

Bridge Replacement  
 BRFN-059-5(60)--39-24  
 LETTING DATE  
 Oct 15 2024

CRAWFORD COUNTY



PLANS OF PROPOSED IMPROVEMENT ON THE  
**PRIMARY ROAD SYSTEM**  
**CRAWFORD COUNTY**  
 Bridge Replacement  
 US 59 Bridge over East Soldier  
 River, 2.9 miles south of  
 County Road E16  
SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

Value Engineering Saves. Refer to Article 1105.14 of the Specifications.

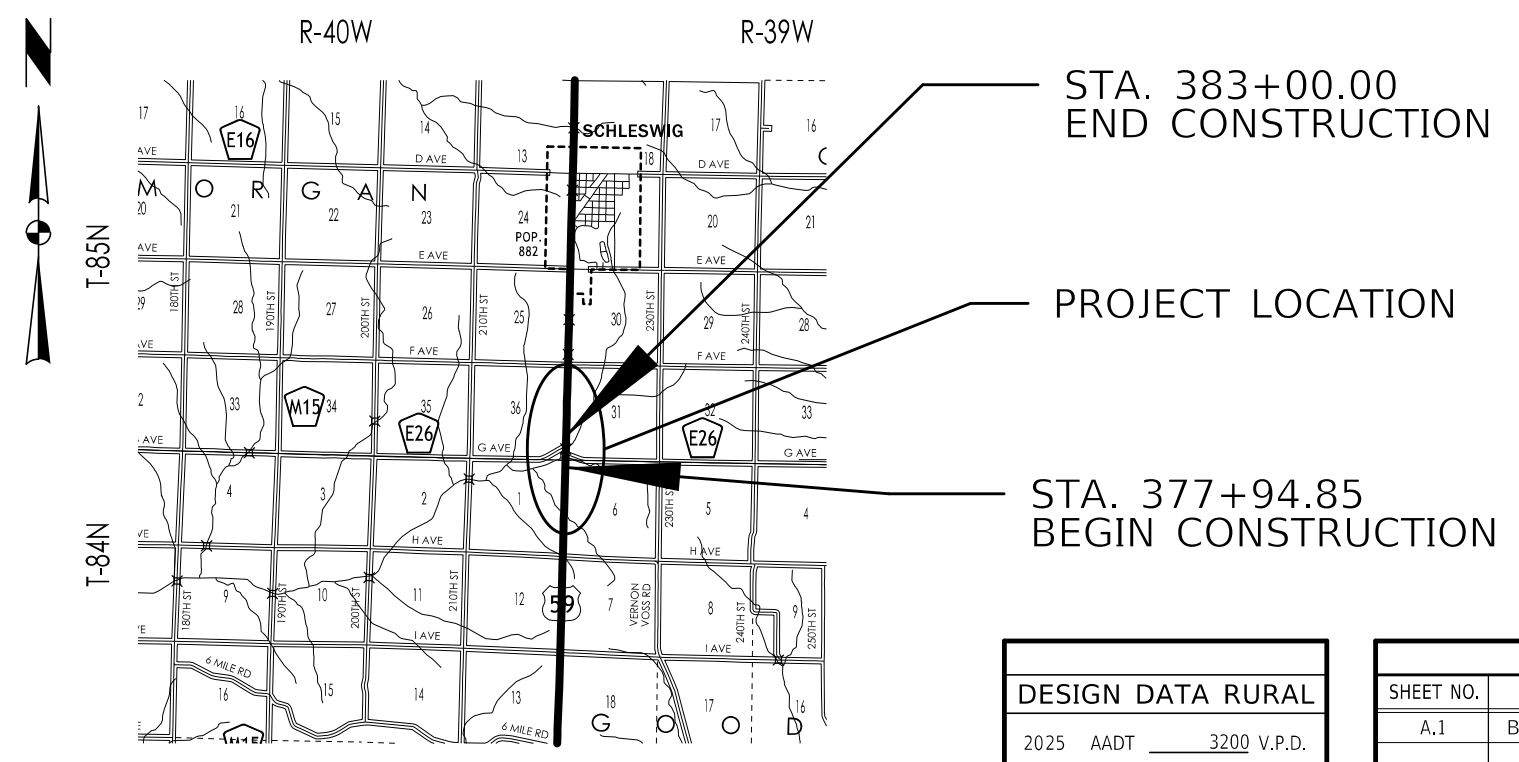


REVISIONS	TOTAL 44
PROJECT IDENTIFICATION NUMBER	
20-24-059-010	
PROJECT NUMBER	
BRFN-059-5(60)--39-24	
R.O.W. PROJECT NUMBER	
NHSN-059-5(61)--2R-24	

No.	DESCRIPTION
<b>INDEX OF SHEETS</b>	
<b>A Sheets</b>	<b>Title Sheets</b>
A.1	Title Sheet
<b>B Sheets</b>	<b>Typical Cross Sections and Details</b>
B.1 - 2	Typical Cross Sections and Details
<b>C Sheets</b>	<b>Quantities and General Information</b>
C.1	Project Description
<b>D Sheets</b>	<b>Mainline Plan and Profile Sheets</b>
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2	US 59
<b>G Sheets</b>	<b>Survey Sheets</b>
G.1 - 3	Reference Ties and Bench Marks
G.4	Horizontal Control Tab. & Super for all Alignments
<b>J Sheets</b>	<b>Traffic Control and Staging Sheets</b>
* J.1	Traffic Control Plan
<b>R Sheets</b>	<b>Erosion Control Sheets</b>
* RR.1	Erosion Control Legend and Symbol Information Sheet
* RR.2	Drainage Basin and Erosion Control Device Maps
<b>U Sheets</b>	<b>500 Series, Mod.Stds. and Detail Sheets</b>
U.1	500 Series, Modified Standards and Detail Sheets
<b>V Sheets</b>	<b>Bridge and Culvert Situation Plans</b>
* V.1 - 3	Bridge and Culvert Situation Plans
<b>W Sheets</b>	<b>Mainline Cross Sections</b>
* W.1	Cross Sections Legend & Symbol Information Sheet
* W.2 - 12	Mainline Cross Sections
<b>X Sheets</b>	<b>Side Road Cross Sections</b>
* X.1 - 6	RCB Excavations
* X.7 - 15	G AVENUE
* Color Plan Sheets	

H Sheets

MILEAGE SUMMARY			
		105-1	
		09-27-94	
Div.	Location	Lin. Ft.	Miles
1	Sta. 377+94.85 to Sta. 383+00.00	505.15	0.096
	Deduct Bridge at Sta. 379+71.40	34.64	0.006
	Total New Bridge at Sta. 379+71.22	21.07	0.004
Total Length of Roadway in Project		470.51	0.089
Total Length of Bridge in Project		34.64	0.006
Total Net Length of Project		505.15	0.096



DESIGN DATA RURAL	
2025 AADT	3200 V.P.D.
2045 AADT	3700 V.P.D.
2025 DHV	38.0 V.P.H.
TRUCKS	12 %
Total Design ESALs	--

INDEX OF SEALS		
SHEET NO.	NAME	TYPE
A.1	Brian T. Higginbotham	Primary Signature Block

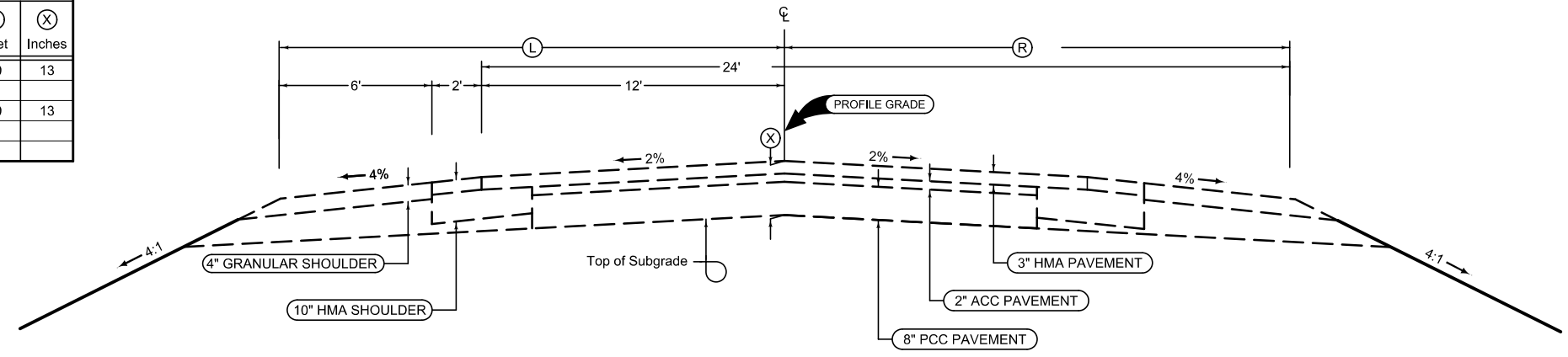
PRELIMINARY PLANS

Subject to change by final design.

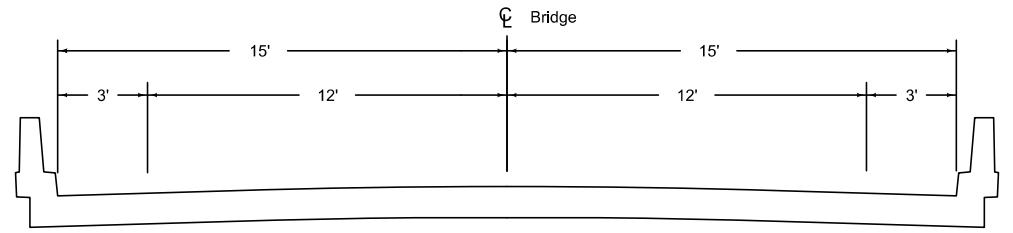
D5 PLAN - Date: 11/01/2022

LOCATION		DIMENSIONS		
ROAD IDENTIFICATION	STATION TO STATION	Ⓐ Feet	Ⓑ Feet	Ⓒ Inches
US 59 Bridge	377+94.85 379+53.90	20	20	13
US 59	379+90.10 383+00.00	20	20	13

G\_2\_Grade  
Modified



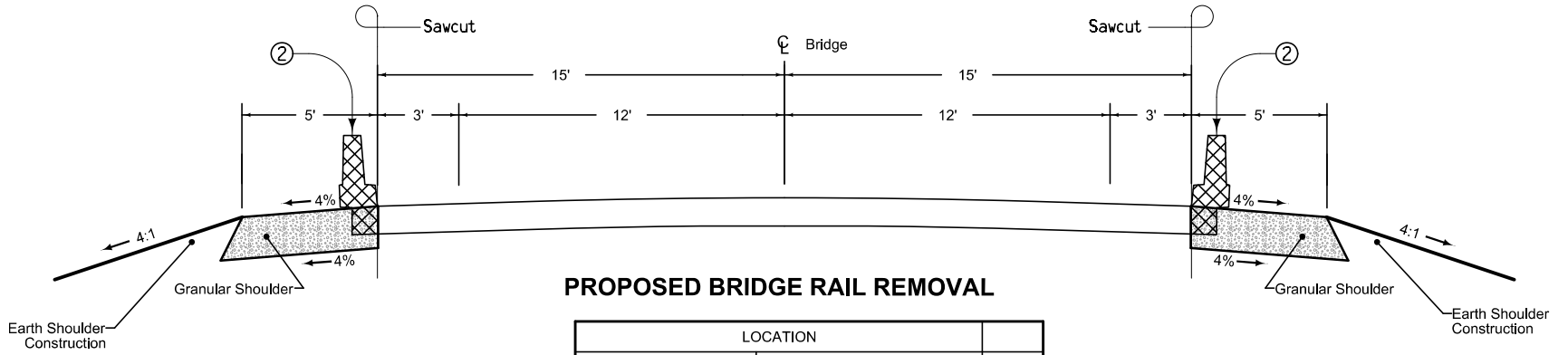
2 LANE EXISTING ROADWAY



2 LANE EXISTING BRIDGE

LOCATION	
ROAD IDENTIFICATION	STATION TO STATION
US 59	379+53.90 379+90.10

Exist Bridge  
04-21-22



PROPOSED BRIDGE RAIL REMOVAL

LOCATION		
ROAD IDENTIFICATION	STATION TO STATION	SIDE
US 59	379+44.88 379+80.66	LT
US 59	379+62.45 379+97.75	RT

- ① Sawcut at face of Bridge Rail. Replace with 5' wide granular shoulder.
- ② Removal of Bridge Rail paid for as "Removals, As Per Plan"
- ③ Refer to 4317 Modified on Sheet U.1 for additional details.

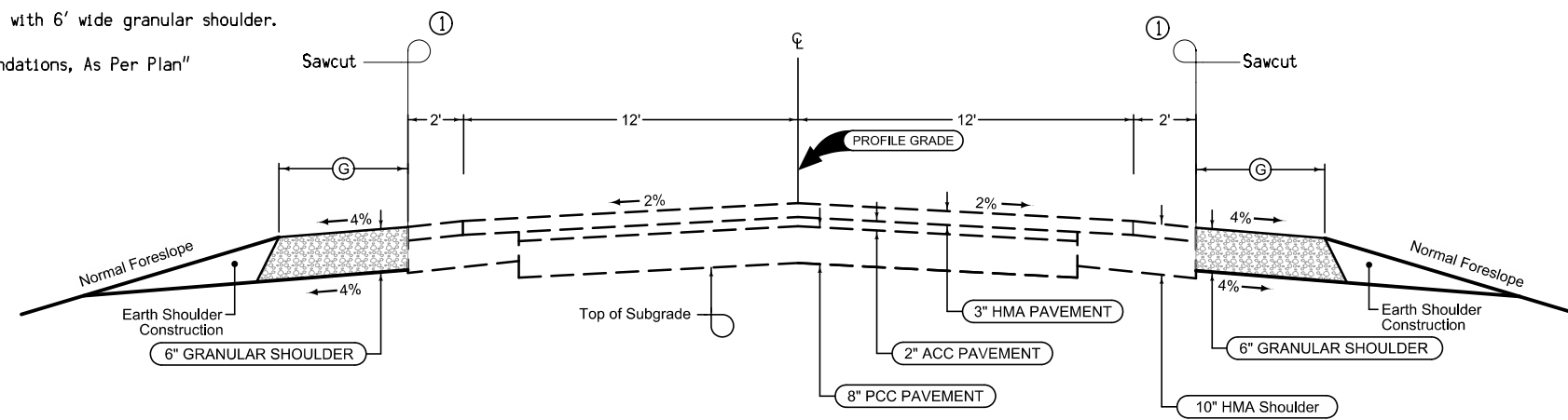
Bridge Shld.  
08-31-22

- ① Sawcut at 14' from  $\mathcal{C}$ . Remove guardrail pavement. Replace with 6' wide granular shoulder.
- ② Removal of Attenuator Anchor paid for as "Removal of Foundations, As Per Plan"

**Granular Shoulder**

STATION TO STATION		① Feet
377+94.85	379+44.88	6
379+80.66	379+85.28	6

2\_G\_SR\_04-21-20



**Granular Shoulder**

STATION TO STATION		① Feet	Remarks
379+57.50	379+62.45	6	②
379+97.75	381+65.39	6	

2\_G\_SR\_MODIFIED

**PROPOSED GUARDRAIL PAVEMENT REMOVAL**

7151  
Modified

**TYPICAL SECTION  
RETROFIT GRANULAR SHOULDER**

Location			① Feet	② TON/STA
Road Identification	Station To Station	Side	Feet	TON/STA
US 59	377+94.85 - 379+36.45	RT	6	3.56
US 59	381+65.39 - 383+00.00	RT	6	6.56
US 59	381+69.99 - 383+00.00	LT	6	10.72

① Dressing estimated at Tons Per STA

7151  
Modified

**TYPICAL SECTION  
RETROFIT GRANULAR SHOULDER**

Location			① Feet	② TON/STA
Road Identification	Station To Station	Side	Feet	TON/STA
G AVENUE	2379+30.00 - 2380+37.00	LT	3	42.3
G AVENUE	2379+30.00 - 2380+37.00	RT	3	15.5

① Dressing estimated at Tons Per STA  
② 12' off  $\mathcal{C}$  or along return alignment. See Sheet G.4

100-1D  
10-18-05

**PROJECT DESCRIPTION**

This project involves the placement of a new twin 8' X 10' RCB under the existing US 59 bridge (maint. No. 2411.7509) over the East Soldier River, 2.9 miles south of County Road E16. The existing bridge will remain in-place and existing bridge rails and guardrail will be removed. The culvert ends will extend beyond the roadway clear zone.

102-5  
04-18-17

**EXISTING PAVEMENT**

No.	Location					Year	Type	Project Number	Surface		Base		Subbase		Removal		Coarse Aggregate			Reinforcement	Remarks
	County	Route	Dir. of Travel	Begin Ref. Loc. Sign	End Ref. Loc. Sign				Type	Depth	Type	Depth	Type	Depth	Type	Depth	Source	Type	Durability Class	Type	
1	CRAWFORD	US59	NB/SB	MP 104.83	MP 117.59	2012		STP-059-5(51)--2C-24	HMA	1.5		1.5				2					
	CRAWFORD	US59	NB/SB	MP 104.83	MP 117.59	2012	Widening	STP-059-5(51)--2C-24	HMA	1.5		1.5	HMA	7							
2	CRAWFORD	US 59	NB/SB	MP 104.83	MP 117.59	1991		FN-59-5(23--21-24	ACC	2		2					FT. DODGE MINE	C LST.			
3	CRAWFORD	US 59	NB/SB	MP 104.83	MP 117.59	1948		F-879 (2)	PCC	8							SACTON	GRAVEL	3	FD-1	



### SURVEY SYMBOLS

- BCL Bridge Centerline
- BD Bridge Deck
- BL Topo Breakline
- BNK Stream Bank
- BRG Bridge
- C Centerline BL of Road (ML or SR)
- CON Concrete or A/C Slab
- > D Centerline Draw or Stream (Down)
- < DU Centerline Draw or Stream (Up)
- EG Edge of Gravel Road
- ENT Centerline BL of Entrance
- ENU Edge Unpaved Entrance & Parking
- EP Edge of Paved Roads (ML or SR)
- EW Edge of Water
- FO - FO1D - Arcadia Telephone Cooperative - Quality D
- F02 - FO2D - ICN - Quality D
- GDL Guard Rail Steel
- PIP Pipe Culvert
- RET Retaining Walls
- △ RIP Rip-Rap
- SH Paved Shoulder
- SNP Unpaved Shoulder
- T1 - TL1D - Windstream - Quality D
- W - WL1D - West Central Iowa Rural Water - Quality D
- CP Control Point
- SOP Size of Pipe or Culvert
- PRO Profile Shot
- WC Wild Card (Misc. Field Shot)
- SBR Size of Bridge
- PLG Location of General Photo
- SIGN SI Sign
- DTM Photogrammetry Elv Control Check
- TP TPD Telephone Pedestal
- GR Ground Shot
- TW Top of Water
- SP Stream Profile
- PPA Western Iowa Power Co
- PR Electric Riser Pole
- MIS Miscellaneous
- B BIN Grain Bin
- BLS Bridge Low Steel

### SURVEYED UTILITY OWNER SYMBOLS

Sub-Surface Utility Mapping Quality Level is in accordance with CI/ASCE 38-02 Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data.

- Remark Abbreviations  
 QLA Quality Level A Highest guideline quality level  
 QLD Quality Level D Lowest guideline quality level
- FO - FO1D - Arcadia Telephone Cooperative - Quality D
  - F02 - FO2D - ICN - Quality D
  - T1 - TL1D - Windstream - Quality D
  - W - WL1D - West Central Iowa Rural Water - Quality D
  - PPA Western Iowa Power Co

### PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design	Color No.	
Green	(2)	█	Existing Topographic Features and Labels
Blue	(1)	█	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Magenta	(5)	█	Existing Utilities
SHADING		Design Color No.	
Lavender	(9)	█	Temporary Pavement Shading
Yellow	(4)	█	Proposed Pavement Shading
Orange	(6)	█	Proposed Granular Shading
Orange	(70)	█	Proposed Shoulder Granular Shading
Yellow	(68)	█	Proposed Shoulder Paved Full Depth Shading
Yellow	(132)	█	Proposed Shoulder Paved Partial Depth Shading
Gray, Dark	(112)	█	Proposed Grade and Pave Shading "In conjunction with a paving project"
Brown, Light	(236)	█	Grading Shading
Orange, Light	(134)	█	Proposed Granular Entrance Shading
Yellow	(220)	█	Proposed Paved Entrance Shading
Tan	(8)	█	Proposed Sidewalk Shading
Blue, Light	(230)	█	Proposed Sidewalk Landing Shading
Pink	(11)	█	Proposed Sidewalk Ramp Shading
Green, Light	(225)	█	Existing Pavement Shading
Red	(3)	█	Proposed Structure Shading

### PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design	Color No.	
Green	(2)	█	Existing Ground Line Profile
Blue	(1)	█	Proposed Profile and Annotation
Magenta	(5)	█	Existing Utilities
Blue, Light	(230)	█	Proposed Ditch Grades, Left
Black	(0)	█	Proposed Ditch Grades, Median
Rust	(14)	█	Proposed Ditch Grades, Right

Reference Point

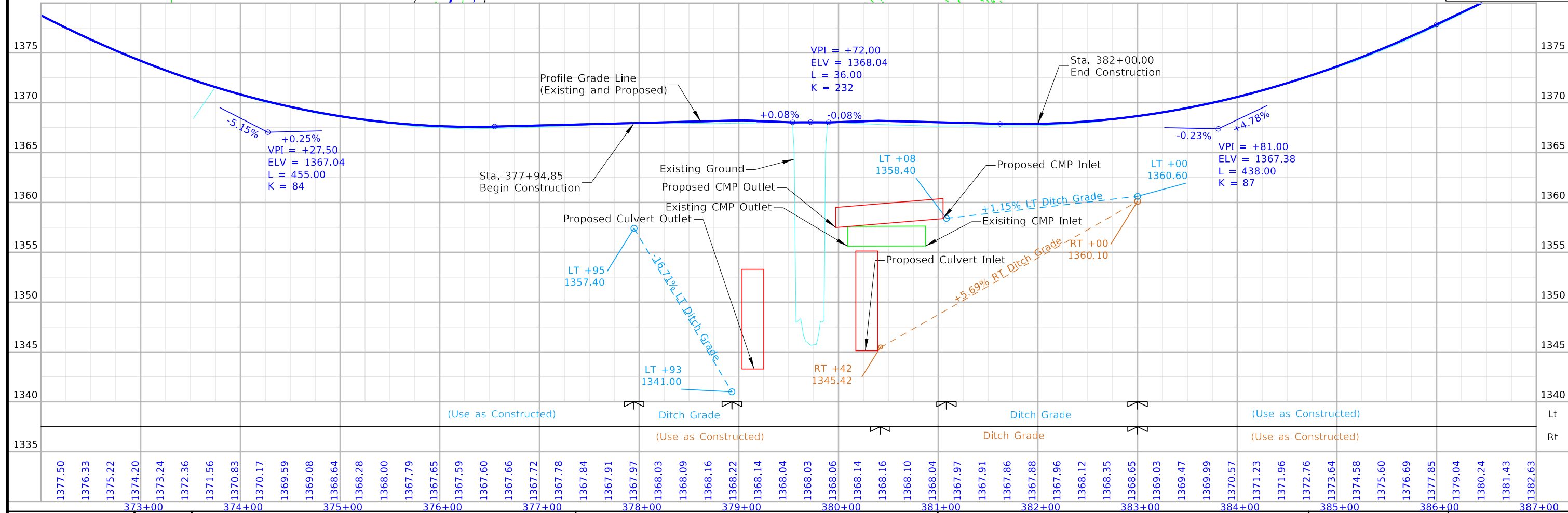
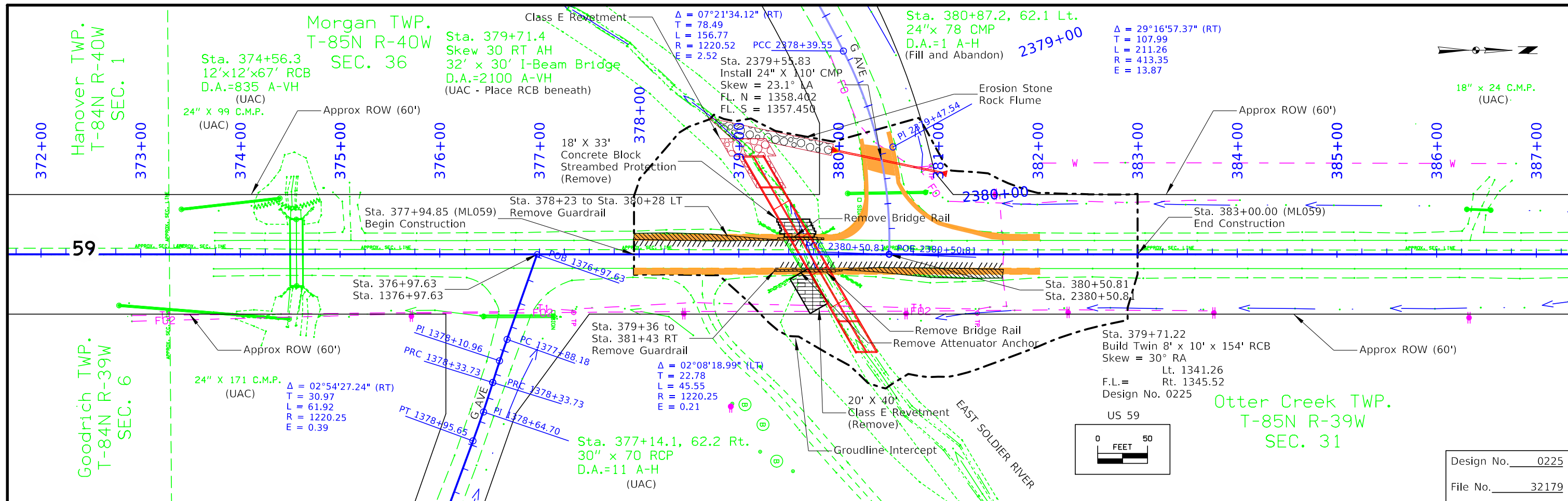
- Station
- ▲ Section Corner
- Ground Line Intercept
- Saw Cut
- Guardrail
- Trench Drain
- HighTension Cable Guardrail
- Sheet Pile
- ▨ Pavement Removal
- ▩ Clearing & Grubbing Area
- ▧ Revetment Removal

#### RIGHT-OF-WAY LEGEND

- ▲ Proposed Right-of-Way
- △ Existing Right of Way
- ▲ Existing and Proposed Right-of-Way
- ▲ Easement and Existing Right-of-Way
- Easement (Temporary)
- Easement
- C/A Access Control
- Property Line

## PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

(COVERS SHEET SERIES D, E, F, & K)



FILE NO. 32179	ENGLISH	DESIGN TEAM Iowa DOT / HGM	CRAWFORD COUNTY	PROJECT NUMBER BRFN-059-5(60)--39-24	SHEET NUMBER D.2
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## Survey Information

**Crawford County**  
**BRFN-059-5(60)- -39-24**  
**Soldier River 2.9 mi S of Co Rd E16**  
**Project Directory: 2405901020**  
**PIN 20-24-059-010**  
**Sap-0627.4**

### Party Personnel

Clayton Henningsen- Survey Party Chief  
Jason Arn- Survey Party Chief  
Paul Harry- Asst. Party Chief

### Date(s) of Survey

Begin Date 06/01/2020  
End Date 07/21/2020

### General Information

Measurement units for this survey are US survey feet. This survey is for proposed bridge reconstruction on US 59 south of Schleswig. This is a partial terrain and underground structure field survey with aerial image and lidar acquired terrain added in the Photogrammetry section of the Design Office.

### Vertical Control

Vertical datum for this survey is NAVD88 (Computed using Geoid12b). GRS80 Ellipsoidal Height was computed at project Pts. 24059013, 24059014, 24059015, H 186, and F 94 by doing concurrent 6 hour static observations. The project control is relative to nearby Iowa RTN Base Stations.

This survey observed 2 NGS GPS control with published NAVD88 heights to compare to local ground control:

NGS mark designated F 94 (PID NL0331) has a published Elev. of 1368.06  
Survey Elev. = 1368.074

NGS mark designated H 186 (PID DP4672) has a published Elev. of 1421.31  
Survey Elev. = 1421.144

### Horizontal Control

The project coordinate system for this survey is Iowa RCS Zone 6 (U.S. Survey Feet). This survey control is relative to IaRTN reference stations. IaRTN Reference Station coordinates are relative to the National Reference Station network datum: NAD83 (2011) for Epoch 2010.00. Coordinates were determined by conducting concurrent 6 hour static observations on Project Pts. 24059013, 24059014, 24059015, H 186, and F 94.

### Alignment Information

The horizontal alignment for this survey is a retrace of As-built Plans No. F-879(2). Survey stationing was equated to the plan POT at Sta. 346+79.0 and run ahead without equation throughout the survey.

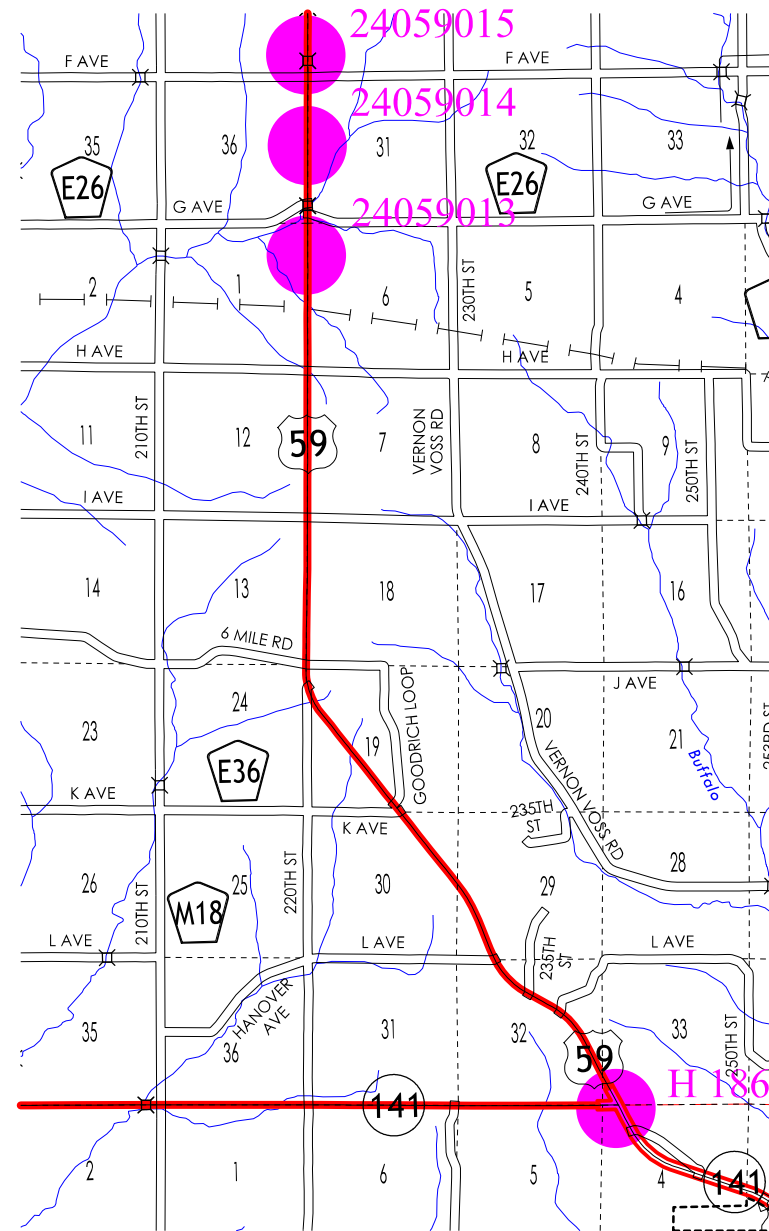
Survey stationing relates to as built plan stationing as follows:

POT Sta. 346+79.0 As-built Plans Project No. F-879(2)  
Survey POT Sta. 346+79.0

POT Sta 399+44.4 As-built Plans Project No. F-879(2)  
Survey POT Sta. 399+42.74

## CONTROL POINT VICINITY MAP

This map is a guide to the vicinity of the primary project control points. Primary control is for use with RTK base stations and for RTN validation. Future surveys will use primary project control to establish temporary control as needed for construction or other surveying applications.



HORIZ. DATUM: NAD83(2011) EPOCH 2010.00

VERT. DATUM: NAVD88

1a. Regional Coordinate System Zone 6

Coordinate listing from next sheet will be used with 1aRTN for monument recovery. No other reference ties are given.

HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING

HORIZ. DATUM: NAD83(2011) EPOCH 2010.00

VERT. DATUM: NAVD88

Ia. Regional Coordinate System Zone 6

Control Points are Bench Marks

Point Name	North Coordinate	East Coordinate	Elevation	Feature Code- Monument Description
24059013	7281846.238	16579639.74	1412.678	CP 24059013 AT THE INTERSECTION OF HIGHWAY 59 AND CO RD E16 IN SCHLESWIG GO 3.2 MI SOUTH ALONG HWY 59 SET FENO MONUMENT IN FIELD ENTRANCE ON WEST SIDE OF HIGHWAY 25 FEET SOUTH OF ENTRANCE CENTERLINE 52 FEET WEST OF HWY 59 CENTERLINE
24059014	7285783.945	16579668.86	1408.904	CP 24059014 AT THE INTERSECTION OF HIGHWAY 59 AND CO RD E16 IN SCHLESWIG GO 2.4 MI SOUTH ALONG HWY 59 FOUND BUTTON ON INLET HDWL 3X3 BOX CULVERT 26 FEET WEST HWY 59 CENTERLINE 24 FEET NORTH OF A NO PASSING ZONE SIGN AND 41 FEET EAST OF A BURIED FIBER OPTIC CABLE SIGN
24059015	7286929.934	16579620.3	1439.036	CP 24059015 AT THE INTERSECTION OF HIGHWAY 59 AND CO RD E16 IN SCHLESWIG GO 2.2 MI SOUTH ALONG HWY 59 FOUND X ON ROW RAIL ALONG NORTH EDGE OF ENTRANCE TO WEST 31 FEET SOUTHWEST OF TOP CENTER INLET 24 IN CMP 75 WEST OF HWY 59 CENTERLINE 76 FEET SOUTH OF P POLE
F 94	7310322.422	16627374.37	1368.074	CP F 94 AT KIRON GO EAST ALONG B AVE 3.0 MILES AT INTERSECTION OF B AVE AND 310TH ST GO NORTH 0.1 MILE ALONG 310 TH ST FOLLOW FENCELINE 500 FEET TO THE EAST ALONG OLD RR BED A STANDARD DISK STAMPED F 94 1935 AND SET IN THE TOP OF A CONCRETE POST 6 FEET NORTHEAST OF CORNER POST
H 186	7251200.108	16590760.15	1421.153	CP H 186 THE STATION IS LOCATED ABOUT 9.1 MI SOUTH-SOUTHEAST OF SCHLESWIG 8.9 MI NORTH-NORTHEAST OF DOW CITY AND 2.6 MI WEST-NORTHWEST OF DENISON THE GRAVITY CONTROL MARK IS FOUND NORTHWEST OF DENISON AT THE JUNCTION OF STATE ROUTE 141 AND 59 61 FT EAST OF THE FOG LINE OF THE STATE ROUTE 141 RAMP TO STATE ROUTE 59 ALIGNED WITH A YIELD SIGN 40.5 FT SOUTH OF A YIELD SIGN 31 FT SOUTHEAST OF A USGS GRAY WELL BOX 8.5 FT WEST OF A T-POST ENCASED IN ORANGE TUBING 1.7 FT SOUTHWEST OF A FIBERGLASS WITNESS POST AND SET IN THE TOP OF A 1 FT DIAMETER BY 4 FT DEEP BELLOWED OUT CONCRETE MONUMENT SURROUNDED BY A 2 FT DIAMETER BY 0.5 FT DEEP CONCRETE COLLAR



**ALIGNMENT COORDINATES**

Name	Location	Point on Tangent			Begin Spiral			Begin Curve			Simple Curve PI or Master PI of SCS			End Curve			End Spiral		
		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates	
			Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)
20000	ML059	346+79.00	7280347.47	16579689.68															
20001	ML059	399+42.74	7285611.21	16579694.49															
30000	CULV379	1376+18.51	7283398.03	16579444.90															
30001	CULV379	1376+88.48	7283457.74	16579481.39															
30002	CULV379	1378+56.71	7283582.71	16579594.00															
30003	CULV379	1380+84.61	7283696.66	16579791.37															
30004	CULV379	1381+56.65	7283738.84	16579849.77															
30005	CULV379	1382+17.37	7283784.70	16579889.57															
30006	CULV379	1383+05.43	7283835.12	16579961.77															
30007	CULV379	1383+78.14	7283894.41	16580003.86															
31000	SR G AVE																		
31001	SR G AVE																		
								1376+82.78	7283594.39	16579353.67	1377+61.27	7283638.32	16579418.72	1378+39.55	7283673.55	16579488.86			
								1378+39.55	7283673.55	16579488.86	1379+47.54	7283723.05	16579584.84	1380+50.81	7283719.28	16579692.76			
31010	SR G AVE RET 1	1379+37.05	7283690.65	16579584.12															
31011	SR G AVE RET 1																		
								1379+83.30	7283694.57	16579628.18	1380+21.96	7283702.03	16579664.48	1380+29.92	7283665.90	16579672.71			
31020	SR G AVE RET 2	1379+30.00	7283720.43	16579569.31															
31021	SR G AVE RET 2																		
								1379+83.42	7283831.61	16579623.53	1380+22.33	7283753.96	16579662.30	1380+28.26	7283798.25	16579668.68			
31022	SR G AVE RET 2	1380+32.13	7283838.48	16579672.87															

**SPIRAL OR CIRCULAR CURVE DATA**

Name	Location	ΔSCS	Horizontal Alignment Data												Remarks				
			Spiral Data						Curve Data										
			θS	Ls	Ts	Es	Xc	Yc	L.T.	S.T.	ΔC	T	L	R		E			
31000	SR G AVE																		
31001	SR G AVE																		
31011	SR G AVE RET 1																		
31021	SR G AVE RET 2																		

NO ACCESS RIGHTS ARE TO BE ACQUIRED ON THIS PROJECT.

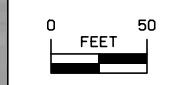
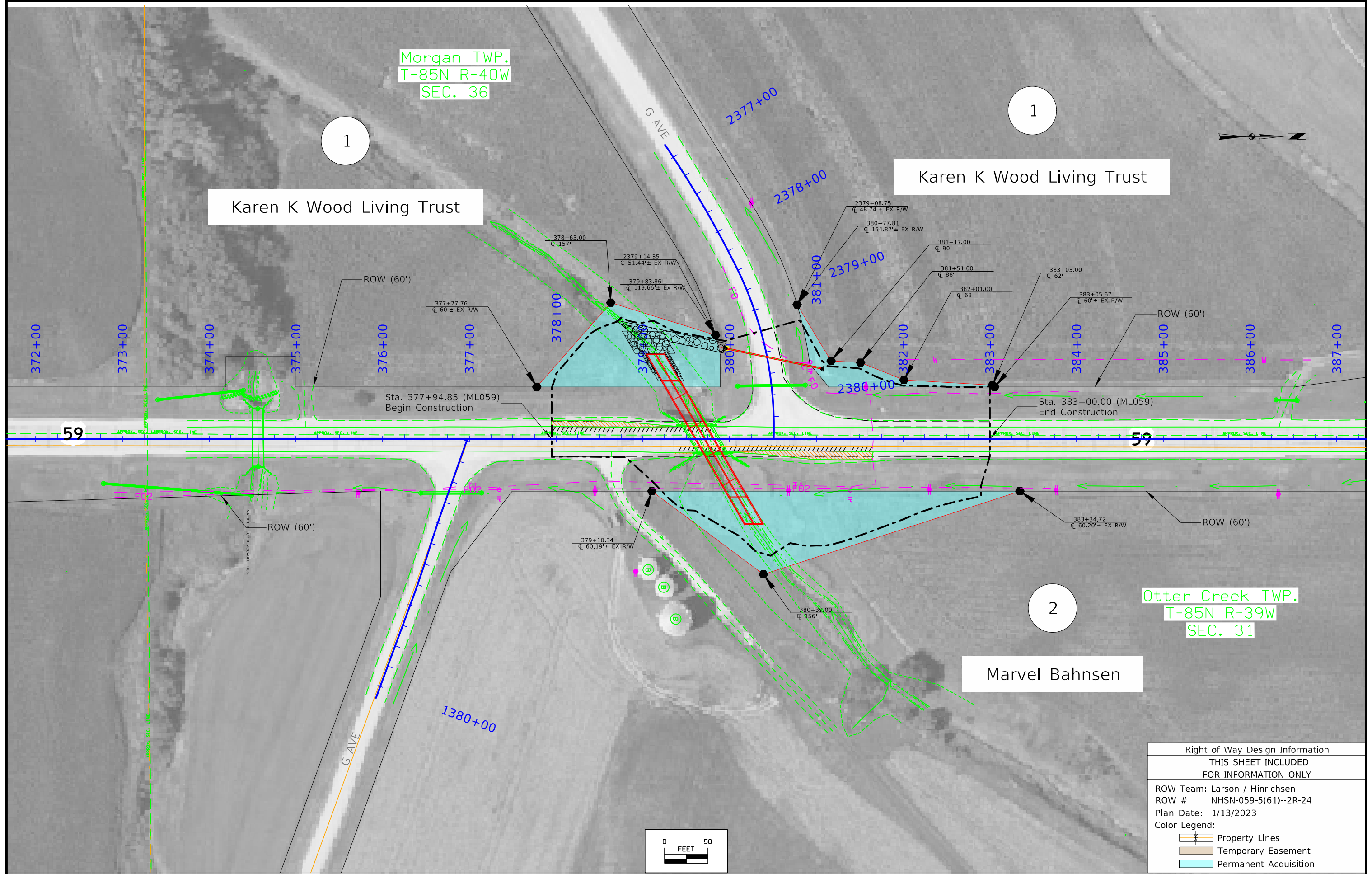
Morgan TWP.  
T-85N R-40W  
SEC. 36

Karen K Wood Living Trust

Karen K Wood Living Trust

Otter Creek TWP.  
T-85N R-39W  
SEC. 31

Marvel Bahnsen



Right of Way Design Information	
THIS SHEET INCLUDED FOR INFORMATION ONLY	
ROW Team: Larson / Hinrichsen	
ROW #: NHSN-059-5(61)--2R-24	
Plan Date: 1/13/2023	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition



108-23A  
08-01-08

### TRAFFIC CONTROL PLAN

There will be no off-site detour for US 59. One lane of traffic will be maintained during backfilling of the culvert under the bridge utilizing lane closure with flaggers. County Roads E26 G Avenue (east and west) will remain open.

108-26A  
08-01-08

### STAGING NOTES

Contractor shall remove bridge rail, contiguous guardrail, guardrail anchor, and approach curb in a single day, backfill adjacent to the driving surface of the bridge, and not allow overnight non-traversable slopes (3:1 or steeper).

Bridge rail, guardrail, anchor, and curb on opposite side of bridge may be removed on a separate day.

### LINE STYLE LEGEND OF LANDSCAPE SHEETS

LINETYPE	Design Element
	Living Snow Fence Single Row
	Living Snow Fence Double Row
	Mechanical Edge

### CELL LEGEND OF LANDSCAPE SHEETS

CELL	Design Element	Plant Diameter
	Clearing	
	Proposed Shrub	
	Proposed Understory Tree	
	Proposed Conifer Tree	
	Proposed Overstory Tree	

### PATTERN LEGEND OF LANDSCAPE SHEETS

	Brush Clearing		Spary Area
	Clearing & Grubbing		

### LINE STYLE LEGEND OF EROSION CONTROL SHEETS

LINETYPE	Design Element
	Silt Fence
	Perimeter and Slope Sediment Control Device (9")
	Perimeter and Slope Sediment Control Device (12")
	Perimeter and Slope Sediment Control Device (20")
	Open-Throat Curb Intake Sediment Filter
	Concentrated Flow
	Rock Check and Rock Check Dam
	Sheet Flow

### CELL LEGEND OF EROSION CONTROL SHEETS

CELL	Design Element
	Temporary Sediment Control basin
	Erosion Control for Circular Intake or Manhole Well
	Erosion Control for Rectangular Intake or Manhole Well
	Grate Intake Sediment Filter Bag
	Silt Basin
	Silt Fence Tail
	Stormwater Drainage Basin Discharge Point

### PLAN VIEW COLOR LEGEND OF EROSION CONTROL SHEETS

LINWORK	Design Color No.	Design Element
Green	(2)	Existing Topographic Features and Labels
Blue	(1)	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Magenta	(5)	Existing Utilities
Black	(0)	Permanent Erosion Control Features
Blaze Orange	(222)	Temporary Erosion Control Features

SHADING	Design Color No.	Design Element	Transparency
Citron	(234)	Mulching, All Types	50%
Light Brown	(238)	Special Ditch Control, Wood Excelsior Mat	0%
Grass Green	(233)	8FT Mow Strip	50%

### PATTERN LEGEND OF EROSION CONTROL SHEETS

	Seeding and Fertilizing		Turf Reinforcement Mat Type 1
	Seeding and Fertilizing (Rural)		Turf Reinforcement Mat Type 2
	Seeding and Fertilizing (Urban)		Turf Reinforcement Mat Type 3
	Native Grass Seeding		Turf Reinforcement Mat Type 4
	Salt Tolerant Seeding		Slope Protection, Wood Excelsior Mat
	Wetland Grass Seeding		Transition Mat
	Wildflower Seeding		Rock Features, Permanent
	Sodding		Rock Features, Temporary

## EROSION CONTROL LEGEND AND SYMBOL INFORMATION SHEET

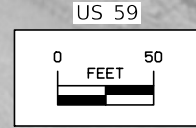
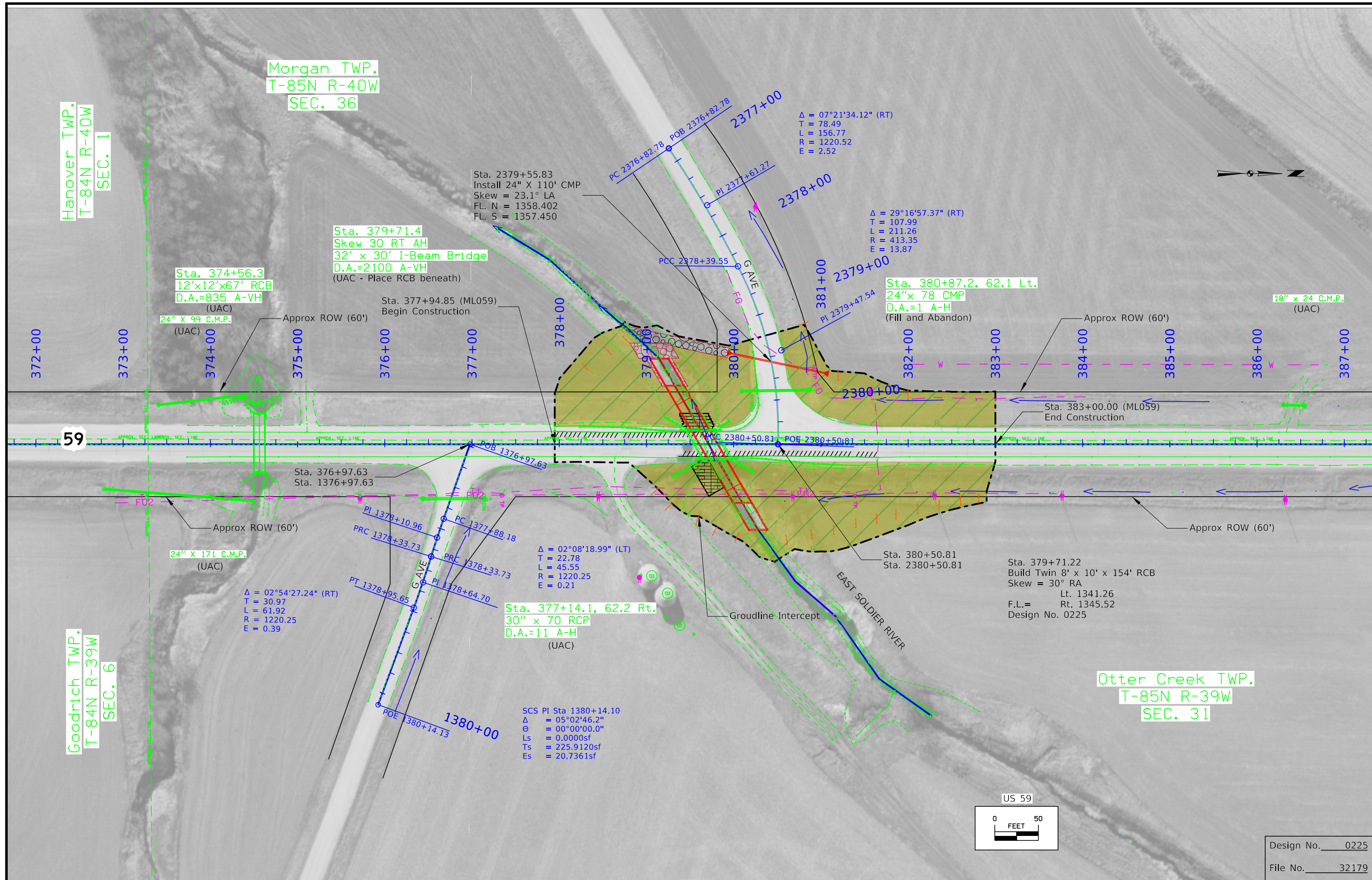
(COVERS SHEET SERIES R)

Morgan TWP.  
T-85N R-40W  
SEC. 36

Hanover TWP.  
T-84N R-40W  
SEC. 1

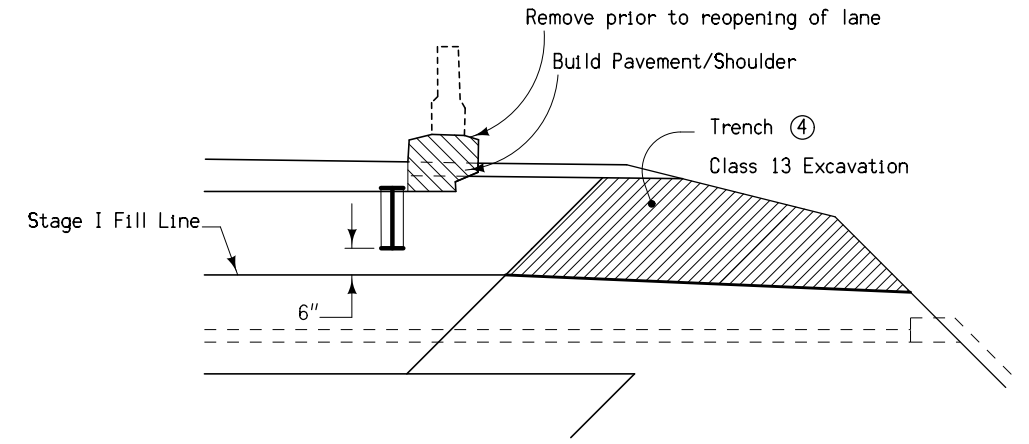
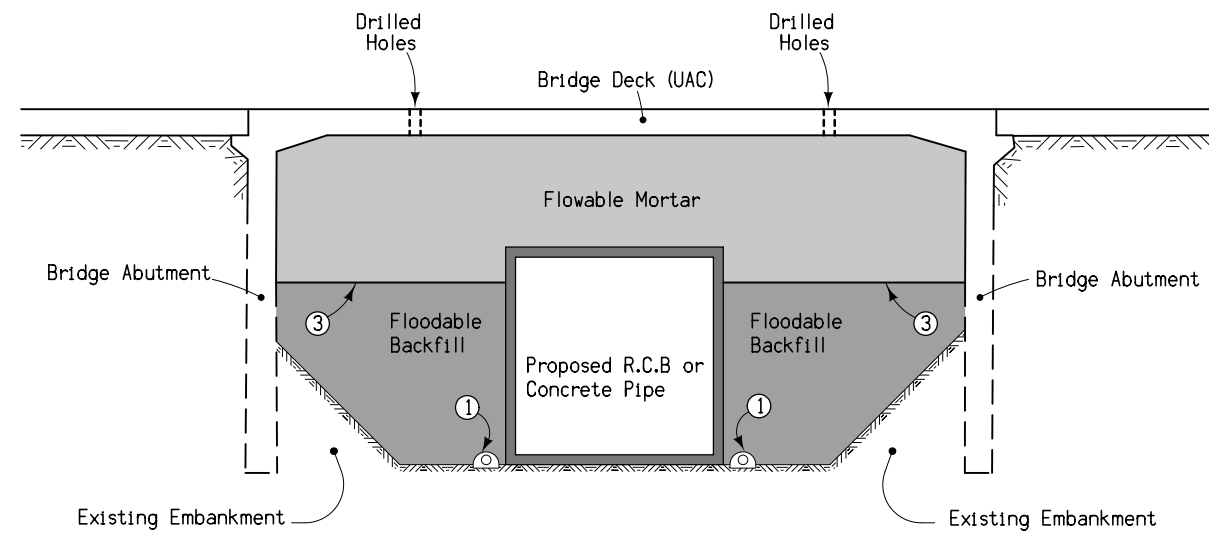
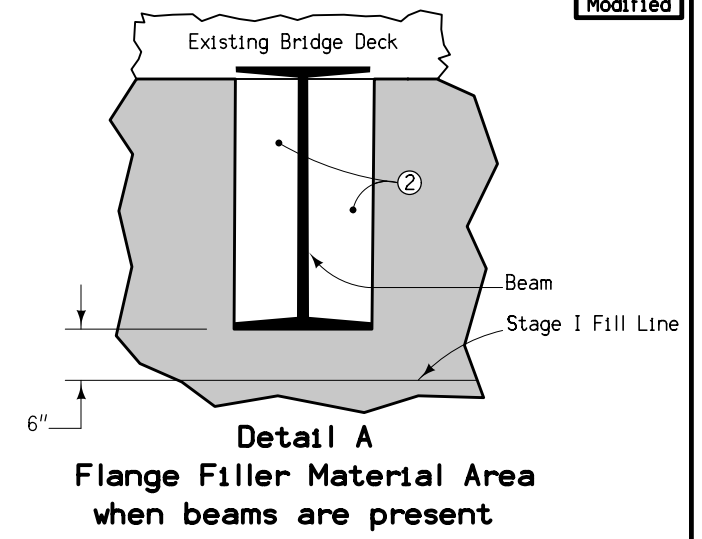
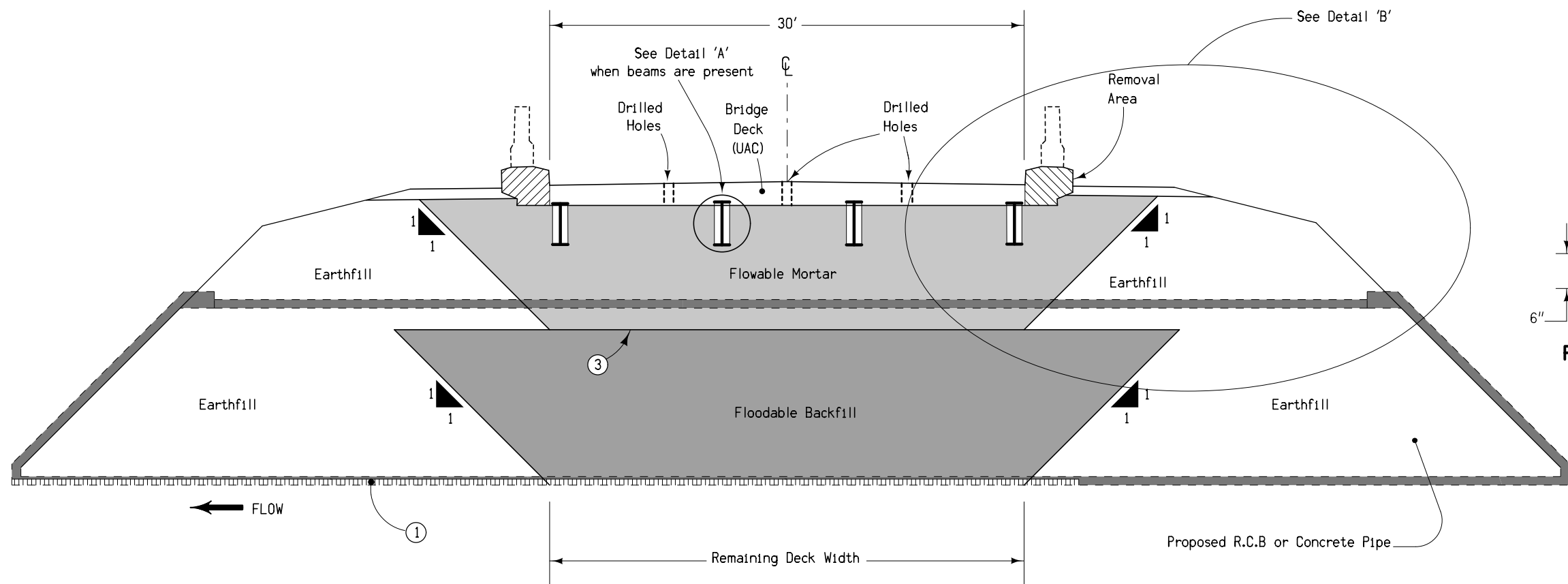
Goodrich TWP.  
T-84N R-39W  
SEC. 6

Otter Creek TWP.  
T-85N R-39W  
SEC. 31

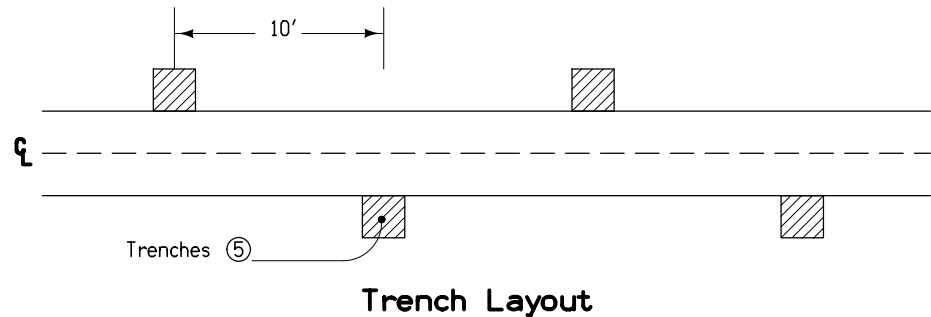


Design No. 0225  
File No. 32179





Section along Centerline

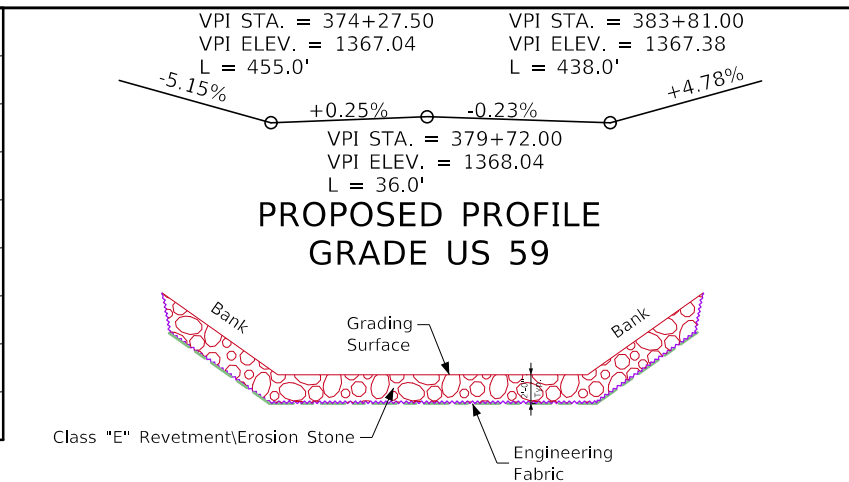
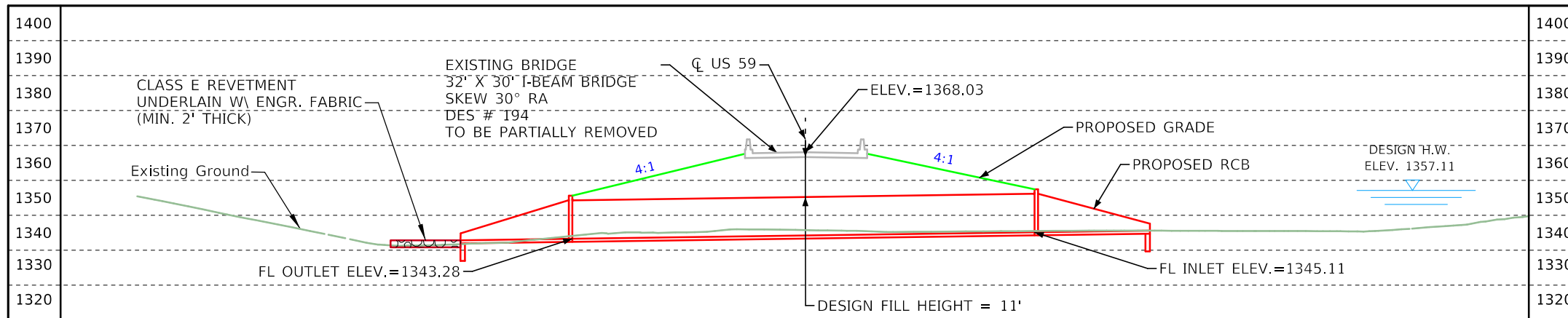


Denotes pay limits for flowable mortar  
Denotes pay limits for flooded backfill

Trench Layout

- ① 4" Subdrain at flowline elevation of culvert with 4" cover of porous backfill.
- ② Place Flange Filler Material to fill pocket area between flanges to prevent flowable mortar from building up. Flange Filler Material is incidental to flowable mortar.
- ③ Fill void with the maximum amount of Floodable Backfill possible. Distance from Floodable Backfill to bridge beams (when present) or bridge deck shall not exceed 5'.
- ④ Cut trenches in the soil plug to provide drainage for the flowable mortar. Backfill the trenches with open graded crushed stone, gravel, or recycled PCC to allow water to drain. Backfill material is incidental to flowable mortar.
- ⑤ Place trenches at 10' spacing with two trenches on each side of the roadway.

**FILL FOR CULVERT USED IN BRIDGE REPLACEMENTS**



**UTILITIES LEGEND:**

- FO Arcadia Telephone Cooperative
- F02 ICN
- T1 Windstream
- W Western Central Iowa Rural Water
- Western Iowa Power Co

**LONGITUDINAL SECTION ALONG CL OF CULVERT**

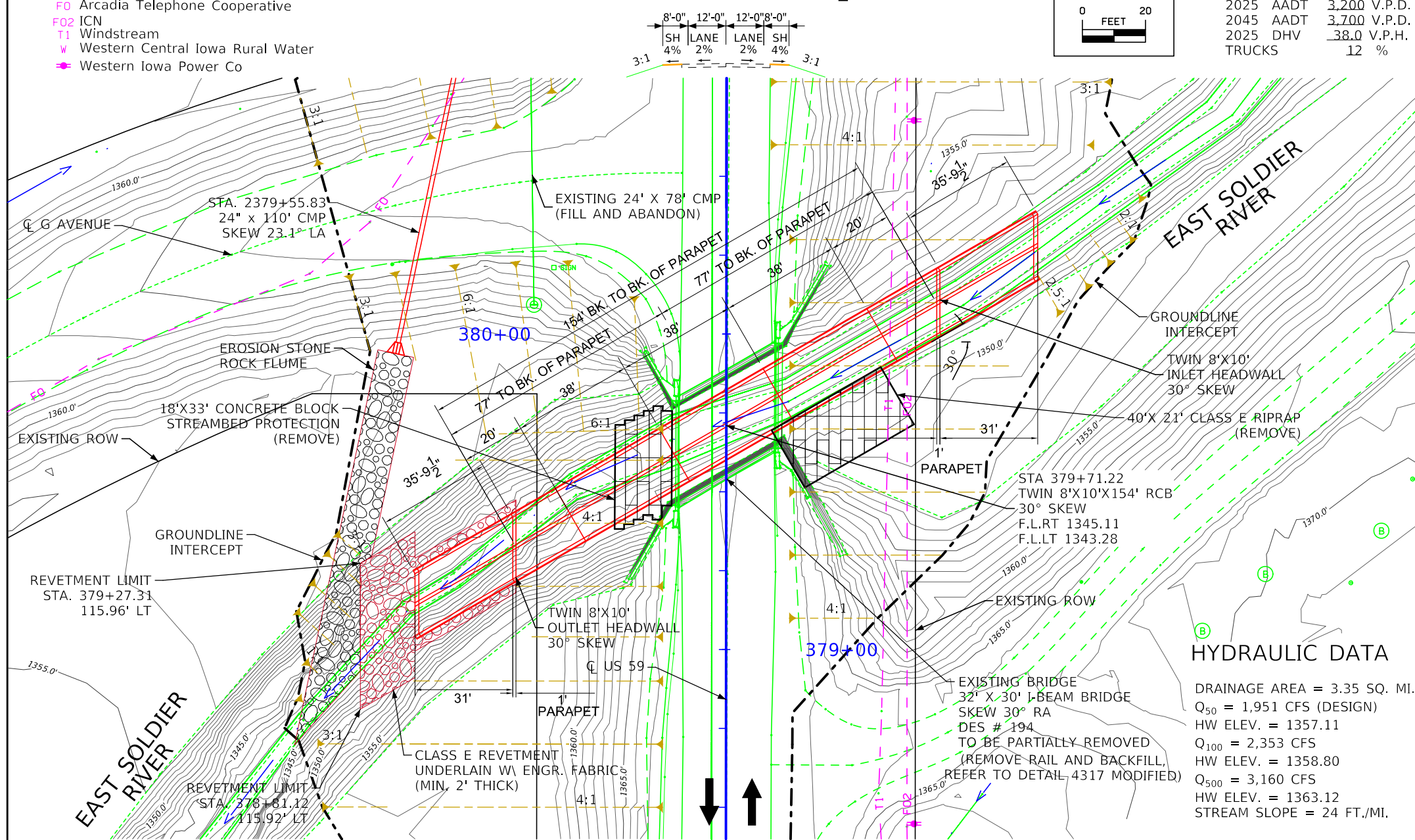
**TRAFFIC ESTIMATE**

2025 AADT	3,200	V.P.D.
2045 AADT	3,700	V.P.D.
2025 DHV	38.0	V.P.H.
TRUCKS	12	%

**Estimated Revetment Quantities Included With Road Plans**

Location	Revetment Class "E" (Ton)	Erosion Stone (Ton)	Engineering Fabric (SY)	Excavation (CY)
Outlet	107		146	60
Rock Flume		167	184	103
<b>Totals</b>	<b>107</b>	<b>167</b>	<b>330</b>	<b>163</b>

Excavation quantity calculated from grading surface. Quantities shown for information only. See Road Sheets.



**HYDRAULIC DATA**

DRAINAGE AREA = 3.35 SQ. MI.  
 $Q_{50} = 1,951$  CFS (DESIGN)  
 HW ELEV. = 1357.11  
 $Q_{100} = 2,353$  CFS  
 HW ELEV. = 1358.80  
 $Q_{500} = 3,160$  CFS  
 HW ELEV. = 1363.12  
 STREAM SLOPE = 24 FT./MI.



**LOCATION**

US 59 BRIDGE OVER EAST SOLDIER RIVER  
 T-85N R-40W  
 SECTION 36  
 MORGAN TOWNSHIP  
 CRAWFORD COUNTY  
 FHWA NO. 21510  
 BRIDGE MAINT. NO. 2411.75059  
 LATITUDE 42.125801°  
 LONGITUDE -95.439531°

BENCHMARK NO. CP 24059014  
 NORTHING: 7285783.945  
 EASTING: 16579668.86  
 ELEV. 1408.904

BENCHMARK NO. CP F 94  
 NORTHING: 7310322.422  
 EASTING: 16627374.37  
 ELEV. 1368.074

BENCHMARK NO. CP H 186  
 NORTHING: 7251200.108  
 EASTING: 16590760.15  
 ELEV. 1421.153

BENCHMARK NO. CP 24059015  
 NORTHING: 7286929.934  
 EASTING: 16579620.3  
 ELEV. 1439.036

BENCHMARK NO. CP 24059013  
 NORTHING: 7281846.238  
 EASTING: 16579639.74  
 ELEV. 1412.678

**HYDRAULIC & STRUCTURAL DESIGN**

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature: Jonathan E. Peterson Date: XX-XX-XXXX

Printed or Typed Name: Jonathan E. Peterson

My license renewal date is December 31, 2022

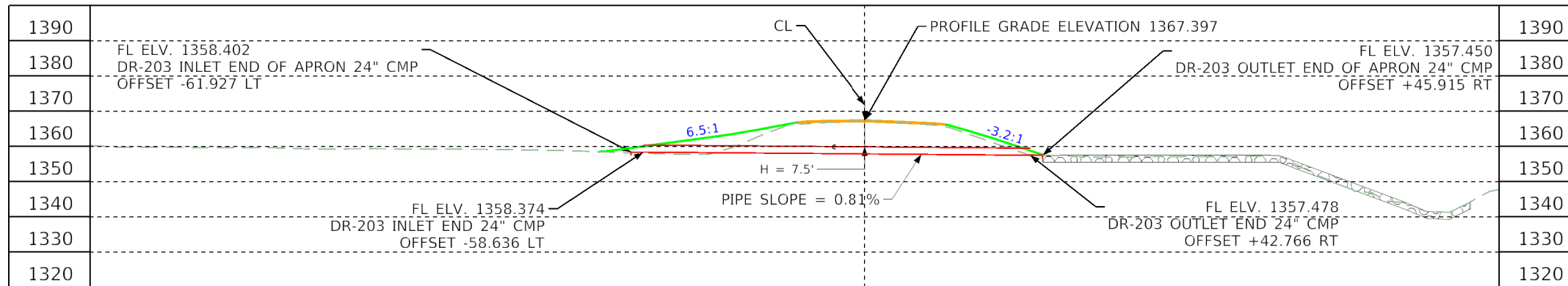
Pages or sheets covered by this seal: V.1, V.2

Design For 30 Degree Skew RA  
**Twin 8'-0" x 10'-0" x 154'-0"**  
**Reinforced Concrete Box Culvert**

Preliminary Situation Plan  
 STA. 379+71.22 (US 59) Turn-In Date: October 2022  
 Crawford County  
 IOWA DEPARTMENT OF TRANSPORTATION  
 Design No. 0225 Design Sheet No. 1 of 3 FHWA/Asset 21510

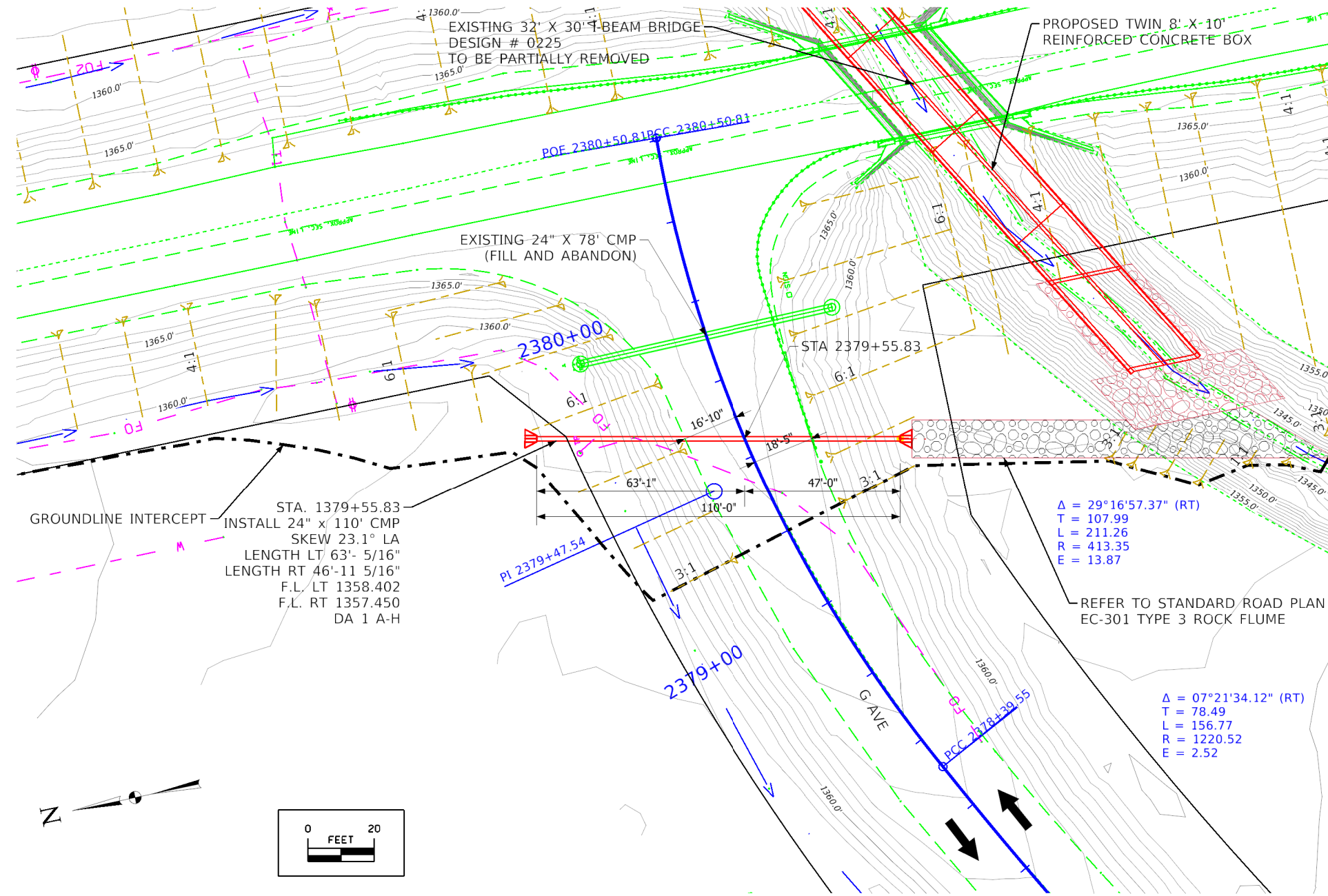






BENCHMARK NO. CP 24059013 NORTHING: 7281846.238 EASTING: 16579639.74 ELEV. 1412.678	BENCHMARK NO. CP F 94 NORTHING: 7310322.422 EASTING: 16627374.37 ELEV. 1368.074
BENCHMARK NO. CP 24059014 NORTHING: 7285783.945 EASTING: 16579668.86 ELEV. 1408.904	BENCHMARK NO. CP H 186 NORTHING: 7251200.108 EASTING: 16590760.15 ELEV. 1421.153
BENCHMARK NO. CP 24059015 NORTHING: 7286929.934 EASTING: 16579620.3 ELEV. 1439.036	

## LONGITUDINAL SECTION ALONG CL CULVERT



### UTILITIES LEGEND:

- F0 Arcadia Telephone Cooperative
- F02 ICN
- T1 Windstream
- W Western Central Iowa Rural Water
- W Western Iowa Power Co

### HYDRAULIC DATA

Drainage Area = 1.0 Acres  
 Q<sub>50</sub> = 4 CFS  
 HW Elev. = 1359.36

### LOCATION

County Road E26  
 G Avenue  
 T-85N R-40W  
 Section 36  
 Morgan Township  
 Crawford County  
 Latitude 42.126042°  
 Longitude -95.439814°

## PIPE PLAT

Design For 23.1° Skew LA  
**24" x 110'**  
 Corrugated Metal Pipe

### PLAT PLAN

STA. 2379+55.83 (G AVENUE) October 2022  
 Crawford County  
 IOWA DEPARTMENT OF TRANSPORTATION  
 Design No. N/A Design Sheet No. 3 of 3 FHWA/Asset



## CROSS SECTION VIEW COLOR LEGEND

Design Color No.	Feature	Design Color No.	Feature
<b>Aggregate</b>			
(64)	Choke Stone	(112)	Noise Wall
(42)	Engineering Fabric	(112)	Noise Wall Footing
(8)	Flooded Backfill	(112)	Retaining Wall Back
(92)	Macadam Stone	(112)	Retaining Wall Back Excavate
(20)	Modified	(112)	Retaining Wall Face
(12)	Plowing Shaping	(112)	Retaining Wall Front Excavate
(14)	Porous Backfill	(112)	Retaining Wall Front Footing
(8)	Revetment Class A	(112)	Retaining Wall MSE Gutter
(6)	Revetment Class B	(112)	Retaining Wall Reinforced Earth
(62)	Revetment Class C		
(188)	Revetment Class D	<b>Grading</b>	
(28)	Revetment Class E	(8)	Behind Curb Cut
(12)	Shoulder Special Backfill	(6)	Granular
(12)	Special Backfill	(13)	Granular Back Fill
(20)	Subbase	(48)	Rock Undercut
(20)	Subbase Lower	(8)	Shoulder Earth Fill
(20)	Subbase Upper	(2)	Side Slopes
(118)	Subgrade Treatment	(226)	Side Slopes Dressing
<b>Asphalt</b>			
(207)	HMA Base Course	<b>Substrata</b>	
(207)	HMA Interim Course	(128)	Boulder Substrata
(207)	HMA Surface Course	(48)	Broken Weathered Substrata
<b>Concrete</b>			
(0)	Barrier Concrete	(3)	Core Out Substrata
(0)	Barrier Concrete Footing	(203)	Existing Pavement Substrata
(0)	Curb Gutter	(6)	Loam Substrata
(48)	Flowable Mortar	(80)	Rock Substrata
(0)	Median Concrete	(4)	Select Sand Substrata
(0)	PCC Pavement	(3)	Shale Substrata
(0)	Sidewalk	(10)	Topsoil Substrata
<b>Shoulder</b>			
(209)	Shoulder HMA	<b>Unsuitable / Waste</b>	
(0)	Shoulder PCC	(3)	Unsuitable Type A
(6)	Shoulder Granular	(13)	Unsuitable Type B
<b>Existing</b>			
(0)	Existing Pavement	(11)	Unsuitable Type C
		(3)	Waste

NOTES:

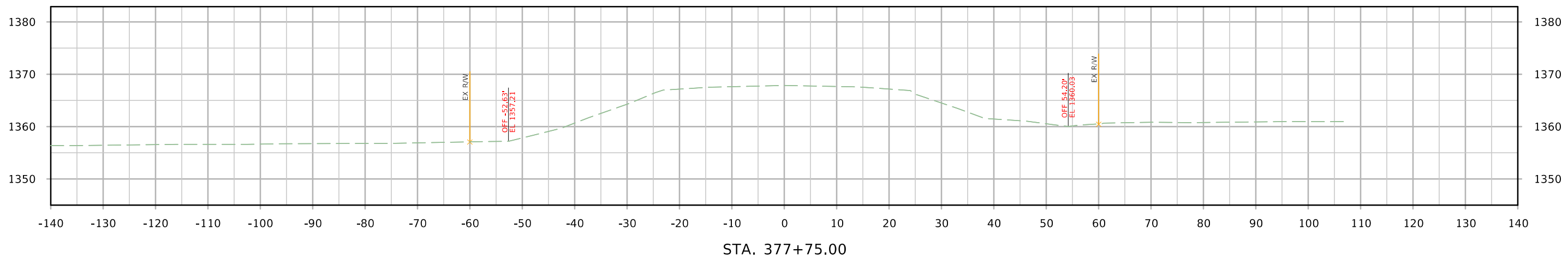
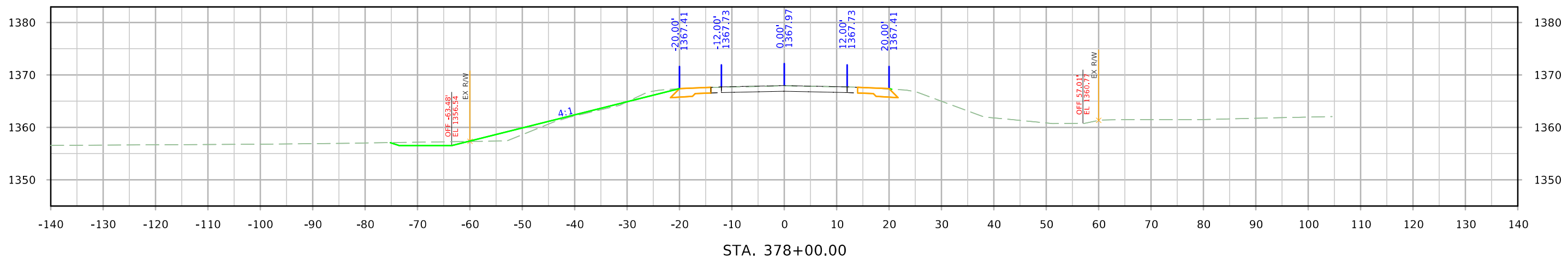
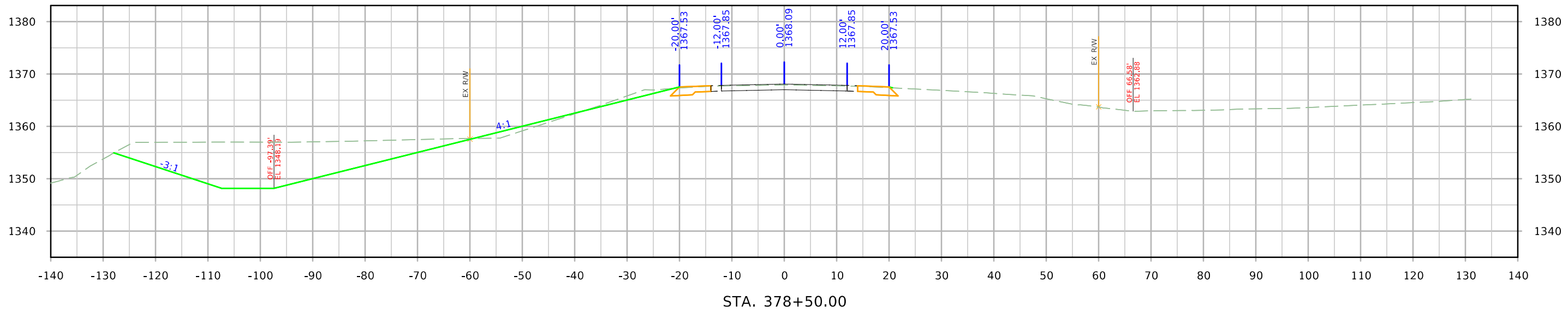
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## CROSS SECTIONS LEGEND AND INFORMATION SHEET

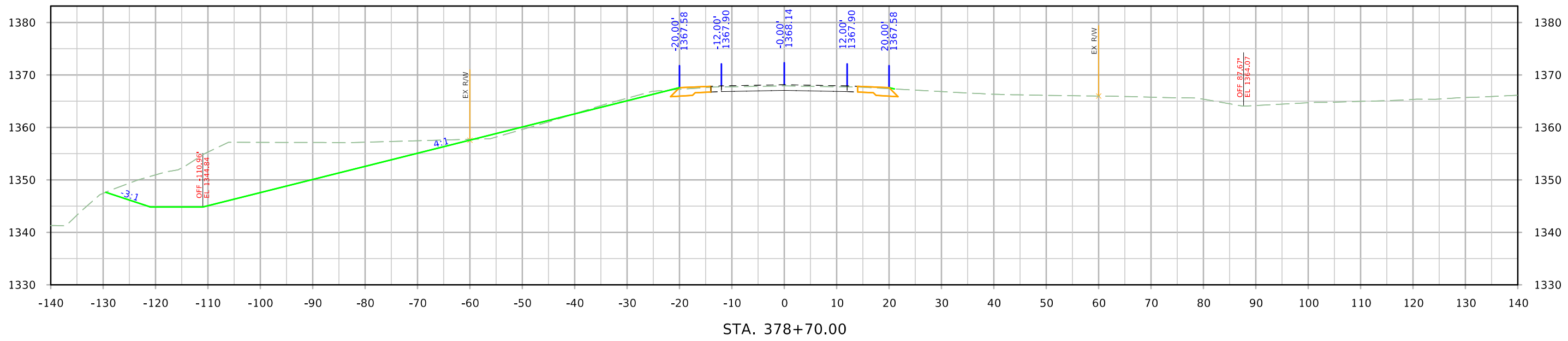
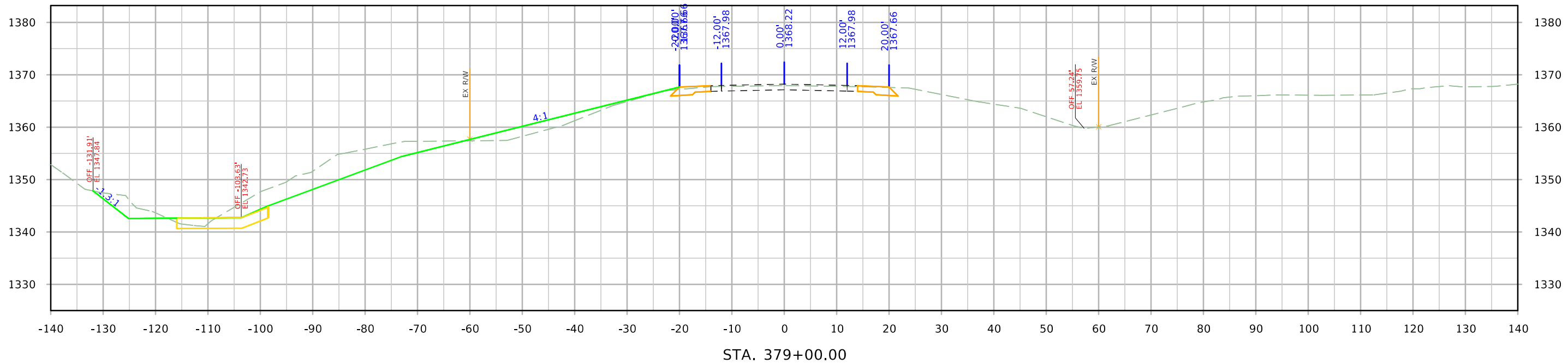
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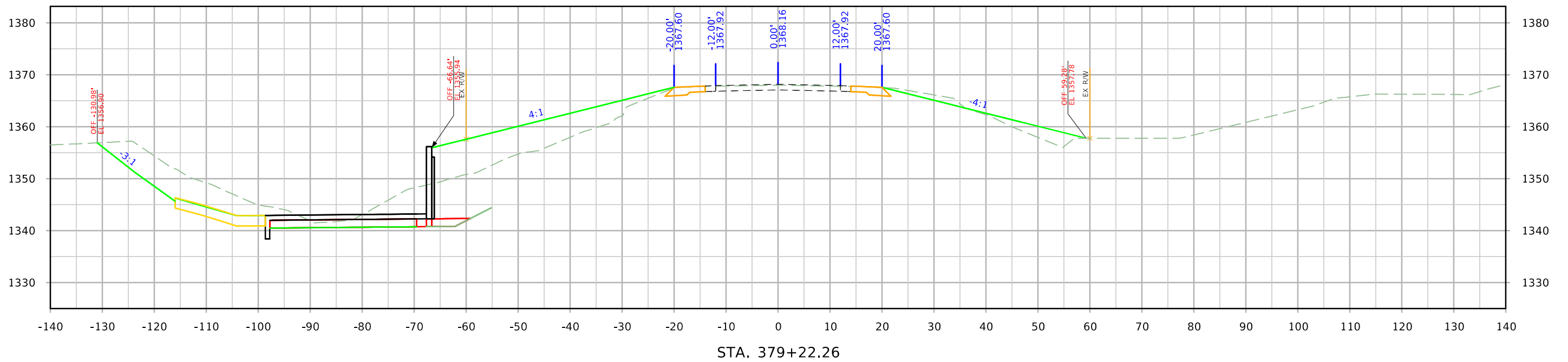
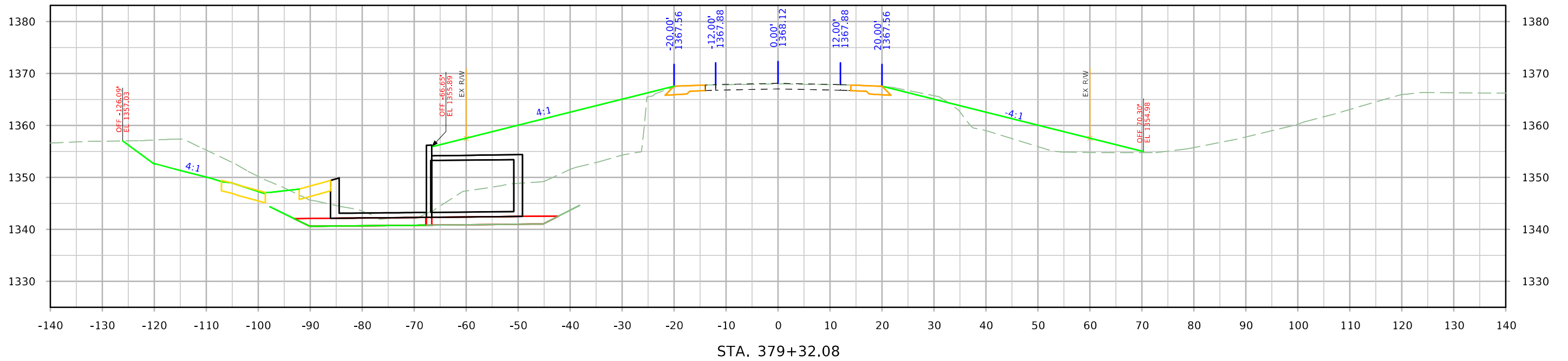
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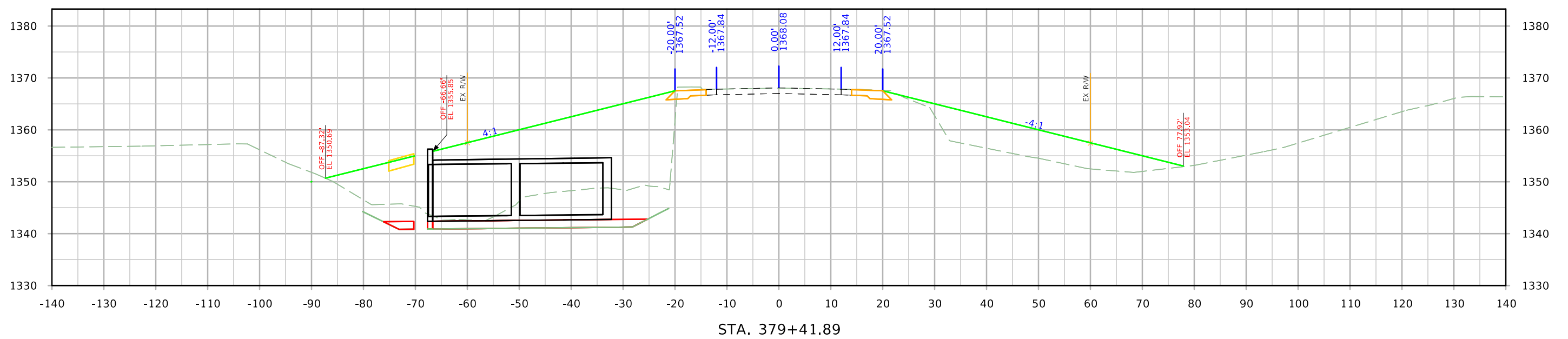
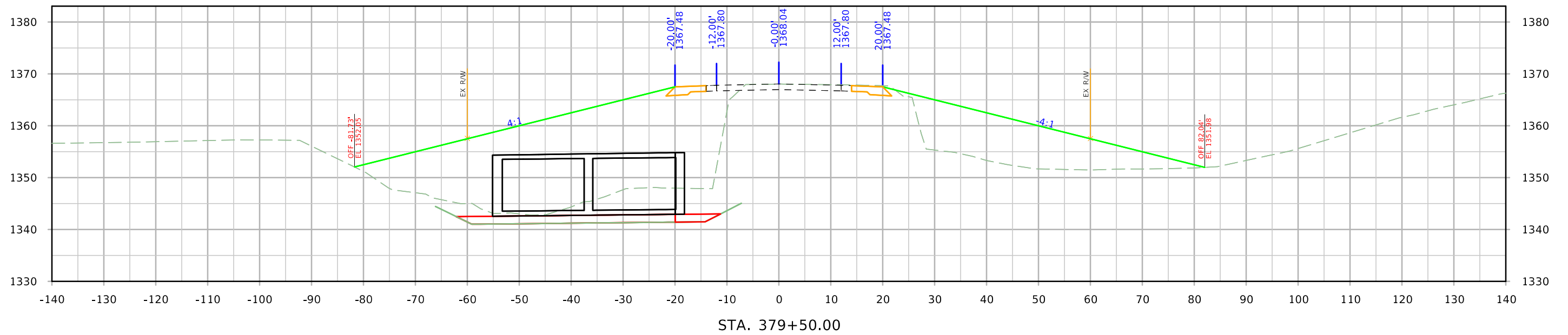
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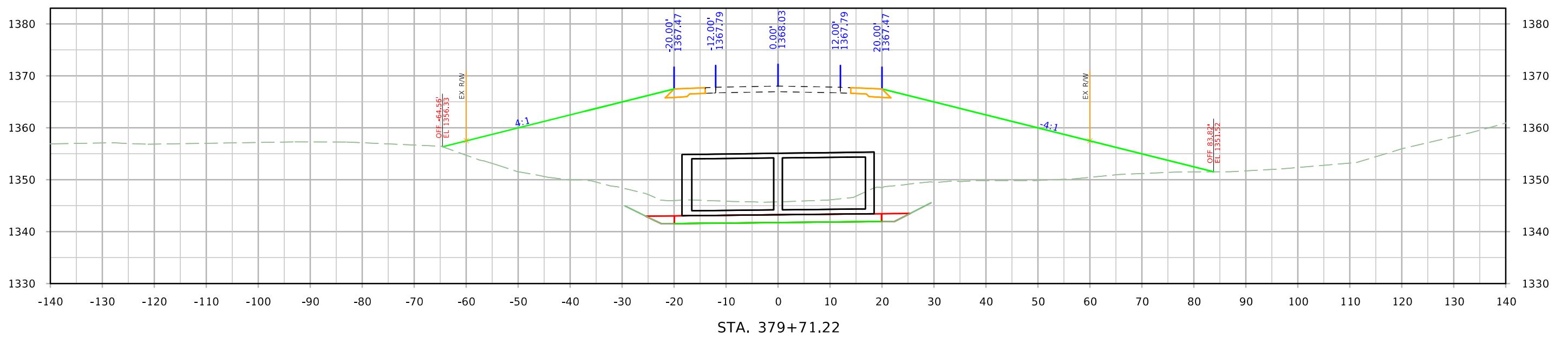
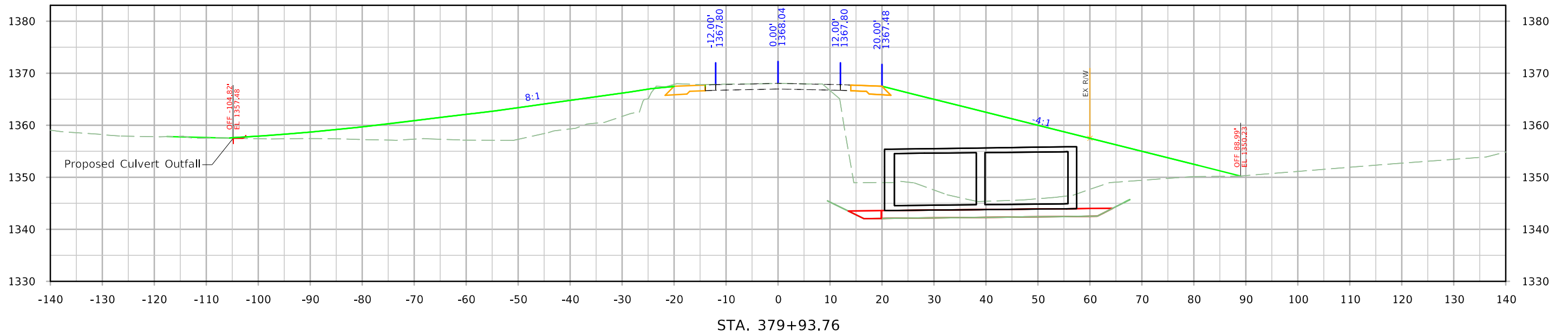
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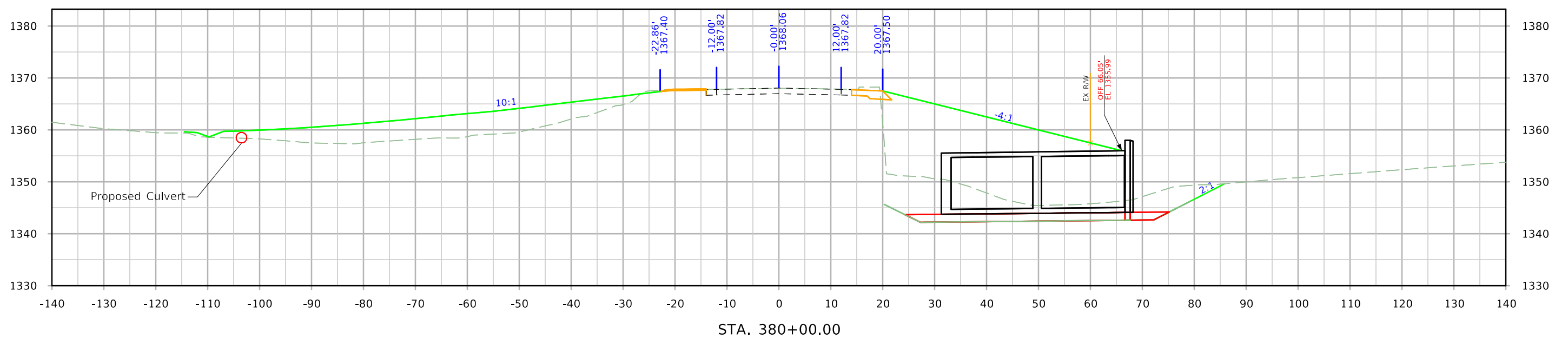
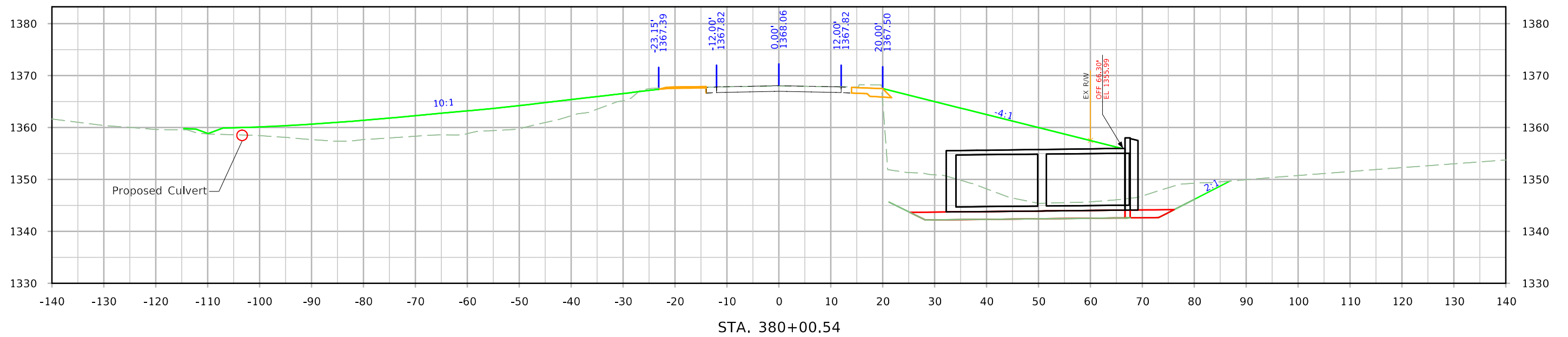
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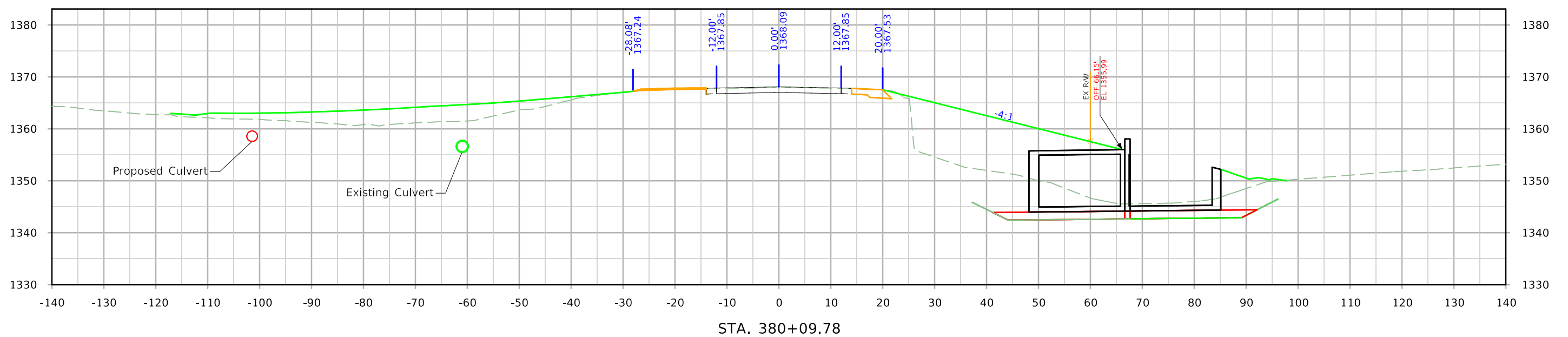
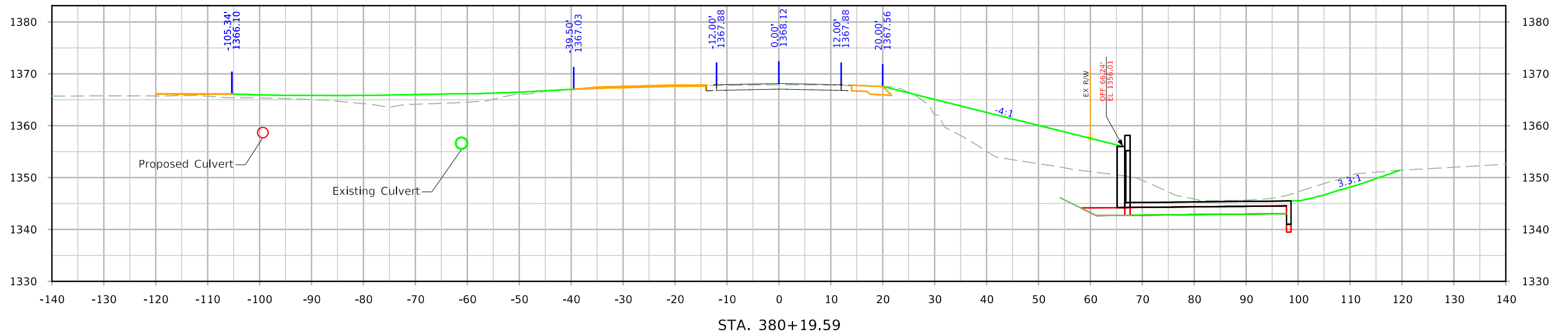
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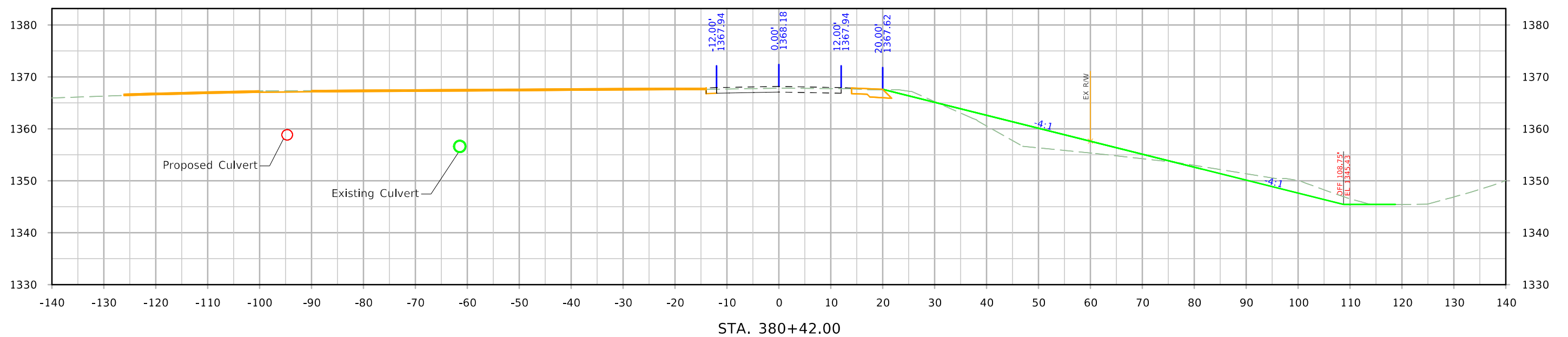
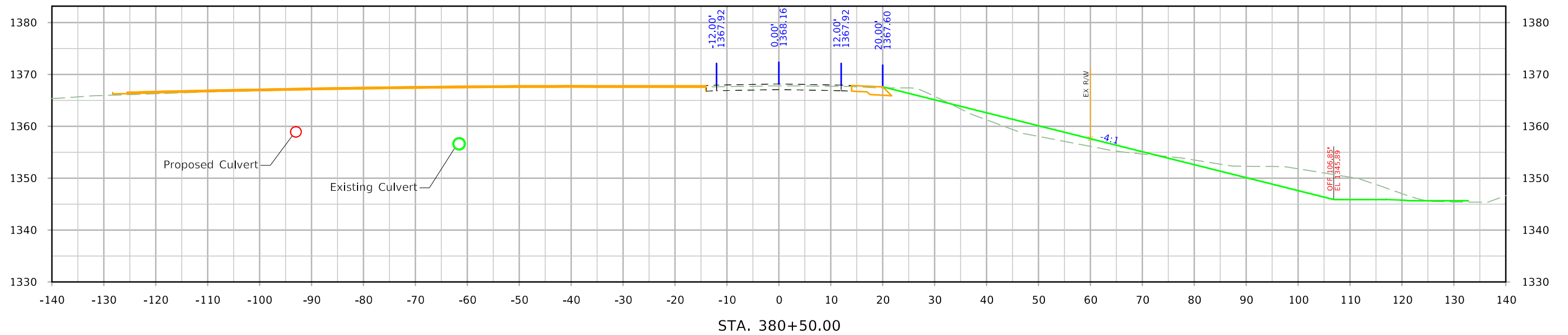
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# ML - US59

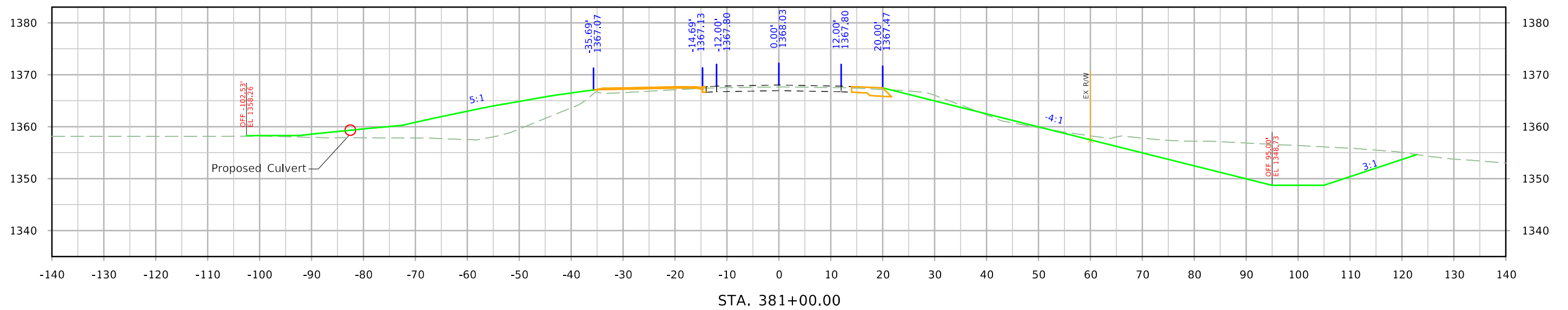
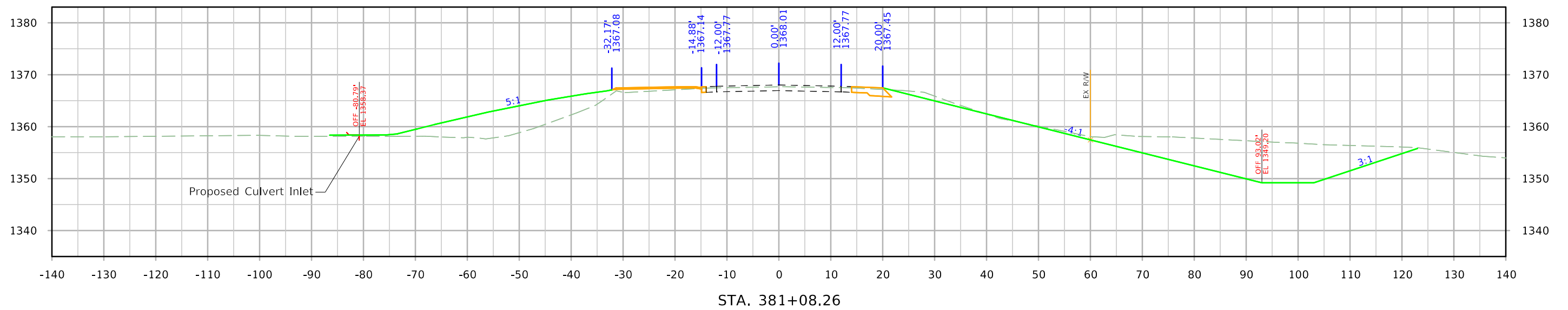


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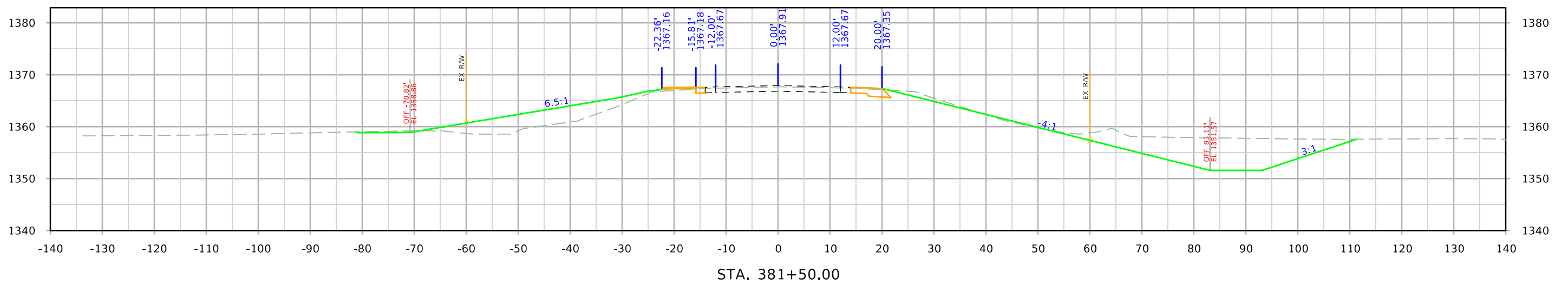
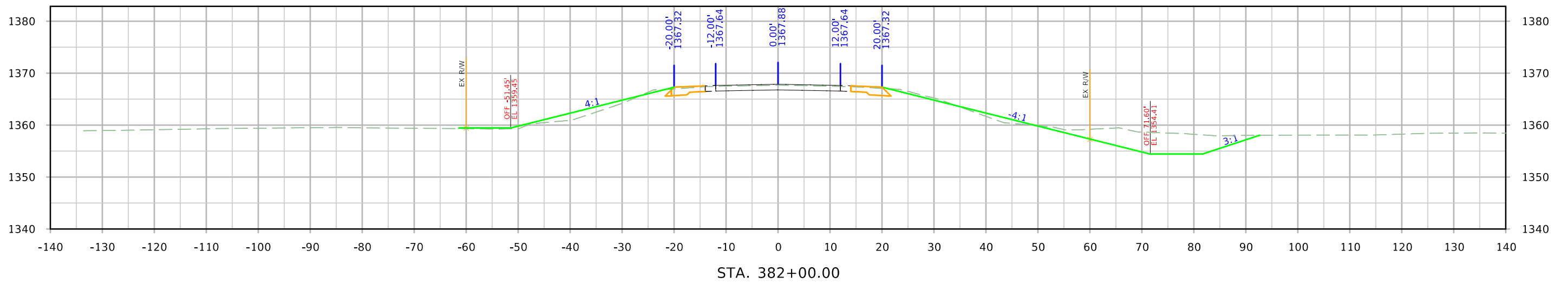
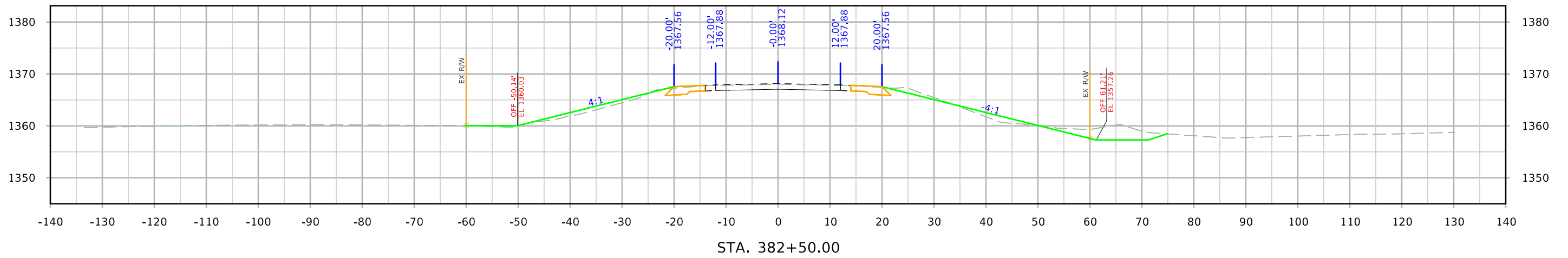




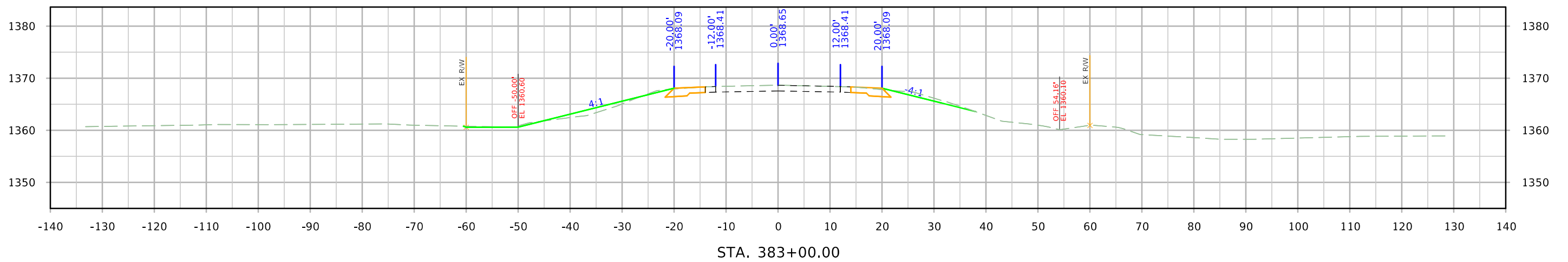
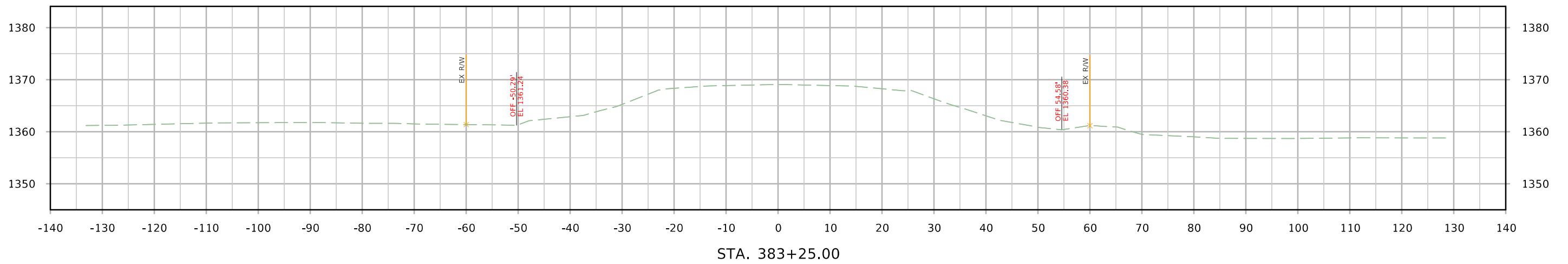
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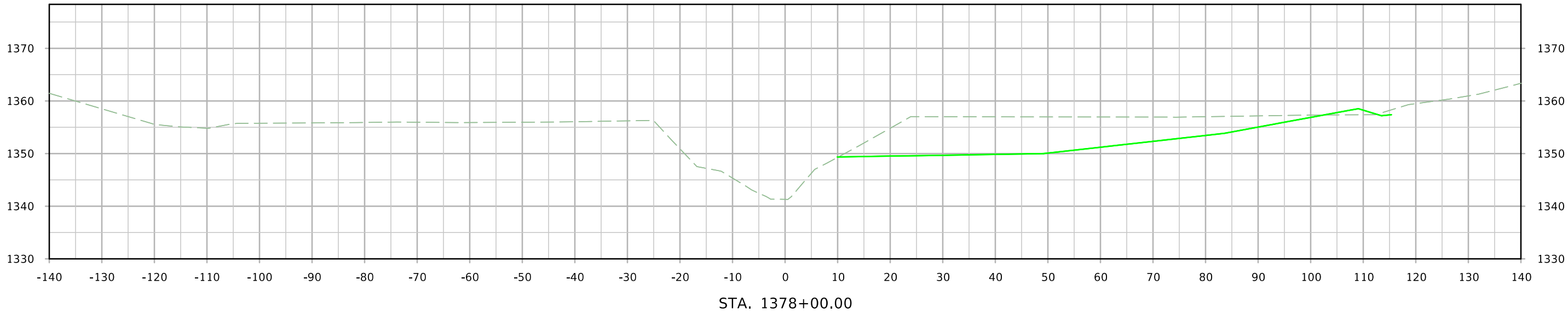
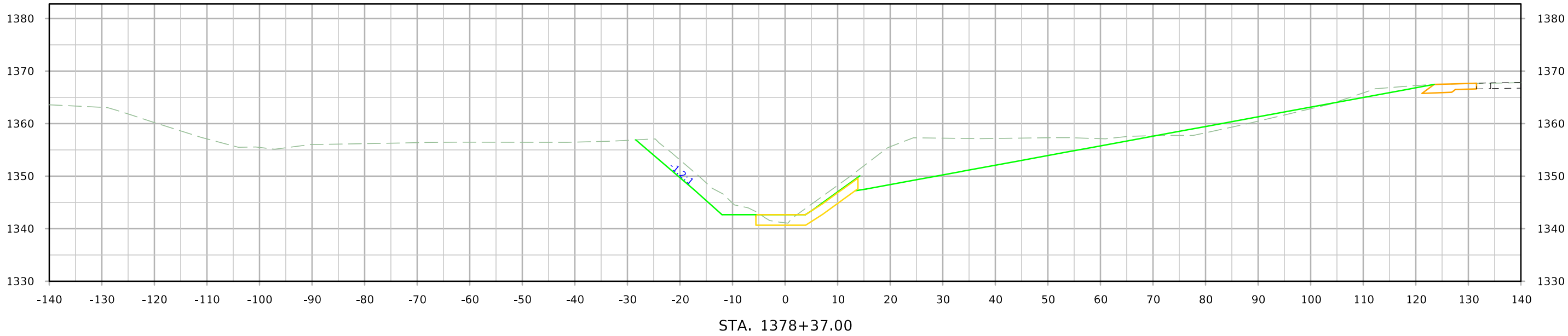
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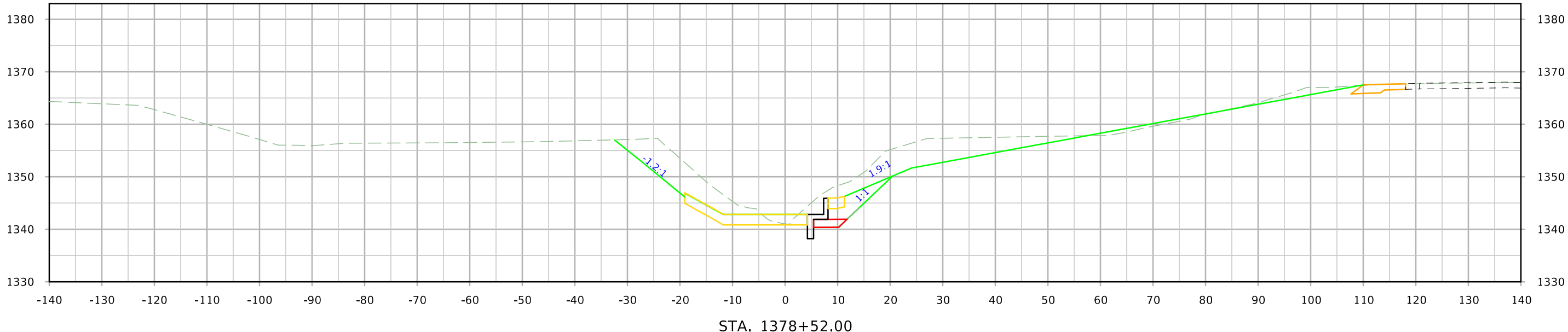
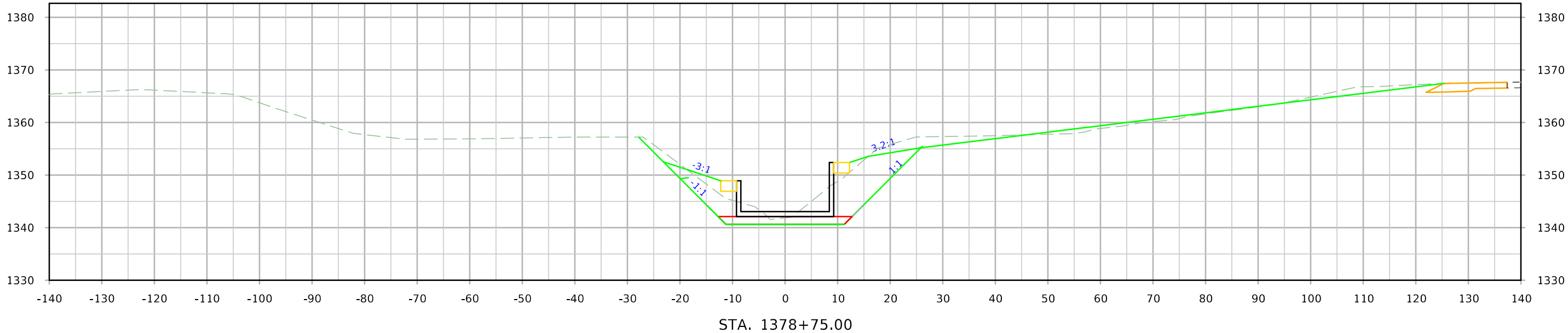
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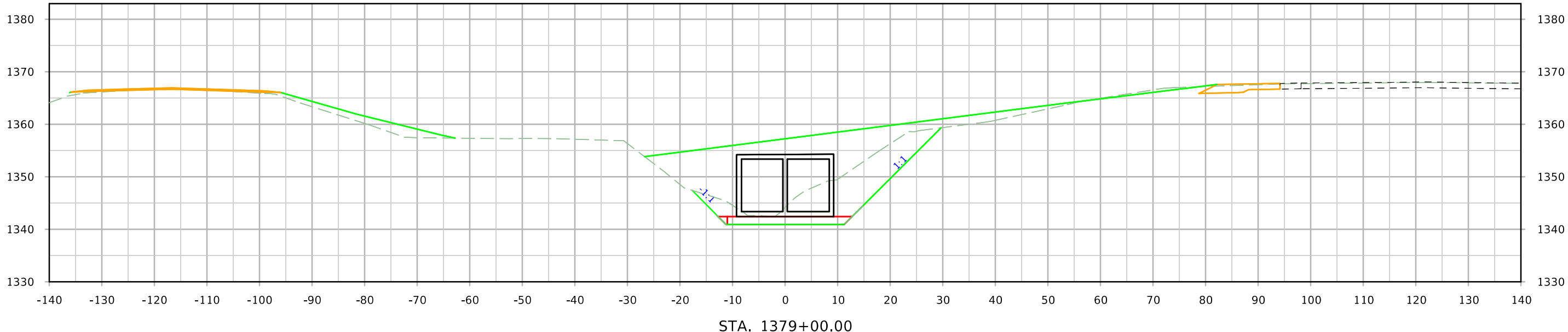
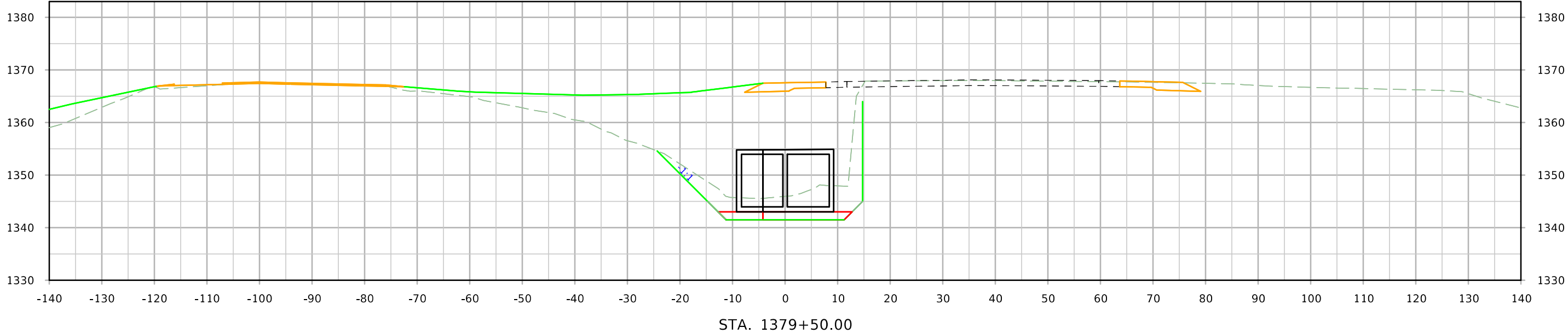
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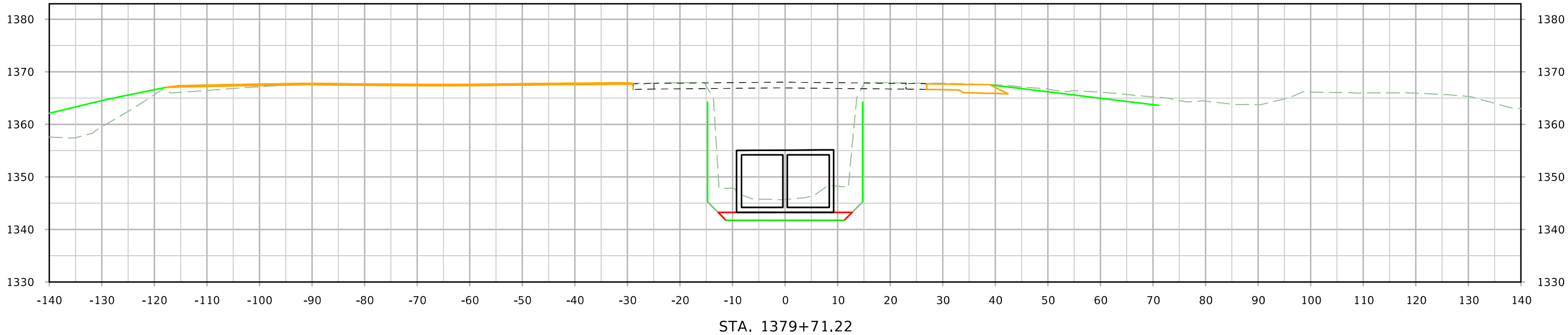
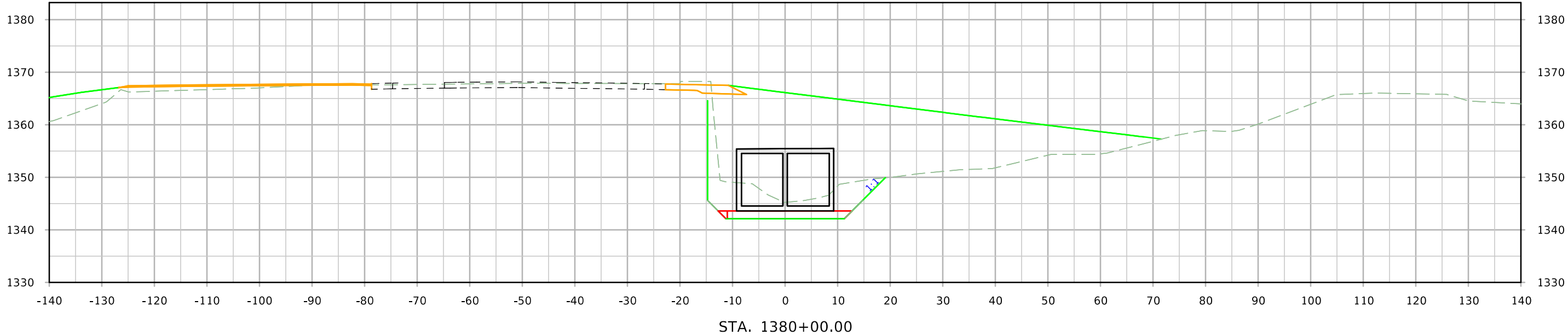
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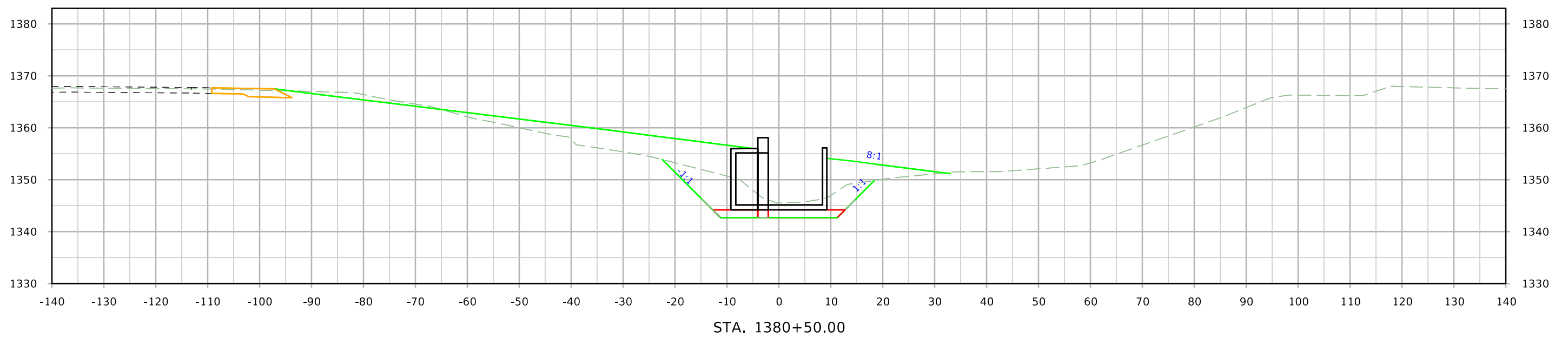
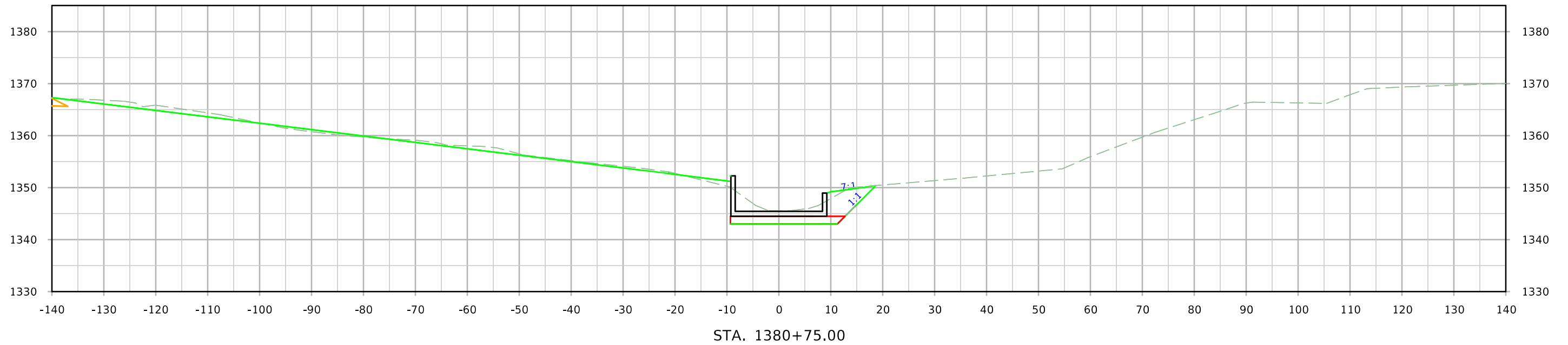
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# RCB Excavation

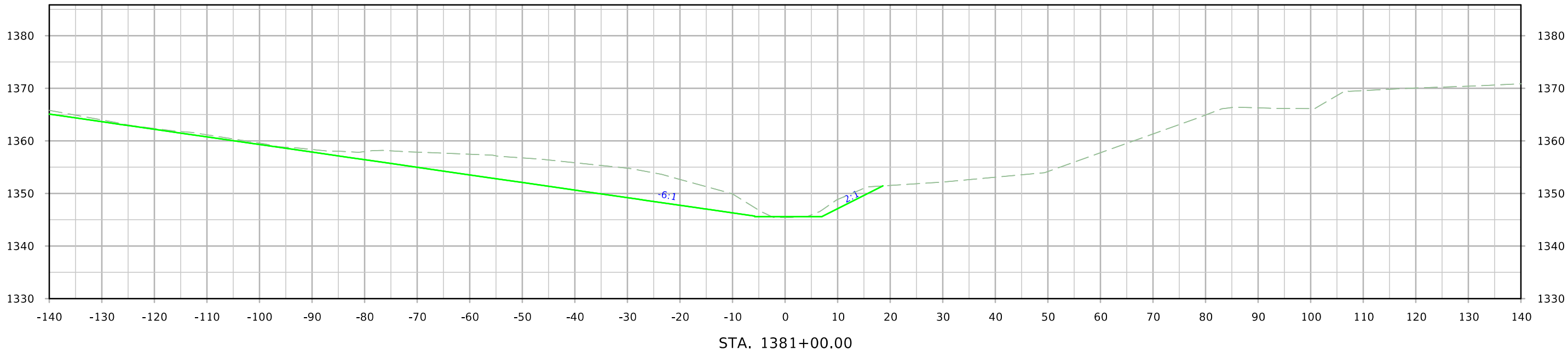
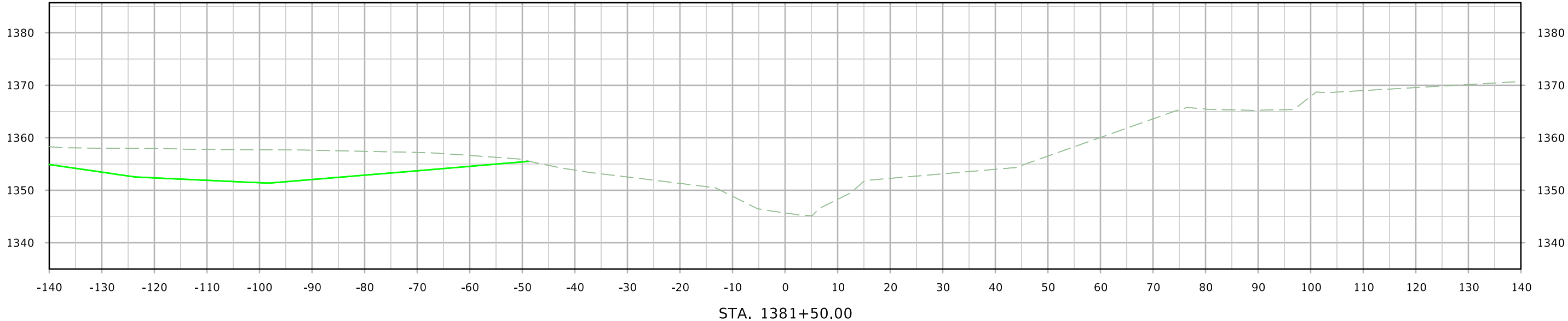


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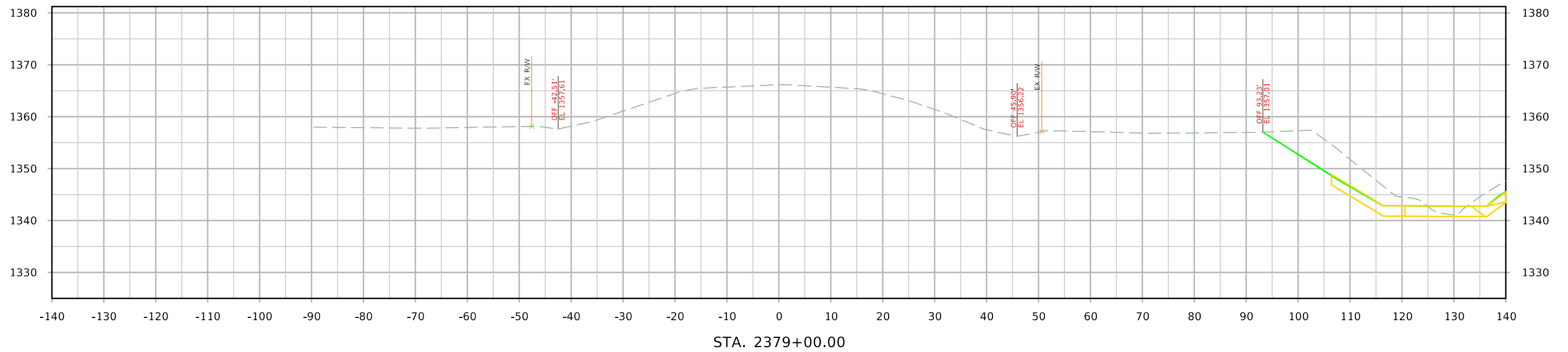




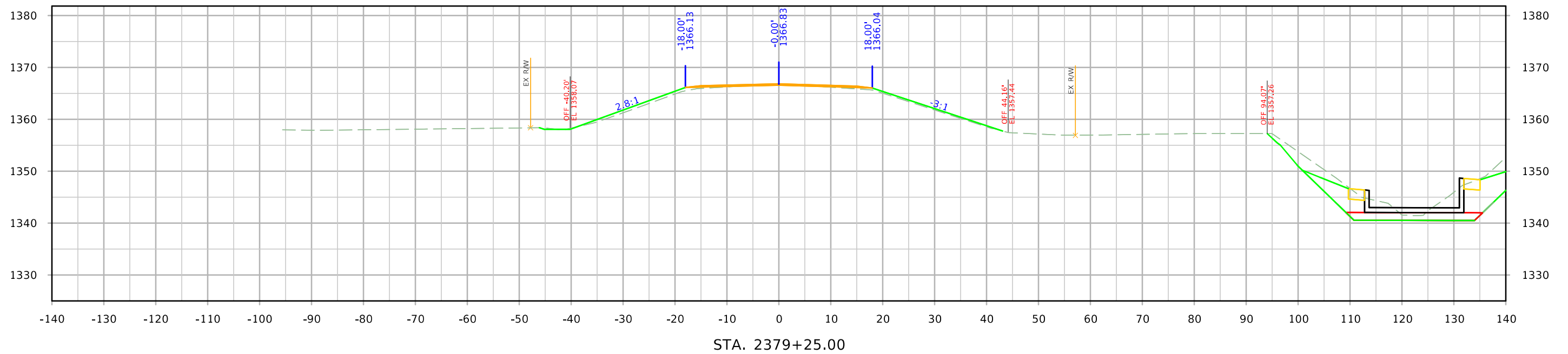
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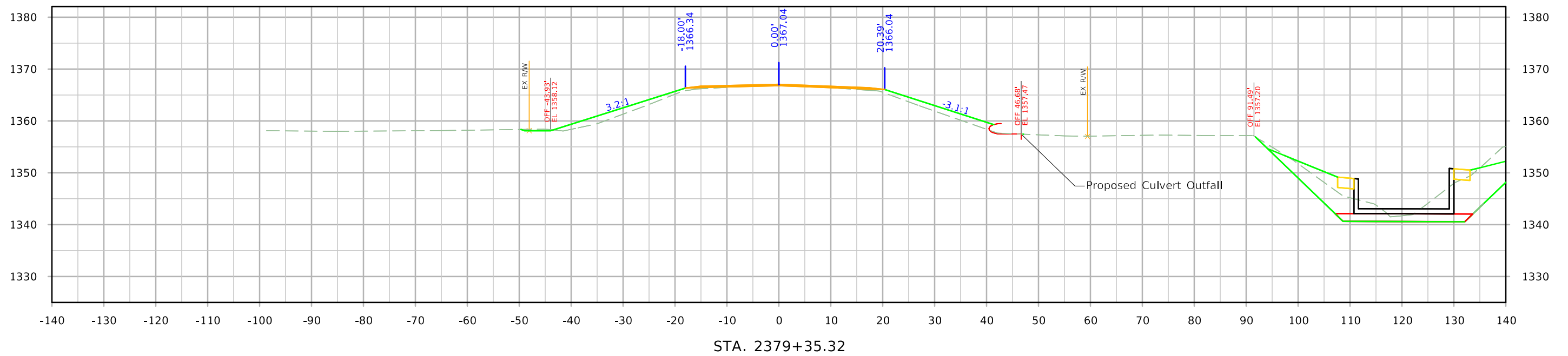
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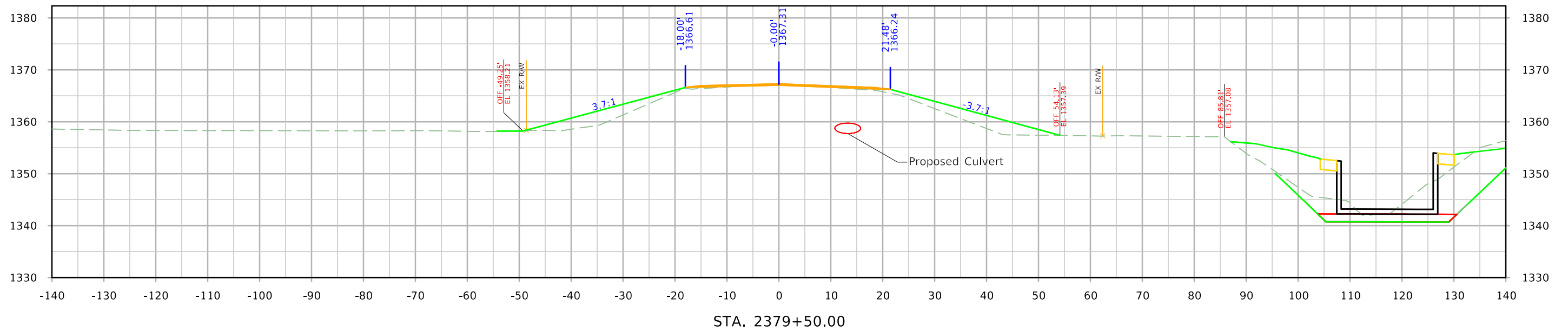
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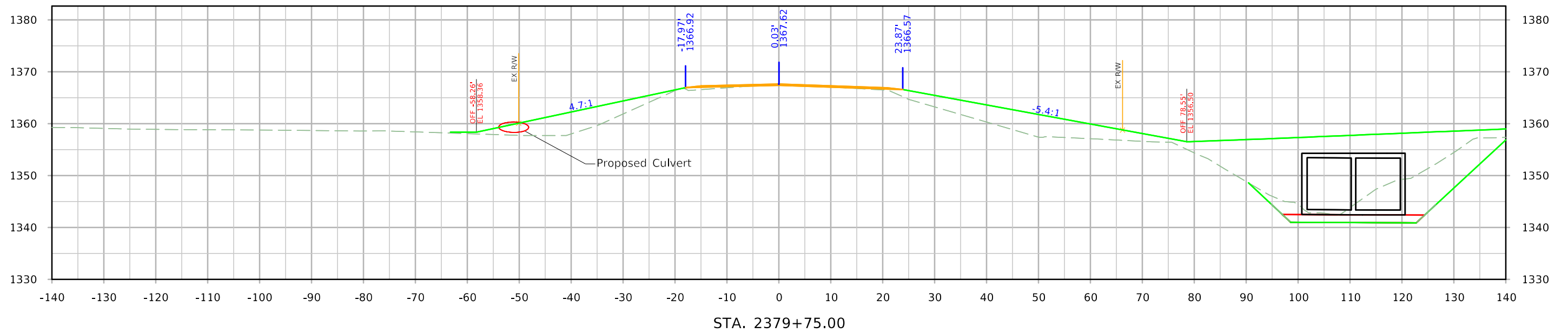
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# G AVENUE

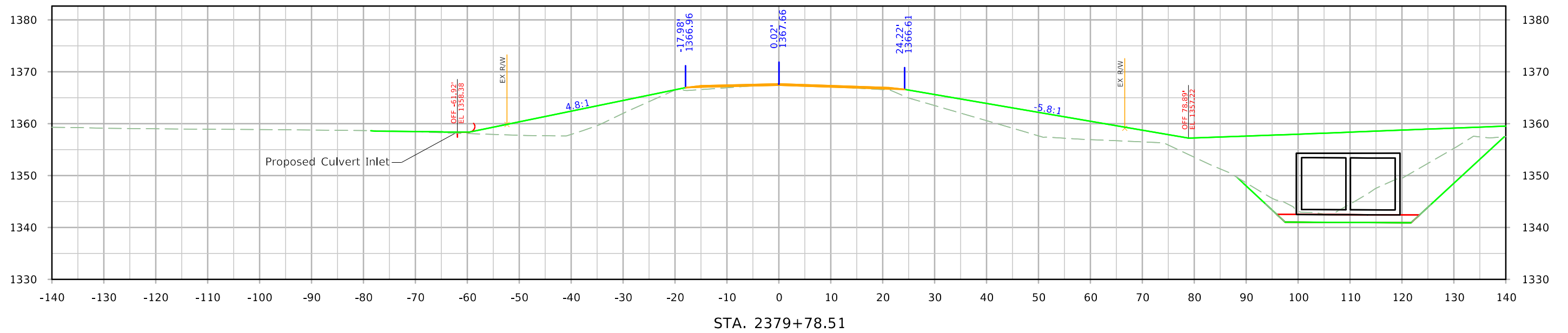


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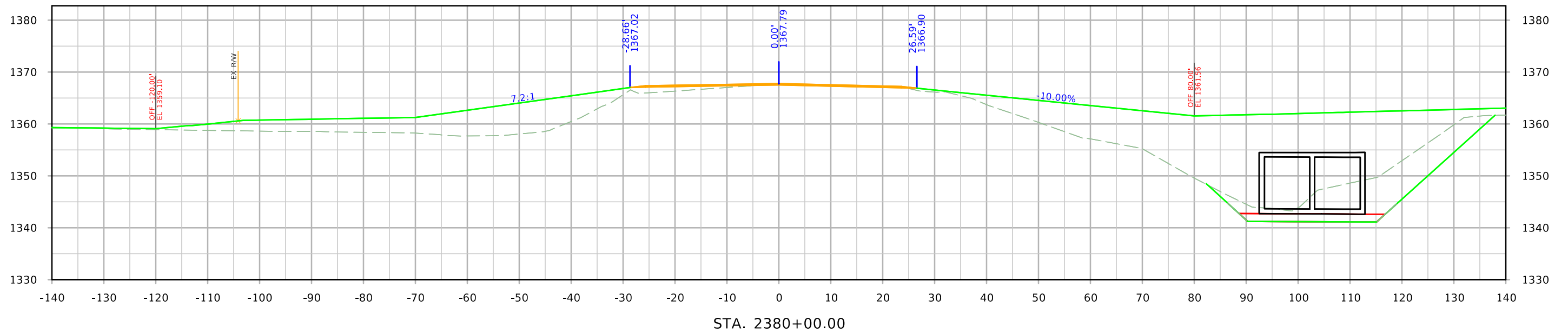




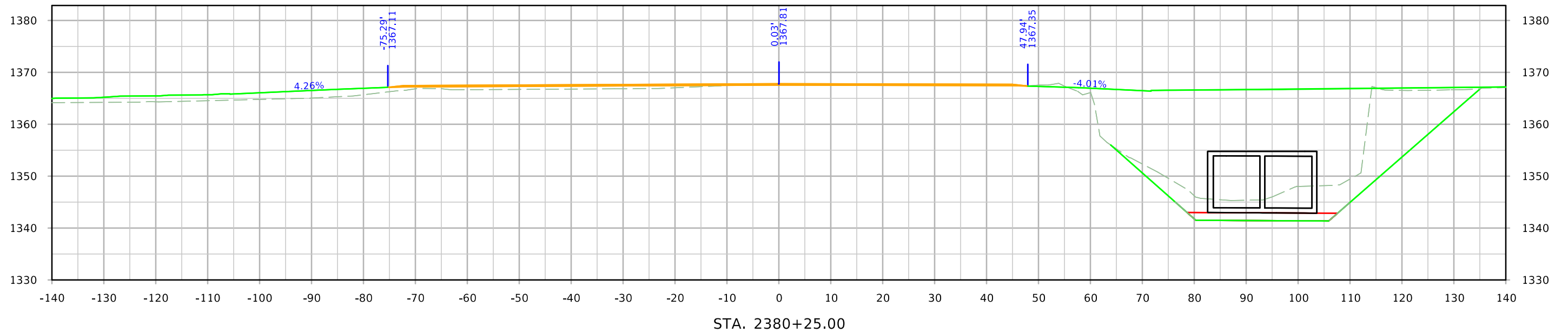
# G AVENUE



# G AVENUE



# G AVENUE



STA. 2380+25.00

# G AVENUE

