	$63,960.00	200	$1,600.00	360	$2,880.00	7435	$59,480.00
17	8" Drain Tile	4345	LIN FT	$10.00	$43,450.00	200	$2,000.00	1450	$14,500.00	2695	$26,950.00
18	10" Drain Tile	1450	LIN FT	$12.00	$17,400.00	200	$2,400.00	1250	$15,000.00		
19	12" Drain Tile	2355	LIN FT	$16.00	$37,680.00	100	$1,600.00	1500	$24,000.00	755	$12,080.00
20	15" Drain Tile	2555	LIN FT	$20.00	$51,100.00	100	$2,000.00	1320	$26,400.00	1135	$22,700.00
21	18" Drain Tile	3070	LIN FT	$25.00	$76,750.00	100	$2,500.00	90	$2,250.00	2880	$72,000.00
22	24" Drain Tile	4975	LIN FT	$30.00	$149,250.00	40	$1,200.00			4935	$148,050.00
23	30" Drain Tile	40	LIN FT	$40.00	$1,600.00	40	$1,600.00				
24	6" CS Drain Tile Outlet Pipe w Rodent Guard	200	LIN FT	$18.00	$3,600.00	200	$3,600.00				
25	8" CS Drain Tile Outlet Pipe w Rodent Guard	300	LIN FT	$20.00	$6,000.00	300	$6,000.00				
26	10" CS Drain Tile Outlet Pipe w Rodent Guard	300	LIN FT	$24.00	$7,200.00	300	$7,200.00				
27	12" CS Drain Tile Outlet Pipe w Rodent Guard	300	LIN FT	$28.00	$8,400.00	300	$8,400.00				

SEPERABLE MAINTENANCE

IMPROVEMENT OF MAIN OPEN DITCH, BRANCH 309 & BRANCH C
RENVILLE COUNTY DITCH NO. 59
BMI PROJECT NO. S15.112473

BOLTON & MENK
Real People. Real Solutions.

Date: 9/13/2023

Item No.	Item	Estimated Quantity	Unit	Unit Price	Total Amount	Main Open Ditch		Branch 309		Branch C	
						Qty.	Price	Qty.	Price	Qty.	Price
28	15" CS Drain Tile Outlet Pipe w Rodent Guard	200	LIN FT	$35.00	$7,000.00	200	$7,000.00				
29	18" CS Drain Tile Outlet Pipe w Rodent Guard	200	LIN FT	$40.00	$8,000.00	200	$8,000.00				
30	24" CS Drain Tile Outlet Pipe w Rodent Guard	80	LIN FT	$50.00	$4,000.00	60	$3,000.00	20	$1,000.00		
31	30" CS Drain Tile Outlet Pipe w Rodent Guard	40	LIN FT	$75.00	$3,000.00	20	$1,500.00			20	$1,500.00
32	15" CS Pipe Culvert	920	LIN FT	$40.00	$36,800.00	920	$36,800.00				
33	15" CS Safety Apron	23	EACH	$300.00	$6,900.00	23	$6,900.00				
34	Install Pipe Culvert	592	LIN FT	$50.00	$29,600.00	592	$29,600.00				
35	Random Riprap, Class II	800	TON	$50.00	$40,000.00	800	$40,000.00				
36	Random Riprap, Class III	780	TON	$55.00	$42,900.00	700	$38,500.00	40	$2,200.00	40	$2,200.00
37	Random Riprap, Class IV	1500	TON	$65.00	$97,500.00	1500	$97,500.00				
38	Filter Berm, Type 5	170	LIN FT	$50.00	$8,500.00	150	$7,500.00	20	$1,000.00		
39	Storm Drain Inlet Protection	150	EACH	$100.00	$15,000.00	100	$10,000.00			50	$5,000.00
40	Sediment Control Log, Type Straw	5000	LIN FT	$3.00	$15,000.00	5000	$15,000.00				
41	Immediate Ditch Slope Seeding	336	STATION	$100.00	$33,600.00	336	$33,600.00				
42	Seeding (Buffer Strip, Storage Disposal Area)	84.36	ACRE	$500.00	$42,180.00	26	$13,000.00	13.24	$6,620.00	45.1	$22,560.00
43	Rapid Stabilization, Method 4	8300	SQ YD	$3.00	$24,900.00	8000	$24,000.00	100	$300.00	200	$600.00
				SUBTOTAL ESTIMATED CONSTRUCTION BID ITEMS:	**$1,202,975.00**		**$636,530.00**		**$110,025.00**		**$456,420.00**
	Temporary Open Ditch Right-of-Way Damages	55.63	ACRE	$600.00	$33,378.00	55.6	$33,378.00				
	Temprorary Tile Right-of-Way Damages	58.36	ACRE	$600.00	$35,016.00			13.24	$7,944.00	45.1	$27,072.00
				SUBTOTAL:	$1,271,369.00		$669,908.00		$117,969.00		$483,492.00
				10% CONTINGENCY:	$127,140.00		$66,990.00		$11,800.00		$48,350.00
				TOTAL ESTIMATED CONSTRUCTION COST:	**$1,398,509.00**		**$736,898.00**		**$129,769.00**		**$531,842.00**
				DESIGN, ADMINISTRATION AND CONSTRUCTION ENGINEERING:	$254,270.00		$133,980.00		$23,590.00		$96,700.00
				TOTAL ESTIMATED PROJECT COST:	**$1,652,779.00**		**$870,878.00**		**$153,359.00**		**$628,542.00**

EXHIBIT 5: TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATIONS

IMPROVEMENT OF MAIN OPEN DITCH, BRANCH 309, & BRANCH C OF COUNTY DITCH NO. 59

RENVILLE COUNTY, MN

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SECTION 02210 - SUBSURFACE INVESTIGATION

PART 1 -- GENERAL

1.1 SUMMARY

A. This section covers the furnishing of all labor, materials, tools, equipment and performances of all work and services necessary or incidental to conducting subsurface investigation as shown on the drawings, as specified herein, and/or as specified by the Engineer.

1.2 METHOD OF MEASUREMENT AND PAYMENT

A. Measurement and compensation for the following items shall be paid according to the referenced specification or as modified below:

1. No exception to the referenced specification is made.

1.3 SPECIFICATION REFERENCES

A. Mn/DOT Specification Section 2123 shall apply, except as modified herein.

B. Unless noted otherwise, the provisions in this section are in addition to the referenced specification.

PART 2 -- PRODUCTS

2.1 MATERIALS

A. No exception to the referenced specification is made.

PART 3 -- EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

A. The Contractor shall:

1. Perform underground utility exploration as directed by the Engineer which involves excavation to locate pipelines for location and elevation verification.
2. Other work associated with the Project, as directed by the Engineer.
3. Subsurface investigation shall consist of a rubber-tired backhoe, operator and laborer to find the tile.

B. Where exploratory excavation is performed in a location that will not be disturbed later, the backfill shall be placed and compacted to the density specified elsewhere in these Specifications for the type of utility located.

******END OF SECTION******

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SECTION 02220 - REMOVING PIPE AND MISCELLANEOUS STRUCTURES

PART 1 -- GENERAL

1.1 SUMMARY

A. This section covers the furnishing of all labor, materials, tools, equipment and performances of all work and services necessary or incidental to the removal of pipe and miscellaneous structures as indicated on the drawings or as specified herein.

1.2 METHOD OF MEASUREMENT AND PAYMENT

A. Measurement and compensation for the following items shall be paid according to the referenced specification or as modified below:

1. The UNIT PRICE bid for removing miscellaneous structures shall include all costs of labor, materials, equipment and ultimate disposal required to complete the work, as specified.

B. The furnishing and installing of specific items and/or the performance of work under certain circumstances shall not be individually paid. The costs shall be included in the unit price bid for the associated removal and excavation items. Such items of work include but are not limited to:

1. Off-site disposal of debris.
2. Fees and permits for the disposal of materials.
3. Removal and disposal of existing tiles which conflict with the construction
4. Bulkheading the ends of existing pipes designated by the Engineer to be abandoned in place.
5. Salvage and reinstall fence (as needed)
6. Protection from damage of structures or other surface improvements that are not to be removed, and subsequent repair and/or replacement if damaged by Contractor operations.

1.3 SPECIFICATIONS REFERENCES

A. Mn/DOT Specification Section 2104 shall apply to the removal of pipe and miscellaneous structures, except as modified herein.

B. Unless noted otherwise, the provisions in this section are in addition to the referenced specification.

1.4 SUBMITTALS

A. No exception to the referenced specification is made.

PART 2 -- PRODUCTS

2.1 NO EXCEPTION TO THE REFERENCED SPECIFICATION IS MADE.

PART 3 -- EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

A. Salvage existing fences where shown on the plans and/or required for the construction of the project, including posts and hardware. Replace when construction is complete, including new posts and wire if needed.

B. Dispose of all concrete items, rubbish and debris outside of the construction zone. It shall be the Contractor's responsibility to secure all required permits and pay all fees associated with the disposal of the material and to secure the disposal site.

C. The Contractor shall take full responsibility to protect structures or other surface improvements from damage that are not to be removed. If damage to these facilities occurs due to the construction of the project, the Contractor shall replace or repair them.

D. Where existing pipes are to be abandoned in place, the exposed pipe ends shall be bulkheaded shut with a watertight non-shrink concrete grout at a thickness of not less than one pipe diameter.

******END OF SECTION******

SECTION 02240 - DEWATERING

PART 1 -- GENERAL

1.1 SUMMARY

A. This section covers the furnishing of all labor, materials, tools, equipment and performances of all work and services necessary or incidental to the dewatering of trenches as necessary to construct the elements shown on the drawings or as specified herein.

B. This item shall be considered exempt from the requirements of Supplementary Condition 11.03.

1.2 METHOD OF MEASUREMENT AND PAYMENT

A. Measurement and compensation for the following items shall be paid according to the referenced specification or as modified below:

1. No dewatering payment will be made for dewatering for the construction.

B. The furnishing and installing of specific items and/or the performance of work under certain circumstances shall not be individually paid. The costs shall be included in the unit price bid for other associated improvements, as indicated. Such items of work include but are not limited to:

1. The costs of furnishing discharge pumps, rock, piping including bends, and adapters, include in the price bid for tile construction.
2. Protecting existing improvements from damage, include in the price bid for tile construction.
3. Digging a portion of the ditch, allowing it to dewater, and returning later to finish the installation, include in the price bid for tile construction.

1.3 SPECIFICATION REFERENCES

A. Mn/DOT Specification Section 2451.3C shall apply to the dewatering of trenches, except as modified herein.

B. Unless noted otherwise, the provisions in this section are in addition to the referenced specification.

PART 2 -- PRODUCTS

2.1 MATERIALS

A. None

PART 3 -- EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

A. The Contractor shall furnish and install all necessary discharge piping and obtain all permits, easements, rights-of-way, etc. to convey and discharge the water at a sufficient distance from the project area to eliminate recharge of the ground water a the project site.

B. Water from dewatering operations shall not be discharged where it will pond or cause damage to cropland or personal property due to the presence of standing or flowing water.

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C. Water shall be discharged into temporary sedimentary basins prior to ultimate discharge into natural streams or waterways.

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SECTION 02320 - TRENCH EXCAVATION, BEDDING AND BACKFILL

PART 1 -- GENERAL

1.1 SUMMARY

A. This section covers the furnishing of all labor, materials, tools, equipment and performances of all work and services necessary or incidental to maintenance of utility service, trench excavation, bedding and backfill necessary for the construction of underground utilities and structures, as indicated on the drawings or as specified herein.

1.2 DEFINITIONS

A. Excess Material - Material that is not needed to complete the earthwork balance.

B. Suitable Material - Sand, silty sand or low plasticity clay soils with no organic content. The Engineer shall make the final determination as to what material will be considered suitable.

C. Unsuitable Material - Soil with organic content including topsoil, swamp deposits, peat, muck, or other material deemed by the Engineer to be unsuitable for fill or embankment construction.

1.3 METHOD OF MEASUREMENT AND PAYMENT

A. Measurement and compensation for the following items shall be paid according to the referenced specification or as modified below:

1. Rock Excavation

   (a) No extra payment will be made for rock excavation.

2. Items specifically identified in the *Schedule of Unit Prices* will be compensated in accordance with the description of measurement and payment contained in the section applicable to the individual item. Otherwise, no direct compensation shall be granted for compliance with the provisions contained herein.

B. The furnishing and installing of specific items and/or the performance of work under certain circumstances shall not be individually paid. The costs shall be included in the unit price bid for the individual pipeline items associated with the stated specific item or work effort. Such items of work include but are not limited to:

1. Interference with other above and underground structures and utilities.

   (a) The removal and restoration, or protection of existing structures and utilities that are shown on the plans and for which there is no bid item for removing and restoring, or working around the utility.

2. Any dewatering necessary for construction.

3. Foundation materials placed in addition to or in lieu of performing necessary dewatering.

4. Bulkheading of existing pipes to be abandoned in place.

5. Granular foundation, granular bedding and granular encasement materials.

6. Granular foundation materials used in lieu of bedding materials in the specified bedding zone, where specified.

7. Granular foundation materials used in unstable trench conditions.

8. The removal and disposal of native materials that are unsuitable for bedding and/or backfill.

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9. Providing and maintaining flow through the existing tiles.
10. The removal of excess materials above the original topography resulting from the additional volume created from pipe and pipe bedding.
11. Delays due to other utility conflicts that result during the course of construction.
12. Protecting existing improvements and previously accepted elements of this construction from damage.
13. Protecting the inverts of other utility pipes from the accumulation of debris and soil, the removal of blockages that threaten to damage property, and/or the cleaning of both the newly constructed lines and the existing lines of all debris and soil that accumulated during the construction.
14. Providing temporary bypass pumping / control of storm water flows around the construction zone, include in the price bid for the associated items being installed.
15. The use of special construction techniques such as trench boxes, sheeting, shoring, etc., include in the price bid for the associated items being installed.
16. Shaping and grading of the construction zone so that surface drainage is restored following the construction.

1.4 SPECIFICATION REFERENCES

A. Reference CEAM Specification No. 2600 shall apply to excavating, installing bedding, and backfilling all trench excavation construction necessary for the completion of work, except as modified herein.
   1. All references to Mn/DOT specifications shall mean the specific edition, including Supplemental Specifications and Technical Memoranda as identified in Section 01420 of these Specifications.
   2. CEAM Specification 2600.3.A1 Maintenance of Traffic is hereby deleted, See Section 01555 of these Specifications.
   3. CEAM Specification 2600.3.A2 Establishing Line and Grade is modified by Section 01720 of these Specifications.
   4. CEAM Specification 2600.3.A3 Protection of Surface Structures:
      (a) The last sentence in the third paragraph is deleted.
   5. CEAM Specification 2600.3.A5 Removal of Surface Improvements - All rubble and debris to be disposed of off-site, shall be disposed of at a location secured by the Contractor and in a manner in compliance with applicable Local, State and Federal regulations.
   6. CEAM Specification 2600.3.B3 Excavation Limits and Requirements - OSHA limitations shall also apply to the top of trench width determination. The seven day written notice is waived if changing soil conditions and OSHA compliance apply.
   7. CEAM 2600.3.F1 Turf Restoration is hereby deleted, See Section 02920 of these Specifications.
   8. CEAM 2600.4 Method of Measurement Paragraphs B and C are hereby deleted. See applicable sections of these Specifications.

B. Reference Mn/DOT Specification No. 2451 shall apply to granular materials for foundation, bedding and encasement of utility line construction, except as modified herein.

C. Unless noted otherwise, the provisions in this section are in addition to the referenced specification.

1.5 SUBMITTALS

A. No exception to the referenced specification is made.

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PART 2 -- PRODUCTS

2.1 GRANULAR MATERIALS

A. Granular Bedding and Granular Encasement - Granular bedding and granular encasement materials used in the pipe zone in dry conditions shall conform to CEAM specifications, with the gradation limits modified as shown below.

Granular Bedding and Granular Encasement	
Sieve Size	**Percent Passing**
1½”	100
# 4	35 - 85
# 10	20 - 70
# 40	5 - 35
# 200	0 - 15

B. Granular Foundation - Granular foundation material shall be rock material, with the gradation limits as modified as shown below. This material shall be used in lieu of standard granular bedding and granular encasement materials where added pipe support is needed due to poor or wet subgrade soil conditions. This rock material shall also be used along with the required trench dewatering to provide for a stable pipe foundation.

Granular Foundation	
Sieve Size	**Percent Passing**
2”	100
1½”	95 - 100
¾	20 - 40
# 4	0 - 5

PART 3 -- EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

3.2 EXCAVATION AND PREPARATION OF TRENCH

A. Interference and Protection of Underground Structures

1. If an existing utility is shown on the plans and there is no bid item for removing and restoring, or working around the utility, the Contractor shall be required to remove and restore, or protect the utility.
2. The inverts of existing tiles, culverts, drains, etc. shall be protected during construction. The Contractor is responsible to inspect and clean, if necessary, all lines which have become compromised by the construction operations.

B. Excavation Limits and Requirements

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1. The trench for all flexible pipe shall be undercut six-inches below the pipe barrel to permit the installation of granular bedding or foundation material.

2. The Contractor shall be responsible for any damage to adjacent structures or buildings caused by the dewatering operations

3. Use of granular foundation material in lieu of performing dewatering is permitted.

C. Preparation and Maintenance of Foundation

1. Flexible Pipe Materials

(a) In ordinary trench conditions, the pipe shall be bedded in compacted granular bedding which extends from 6" below the bottom of the pipe to the spring line of the pipe. The Contractor shall bed and encase the pipe in bedding and encasement material, as shown on the plan details. The bedding and encasement shall be compacted to 95% Standard Proctor Density, or as recommended by the pipe manufacturer, whichever is denser.

(b) Where the trench foundation has been found to be unstable and/or not suitable for pipe support, the trench shall be undercut until acceptable conditions are found. The Contractor shall furnish and install compacted granular foundation material from the bottom of the excavation to the bottom of the pipe. Bedding material shall then be placed to the spring line of the pipe.

3.3 INSTALLATION OF PIPE AND FITTINGS

A. The Contractor shall keep accurate records as to the location of the tile connections, utility crossings, etc. either constructed or encountered during the construction Measurements to lines shall be taken from the two nearest permanent structures (i.e., roads, intakes, etc). Final payment for the project will not be made until the information is in the possession of the Owner.

B. When connection to an existing tile is required, the Contractor shall expose and verify the elevation of the existing tile prior to laying any pipe toward, or away from, the connection point. If the elevation of the existing tile does not match the elevation shown on the plans, the Contractor shall notify the Engineer, at which time the Engineer may adjust the proposed grades.

C. Connection and Assembly of Joints

1. For dual wall polyethylene pipe, a soil-tight joint is required.

D. Bulkheading Open Pipe Ends

1. The Contractor shall furnish, install and maintain a temporary, water-tight plug adequately blocked in place to prevent flooding of the existing downstream tile system. The plug shall be placed at the beginning of the project or at the end of each working day at the end of the day's operation.

2. When flows are diverted from an existing tile to be abandoned in place, the Contractor shall construct a water-tight plug on the open end of the abandoned pipe.

3. Permanent watertight plugs shall be constructed with concrete grout with a thickness of not less than 1 pipe diameter.

3.4 BACKFILLING OPERATIONS

A. Backfill material around all utilities shall be compacted with hand machines. The maximum lift thickness shall be 6-inches.

B. Flexible Pipe Materials

1. Granular bedding and granular encasement material shall be furnished, placed and compacted to bed and encase the pipe to an elevation 12 inches above the pipe the full width of the trench. The

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contractor shall bed and encase the pipe in granular bedding and granular encasement material to 95% Standard Proctor Density or as recommended by the pipe manufacturer, whichever is denser. Select native material shall be used above the bedding and encasement material (12-inches above the pipe) up to the bottom of the subgrade excavation zone.

C. Trench backfill for road crossing shall be compacted in accordance with the Quality Compaction Method. In agricultural fields, no compaction is required on the trench above the bedding and encasement zone.

3.5 SOURCE QUALITY CONTROL

A. The Contractor shall arrange for having the following testing performed:

1. One (1) gradation test per each 500 tons or 275 cubic yards (CV) of granular materials.

******END OF SECTION*****

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SECTION 02370 -EROSION & SEDIMENT CONTROL

PART 1 -- GENERAL

1.1 SUMMARY

A. This section covers the furnishing of all labor, materials, tools, equipment and performances of all work and services necessary or incidental to storm water management as indicated on the plans or as specified herein or as directed by the Engineer.

B. The Contractor and Owner shall identify a person knowledgeable and experienced in the application of erosion and sediment control BMP's who will oversee the implementation of the SWPPP.

C. Minnesota Pollution Control Agency (MPCA) - General Storm Water Permit for Construction Activity (MN R100001)

1. The O**wner** has developed a **Storm Water Pollution Prevention Plan (SWPPP)** in accordance with Part III (Storm Water Discharge Design Requirements) of the National Pollutant Discharge Elimination System (NPDES)/State Disposal System Permit that is included in the Appendix or in the drawings.
2. As a condition of the Award, the Contractor shall assume the role of "**Operator**" under the NPDES Permit by applying and paying for the permit within 7 days of acknowledging the *Notice of Award*. Late submittals will not be rejected; however, the MPCA reserves the right to take enforcement for any unpermitted discharges or permit noncompliance for the new registered party that has assumed control of the site.
3. For **storm water** discharges from construction activities where the **Owner** or **Operator (Contractor)** changes, the new **Owner** or **Operator** can implement the original **SWPPP** created for the project or develop and implement their own **SWPPP**.
4. **Permittee(s)** shall ensure either directly or through coordination with other **Permittee(s)** that their **SWPPP** meets all terms and conditions of this permit and that their activities do not render ineffective another party's **erosion prevention** and **sediment control Best Management Practices (BMP's)**."
5. The Contractor shall maintain copies of the SWPPP <u>on the project site</u> at all times and comply with all provisions contained therein.
6. Process Summary:
   (a) Owner issues *Notice of Award* to Contractor
   (b) Contractor acknowledges the *Notice of Award*
   (c) Within 7 days of acknowledgement, the Contractor applies and pays for the ***MPCA Permit Application*** to the MPCA to accept the responsibilities of the "Operator" on the NPDES Permit. Copies of the application shall be sent to the Owner and the Engineer.
   (d) The Contractor may then review the SWPPP and propose changes or a new SWPPP to the Engineer for review and comment; and the Owner for approval.
      (1) During the review and modification period, all work performed on the project shall be in compliance with the original SWPPP, including having copies available on the project site.
      (2) Once a SWPPP is modified / amended, the Contractor shall distribute new copies to the Owner, the Engineer, the on-site project supervisor and the construction observer.

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1.2 METHOD OF MEASUREMENT AND PAYMENT

A. Measurement and compensation for the following items shall be paid according to the referenced specification or as modified below:

1. Erosion and Sediment Control

(a) Payment for "Inlet Protection" shall be at the contract price per EACH for furnishing, installing, maintaining, and removing the materials as detailed in the plans. Eighty percent (80%) of payment shall be made upon installation. The remaining 20% shall be made upon complete removal of the control measure, removal of any accumulated sediment and surface restoration.

B. The furnishing and installing specific items and/or the performance of work under certain circumstances shall not be individually paid. The costs shall be included in the unit price bid for the associated erosion control and excavation items. Such items of work include but are not limited to:

1. Complying with the Minnesota Pollution Control Agency (MPCA) - General Storm Water Permit for Construction Activity (MN R100001) – Reference Storm Water Pollution Prevention Plan (SWPPP) included in the Appendix.
2. Maintaining clean exit areas or roads from the site.
3. Clean adjacent roads of excess soil.
4. Cleaning drain tiles and culverts that have been partially or completely obstructed by sediment that originated from the site.
5. Geotextile fabric for rock installation.
6. Emergency erosion control mobilization.

1.3 SPECIFICATION REFERENCES

A. Mn/DOT Specification Section 2573 shall apply to temporary erosion control.

B. Mn/DOT Specification Section1717.2 shall apply to erosion control.

C. Section 02930 of these specifications shall apply to Rapid Stabilization, if applicable.

D. Unless noted otherwise, the provisions in this section are in addition to the referenced specification.

PART 2 -- PRODUCTS

2.1 EROSION CONTROL

A. Seeding shall be performed as outlined in Section 02920.

PART 3 -- EXECUTION

3.1 GENERAL

A. Construction and/or installation of all erosion & sediment control devices shall be completed prior to any soil disturbing activities. The rock check dam shall be installed prior to starting any excavation work.

B. Prior to construction, the Owner, Engineer and Contractor shall observe the existing open ditch and discharge area and shall document the existing conditions. Upon completion of turf establishment, the open ditch and discharge area shall be observed and all increased sediment deposits shall be removed and disposed of by the Contractor. All increases in sediment deposits shall be considered to have originated from the project site.

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C. Exit areas or roads shall be kept clean of excess soil by routine blading.

D. The Contractor shall salvage, transport and place cohesive materials excavated from the work for use in constructing berms for temporary sediment traps.

3.2 CONSTRUCTION REQUIREMENTS

A. A goal of the project during construction is to get the cleanest water possible into the drainage system and protect critical and unique areas. Every effort shall be required by the Contractor to achieve these goals.

B. The Contractor shall limit the area of disturbance and shall finish shaping and restoring an area before progressing into new areas. **Less than one half mile of tile shall be under construction and not fully graded and leveled at any one time.**

C. The Contractor shall control drainage and erosion on the project including: haul roads, temporary construction, waste disposal sites, plant and storage locations. The contractor shall clean up the area, shape the area to allow storm runoff with a minimum of erosion and/or siltation, replace topsoil, and establish vegetative cover to the satisfaction of the Engineer on areas where the potential for pollution has been increased due to the Contractor's operations.

D. If Contractor fails to install and/or perform the appropriate erosion and sediment control practices, as determined by the Engineer, the Engineer may issue a written order to the Contractor. The Contractor shall respond within 24 hours with sufficient personnel, equipment and/or materials and conduct the **required work or be subject to a $ 500 per calendar day deduction for non-completion.**

E. When the Engineer determines that the erosion and/or sediment control practices installed by the Contractor have failed, the Contractor shall correct the cause and alleviate all sediment deposition, to the fullest extent possible. If the corrective action is not taken in a timely manner, the Engineer may issue a written order to the Contractor. The Contractor shall respond within 24 hours with sufficient personnel, equipment and/or materials and conduct the **required work or be subject to a $ 500 per calendar day deduction for non-completion.**

F. The Contractor shall remove all deltas and sediment deposited in drainage ways or tiles and re-stabilize the areas where sediment removal results in exposed soil. The removal and stabilization shall take place within 7 calendar days of discovery.

G. Where applicable, the Contractor will be required to co-sign for a "General Storm Water Permit" for construction activity with the Minnesota Pollution Control Agency (MPCA). The application form and information is included an appendix of these specifications. The Owner will initiate the Permit process and pay the required "Application Fee." The Contractor will be required to comply with all of the terms and conditions of the Permit that also includes performing the required inspections of the erosion control devices and maintaining an Inspector's Log for the MPCA Storm Water Permit. A copy of the proposed log form is available from the Engineer.

H. Energy dissipation or other outlet treatment must be installed within 24 hours of connection to surface water.

3.3 EROSION CONTROL

A. Unless precluded by snow cover, all exposed soil areas, including topsoil stockpiles, shall have temporary erosion control or permanent cover for the exposed soil areas within 14 days where the area has not been, or will not be, worked by the Contractor.

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NOTE THAT THIS REQUIREMENT WILL RESULT IN MULTIPLE MOBILIZATIONS IN ORDER TO PROVIDE THE REQUIRED STABILIZATION.

3.4 SEDIMENT CONTROL

A. The Contractor shall install Sediment Control Devices where control is required and/or where directed by the Engineer. The control measures as shown on the plans shall be considered the minimum requirements with additional measures required dependent on construction sequencing and scheduling.

B. Inlet Protection shall be used around inlets and/or other surface water accesses to any existing or proposed storm water conveyance system.

C. The Contractor shall take all steps necessary to prevent excess soil erosion of the project. Temporary erosion control devices shall be constructed, maintained and left in place to such time as permanent erosion control measures are in place or instructed to remove them by the Engineer.

D. The Contractor shall construct temporary sediment traps with granular outlets within the disturbed area and shall stockpile a sufficient quantity of suitable fill material to regrade sedimentation ponds and temporary ditches to match the subgrade elevation.

3.5 INSPECTION AND MAINTENANCE:

A. The Contractor shall routinely inspect the construction site once every seven (7) days during active construction and within 24 hours of a rainfall event greater than 0.5 inches in a 24 hour period.

B. All inspections performed during construction must be recorded and records retained with the SWPP in accordance with the Storm Water Permit.

C. Silt fence, erosion control, and other BMP's must be replaced, repaired, or supplemented when they reach 50% design load.

3.6 FINAL STABILIZATION:

A. The Contractor shall ensure final stabilization of the site. The Contractor shall submit a Notice Of Termination within 30 days after final stabilization is complete or control has been passed to another owner.

B. The Contractor shall remove all temporary erosion control measures and BMP's as part of the final site stabilization.

C. The storm water permit further defines final stabilization and its requirements.

******END OF SECTION******

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SECTION 02625 – AGRICULTURAL DRAIN TILE

PART 1 -- GENERAL

1.1 SUMMARY

A. This section covers the furnishing of all labor, materials, tools, equipment and performances of all work and services necessary or incidental to drain tile construction as indicated on the drawings or as specified herein.

1.2 METHOD OF MEASUREMENT AND PAYMENT

A. Measurement and compensation for the following items shall be paid according to the referenced specification or as modified below:

1. Drain Tile Pipe

(a) Measurement of main line drain tile pipe shall be along the centerline of the pipe. Payment shall be at the unit price bid for the specified size, type and class of pipe, regardless of depth.

2. Tile Connections

(a) Measurement for the connection of existing lateral drain tile to the new main line tile where necessary, shall be per each connection and paid for at the unit price bid.

B. The furnishing and installing of specific items and/or the performance of work under certain circumstances shall not be individually paid. The costs shall be included in the unit price bid for the drain tile items, as indicated. Such items of work include but are not limited to:

1. Excavating, salvaging, stockpiling and replacing the full depth of existing topsoil over the trench in agricultural and turf areas, include in the price bid for drain tile.
2. Providing, installing and compacting granular bedding and encasement material for the polyethylene tile construction.
3. Providing and installing granular foundation materials if unsuitable soils are encountered, include in the price bid for drain tile.
4. Furnishing and placing geotextile fabric at open pipe joints, include in the price bid for drain tile.
5. Furnishing and installing necessary bends, fittings, wyes, tees and adaptors on the drain tile line, include in the unit price bid for the drain tile.
6. Providing an inventory of additional pipe, bends, fittings, wyes, tees and adaptors of various sizes at the project site to accommodate changes which occur during construction and ordering additional materials as needed to complete the work, include in the price bid for drain tile.
7. Marking the location of existing tiles with lathe so that the Engineer can record the location on the plan, include in the price bid for lateral tile connection.
8. Connection of existing lateral drain tiles to the new main tile, including tees, wyes, bends and fittings, include in the price bid for lateral tile connection.
9. Performing the required 12 inch deep tillage of all disturbed areas, include in the price bid for drain tile.
10. Trench excavation, backfill and compaction, include in the price bid for drain tile.
11. Bulkheading of existing pipes to be abandoned in place, include in the price bid for drain tile.

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12. Maintenance of an appropriate drain tile outlet during construction, include in the price bid for drain tile.
13. Dewatering or trench pumping necessary for drain tile construction, include in the price bid for drain tile.
14. Removing and replacing fences as necessary to construct the improvements, include in the price bid for drain tile.
15. Removing and disposing of miscellaneous trees and brush necessary to construct the improvements, include in the price bid for drain tile.
16. Delays due to other utility conflicts, which result during the course of construction, include in the price bid for drain tile.
17. Protecting existing improvements from damage, include in the price bid for drain tile.
18. Protecting the inverts of other pipes from the accumulation of debris and soil, the removal of blockages which threaten to damage property, and/or the clearing of both the newly constructed lines and the existing lines of all debris and soil which accumulated during construction, include in the unit price bid for drain tile.
19. Interference and protection of underground structures and utilities, include in the price bid for drain tile.

(a) The removal and restoration, or protection of existing utilities for which there is no bid item for removing and restoring, or working around the utility.

(b) The utility information included on the Plan may not be complete and is furnished from information supplied by various utility companies as an indication of the presence of utility lines in the vicinity of construction. The Contractor shall contact the utility companies to determine the extent and exact location of their facilities. In the event of accidental damage to any such facility, the Contractor shall immediately notify the utility company and cooperate fully in whatever is necessary to repair such facility or restore service.

1.3 SPECIFICATION REFERENCES

A. Reference Section 02320 of these Specifications for trench excavation, bedding and backfill, except as modified herein.

B. CEAM Specification No. 2621 shall apply to construction of pipe sewers/drain tile, except as modified herein.

C. MnDOT Specification No. 2503 shall apply to measurement and payment of pipe sewers/drain tile, except as modified herein.

D. MnDOT Standard Plates Manual with latest revisions.

E. Unless noted otherwise, the provisions in this section are in addition to the referenced specification.

PART 2 -- PRODUCTS

2.1 DRAIN TILE PIPE

A. Perforated Dual Wall Polyethylene Pipe

1. Dual wall perforated and non-perforated corrugated polyethylene pipe shall conform to the requirement of the American Society for Testing Materials F2648 and shall be perforated or non-perforated as shown on the plans. Perforated pipe shall be installed with woven geotechnical sock. Joints shall be water tight gasketed joints.

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B. Reinforced concrete pipe

1. All reinforced concrete pipe shall meet MnDOT Standard Plate 3000 or 3006.
2. Reinforced concrete pipe shall conform to MnDOT 3236 with tongue and groove joints, Class 3 minimum except as shown otherwise on the plans. Provide geotextile wrap of all joints.
3. Pipe ties shall be required for all joints.
4. Fittings for bends and lateral tile connections shall be precast.
5. Connections of private tile shall be made by sawing a hole in the pipe and making a field connection using inserta-tee fittings or equivalent connections.

2.2 GEOTEXTILE FABRIC

A. Mn/DOT 3733, Type I, knit sock.

PART 3 -- EXECUTION

3.1 INSTALLATION OF PIPE AND FITTINGS

A. Drain Tile

1. All piping shall be installed in accordance with the details in the Plans. Granular bedding and encasement materials shall be installed and compacted as noted.

B. Equipment

1. The use of rubber tired earth moving equipment shall not be permitted on the agricultural fields. Backfill and leveling shall be accomplished with dozers.

C. Bulkheading Open Pipe Ends

1. When flows are diverted from an existing drain tile to be abandoned in place, the Contractor shall construct a water-tight plug on the open ends of the abandoned tile. The plugs shall be constructed with concrete grout and with a thickness of not less than 1 pipe diameter.

D. Backfilling

1. The initial lift of native backfill material, from the top of the granular material to 2’ higher, shall be gently placed with a backhoe to avoid placing rocks on the pipe and to avoid impacting the pipe.

3.2 DRAIN TILE CONNECTIONS

A. Connect to Main Tile

1. When connection to an existing tile or concrete main is made, the Contractor shall expose and verify the elevation of the existing tile prior to laying any tile to, or from, the connection point. If the elevation of the existing tile does not match the elevation shown on the plans, the Contractor shall notify the Engineer, at which time the Engineer may adjust the proposed grades.
2. When connecting to a plastic main, appropriate fittings shall be furnished and installed for the connection so that the main tile does not need to be cut for the connection.
3. If there is a vertical elevation difference of more than 2 feet between the existing tile and the new tile connection, the existing tile shall be reconstructed upstream to a point where the tile can be laid at a 45 degree slope to the connection. The tile shall rest on undisturbed soil or soil which has been compacted to a density of the adjacent soil.

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****END OF SECTION****

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SECTION 02630 – SURFACE WATER INTAKES

PART 1 -- GENERAL

1.1 SUMMARY

A. This section covers the furnishing of all labor, materials, tools, equipment and performances of all work and services necessary or incidental to intake construction as indicated on the drawings or as specified herein.

1.2 METHOD OF MEASUREMENT AND PAYMENT

A. Measurement and compensation for the following items shall be paid according to the referenced specification or as modified below:

1. Surface Water Intakes

   (a) Surface water intakes shall be measured by the individual unit based on the inside diameter of the riser.

B. The furnishing and installing of specific items and/or the performance of work under certain circumstances shall not be individually paid. The costs shall be included in the unit price bid for the intake items, as indicated. Such items of work include but are not limited to:

1. Locating and connecting to drain tile, include in the price bid for Surface Water Intakes.
2. The costs of furnishing bends and adapters, include in the price bid for Surface Water Intakes.
3. Trench excavation, backfill and compaction, include in the price bid for Surface Water Intakes.
4. Furnishing and installing a Hickenbottom riser, or approved equal, on the intake.
5. Furnishing and installing a field marker at each intake.

1.3 SPECIFICATION REFERENCES

A. Reference Section 02320 of these Specifications for trench excavation, bedding and backfill, except as modified herein.

B. CEAM Specification No. 2621 shall apply to construction of pipe, except as modified herein.

C. Mn/DOT Standard Plates Manual with latest revisions.

D. Unless noted otherwise, the provisions in this section are in addition to the referenced specification.

PART 2 -- PRODUCTS

2.1 PIPE AND FITTINGS

1. Dual Wall polyethylene pipe as specified in Section 02625.
2. Hickenbottom tee and riser sections, or approved equal.

2.2 GEOTEXTILE FABRIC

A. Mn/DOT 3733, Type II, non-woven for use in wrapping joints in pipe.

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PART 3 -- EXECUTION

A. Surface water intake locations and sizes will be staked by the Engineer as the project progresses. Surface water intakes shall be constructed within two days following the tile construction.

B. The Contractor shall assure that surface water has an outlet at all times into either the existing tile system, or once it is constructed, the new tile. If the Contractor fails to provide such an outlet, any claims for crop damages will be deducted from payments to the Contractor.

C. Additional grading shall be performed around the intakes to permit farming operations around the intakes.

******END OF SECTION******

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SECTION 02920 - TURF RESTORATION

PART 1 -- GENERAL

1.1 SUMMARY

A. This section covers the furnishing of all labor, materials, tools, equipment and performances of all work and services necessary or incidental to turf restoration as indicated on the drawings or as specified herein.

B. A goal of the project during construction is to get the cleanest water possible into the protected drainage systems as quickly as possible and protect critical and unique areas. Every effort shall be required by the Contractor to achieve these goals.

C. Temporary seeding may be necessary during construction in erosion sensitive areas. The Contractor shall do temporary seeding work as specified herein, as required to comply with the MPCA permit or as directed by the Engineer at no additional expense.

1.2 METHOD OF MEASUREMENT AND PAYMENT

A. Measurement and compensation for the following items shall be paid according to the referenced specification or as modified below:

1. Payment for seeding shall include the costs for furnishing and placing the designated seed mixture, fertilizer and mulch at the rate specified and shall be measured by the ACRE.

B. The furnishing and installing specific items and/or the performance of work under certain circumstances shall not be individually paid. The costs shall be included in the unit price bid for the associated seeding and sodding items. Such items of work include but are not limited to:

1. Complying with the Minnesota Pollution Control Agency (MPCA) - General Storm Water Permit for Construction Activity (MN R100001) – Reference Section 02370 – Storm Water Pollution Prevention Plan (SWPPP).
2. Subgrade preparation and topsoil placement as required on all areas shown on the plans.
3. Maintenance of newly seeded areas, as specified, include in the unit price for the associated items.
4. All re-work necessary to repair areas that do not grow, include in the unit price for the associated items.

1.3 SPECIFICATION REFERENCES

A. Mn/DOT Specification Sections 2575, 3876, and 3878, Controlling Erosion, Establishing Vegetation and Seed shall apply to the establishment of grass and sod as shown on the plans.

B. Unless noted otherwise, the provisions in this section are in addition to the referenced specification.

PART 2 -- PRODUCTS

2.1 MATERIALS

A. Seeding Items

1. The seed mixtures to be used are shown below. In general, all application rates for mixes, except oats, are 150% the rate in Mn/DOT Table.
2. Seeding with the various seed mixture designations shall utilize the following combinations of seed, fertilizer and mulch:

(a) Type 1 mulch shall consist of clean straw with no pasture hay.

(b) Temporary seeding, if required, shall use Seed Mixture – 110B Oats.

(c) Fertilizer shall be 22-5-10. (Phosphorous use in fertilizer for first establishment and the first year is allowed unless limited or prohibited by local ordinances.)

APPLICATION RATES						
		FERTILIZER		MULCH		
Seed Mix	Rate	Type	Rate	Type	Rate	Typical Use
	lb/AC		lb/AC		ton/AC	
25-141 (Mesic General Roadside)	105	22-5-10	200	1	2	All.
21-111 (Oats)	100	22-5-10	200	1	2	All, temporary seeding
Temporary Stabilization- Ag Areas				1	2	Pipe Trench Areas

B. Seed Mixtures:

1. The application rates for Mn/DOT seed mixes shall be at 1.5 times that specified in the referenced specification.

PART 3 -- EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

A. GENERAL

1. Prior to construction, the Owner, Engineer and Contractor shall observe the existing storm water outfall system and discharge area and shall document the existing conditions. Upon completion of surface restoration (i.e., paving and turf establishment), the storm water outfall system and discharge area shall be observed and all increased sediment deposits shall be removed and disposed of by the Contractor. All increases in sediment deposits shall be considered to have originated from the project site.

2. Prior to construction, the Owner, Engineer and Contractor shall review the project to identify critical areas that could require rapid stabilization during the construction process, and develop a plan to either mitigate disturbance to those areas or identify the methods of rapid stabilization most appropriate.

3. If Contractor fails to install and/or perform the appropriate rapid stabilization practices and immediate ditch seeding within 7 days following final slope shaping, the Contractor will **be subject to a $ 500 per calendar day deduction for non-completion.**

4. The subgrade shall be shaped to approximate contour of the finished surface. All construction debris shall be removed from the area prior to the placement of the topsoil.

5. The topsoil shall be shaped to the approximate the contour of the finished surface, with a minimum depth of 12-inches.. All construction debris shall be removed from the area prior to seeding. The topsoil shall be loosened with a disc or harrow to its full depth prior to seeding.

6. The Contractor shall be responsible for providing water and maintenance until final acceptance by the Engineer or Owner, to firmly establish the seed. The term maintenance shall include mowing, weed control and watering, as necessary.

7. The Contractor shall remove all rocks and debris from the surface prior to seeding and mulching.

B. SEEDING REQUIREMENTS

1. Turf establishment by seeding shall be done utilizing the various combinations of seed mixtures, fertilizing and mulching as described.

2. Areas prepared for seeding shall be free of rocks, debris and clumps of soil. The areas shall be graded uniformly dragged until free of chunks exceeding 1 inches diameter.

3. Seed shall be applied with a drill seeder, unless otherwise approved in writing by the Engineer.
4. The Contractor shall furnish weight tickets documenting pounds of fertilizer placed and pounds of seed placed. The seed tickets shall show individual plant species along with the percent purity and percent germination. The fertilizer tickets shall show mix proportions. The Contractor shall also furnish its QA/QC data to the Engineer.
5. Dormant seeding and snow seeding may be utilized in accordance with the referenced specification and technical memorandum, provided the final acceptance standards are met.
6. Final acceptance of seeding shall be based on an established growth of 6-inches with a uniform density to cover 70% of the designated area, free of weeds and bare spots. Any re-seeding necessary shall be performed at the Contractor's expense.

******END OF SECTION******

EXHIBIT 6: RIGHT-OF-WAY TABLE

County Ditch 59 Open Ditch, Br 309 & Br C Improvements

Renville County, MN

Open Ditch & Pond Permanent Easement

Date: 9/14/2023

Filename: H:\RNCO\S15112473\3_Design\A_Calculations\[2020-10-29_112473_CD 59 OPEN DITCH &TILE_ROW.xlsx]Open Ditch PERMANENT ROW

			Ditch Widening & Pond Permanent Easement					Amount/Ac
Parcel No.	**Property Owner**	**Legal Description**	**Station to Station**		**Length**	**Width**	**Area (Acres)**	**$15,000**
27-01730-00	Hartung/Donald L	SE 1/4 SE 1/4 27-116N-35W	351+89	360+77	888	*POND	5.90	$88,500
24-01130-00	Aakre Family Farms, LLC C/O	NE 1/4 NE 1/4 3-115N-35W	787+60	793+55	595	*POND	6.87	$103,050
	Sally Jo Aakre							
			Subtotal Pond 2 & 3 Improvements=				12.77	$191,550
10-00050-00	Duininck Companies	NW 1/4 NW 1/4 1-115N-36W	43+01	49+75	674	*POND	LUMP SUM	$60,000
			Subtotal Pond 1 Improvements=					$60,000
09-00500-00	Tersteeg/Alan & Peggy	SW 1/4 SW 1/4 36-116N-36W	43+05	52+85	980	VARIES	0.38	$5,700
10-00050-00	Duninck Companies	NW 1/4 NW 1/4 1-115N-36W	52+85	56+65	380	VARIES	0.10	$1,500
		NE 1/4 NW 1/4 1-115N-36W	56+65	58+44	179	VARIES	0.09	$1,350
10-00040-00	Tersteeg/Alan & Peggy	NE 1/4 NW 1/4 1-115N-36W	58+44	70+38	1194	VARIES	0.72	$10,800
10-00020-00	Braun/Bonnie L.	NW 1/4 NE 1/4 1-115N-36W	70+38	84+34	1396	VARIES	0.57	$8,550
10-00021-00	Duininck Bros, INC	NW 1/4 NE 1/4 1-115N-36W	70+38	84+34	1396	VARIES	0.30	$4,500
10-00020-00	Braun/Bonnie L.	NE 1/4 NE 1/4 1-115N-36W	84+34	97+62	1328	VARIES	0.58	$8,700
10-00021-00	Duininck Bros, INC	NE 1/4 NE 1/4 1-115N-36W	84+34	97+62	1328	VARIES	0.33	$4,950
24-00170-00	Haug/Darlene/Trustee Haug	NW 1/4 NW 1/4 6-115N-35W	97+62	110+34	1272	VARIES	0.47	$7,050
	Family Trust	NE 1/4 NW 1/4 6-115N-35W	110+34	123+55	1321	VARIES	0.90	$13,500
24-00160-00	Braun/ Kevin J	NW 1/4 NW 1/4 6-115N-35W	123+55	137+34	1379	VARIES	0.96	$14,400
		NE 1/4 NW 1/4 6-115N-35W	137+34	150+60	1326	VARIES	0.98	$14,700

24-00130-00	Block/Brian & Sabrina/& Kevin	NW 1/4 NW 1/4 5-115N-35W	150+60	163+97	1337	VARIES	0.94	$14,100
	Block	NE 1/4 NW 1/4 5-115N-35W	163+97	177+32	1335	VARIES	0.84	$12,600
24-00110-00	Voelz/Robert/& William Voelz &	NW 1/4 NE 1/4 5-115N-35W	177+32	187+39	1007	VARIES	0.49	$7,350
	John Voelz							
24-00110-00	Schneiderman/Jeanette	NW 1/4 NE 1/4 5-115N-35W	187+39	190+71	332	VARIES	0.14	$2,100
		NE 1/4 NE 1/4 5-115N-35W	190+71	204+07	1336	VARIES	0.81	$12,150
24-00100-00	Penk/Eloid O & Christine L/&	NW 1/4 NW 1/4 4-115N-35W	204+07	218+61	1454	VARIES	0.93	$13,950
	Lorna J Staedy							
24-00100-00	Penk/Eloid O & Christine L/&	NE 1/4 NW 1/4 4-115N-35W	218+61	232+05	1344	VARIES	0.60	$9,000
	Lorna J Staedy							
27-01040-00	Voelz/Robert/& William Voelz &	SE 1/4 SW 1/4 33-116N-35W	221+29	232+05	1076	VARIES	0.22	$3,300
	John Voelz							
27-01060-00	Kopel/James/& James Kopel &	SW 1/4 SE 1/4 33-116N-35W	232+05	245+28	1323	VARIES	0.56	$8,400
	Kathy Dillion TR of Helen Trust							
24-00041-00	Rauenhorst/Daniel & Cheryl	NW 1/4 NE 1/4 4-115N-35W	232+05	245+28	1323	VARIES	0.34	$5,100
27-01060-00	Kopel/James/& James Kopel &	SW 1/4 SE 1/4 33-116N-35W	245+28	258+66	1338	VARIES	0.52	$7,800
	Kathy Dillion TR of Helen Trust							
24-00041-00	Rauenhorst/Daniel & Cheryl	NE 1/4 NE 1/4 4-115N-35W	245+25	258+66	1341	VARIES	0.31	$4,650
27-01070-00	Hayek/Keith J. & Anita M.	SW 1/4 SW 1/4 34-116N-35W	258+66	273+35	1469	VARIES	0.55	$8,250
24-00010-00	Kopel/James/& James Kopel &	NW 1/4 NW 1/4 3-115N-35W	258+66	260+34	168	VARIES	0.05	$750
	Kathy Dillion TR of Helen Trust							
27-01750-00	Hayek Living Trust C/O Mark &	SW 1/4 SW 1/4 34-116N-35W	260+34	273+35	1301	VARIES	0.22	$3,300
	Ruth Hayek							
27-01070-00	Hayek/Keith J. & Anita M.	SE 1/4 SW 1/4 34-116N-35W	273+35	274+03	68	VARIES	0.03	$450

27-01100-00	Hayek/Thomas R. & Laurie A.	SE 1/4 SW 1/4 34-116N-35W	274+03	288+68	1465	VARIES	0.55	$8,250
27-01750-00	Hayek Living Trust C/O Mark &	SE 1/4 SW 1/4 34-116N-35W	273+35	279+19	584	VARIES	0.11	$1,650
	Ruth Hayek							
27-01101-00	Johnson/Jay L & Deanna L	SE 1/4 SW 1/4 34-116N-35W	279+19	284+85	566	VARIES	0.08	$1,200
27-01750-00	Hayek Living Trust C/O Mark &	SE 1/4 SW 1/4 34-116N-35W	284+85	288+68	383	VARIES	0.05	$750
	Ruth Hayek							
27-01100-00	Hayek/Thomas R. & Laurie A.	NE 1/4 SW 1/4 34-116N-35W	288+68	289+12	44	VARIES	0.01	$150
			(Approx.)	(Approx.)				
27-01751-00	Hayek Living Trust C/O Mark &	SW 1/4 SW 1/4 34-116N-35W	288+68	289+12	44	VARIES	0.01	$150
	Ruth Hayek		(Approx.)	(Approx.)				
27-01102-00	Hayek/Thomas R. & Laurie A.	NW 1/4 SE 1/4 34-116N-35W	289+12	304+37	1525	VARIES	0.44	$6,600
27-01751-00	Hayek Living Trust C/O Mark &	NW 1/4 SE 1/4 34-116N-35W	289+12	304+37	1525	VARIES	0.12	$1,800
	Ruth Hayek							
27-01770-00	Zenk/Robb J. & Megan C.	NE 1/4 SE 1/4 34-116N-35W	304+37	314+15	978	VARIES	0.48	$7,200
		SE 1/4 NE 1/4 34-116N-35W	314+15	320+58	643	VARIES		$0
27-01771-00	Zenk/Robb J. & Megan C.	SE 1/4 NE 1/4 34-116N-35W	320+58	323+41	283	VARIES	0.14	$2,100
	Subtotal					**Subtotal Open Ditch Improvements=**	15.92	$238,800
	Total					**Total Improvements=**	**28.69**	**$490,350**

County Ditch 59 Open Ditch, Br 309 & Br C Improvements

Renville County, MN

Open Ditch & Pond Temporary Right-of-Way

Date: 9/13/2023

Filename: H:\RNCO\S15112473\3_Design\A_Calculations\[2020-10-29_112473_CD 59 OPEN DITCH &TILE_ROW.xlsx]Branch 309 ROW

			Improvement Temporary Right-of Way Damages					Amount/Ac
Parcel No.	**Property Owner**	**Legal Description**	**Station to Station**		**Length**	**Width**	**Area (Acres)**	**$600**
27-01730-00	Hartung/Donald L	SE 1/4 SE 1/4 27-116N-35W	336+42	348+88	1246	*POND	16.00	$9,600
	Subototal				**Subtotal Pond Right-of-Way Damages=**		16.00	$9,600
09-00500-00	Tersteeg/Alan & Peggy	SW 1/4 SW 1/4 36-116N-36W	43+05	52+85	980	VARIES	0.96	$576
10-00050-00	Duninck Companies	NW 1/4 NW 1/4 1-115N-36W	52+85	56+65	380	VARIES	0.15	$90
		NE 1/4 NW 1/4 1-115N-36W	56+65	58+44	179	VARIES	0.32	$192
10-00040-00	Tersteeg/Alan & Peggy	NE 1/4 NW 1/4 1-115N-36W	58+44	70+38	1194	VARIES	1.62	$972
10-00020-00	Braun/Bonnie L.	NW 1/4 NE 1/4 1-115N-36W	70+38	84+34	1396	VARIES	1.64	$984
10-00021-00	Duininck Bros, INC	NW 1/4 NE 1/4 1-115N-36W	70+38	84+34	1396	VARIES	1.17	$702
10-00020-00	Braun/Bonnie L.	NE 1/4 NE 1/4 1-115N-36W	84+34	97+62	1328	VARIES	1.77	$1,062
10-00021-00	Duininck Bros, INC	NE 1/4 NE 1/4 1-115N-36W	84+34	97+62	1328	VARIES	1.29	$774
24-00170-00	Haug/Darlene/Trustee Haug	NW 1/4 NW 1/4 6-115N-35W	97+62	110+34	1272	VARIES	1.39	$834
	Family Trust	NE 1/4 NW 1/4 6-115N-35W	110+34	123+55	1321	VARIES	4.25	$2,550
24-00160-00	Braun/ Kevin J	NW 1/4 NW 1/4 6-115N-35W	123+55	137+34	1379	VARIES	3.49	$2,094
		NE 1/4 NW 1/4 6-115N-35W	137+34	150+60	1326	VARIES	2.97	$1,782
24-00130-00	Block/Brian & Sabrina/& Kevin	NW 1/4 NW 1/4 5-115N-35W	150+60	163+97	1337	VARIES	2.98	$1,788
	Block	NE 1/4 NW 1/4 5-115N-35W	163+97	177+32	1335	VARIES	3.66	$2,196
24-00110-00	Voelz/Robert/& William Voelz &	NW 1/4 NE 1/4 5-115N-35W	177+32	187+39	1007	VARIES	1.16	$696
	John Voelz							

24-00110-00	Schneiderman/Jeanette	NW 1/4 NE 1/4 5-115N-35W	187+39	190+71	332	VARIES	0.53	$318
		NE 1/4 NE 1/4 5-115N-35W	190+71	204+07	1336	VARIES	1.47	$882
24-00100-00	Penk/Eloid O & Christine L/&	NW 1/4 NW 1/4 4-115N-35W	204+07	218+61	1454	VARIES	2.17	$1,302
	Lorna J Staedy							
24-00100-00	Penk/Eloid O & Christine L/&	NE 1/4 NW 1/4 4-115N-35W	218+61	232+05	1344	VARIES	1.20	$720
	Lorna J Staedy							
27-01040-00	Voelz/Robert/& William Voelz &	SE 1/4 SW 1/4 33-116N-35W	221+29	232+05	1076	VARIES	1.19	$714
	John Voelz							
27-01060-00	Kopel/James/& James Kopel &	SW 1/4 SE 1/4 33-116N-35W	232+05	245+28	1323	VARIES	1.89	$1,134
	Kathy Dillion TR of Helen Trust							
24-00041-00	Rauenhorst/Daniel & Cheryl	NW 1/4 NE 1/4 4-115N-35W	232+05	245+28	1323	VARIES	2.00	$1,200
27-01060-00	Kopel/James/& James Kopel &	SW 1/4 SE 1/4 33-116N-35W	245+28	258+66	1338	VARIES	1.99	$1,194
	Kathy Dillion TR of Helen Trust							
24-00041-00	Rauenhorst/Daniel & Cheryl	NE 1/4 NE 1/4 4-115N-35W	245+25	258+66	1341	VARIES	1.73	$1,038
27-01070-00	Hayek/Keith J. & Anita M.	SW 1/4 SW 1/4 34-116N-35W	258+66	273+35	1469	VARIES	2.42	$1,452
24-00010-00	Kopel/James/& James Kopel &	NW 1/4 NW 1/4 3-115N-35W	258+66	260+34	168	VARIES	0.25	$150
	Kathy Dillion TR of Helen Trust							
27-01750-00	Hayek Living Trust C/O Mark &	SW 1/4 SW 1/4 34-116N-35W	260+34	273+35	1301	VARIES	0.47	$282
	Ruth Hayek							
27-01070-00	Hayek/Keith J. & Anita M.	SE 1/4 SW 1/4 34-116N-35W	273+35	274+03	68	VARIES	0.10	$60
27-01100-00	Hayek/Thomas R. & Laurie A.	SE 1/4 SW 1/4 34-116N-35W	274+03	288+68	1465	VARIES	1.61	$966
27-01750-00	Hayek Living Trust C/O Mark &	SE 1/4 SW 1/4 34-116N-35W	273+35	279+19	584	VARIES	0.51	$306
	Ruth Hayek							
27-01101-00	Johnson/Jay L & Deanna L	SE 1/4 SW 1/4 34-116N-35W	279+19	284+85	566	VARIES	0.39	$234

27-01750-00	Hayek Living Trust C/O Mark &	SE 1/4 SW 1/4 34-116N-35W	284+85	288+68	383	VARIES	0.34	$204
	Ruth Hayek							
27-01100-00	Hayek/Thomas R. & Laurie A.	NE 1/4 SW 1/4 34-116N-35W	288+68	289+12	44	VARIES	0.25	$150
			(Approx.)	(Approx.)				
27-01751-00	Hayek Living Trust C/O Mark &	SW 1/4 SW 1/4 34-116N-35W	288+68	289+12	44	VARIES	0.11	$66
	Ruth Hayek		(Approx.)	(Approx.)				
27-01102-00	Hayek/Thomas R. & Laurie A.	NW 1/4 SE 1/4 34-116N-35W	289+12	304+37	1525	VARIES	2.09	$1,254
27-01751-00	Hayek Living Trust C/O Mark &	NW 1/4 SE 1/4 34-116N-35W	289+12	304+37	1525	VARIES	0.52	$312
	Ruth Hayek							
27-01770-00	Zenk/Robb J. & Megan C.	NE 1/4 SE 1/4 34-116N-35W	304+37	314+15	978	VARIES	1.96	$1,176
		SE 1/4 NE 1/4 34-116N-35W	314+15	320+58	643	VARIES	1.36	$816
27-01771-00	Zenk/Robb J. & Megan C.	SE 1/4 NE 1/4 34-116N-35W	320+58	323+41	283	VARIES	0.26	$156
	Subtotal					**Subtotal Open Ditch Right-of-Way Damages=**	55.63	$33,378
	Total					**Total Right-of-Way Damages=**	**71.63**	**$42,978**

County Ditch 59 Open Ditch, Br 309 & Br C Improvements
Renville County, MN
BR C Tile Right-of-Way Table

Date: 9/13/2023

Filename: H:\RNCO\S15112473\3_Design\A_Calculations\[2020-10-29_112473_CD 59 OPEN DITCH &TILE_ROW.xlsx]Branch 309 F

			Improvement Right-of-Way Damages					Amount/Ac
Parcel No.	**Property Owner**	**Legal Description**	**Station to Station**		**Length**	**Width**	**Area (Acres)**	**$600**
Lateral C								
24-00041-00	Rauenhorst/Daniel & Cheryl	NE 1/4 NE 1/4 4-115N-35W	550+98	551+75	77	80	0.14	$85
24-00010-00	Kopel/James/& James Kopel &	NW 1/4 NW1/4 3-115N-35W	551+75	567+63	1588	80	2.92	$1,750
	Kathy Dillion TR of Helen Trust	NW 1/4 NW1/4 3-115N-35W	565+37	567+99	262	*WASCOB	0.58	$348
24-0030-00	Trojan Family Farms LLLP	SW 1/4 NW 1/4 3-115N-35W	567+63	572+86	523	80	0.96	$576
24-00010-00	Kopel/James/& James Kopel &	SE 1/4 NW 1/4 3-115N-35W	572+86	587+80	1494	80	2.74	$1,646
	Kathy Dillion TR of Helen Trust	SE 1/4 NW 1/4 3-115N-35W	586+10	587+66	156	*WASCOB	0.98	$588
24-01140-00	Kelly/Mary	SW 1/4 NE 1/4 3-115N-35W	587+80	592+47	467	80	0.86	$515
24-01130-00	Aakre Family Farms, LLC C/O	NW 1/4 NE 1/4 3-115N-35W	592+47	601+99	952	80	1.75	$1,049
	Sally Jo Aakre	NE 1/4 NE 1/4 3-115N-35W	601+99	613+83	1184	80	2.17	$1,305
24-01140-00	Kelly/Mary	SE 1/4 NE 1/4 3-115N-35W	613+83	615+63	180	80	0.33	$198
24-01110-00	Kopel/Aaron C	SW 1/4 NW 1/4 2-115N-35W	615+63	629+29	1366	80	2.51	$1,505
24-01090-00	Verzalik/Gary	SE 1/4 NW 1/4 2-115N-35W	629+29	642+96	1367	80	2.51	$1,506
		SW 1/4 NE 1/4 2-115N-35W	642+96	658+00	1504	80	2.76	$1,657
24-01120-00	Morgan Family Partnership C/O	NW 1/4 SW 1/4 2-115N-35W	658+00	659+38	138	80	0.25	$152
	Paul Morgan							
24-01100-00	Heller/Ruth/& Naomi Endter, TR	NE 1/4 SE 1/4 2-115N-35W	659+38	678+00	1862	80	3.42	$2,052
Lateral C-1								
24-0030-00	Trojan Family Farms LLLP	SW 1/4 NW 1/4 3-115N-35W	699+78	714+61	1483	80	2.72	$1,634
24-00021-00	Von Bank/Dean/Revocable Trust	NW 1/4 SW 1/4 3-115N-35W	714+61	715+20	59	80	0.11	$65
	& Susan Von Bank							

24-00020-00	Von Bank/Dean/Revocable Trust	NE 1/4 SW 1/4 3-115N-35W	715+20	717+00	180	80	0.33	$198
	& Susan Von Bank							
Lateral C-2								
24-01140-00	Kelly/Mary	SW 1/4 NE 1/4 3-115N-35W	740+15	741+75	160	80	0.29	$176
24-01130-00	Aakre Family Farms, LLC C/O	NW 1/4 NE 1/4 3-115N-35W	741+75	743+93	218	80	0.40	$240
	Sally Jo Aakre							
24-00010-00	Kopel/James/& James Kopel &	NW 1/4 NW 1/4 3-115N-35W	743+93	751+06	713	80	1.31	$786
	Kathy Dillion TR of Helen Trust							
24-01130-00	Aakre Family Farms, LLC C/O	NW 1/4 NE 1/4 3-115N-35W	751+06	754+99	393	80	0.72	$433
	Sally Jo Aakre							
24-00010-00	Kopel/James/& James Kopel &	NE 1/4 NW 1/4 3-115N-35W	754+99	756+00	101	80	0.19	$111
	Kathy Dillion TR of Helen Trust							
Lateral C-3								
24-01130-00	Aakre Family Farms, LLC C/O	NE 1/4 NE 1/4 3-115N-35W	780+14	787+02	688	80	1.26	$758
	Sally Jo Aakre							
24-01131-00	Balderston/Bernard & Norma	5.05 AC Site in N 1/2 of NE 1/4	787+02	787+48	46	80	0.08	$51
24-01130-00	Aakre Family Farms, LLC C/O	NE 1/4 NE 1/4 3-115N-35W	787+48	793+82	634	80	1.16	$699
	Sally Jo Aakre							
27-01780-00	Kopel/James/& James Kopel &		793+82	795+00	118	80	0.22	$130
	Kathy Dillon TR of Helen Trust							
Lateral C-3-1								
24-01130-00	Aakre Family Farms, LLC C/O	NE 1/4 NE 1/4 3-115N-35W	800+10	801+50	140	80	0.26	$154
	Sally Jo Aakre							
Lateral C-3-1-A								
24-01110-00	Kopel/Aaron C	SW 1/4 NW 1/4 2-115N-35W	806+10	806+58	48	80	0.09	$53
		NW 1/4 NW 1/4 2-115N-35W	806+58	817+50	1092	80	2.01	$1,203
Lateral C-3-2								
24-01130-00	Aakre Family Farms, LLC C/O	NE 1/4 NE 1/4 3-115N-35W	829+91	841+05	1114	80	2.05	$1,228
	Sally Jo Aakre	NW 1/4 NE 1/4 3-115N-35W	841+05	846+61	556	80	1.02	$613
Lateral C-4								
24-01090-00	Verzalik/Gary	SW 1/4 NE 1/4 2-115N-35W	860+12	868+56	844	80	1.55	$930
		NW 1/4 NE 1/4 2-115N-35W	868+56	879+94	1138	80	2.09	$1,254

24-01100-00	Heller/Ruth/& Naomi Endter, TR	NE 1/4 NE 1/4 2-115N-35W	879+94	880+00	6	80	0.01	$7
Lateral C-4-1								
24-01090-00	Verzalik/Gary	SW 1/4 NE 1/4 2-115N-35W	889+97	890+75	78	80	0.14	$86
		NW 1/4 NE 1/4 2-115N-35W	890+75	891+23	48	80	0.09	$53
		NE 1/4 NW 1/4 2-115N-35W	891+23	900+68	945	80	1.74	$1,041
Lateral C-4-1								
24-01090-00	Verzalik/Gary	NW 1/4 NE 1/4 2-115N-35W	906+06	907+27	121	80	0.22	$133
		SW 1/4 NE 1/4 2-115N-35W	907+27	912+45	518	80	0.95	$571
Lateral C-5								
24-01090-00	Verzalik/Gary	SW 1/4 NE 1/4 2-115N-35W	920+77	922+45	168	80	0.31	$185
24-01120-00	Morgan Family Partnership C/O	NW 1/4 SW 1/4 2-115N-35W	922+45	925+00	255	80	0.47	$281
	Paul Morgan							
	Total		**Branch C Improvement Right-of-Way Damages=**				**46.68**	**$28,006**

County Ditch 59 Open Ditch, Br 309 & Br C Improvements

Renville County, MN

BR 309 Tile Right-Of-Way Table

Date: 9/13/2023

Filename: H:\RNCO\S15112473\3_Design\A_Calculations\[2020-10-29_112473_CD 59 OPEN DITCH &TILE_ROW.xlsx]Branch 309 R

			Improvement Right-of-Way Damages					Amount/Ac
Parcel No.	**Property Owner**	**Legal Description**	**Station to Station**		**Length**	**Width**	**Area (Acres)**	**$600**
Lateral 309								
24-00100-00	Penke/Eloid O & Christine L/&	NE 1/4 NW 1/4 4-115N-35W	399+19	400+20	101	80	0.19	$111
	Lorna J Staedy							
27-01040-00	Voelz/Robert/&William Voelz	SE 1/4 SW 1/4 33-116N-35W	400+20	413+86	1366	80	2.51	$1,505
	& John Voelz	NE 1/4 SW 1/4 33-116N-35W	413+86	424+72	1086	80	1.99	$1,197
		NE 1/4 SW 1/4 33-116N-35W	424+48	424+72	24	*WASCOB	0.27	$162
27-01030-00	Wat Family Farms LC	NE 1/4 SW 1/4 33-116N-35W	424+72	429+68	496	80	0.91	$547
		NE 1/4 SW 1/4 33-116N-35W	424+72	426+87	215	*WASCOB	0.13	$78
		NW 1/4 SW 1/4 33-116N-35W	429+68	443+01	1333	80	2.45	$1,469
27-00981-00	Schneiderman/Dale & Rachel	NE 1/4 SE 1/4 32-116N-35W	443+01	450+06	705	80	1.29	$777
		SE 1/4 NE 1/4 32-116N-35W	450+06	456+00	594	80	1.09	$655
		SE 1/4 NE 1/4 32-116N-35W	456+00	461+50	550	100	1.26	$758
		NE 1/4 NE 1/4 32-116N-35W	461+50	463+19	169	80	0.31	$186
27-00980-00	Schneiderman/Dale & Rachel	NE 1/4 NE 1/4 32-116N-35W	463+19	470+00	681	80	1.25	$750
Lateral 309-1								
27-01040-00	Voelz/Robert/&William Voelz	SE 1/4 SW 1/4 33-116N-35W	459+97	461+76	179	80	0.33	$197
	& John Voelz							
27-01060-00	Kopel/James/& James Kopel &	SW 1/4 SE 1/4 33-116N-35W	461+76	461+98	22	80	0.04	$24
	Kathy Dillon TR of Helen Trust							
Lateral 309-2								
27-01040-00	Voelz/Robert/&William Voelz	SE 1/4 SW 1/4 33-116N-35W	474+75	475+67	92	80	0.17	$101
	& John Voelz							
27-01060-00	Kopel/James/& James Kopel &	NW 1/4 SE 1/4 33-116N-35W	475+67	481+29	562	80	1.03	$619
	Kathy Dillon TR of Helen Trust							
Lateral 309-3								
27-01040-00	Voelz/Robert/&William Voelz		491+00	497+00	600	80	1.10	$661

	& John Voelz							
27-01030-00	Wat Family Farms LC	NE 1/4 SW 1/4 33-116N-35W	497+00	503+81	681	80	1.25	$750
		SE 1/4 NW 1/4 33-116N-35W	503+81	517+00	1319	80	2.42	$1,453
		SE 1/4 NW 1/4 33-116N-35W	517+00	517+21	21	100	0.05	$29
		NE 1/4 NW 1/4 33-116N-35W	517+21	526+00	879	100	2.02	$1,211
		NE 1/4 NW 1/4 33-116N-35W	526+00	527+34	134	80	0.25	$148
27-01050-00	Ahrenholz/Troy	NW 1/4 NE 1/4 33-116N-35W	527+34	531+27	393	80	0.72	$433
27-00801-00	Lippert/James & Carol/Trustees	SW 1/4 SW1/4 28-116N-35W	531+27	532+50	123	80	0.23	$136
	James & Carol Lippert Trust							
	Total		**Branch 309 Improvement Right-of-Way Damages=**				**20.57**	**$12,341**