

BRFN-059-5(60)--39-24
 Bridge Replacement
 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
A Sheets	Title Sheets
A.1	Title Sheet
B Sheets	Typical Cross Sections and Details
B.1 - 2	Typical Cross Sections and Details
C Sheets	Quantities and General Information
C.1	Project Description
D Sheets	Mainline Plan and Profile Sheets
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2	US 59
G Sheets	Survey Sheets
G.1 - 3	Reference Ties and Bench Marks
G.4	Horizontal Control Tab. & Super for all Alignments
J Sheets	Traffic Control and Staging Sheets
* J.1	Traffic Control Plan
R Sheets	Erosion Control Sheets
* RR.1	Erosion Control Legend and Symbol Information Sheet
* RR.2	Drainage Basin and Erosion Control Device Maps
U Sheets	500 Series, Mod.Stds. and Detail Sheets
U.1	500 Series, Modified Standards and Detail Sheets
V Sheets	Bridge and Culvert Situation Plans
* V.1 - 3	Bridge and Culvert Situation Plans
W Sheets	Mainline Cross Sections
* W.1	Cross Sections Legend & Symbol Information Sheet
* W.2 - 12	Mainline Cross Sections
X Sheets	Side Road Cross Sections
* 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 Deduct Bridge at Sta. 379+71.40 Total New Bridge at Sta. 379+71.22	505.15 34.64 21.07	0.096 0.006 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



STA. 383+00.00
END CONSTRUCTION

PROJECT LOCATION

STA. 377+94.85
BEGIN CONSTRUCTION

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

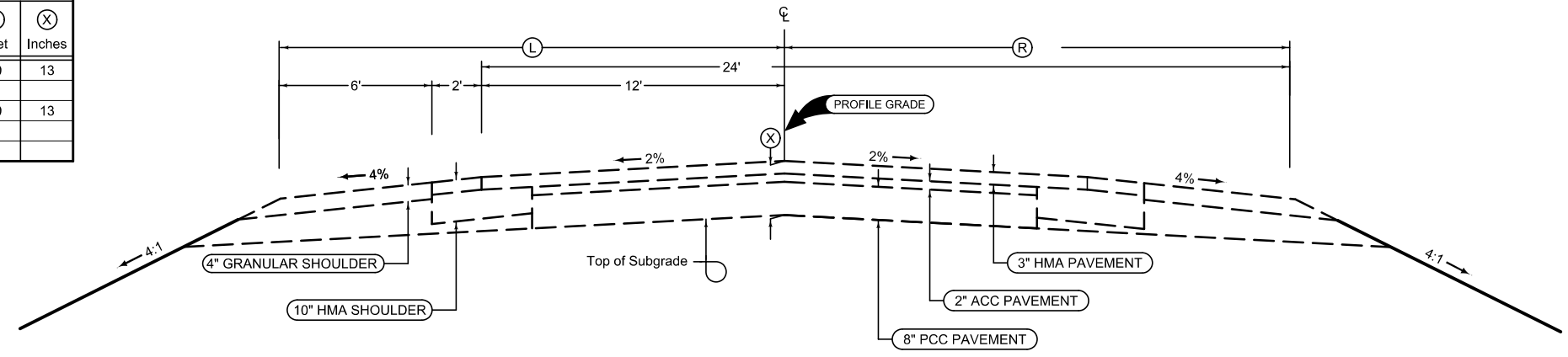
PRELIMINARY PLANS

Subject to change by final design.

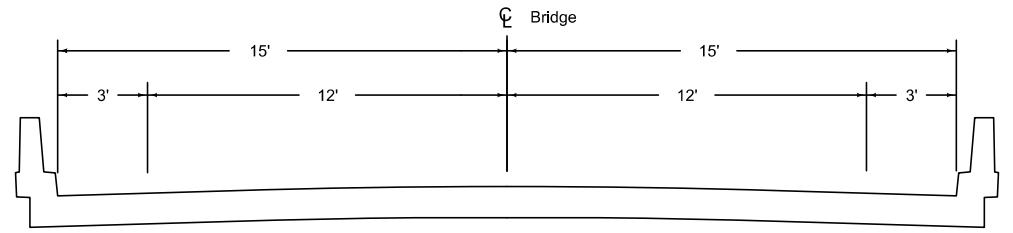
D5 PLAN - Date: 11/01/2022

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



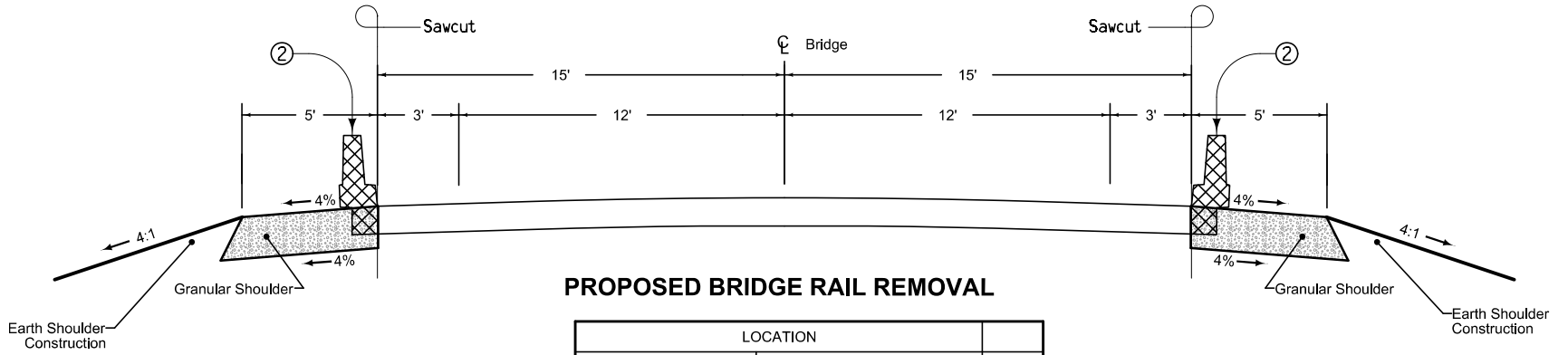
2 LANE EXISTING ROADWAY



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

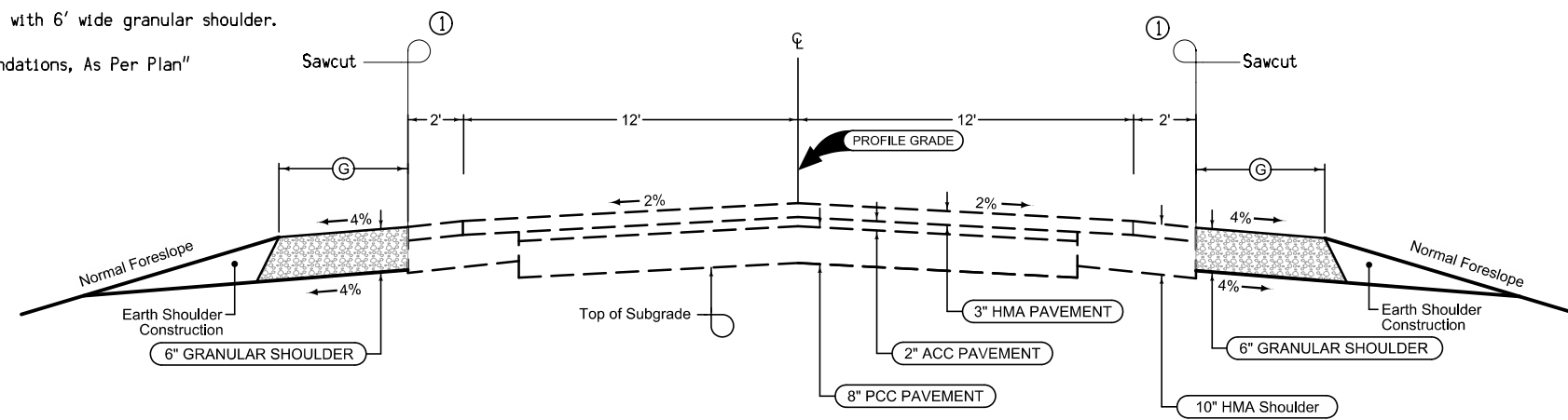
- ① Sawcut at face of Bridge Rail. Replace with 5' wide granular shoulder.
- ② Removal of Bridge Rail paid for as "Removals, As Per Plan"
- ③ Refer to 4317 Modified on Sheet U.1 for additional details.

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

2_G_SR_04-21-20		
STATION TO STATION	(G)	Feet
377+94.85 - 379+44.88		6
379+80.66 - 379+85.28		6



Granular Shoulder

2_G_SR_MODIFIED		
STATION TO STATION	(G)	Feet
379+57.50 - 379+62.45		6
379+97.75 - 381+65.39		6
		Remarks
		②

PROPOSED GUARDRAIL PAVEMENT REMOVAL

7151
Modified

**TYPICAL SECTION
RETROFIT GRANULAR SHOULDER**

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

① Dressing estimated at Tons Per STA

7151
Modified

**TYPICAL SECTION
RETROFIT GRANULAR SHOULDER**

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

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.

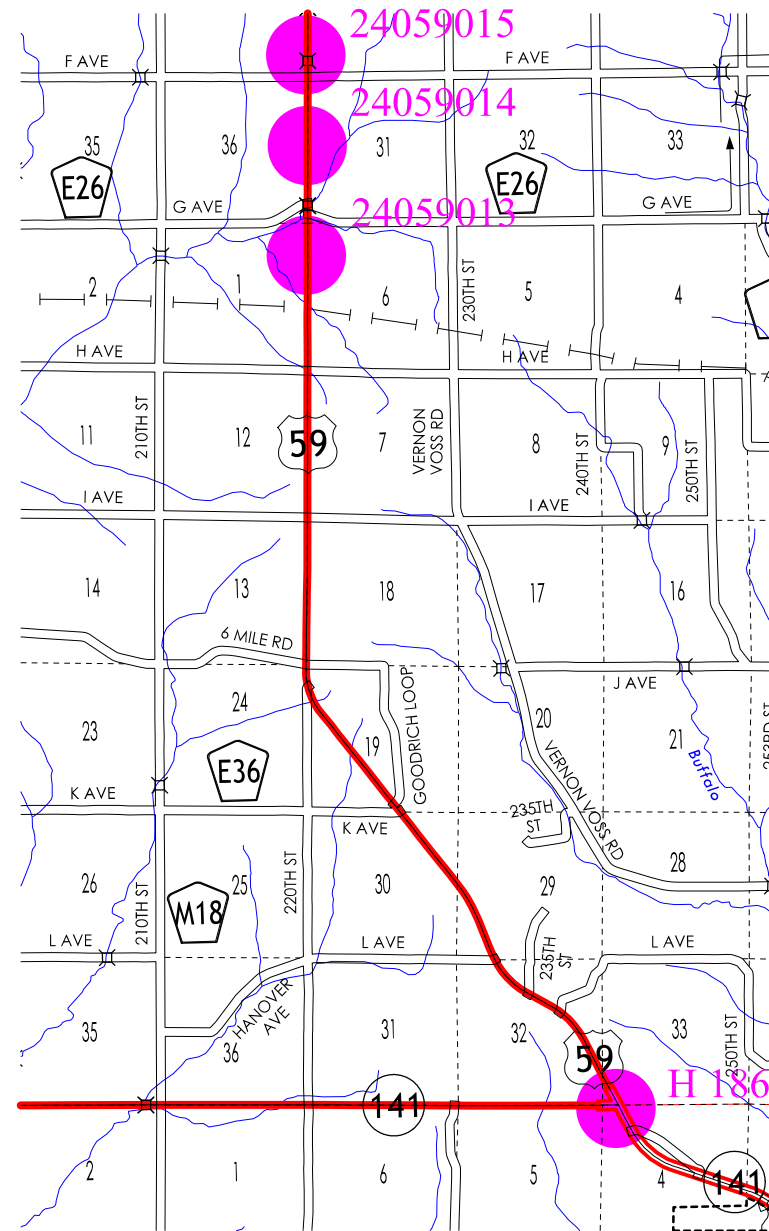
Survey stationing relates to as built plan stationing as follows:

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																		
31010	SR G AVE RET 1	1379+37.05	7283690.65	16579584.12															
31011	SR G AVE RET 1																		
31020	SR G AVE RET 2	1379+30.00	7283720.43	16579569.31															
31021	SR G AVE RET 2																		
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										
			OS	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.

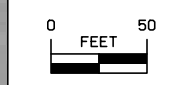
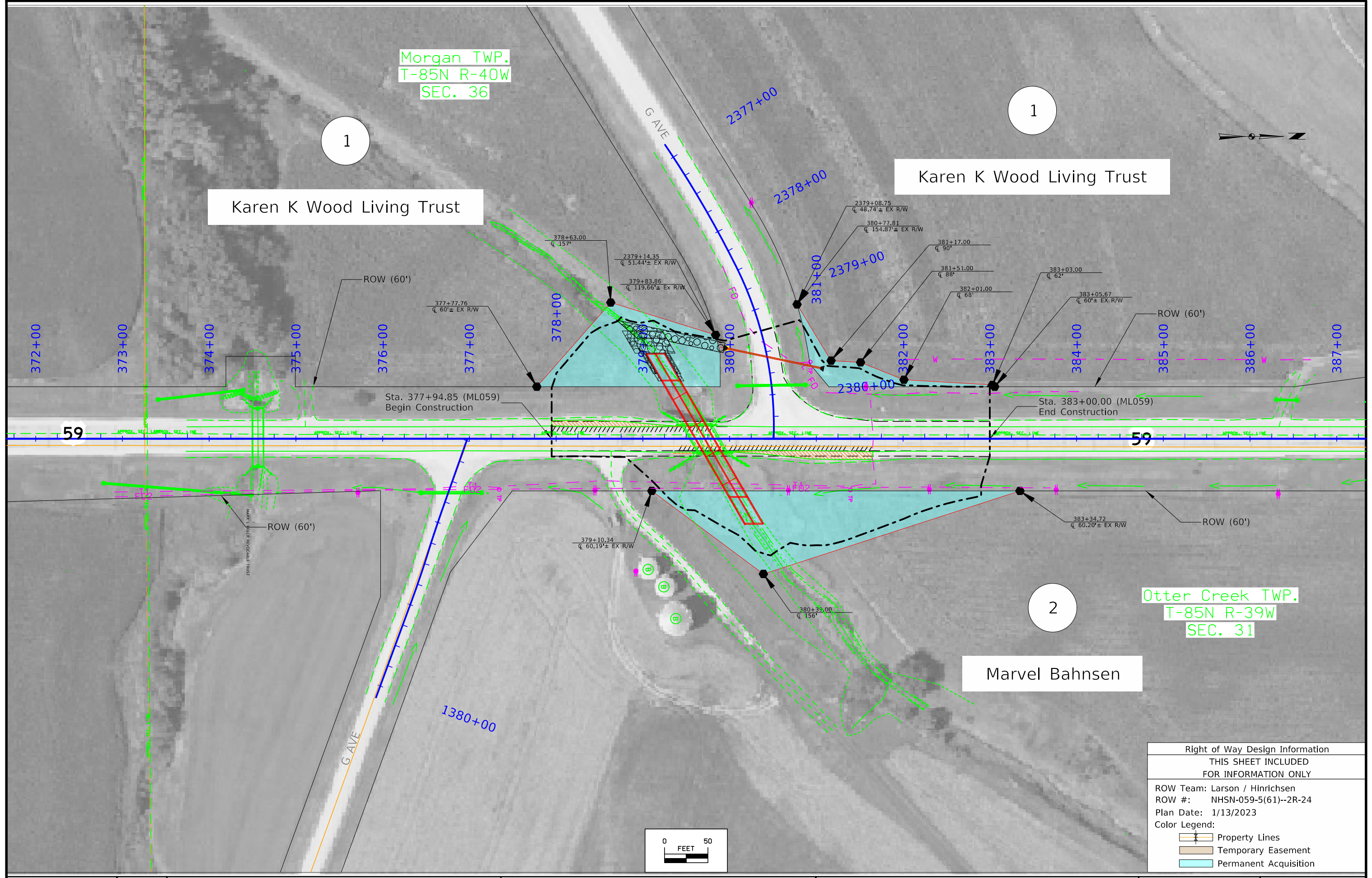
Morgan TWP.
T-85N R-40W
SEC. 36

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

LINework	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

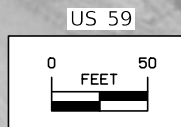
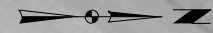
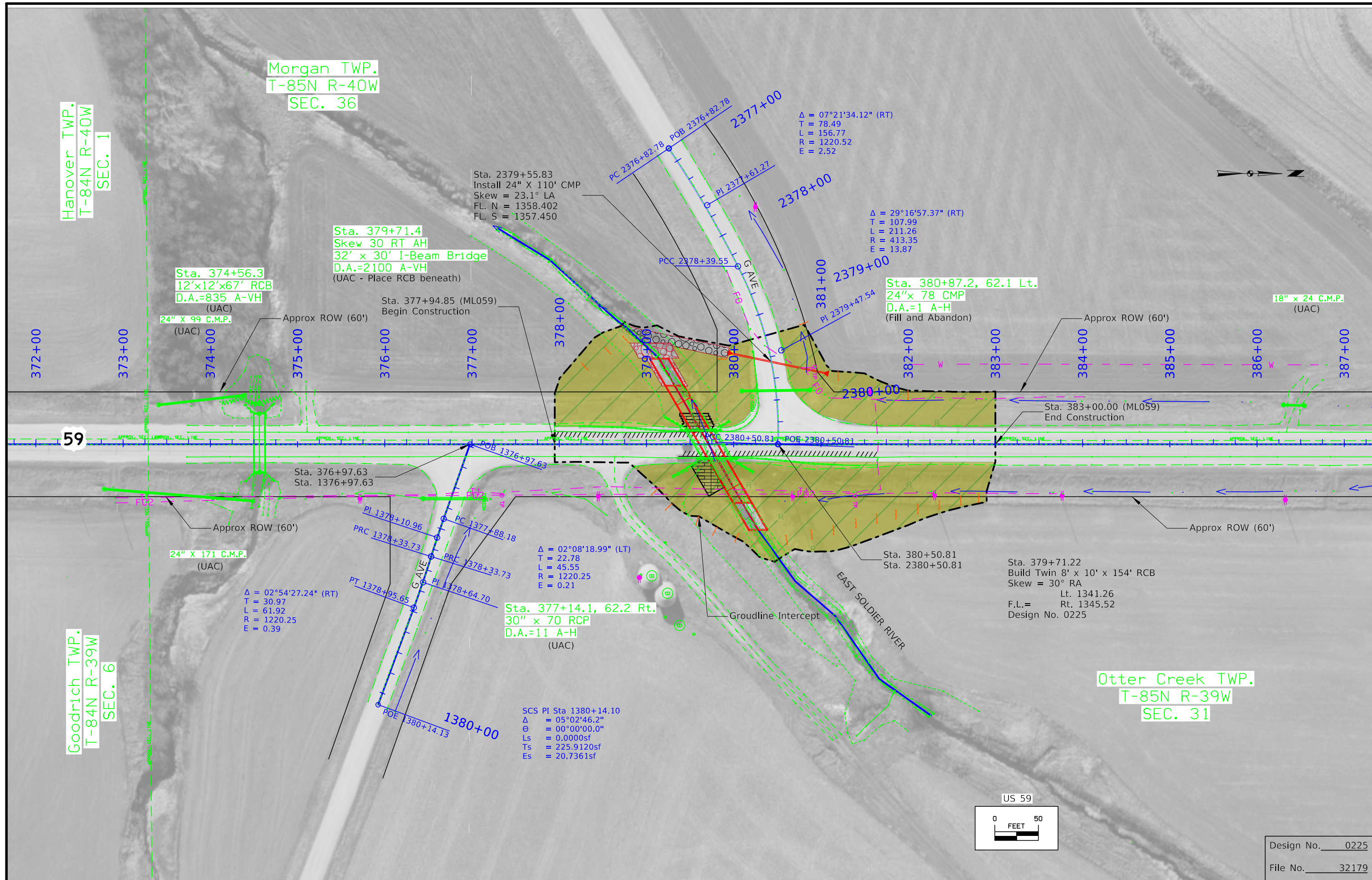
(COVERS SHEET SERIES R)

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

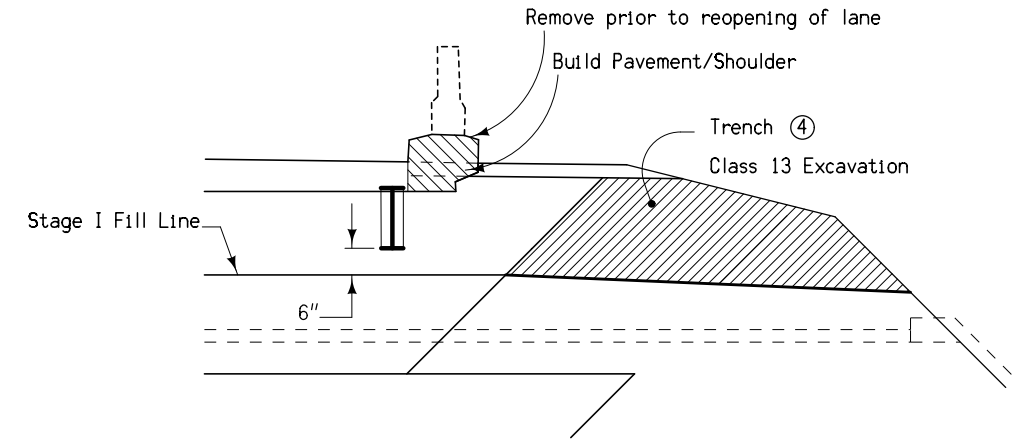
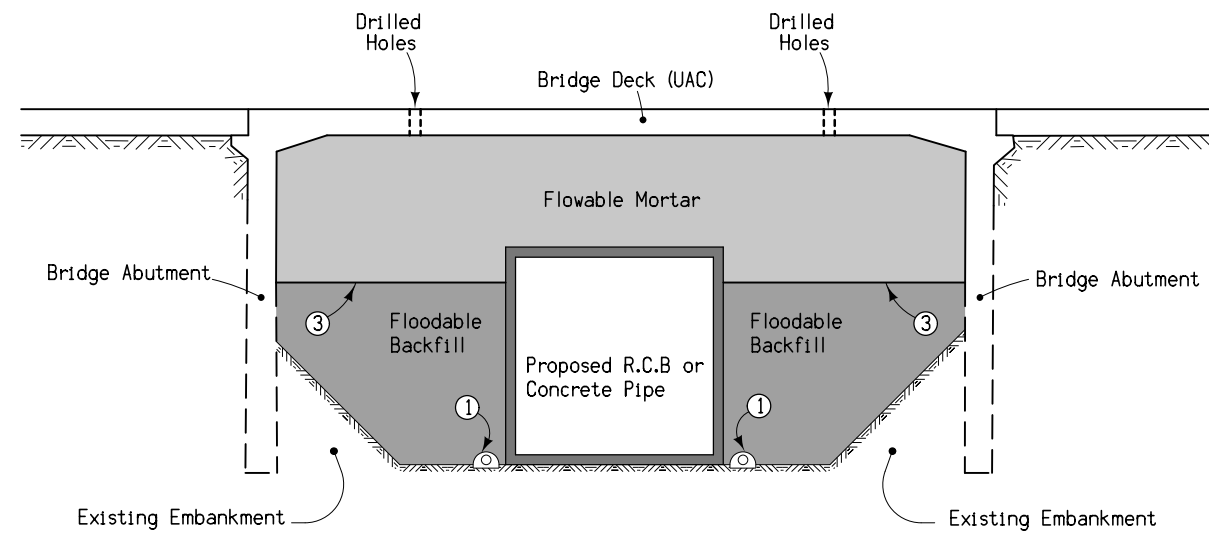
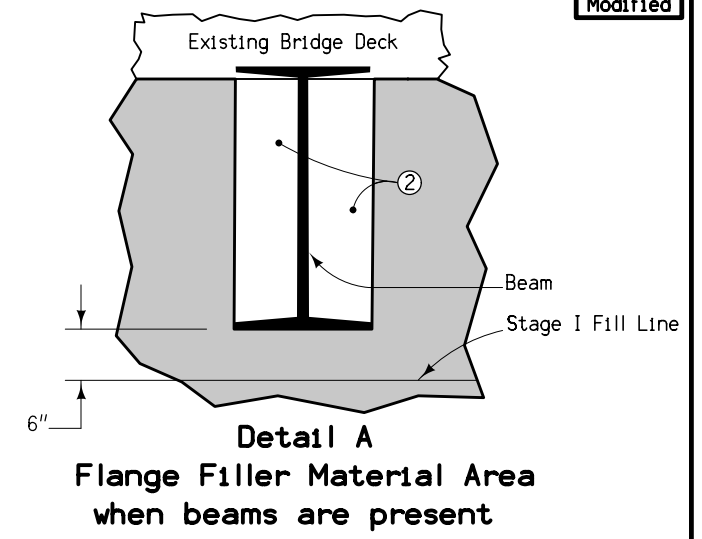
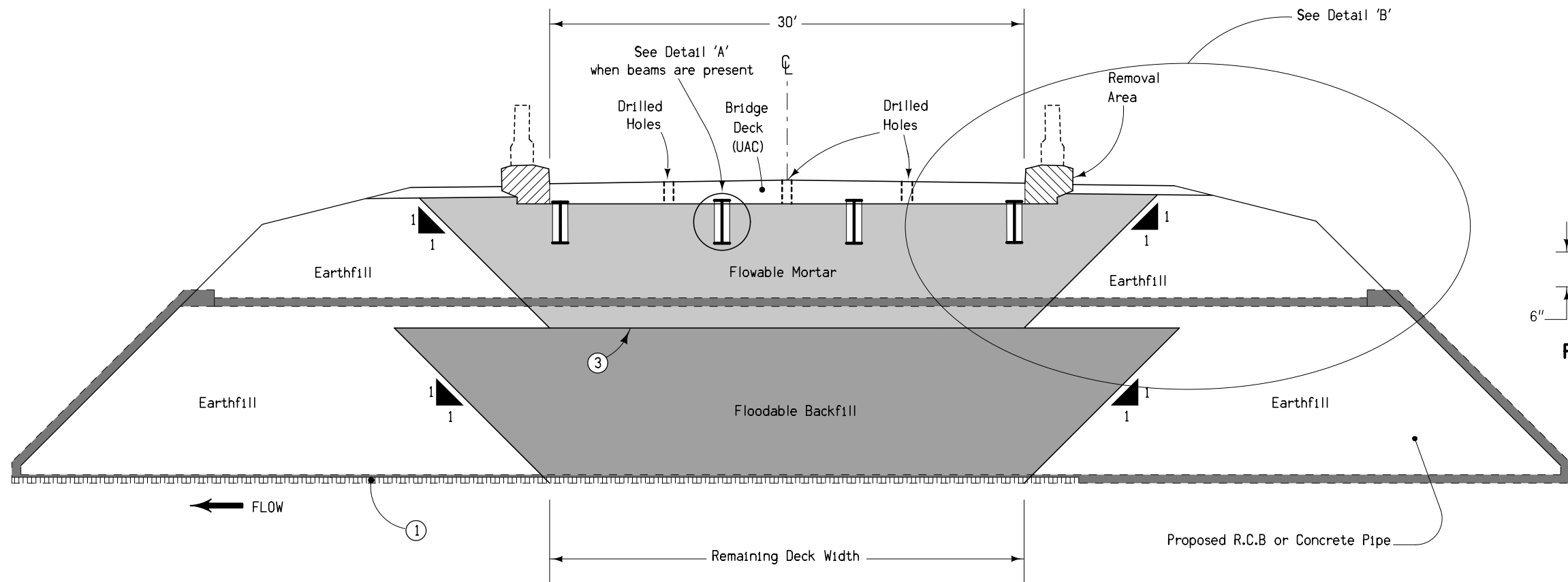
Hanover TWP.
T-84N R-40W
SEC. 1

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

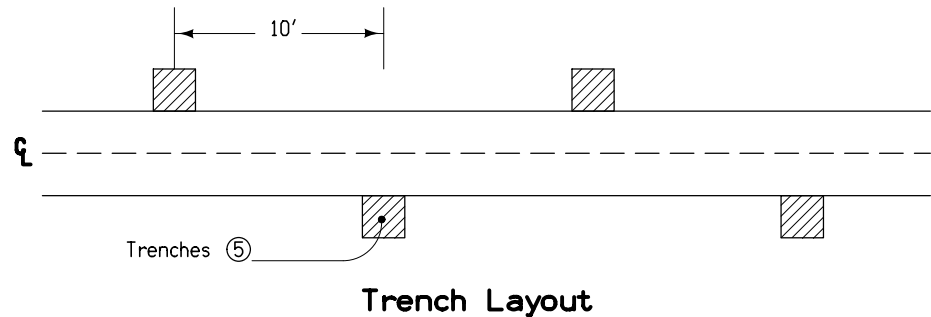
Otter Creek TWP.
T-85N R-39W
SEC. 31



Design No. 0225
File No. 32179



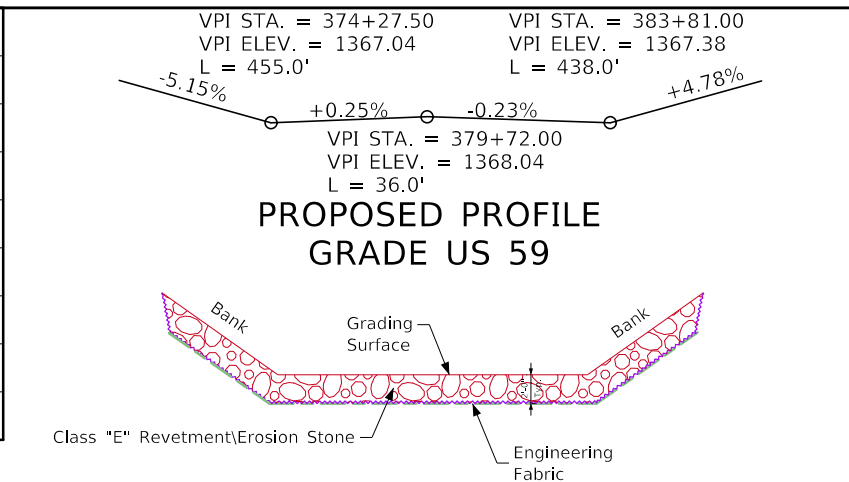
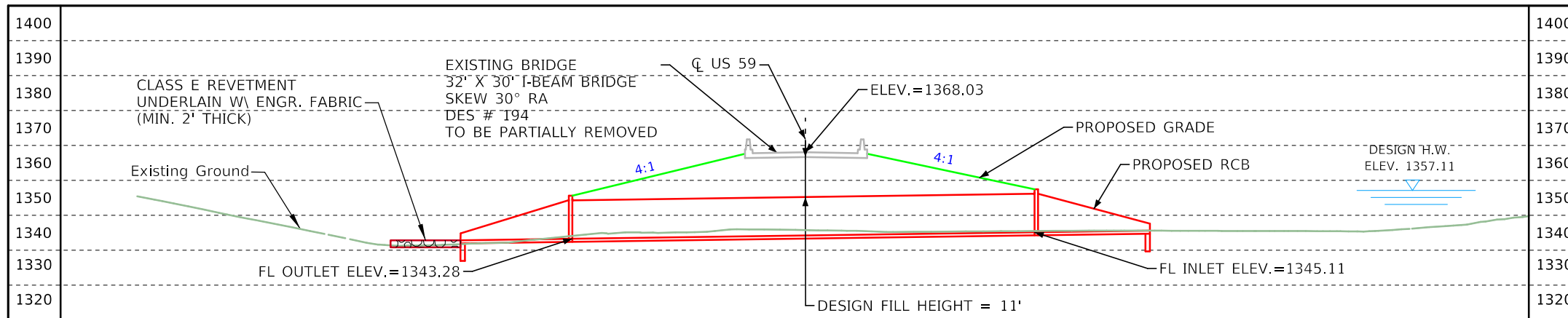
Section along Centerline



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

- 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:

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

LONGITUDINAL SECTION ALONG CL OF CULVERT

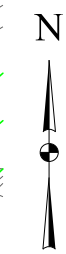
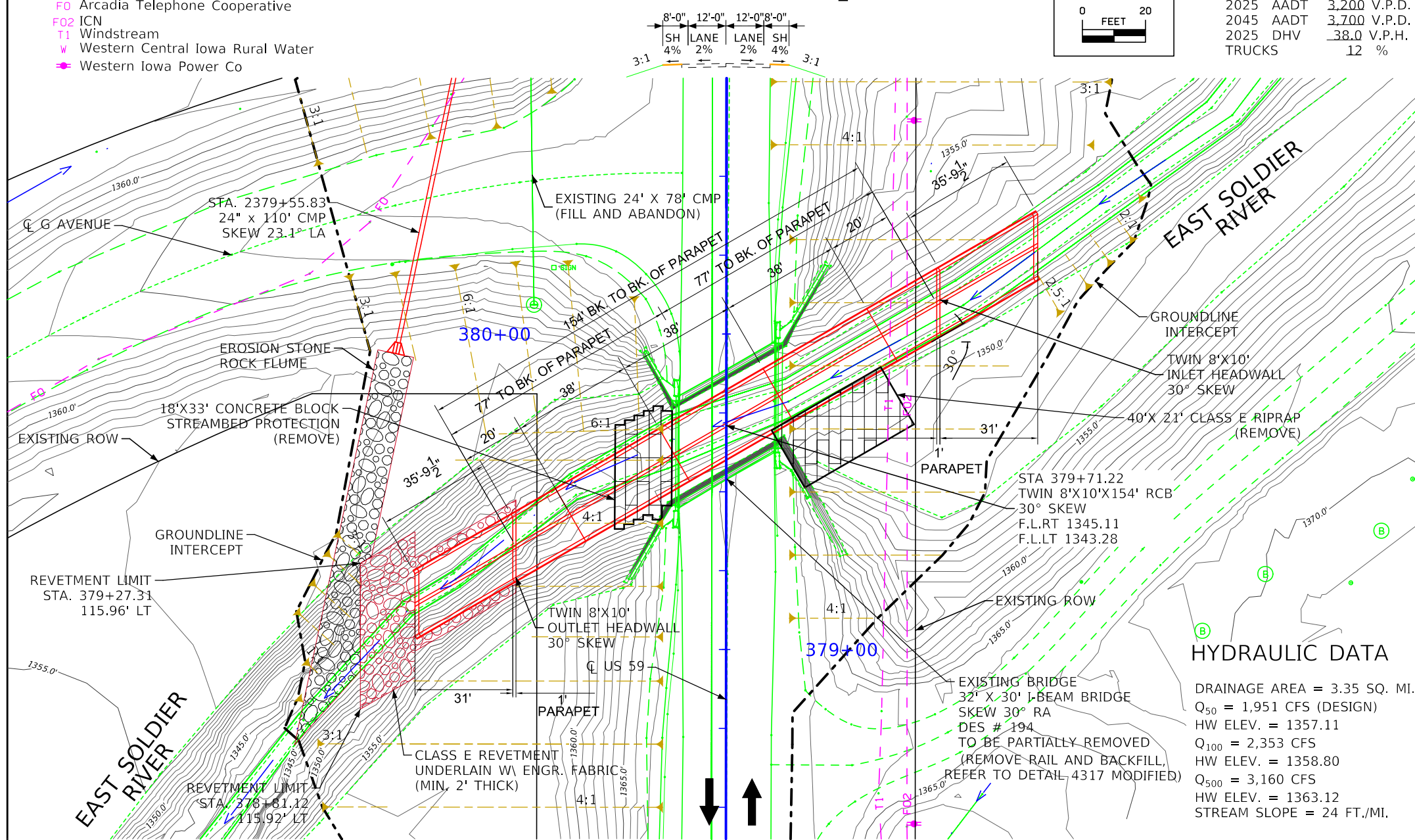
TRAFFIC ESTIMATE

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
Totals	107	167	330	163

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



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 DATA

DRAINAGE AREA = 3.35 SQ. MI.
Q₅₀ = 1,951 CFS (DESIGN)
HW ELEV. = 1357.11
Q₁₀₀ = 2,353 CFS
HW ELEV. = 1358.80
Q₅₀₀ = 3,160 CFS
HW ELEV. = 1363.12
STREAM SLOPE = 24 FT./MI.

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.

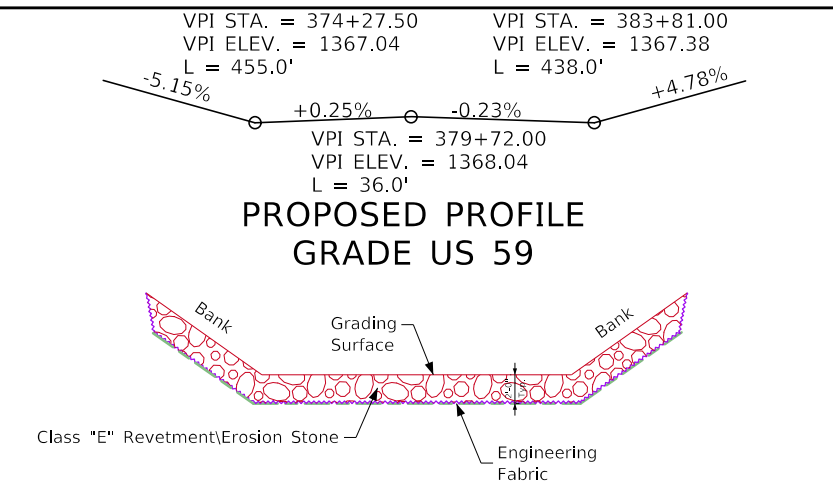
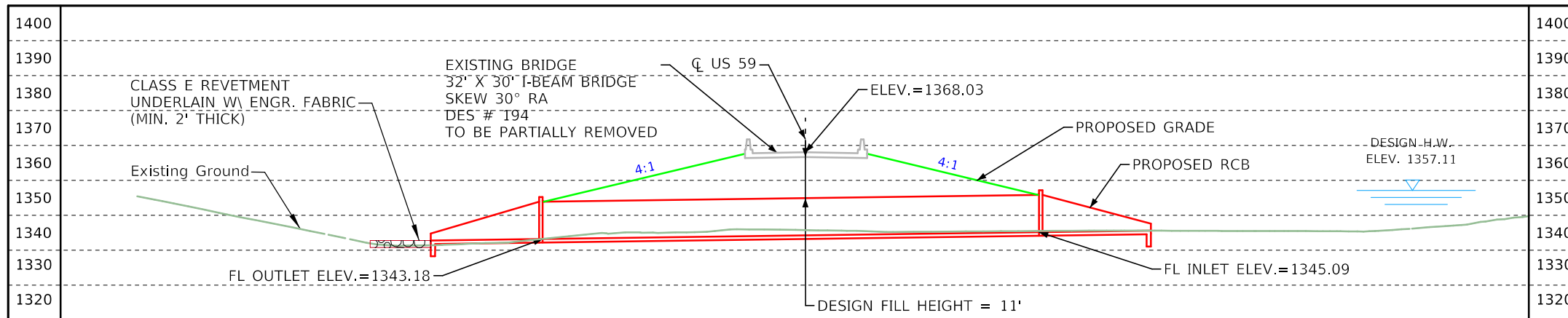
Signature: Jonathan E. Peterson Date: XX-XX-XXXX

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

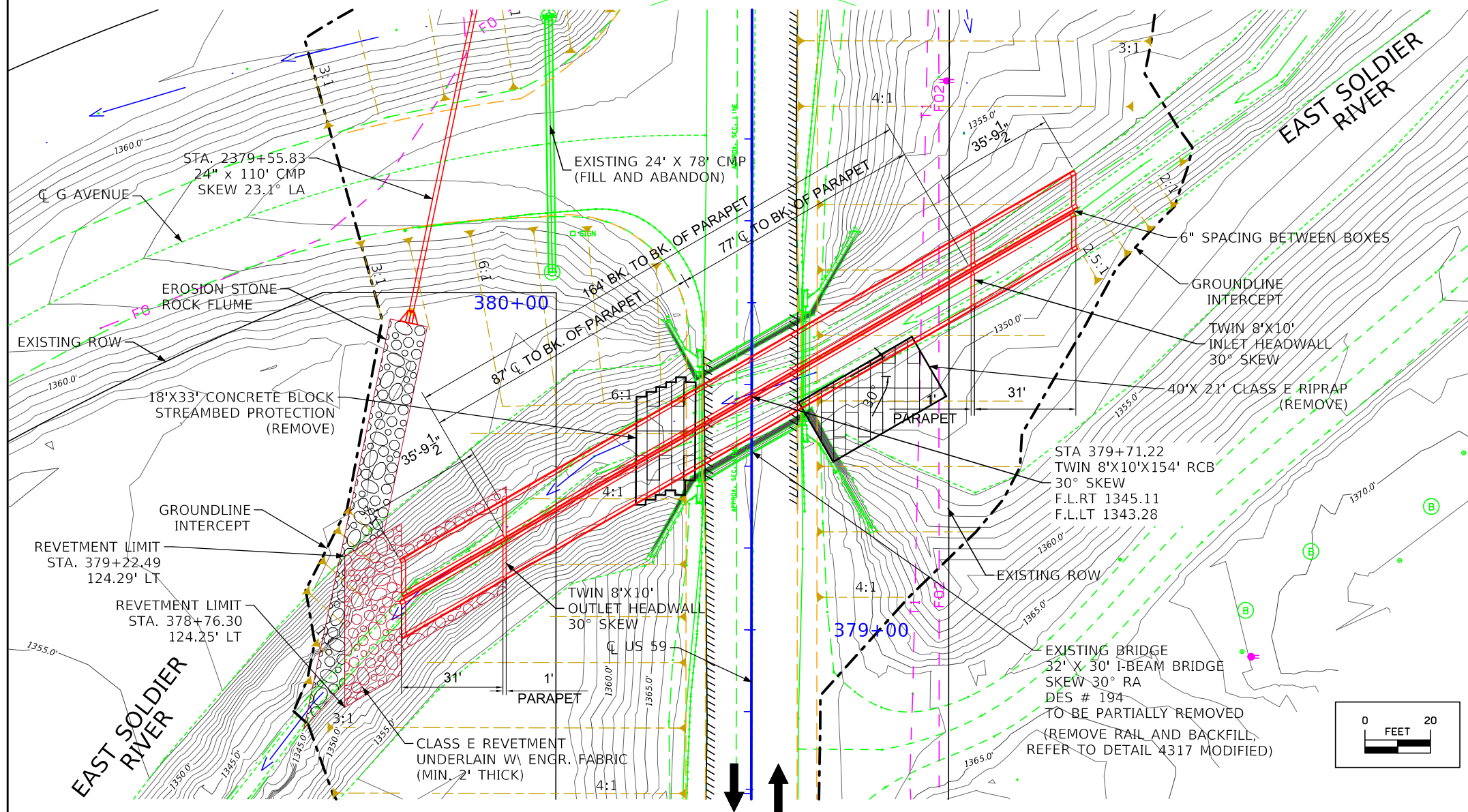
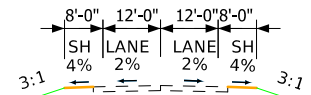
Design For 30 Degree Skew RA
Twin 8'-0" x 10'-0" x 154'-0"
Reinforced Concrete Box Culvert
Preliminary Situation Plan
STA. 379+71.22 (US 59) Turn-In Date: October 2022
Crawford County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 0225 Design Sheet No. 1 of 3 FHWA/Asset 21510



UTILITIES LEGEND:

- FO Arcadia Telephone Cooperative
- FO2 ICN
- T1 Windstream
- W Western Central Iowa Rural Water
- Western Iowa Power Co

LONGITUDINAL SECTION ALONG CL OF CULVERT



NOTES:
 ALL UNITS ARE IN FEET UNLESS OTHERWISE NOTED OR SHOWN.
 DRAINAGE THROUGH EXISTING CHANNEL MUST BE MAINTAINED THROUGHOUT CONSTRUCTION.
 6 INCH GAP BETWEEN CULVERT BARRELS

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
Totals	107	167	330	163

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

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 DATA

DRAINAGE AREA = 3.35 SQ. MI.
 Q₅₀ = 1,951 CFS (DESIGN)
 HW ELEV. = 1357.11
 Q₁₀₀ = 2,353 CFS
 HW ELEV. = 1358.80
 Q₅₀₀ = 3,160 CFS
 HW ELEV. = 1363.12
 STREAM SLOPE = 24 FT./MI.

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 %

Design For 30 Degree Skew RA
TWIN 8'-0" X 10'-0" X 164'-0"
PRECAST 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. 2 of 3 FHWA/Asset 21510

1390		CL	PROFILE GRADE ELEVATION 1367.397		1390
1380	FL ELV. 1358.402 DR-203 INLET END OF APRON 24" CMP OFFSET -61.927 LT			FL ELV. 1357.450 DR-203 OUTLET END OF APRON 24" CMP OFFSET +45.915 RT	1380
1370					1370
1360					1360
1350			H = 7.5'		1350
1340	FL ELV. 1358.374 DR-203 INLET END 24" CMP OFFSET -58.636 LT	PIPE SLOPE = 0.81%		FL ELV. 1357.478 DR-203 OUTLET END 24" CMP OFFSET +42.766 RT	1340
1330					1330
1320					1320

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

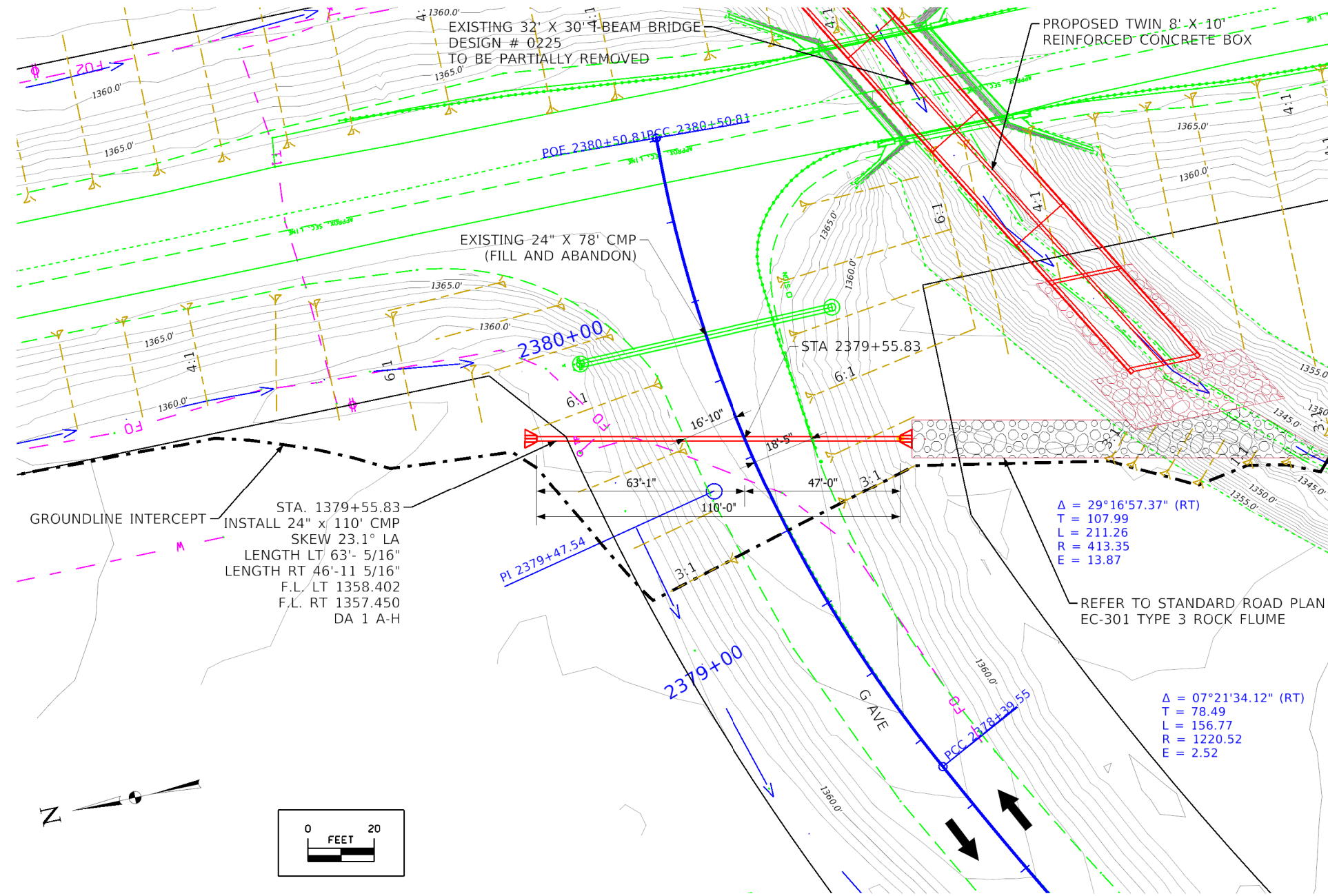
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EASTING: 16627374.37
ELEV. 1368.074

BENCHMARK NO. CP 24059014
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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 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
Q₅₀ = 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
Aggregate			
(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	Grading	
(188)	Revetment Class D	(8)	Behind Curb Cut
(28)	Revetment Class E	(6)	Granular
(12)	Shoulder Special Backfill	(13)	Granular Back Fill
(12)	Special Backfill	(48)	Rock Undercut
(20)	Subbase	(8)	Shoulder Earth Fill
(20)	Subbase Lower	(2)	Side Slopes
(20)	Subbase Upper	(226)	Side Slopes Dressing
(118)	Subgrade Treatment	Substrata	
Asphalt			
(207)	HMA Base Course	(128)	Boulder Substrata
(207)	HMA Interim Course	(48)	Broken Weathered Substrata
(207)	HMA Surface Course	(3)	Core Out Substrata
Concrete			
(0)	Barrier Concrete	(203)	Existing Pavement Substrata
(0)	Barrier Concrete Footing	(6)	Loam Substrata
(0)	Curb Gutter	(80)	Rock Substrata
(48)	Flowable Mortar	(4)	Select Sand Substrata
(0)	Median Concrete	(3)	Shale Substrata
(0)	PCC Pavement	(10)	Topsoil Substrata
(0)	Sidewalk	Unsuitable / Waste	
Shoulder			
(209)	Shoulder HMA	(3)	Unsuitable Type A
(0)	Shoulder PCC	(13)	Unsuitable Type B
(6)	Shoulder Granular	(11)	Unsuitable Type C
Existing			
(0)	Existing Pavement	(3)	Waste

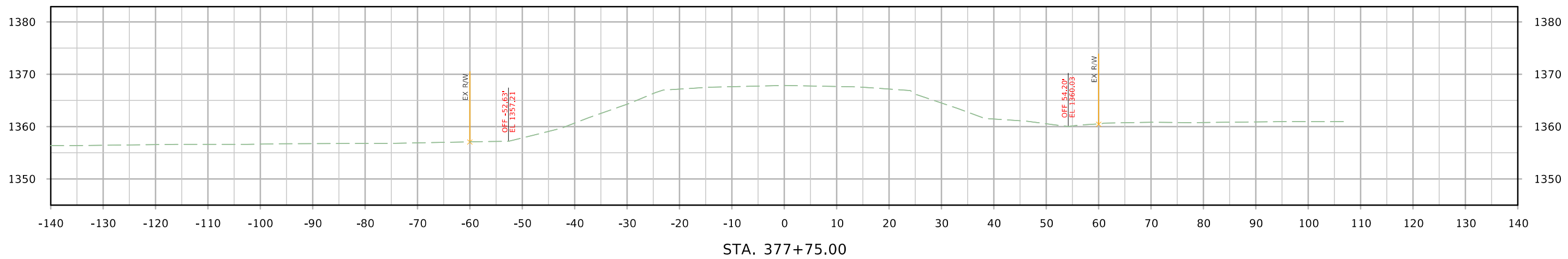
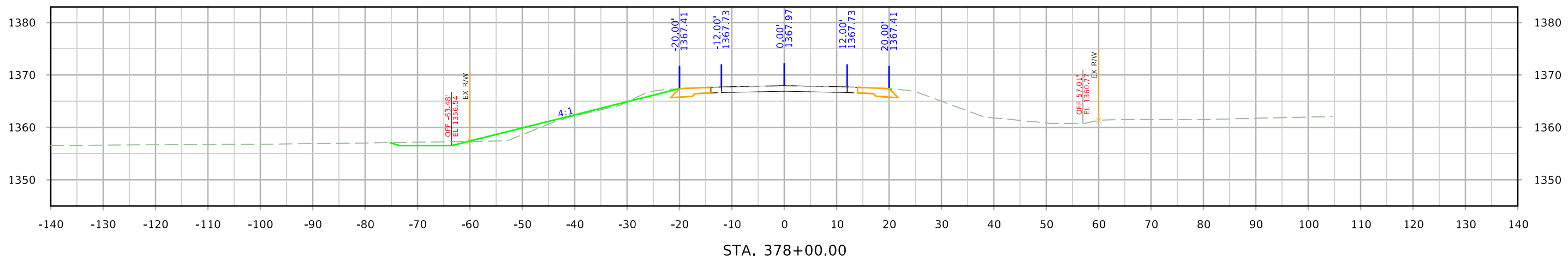
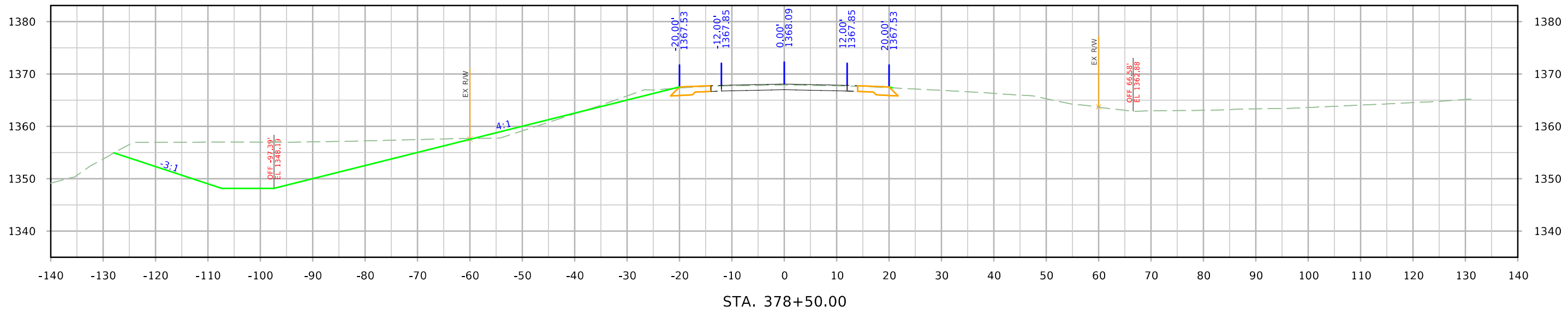
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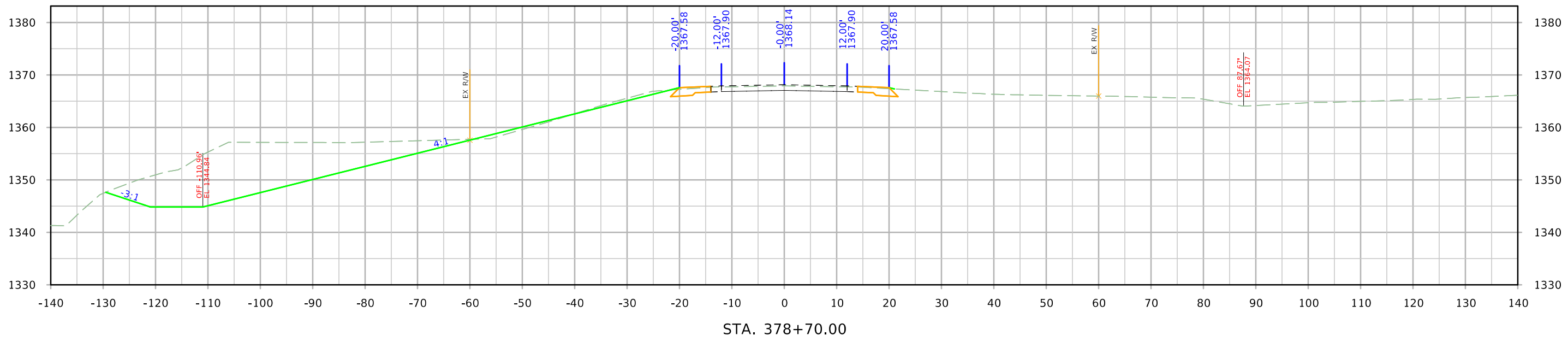
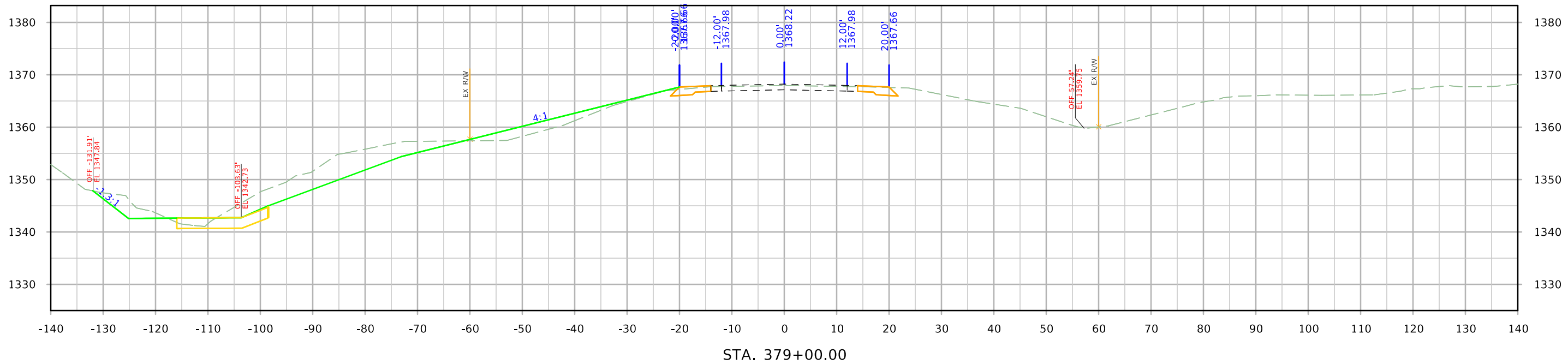
CROSS SECTIONS LEGEND AND INFORMATION SHEET

(COVERS SHEET SERIES W, X, Y, & Z)

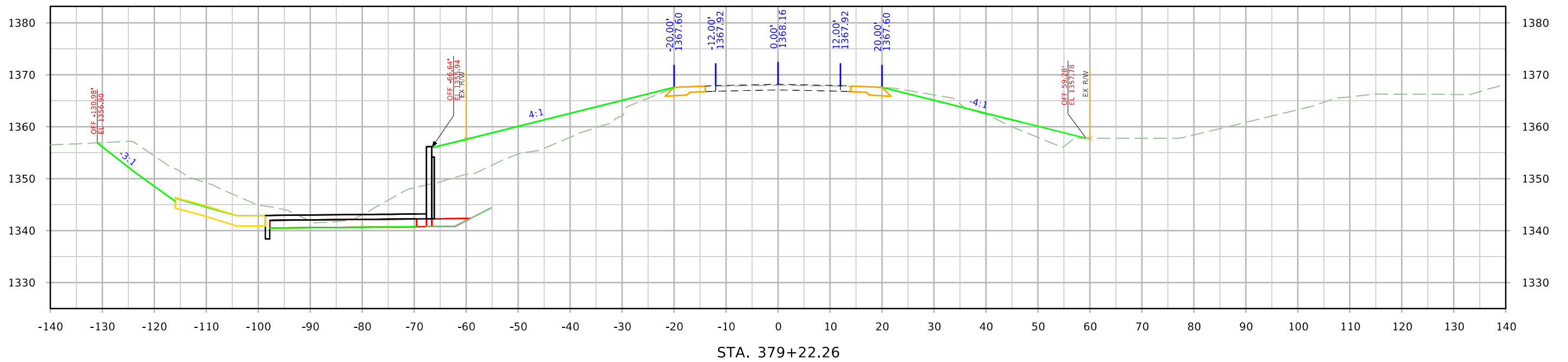
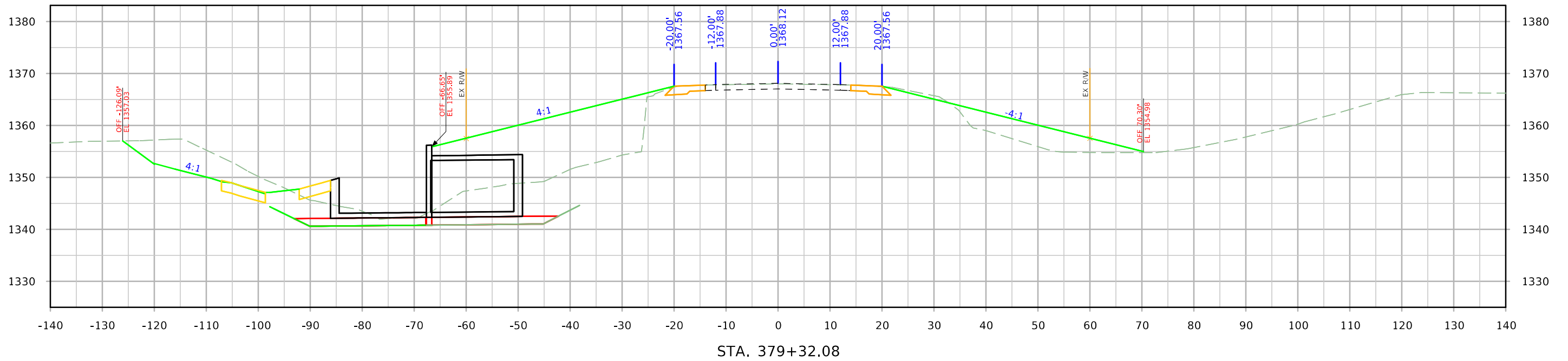
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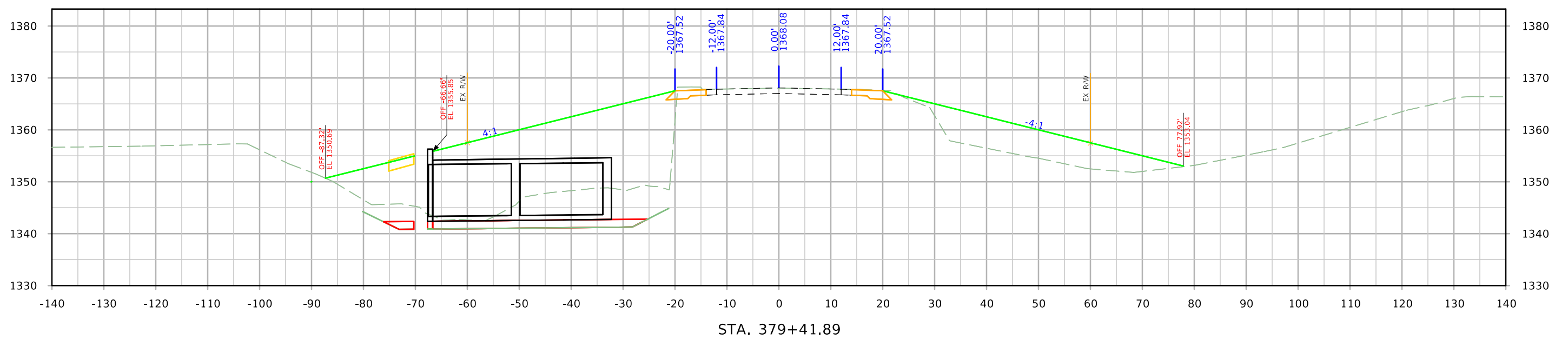
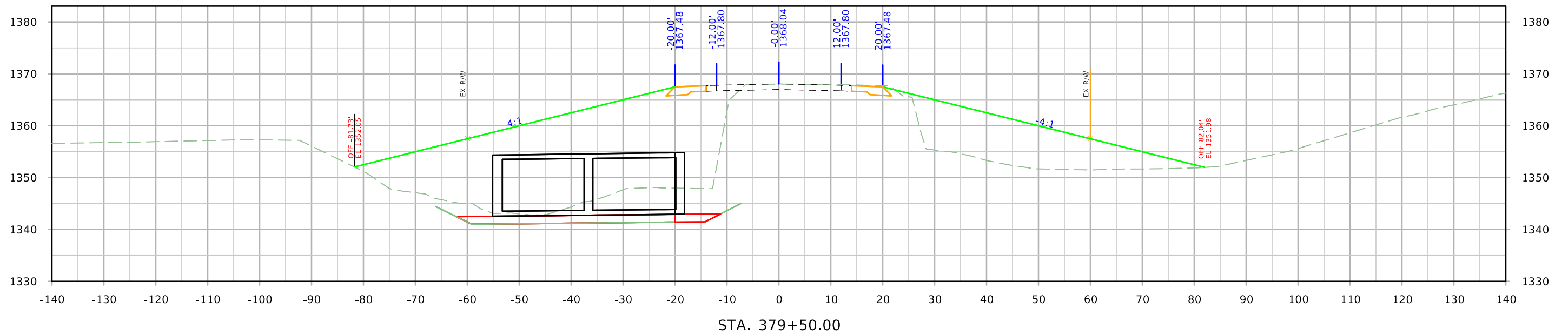
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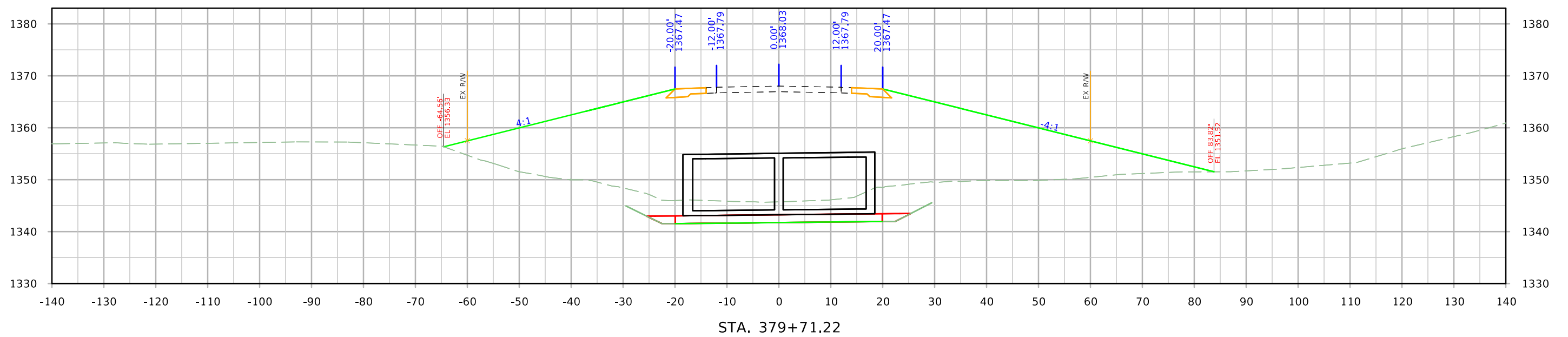
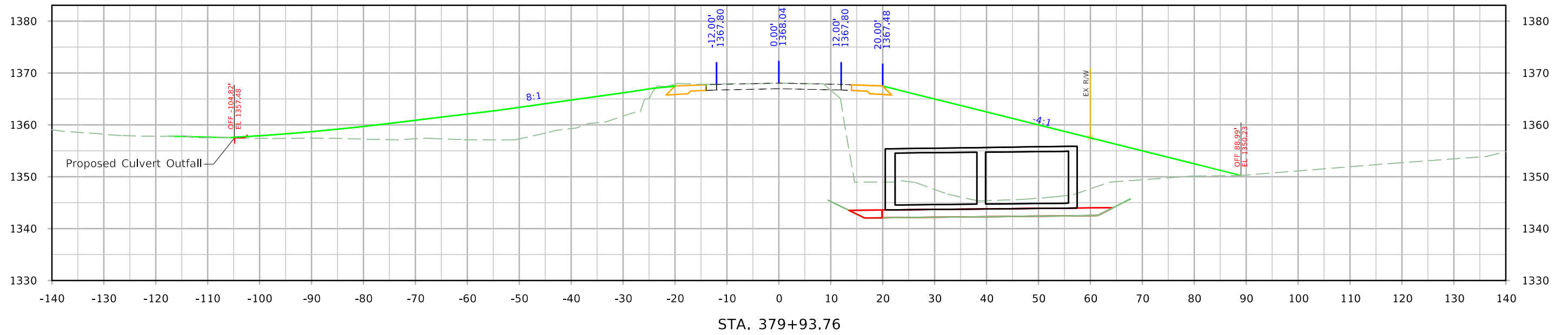
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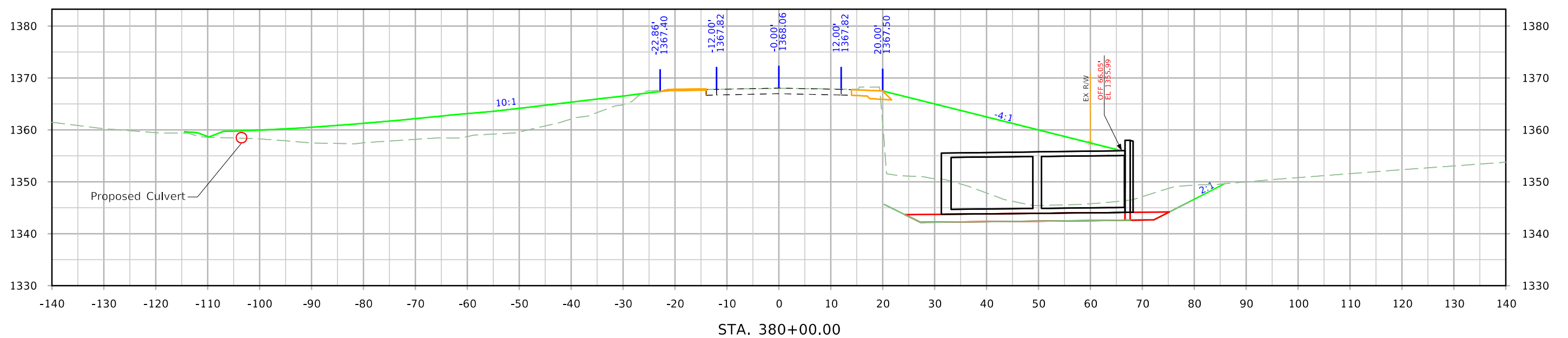
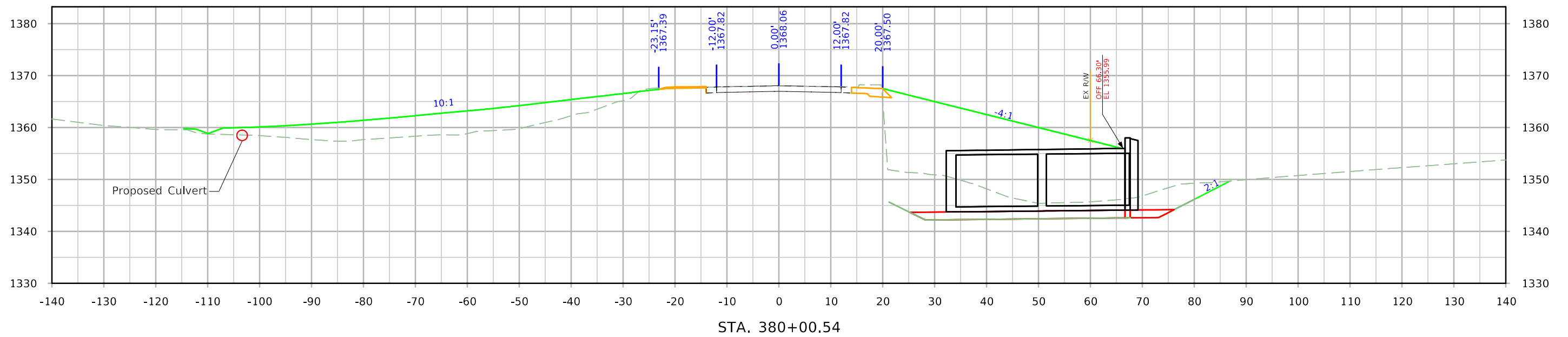
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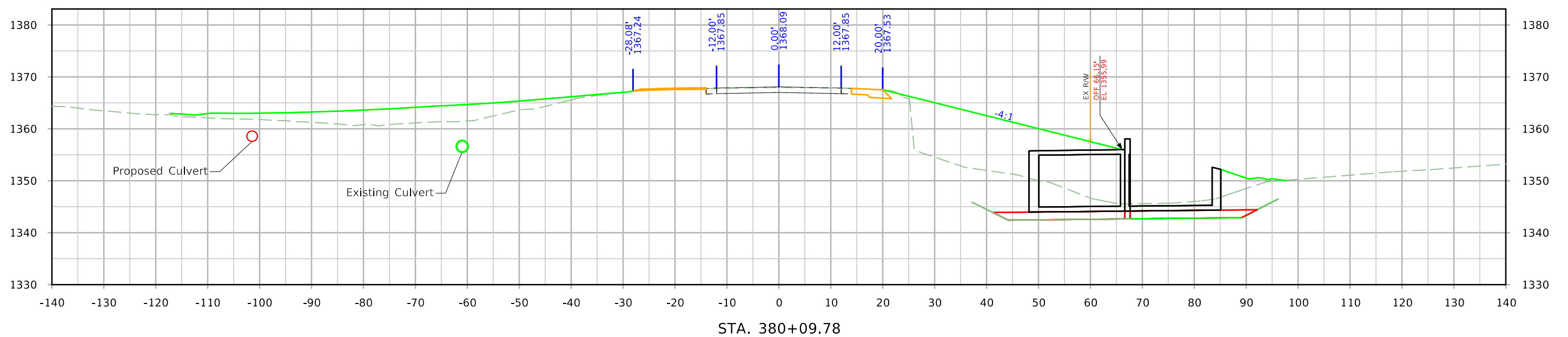
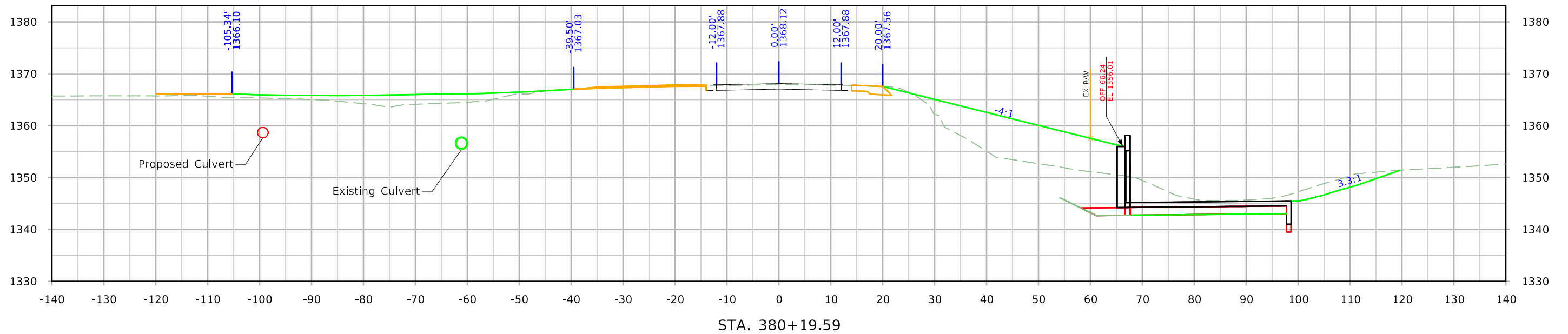
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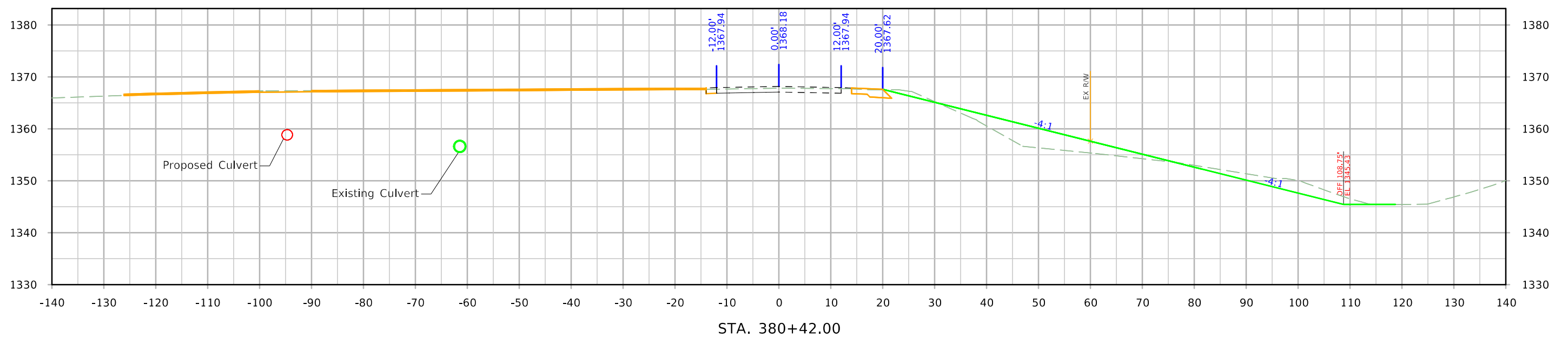
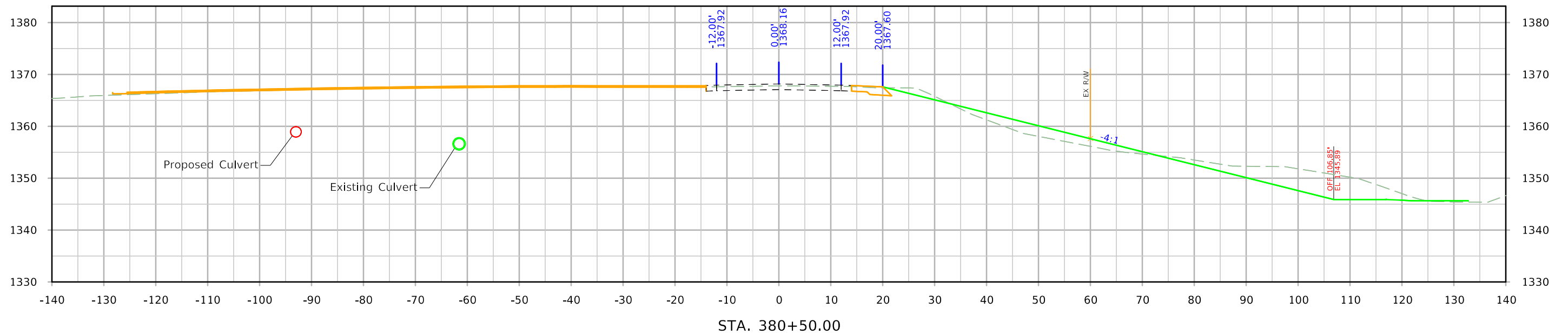
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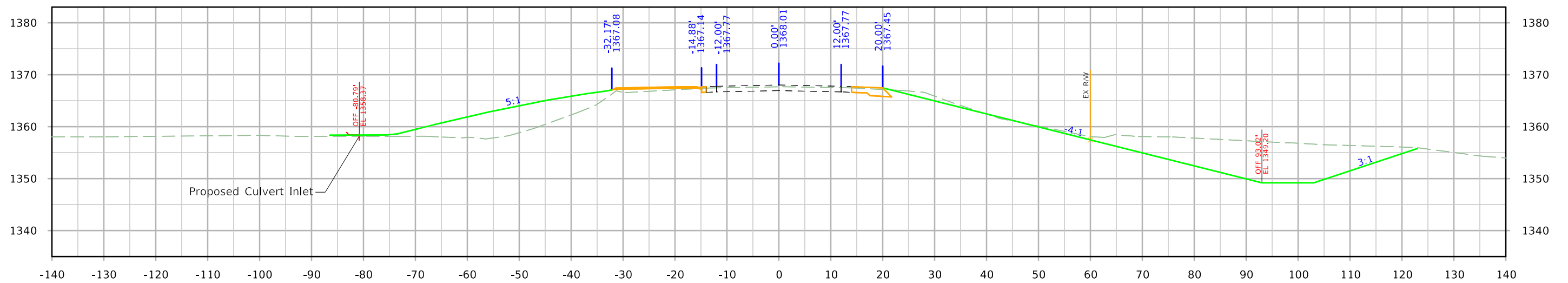
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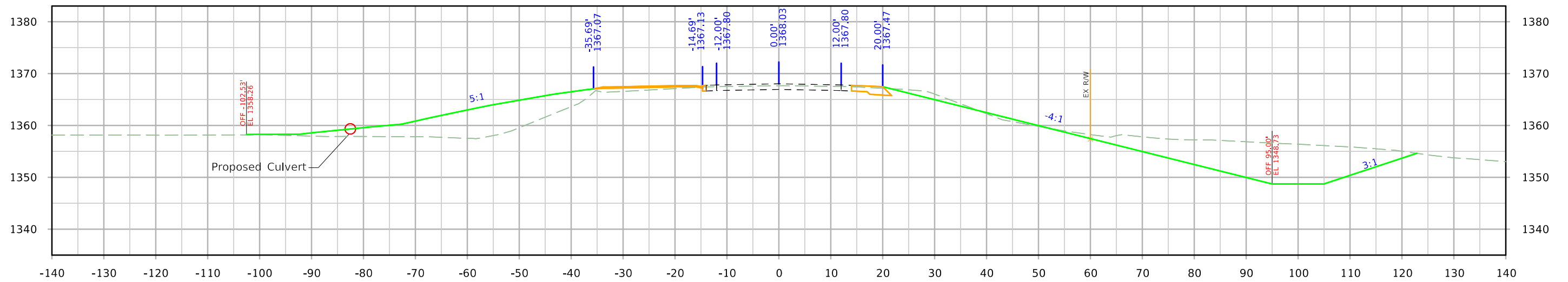
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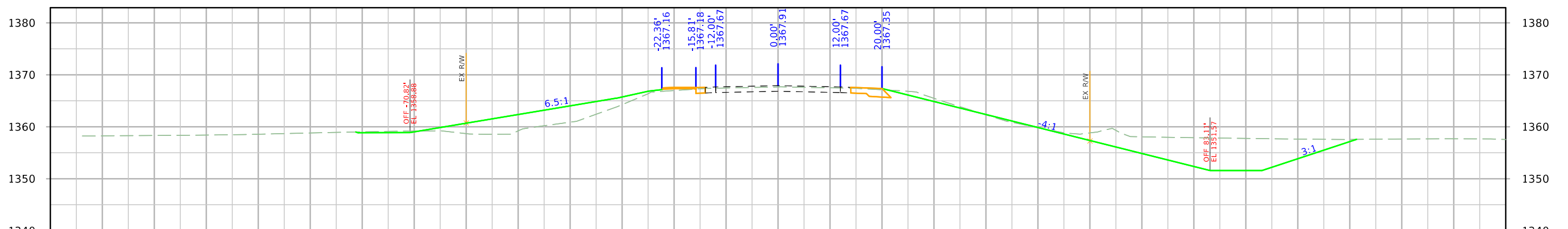
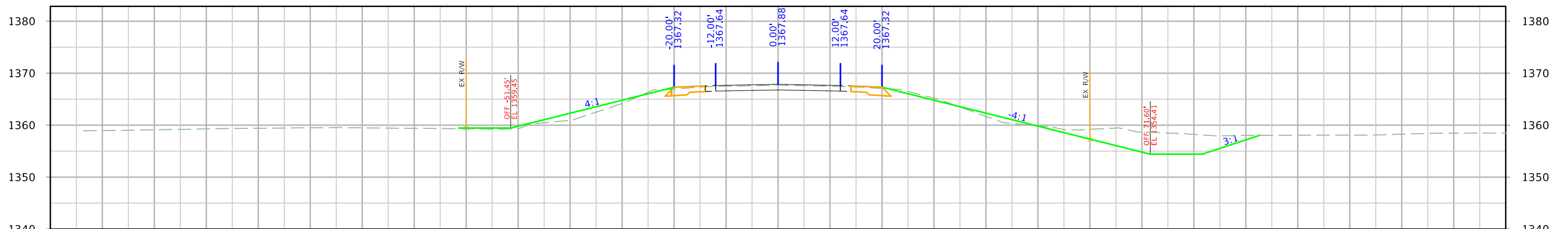
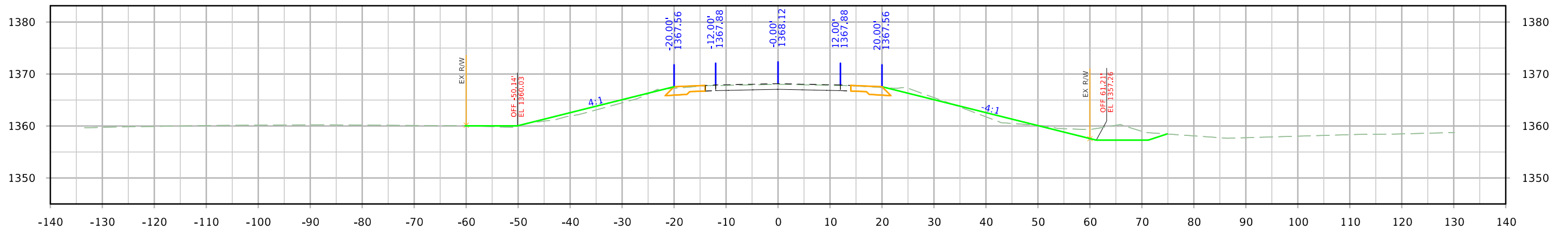


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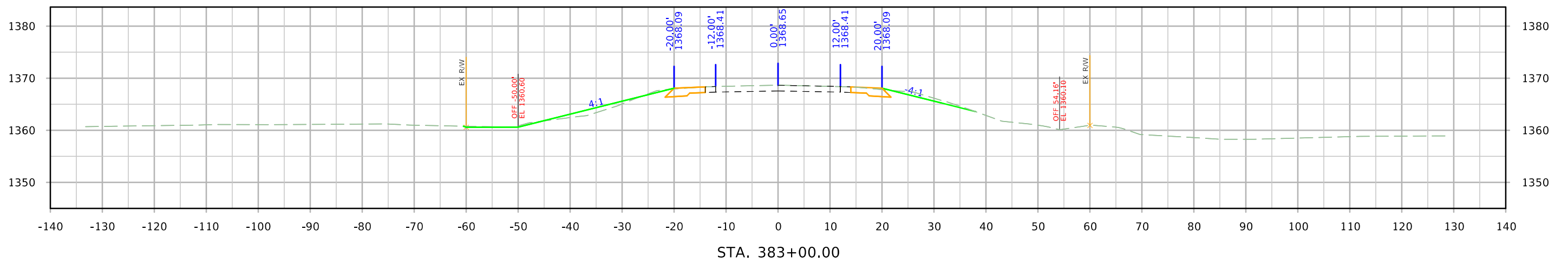
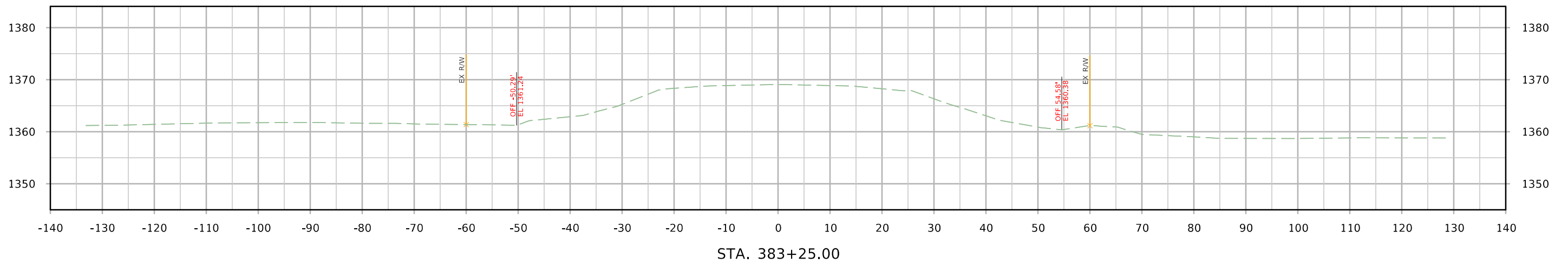


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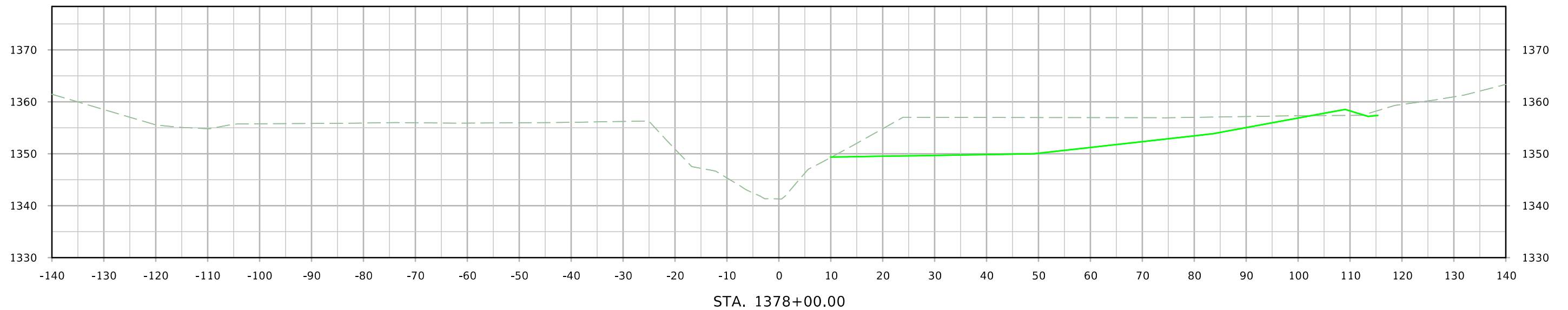
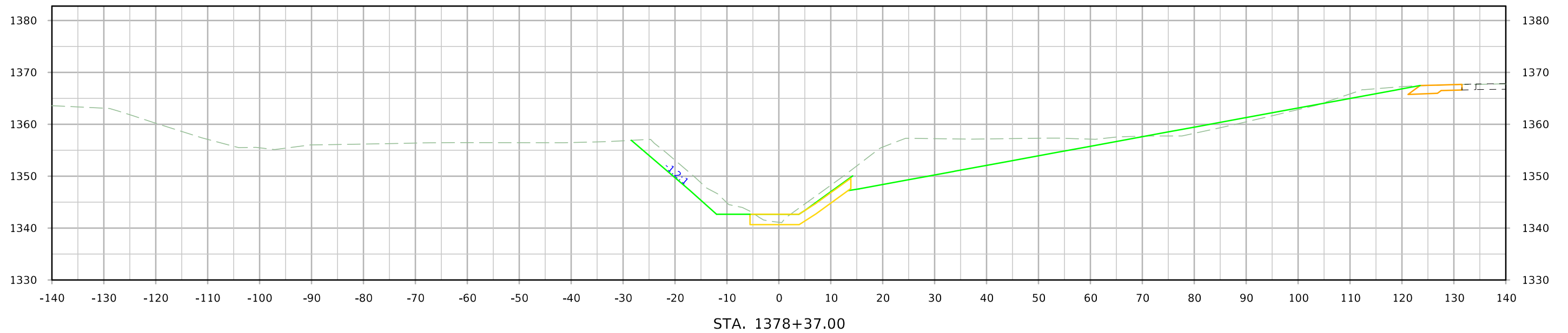
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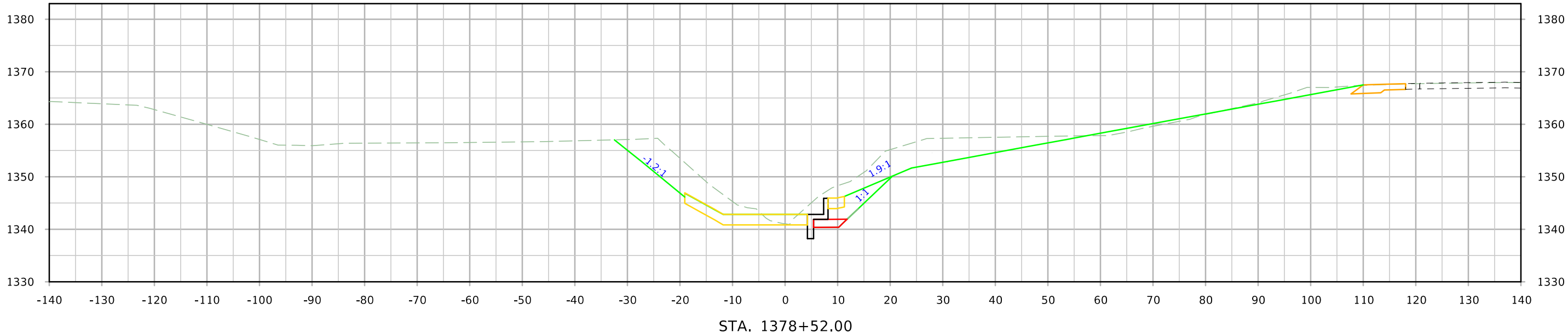
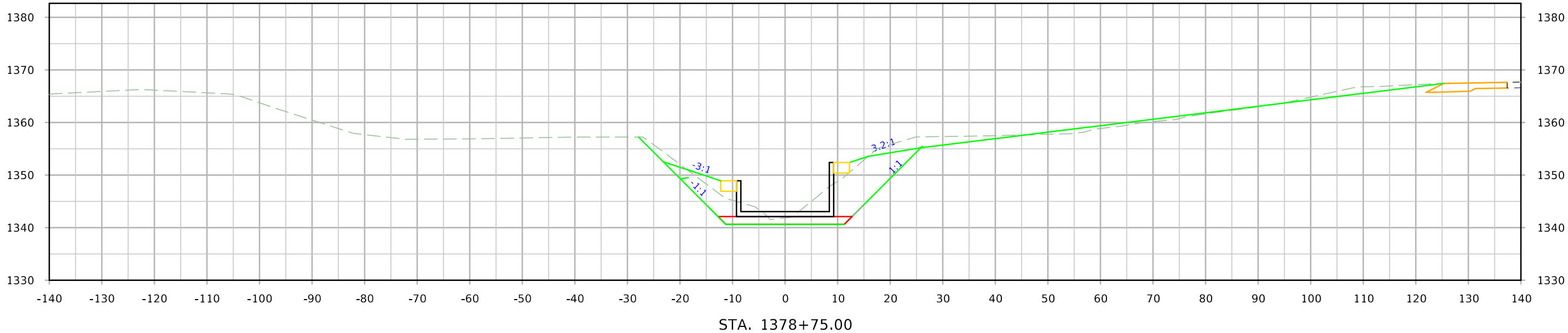
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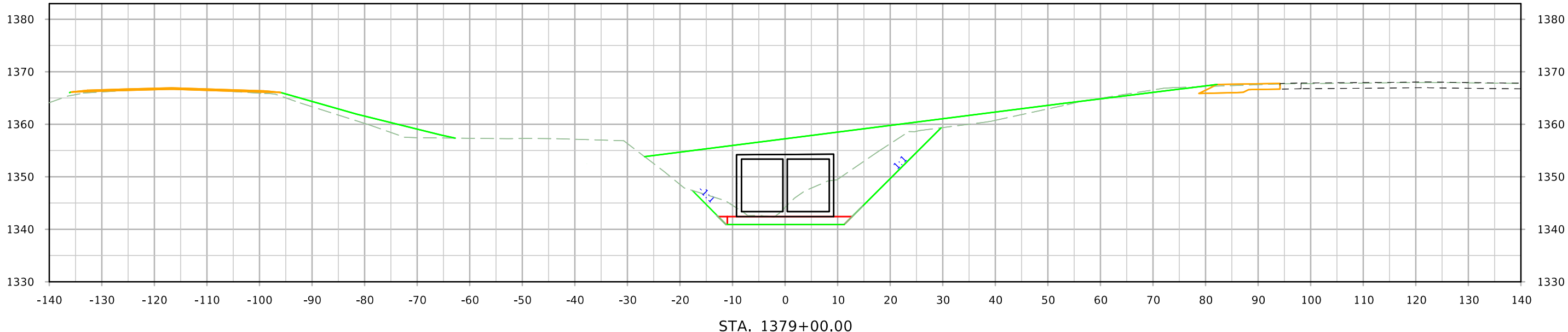
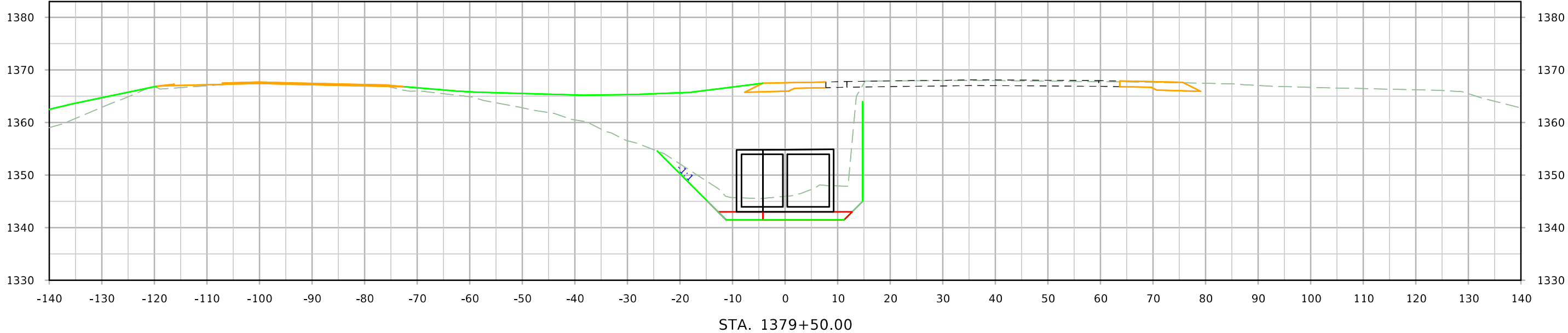
RCB Excavation



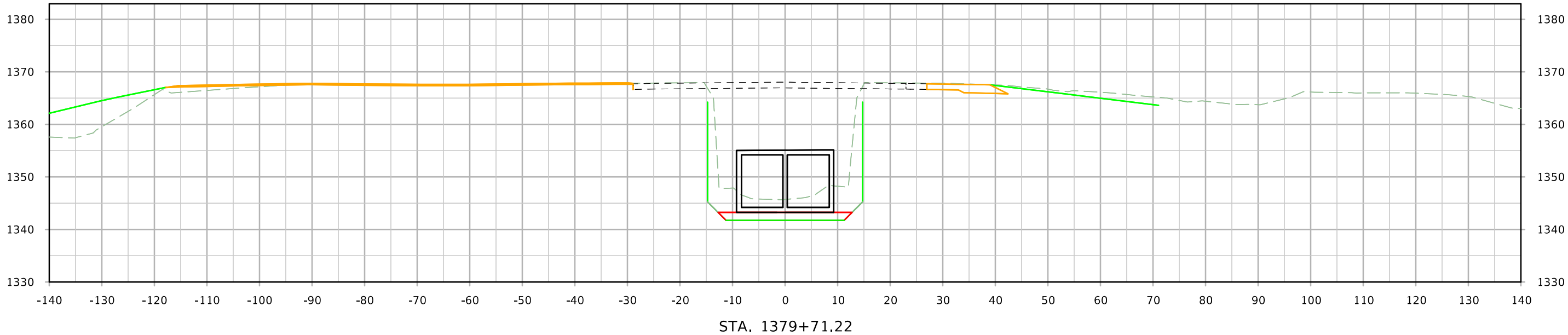
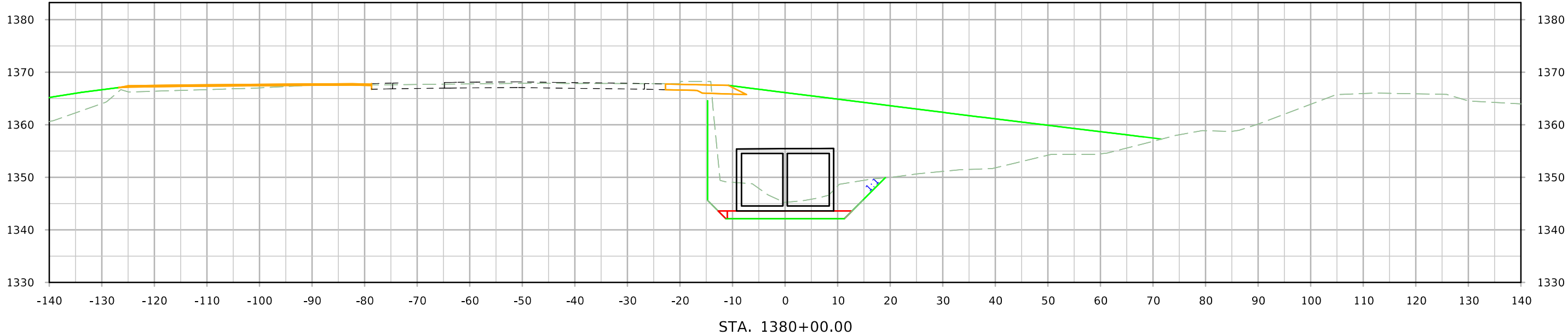
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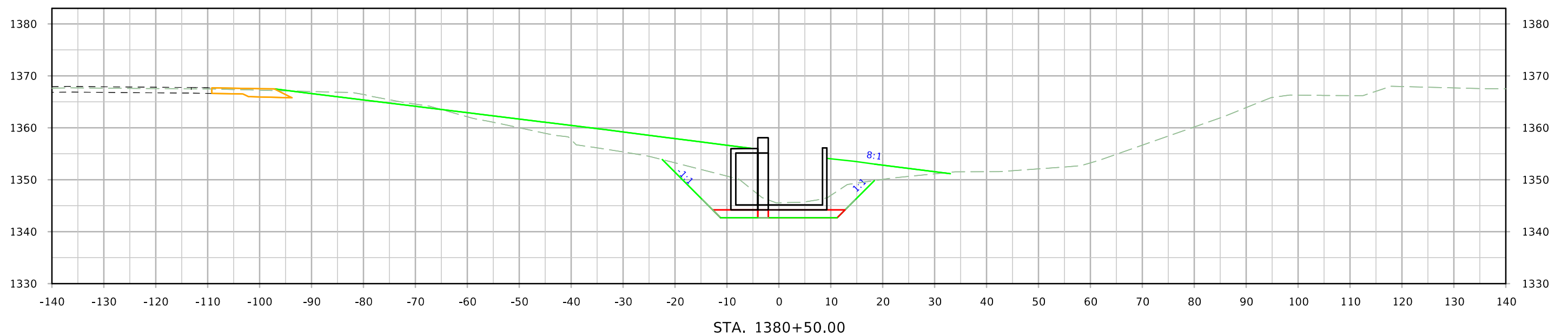
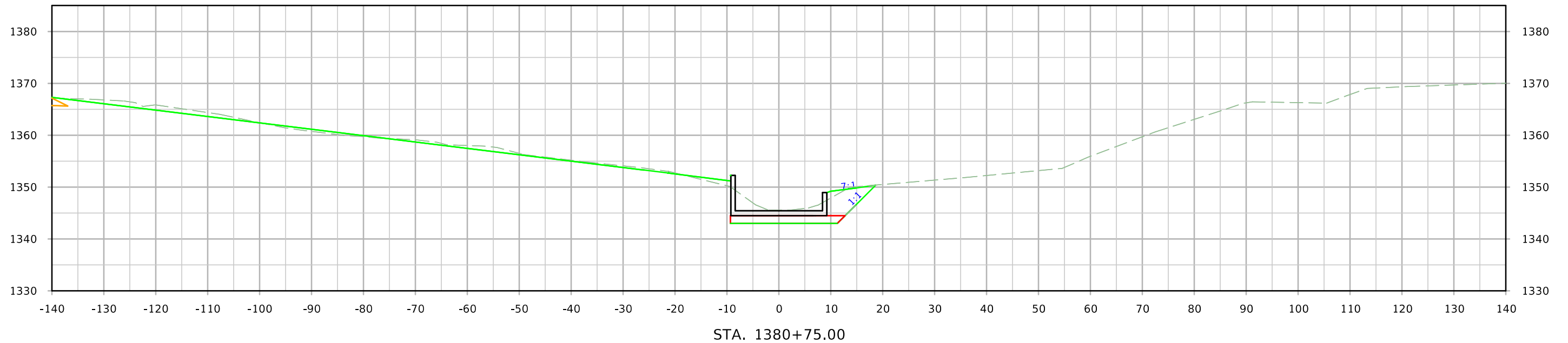
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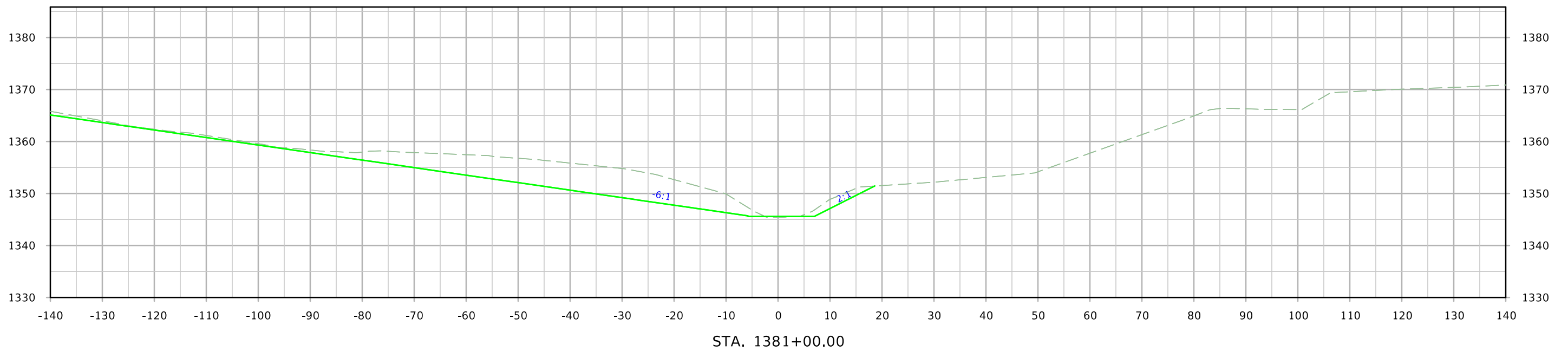
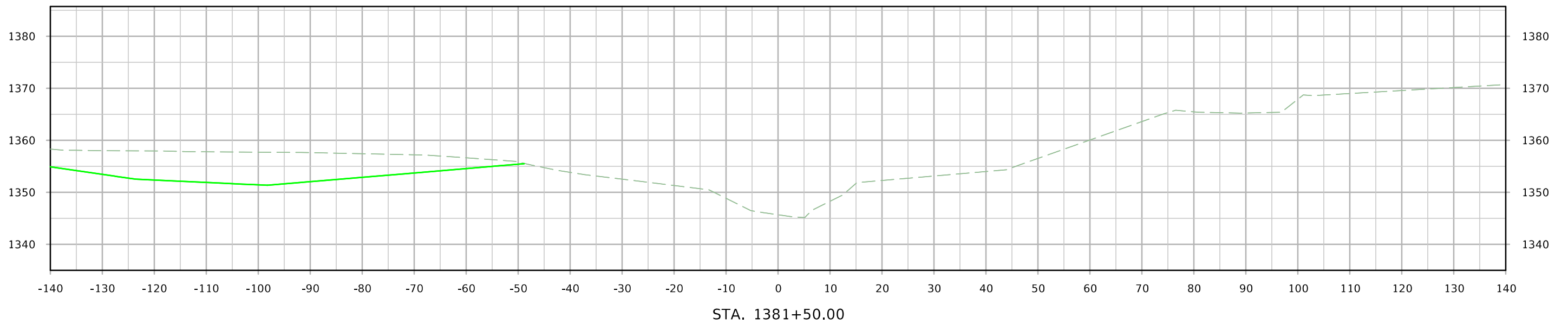
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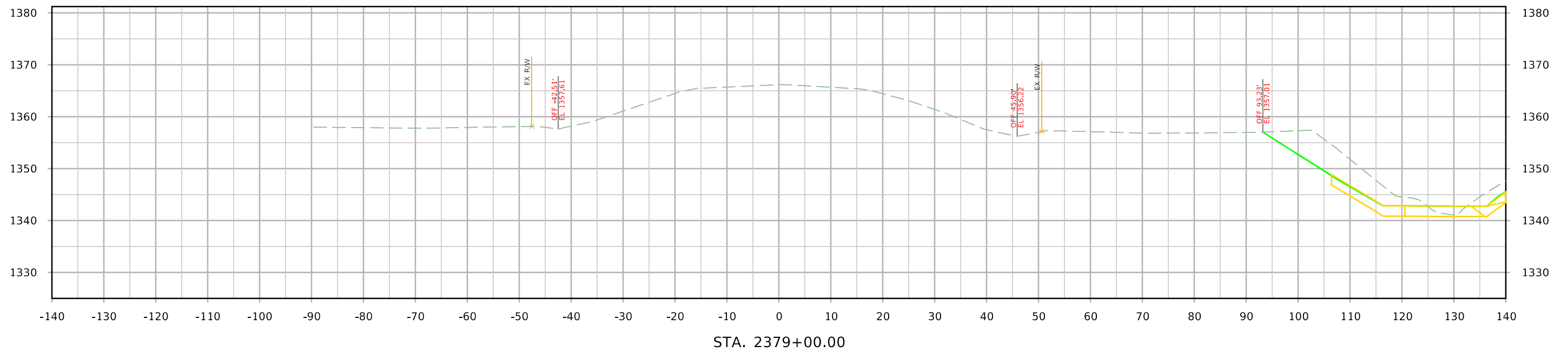
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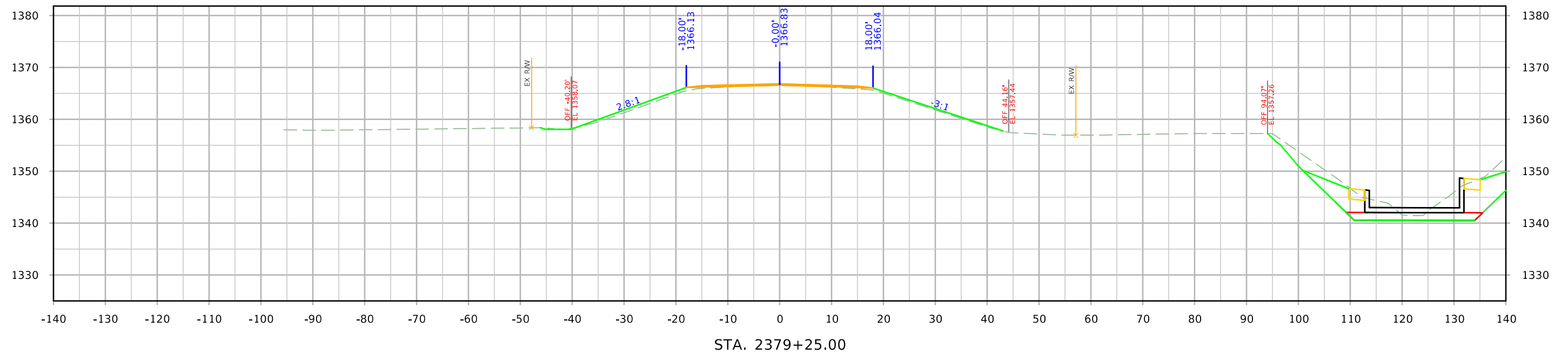
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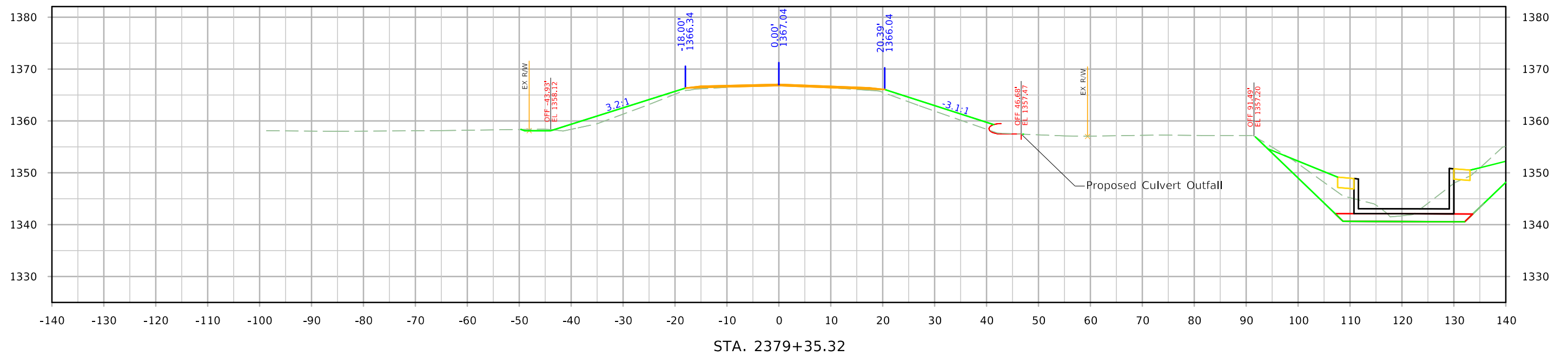
G AVENUE



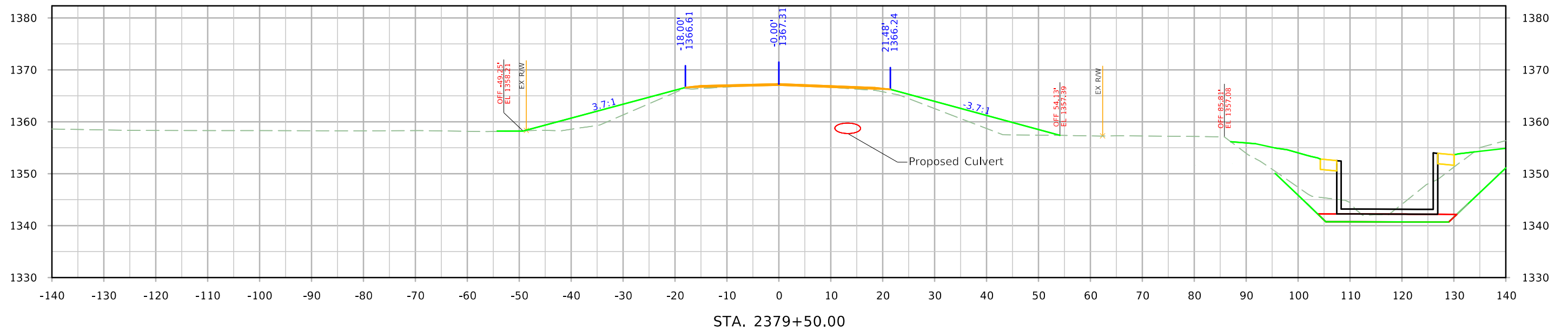
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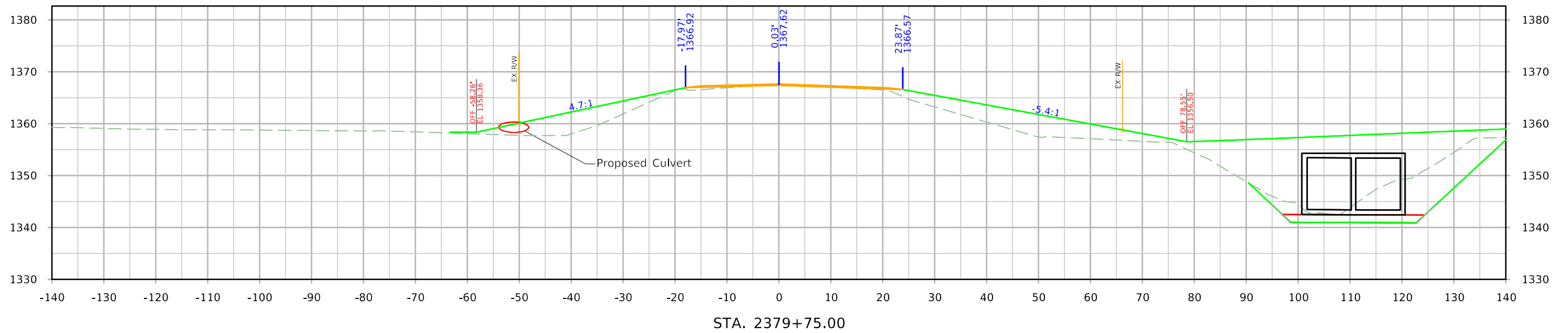
G AVENUE



G AVENUE

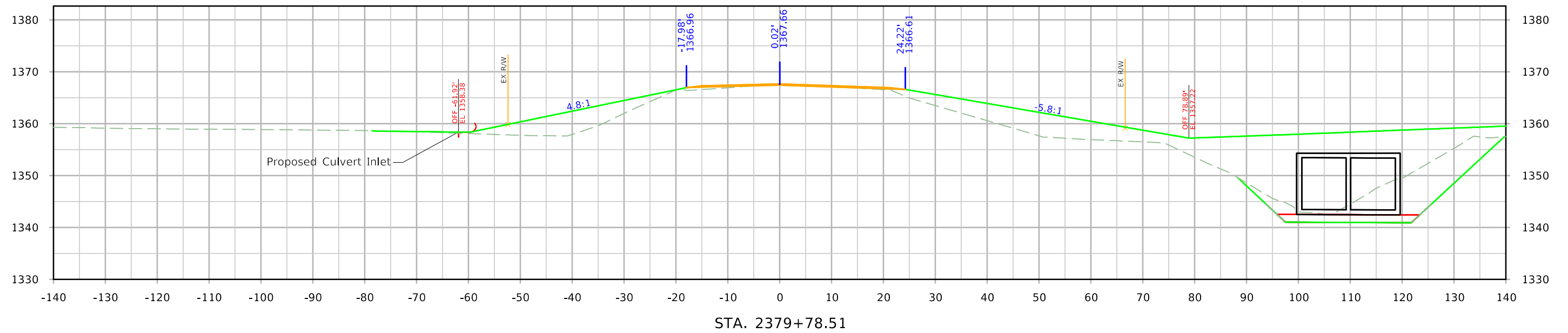


G AVENUE

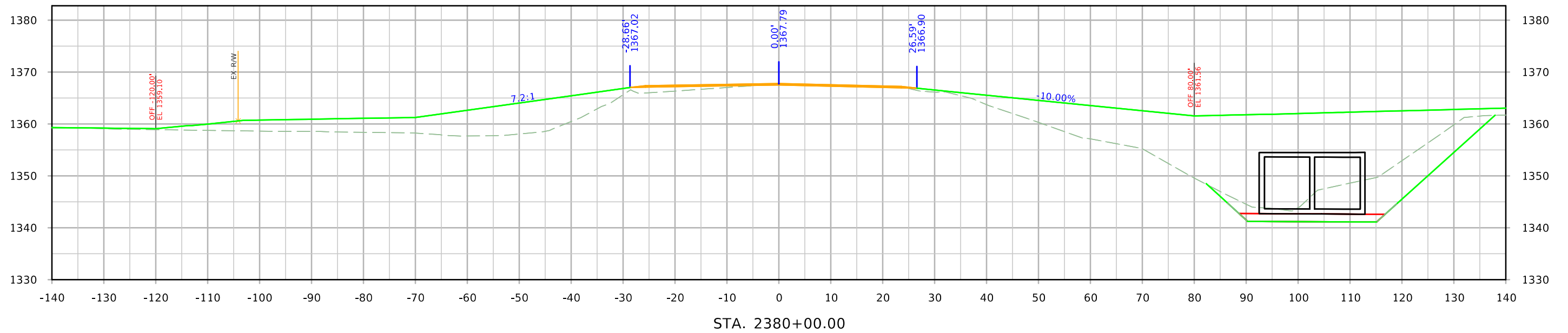


STA. 2379+75.00

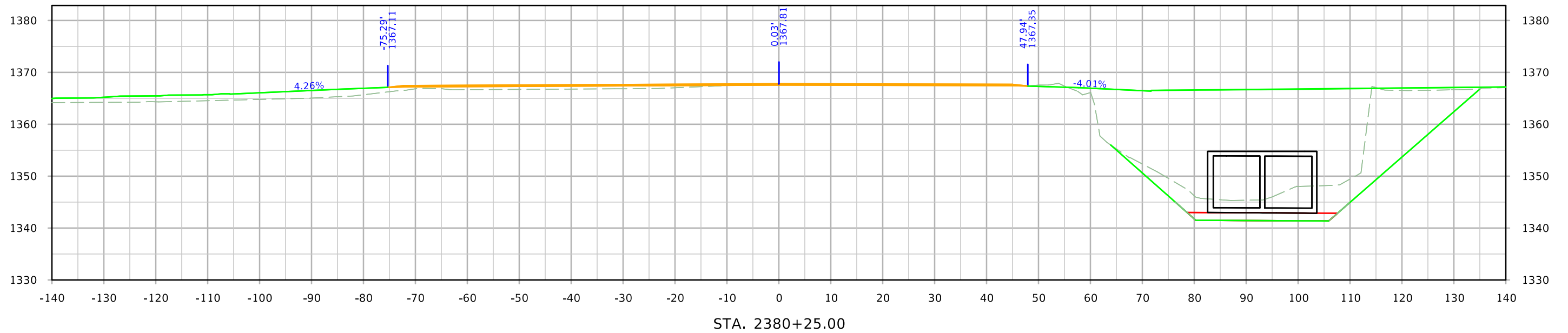
G AVENUE



G AVENUE



G AVENUE



STA. 2380+25.00

G AVENUE

