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PLANS OF PROPOSED IMPROVEMENT ON THE
PRIMARY ROAD SYSTEM
APPANOOSE COUNTY
Bridge Unspecified

IA 5 Bridge over Drainage Ditch, 0.4 mi N of Co Rd T30

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	
..	
PROJECT IDENTIFICATION NUMBER	
23-04-005-010	
PROJECT NUMBER	
BRF-005-1(082)--38-04	
R.O.W. PROJECT NUMBER	
STPN-005-1(083)--2J-04	
56478	
98765	

D05 Nov. 21, 2025

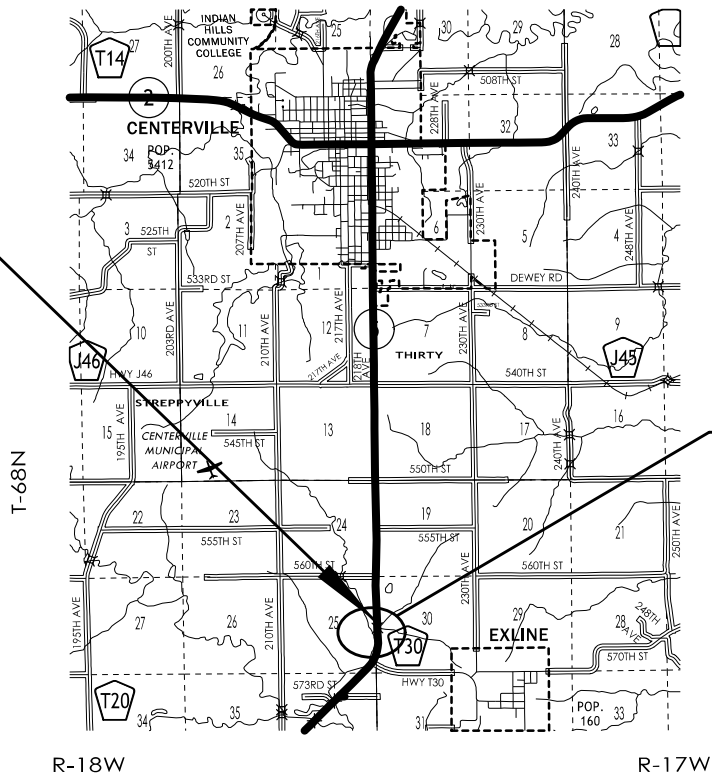
PRELIMINARY PLANS

Subject to change by final design.

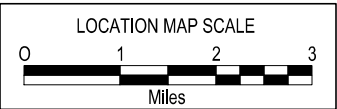
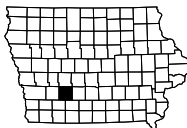
D2 PLAN - Date: August 6, 2025

INDEX OF SEALS			
SHEET NO.	NAME	TYPE	BID QUANTITY SHEETS
A.1	Alex J. Kiebel	Primary Signature Block	X
X	X	X	X

BRIDGE
US-5 over drainage ditch
STA. 594+61.25
FHWA# 13190 (EXST)
FHWA# 13911(NEW)



PROJECT LOCATION



IOWA DEPARTMENT OF TRANSPORTATION

TO OFFICE:	District 5	DATE:	December 2, 2024
ATTENTION:	Robert Younie	PROJECT:	Appanoose County BRF-005-1(082)--38-04
FROM:	John E. Bartholomew		Project Code: 23-04-005-010
BUREAU:	Design		
SUBJECT:	Project Concept Statement; (Final, D0)		

This project involves the replacement of the IA 5 bridge (Maint. No 0408.6S005) over Drainage Ditch, 0.4 mi N of Co Rd T30

A concept review was held on June 26, 2024. Those present included Robert Porter, Bob Younie, Steven McElmeel, and Darrick Bielser from the District 5 Office; Jimmy Ellis and Tom Lovan from the Bridges and Structures Bureau; and John Bartholomew, Yuejia Gu, and Kevin Patel from the Design Bureau.

A staging review meeting was held on October 10, 2024. Those present included Tom Lovan and Jimmy Ellis from the Bridges and Structures Bureau; Mark Dell from the Soils Design Section; and John Bartholomew, Yuejia Gu, and Kevin Patel from the Design Bureau.

The alternative considered was:

1. Replace with a twin 12'x10' x 123' cast-in-place (CIP) reinforced concrete box (RCB) utilizing an on-site detour (temporary runaround) and staged construction **(Estimated Cost \$1,007,629)**

Alternative 1 is the preferred alternative due to the soil type in the area and a lack of viable detour routes (see attached concept for details). Additional right of way may be required. Traffic will be maintained by staged construction with onsite detour (temporary turnaround).

The Draft Project Concept Statement was sent out for review and comment with concerns to be resolved by Tuesday, November 26, 2024. No comments were received during this time.

This project is recommended for construction in FY 2028. The Design Bureau will coordinate plan preparation with assistance from the Bridges and Structures Bureau.

JEB: YG
Attach.
cc:

C. Purcell
M. Dell
M. A. Swenson
S. Majors
D. L. Newell
W. A. Sorenson
A. A. Welch
B. Hofer
H. Naraghi
M. Gillette
M. Todsen
M. Solberg
L. Armstrong
R. Meyer
M. E. Khoda
J. Ellis
S. McElmeel
B. Lauderman
J. Woodcock

M. J. Kennerly
J. S. Nelson
D. E. Sprengeler
A. Poole
B. Bradley
E. C. Wright
J. Harris
G. Karssen
S. Anderson
K. K. Patel
B. Dolan
T. Gustafson
N. Abuissa
J. Hauber
K. Olson

D. Bielser
H. Torres-Cacho
B. M. Clancy

K. D. Nicholson
M. Nop
C. C. Poole
K. Brink
J. W. Laaser-Webb
M. E. Ross
M. Van Dyke
B. E. Azeltine
D. Stokes
R. Harris
T. Lovan
D. Dudley
P. Leanos
S. Sersland
S. Neubauer

B. Beavers
J. Garton
B. Porter

FINAL PROJECT CONCEPT STATEMENT

IA 5 Bridge over Drainage Ditch, 0.4 mi N of Co Rd T30

Appanoose County
BRF-005-1(082)--38-04
Project Code: 23-04-005-010
Maint. No. 0408.6S005
FHWA No. 13910

Highway Division
Design Bureau

John Bartholomew, P.E.
515-239-1540

December 2, 2024

I. STUDY AREA

A. Project Description

This project involves the replacement of the IA 5 bridge (Maint. No 0408.6S005) over the drainage ditch, 0.4 mi N of Co Rd T30.

The alternative considered was:

1. Replace with a twin 12'x10' x 123' cast-in-place (CIP) reinforced concrete box (RCB) utilizing an on-site detour (temporary runaround) and staged construction (**Estimated Cost \$1,007,629**)

Alternative 1 is the preferred alternative due to lack of viable detour routes in the project area and presence of poor soil conditions and shallow bridge footings.

B. Need for Project

This is a 51' x 31' concrete slab bridge that was built in 1948 and overlaid with asphaltic concrete. The bottom of the deck has several hollow areas, heavy leaching transverse cracks, and spalled area with exposed steel. The abutment and wing concrete sheet piles have several hairline horizontal cracks, leaching cracks, and spalled areas. The bridge was designed for live loads below the current standards. Due to the condition, the bridge should be replaced.



Figure 1: with route n-f, 2024



Figure 3: against route f-n, 2024



Figure 2: left profile outlet, 2024



Figure 4: right profile, 2024

C. Present Facility

The existing structure is a 51' x 31' concrete slab bridge constructed in 1948.

IA 5 in the project area was 22' wide, 10"-8"-10" thick PCC pavement with 10' wide paved and granular shoulders and 3:1 foreslopes, constructed in 1949. ACC resurfacing was accomplished in 1975 with 2" type B binder course and 1" type A surface course along with granular shoulder surfacing. ACC resurfacing was also done in 1992 with 1.5" type B binder course and 1.5" type A surface course. HMA resurfacing and base widening was done in 2016 to 32' wide pavement with 1" milling, 1.5" intermediate course, and 1.5" surface course. HMA joint and crack sealing was done in 2018.

D. Traffic Estimates

The 2028 construction year and 2048 design year average daily traffic estimates are 3100 ADT with 8% trucks and 3400 ADT with 8% trucks, respectively.

E. Sufficiency Ratings

IA 5 is classified as an "Area Development" route and is a maintenance service level "C" roadway. The Bridge Condition Index is 61.9 and the Bridge Condition Rating is "Fair".

F. Access Control

Access rights will not be acquired for this project.

G. Crash History

During the five-year study period from January 1, 2019 through December 31, 2023, there were 3 personal property crashes. The PCR value for all crashes is 0.545 crash/mile/year.

II. PROJECT CONCEPT

A. Feasible Alternatives

Alternative #1 - Replace with a twin RCB utilizing on-site detour

The existing 51' x 31' concrete slab bridge will be replaced with a twin 12'x10 CIP RCB placed at a 30 degree right ahead skew. The typical cross section will consist of a 24' wide roadway with 12' lanes and 10' paved shoulders.

The roadway will be reconstructed on the existing vertical and horizontal alignment. The flow line of the box will be buried 1' below the existing flow line in the channel. This will allow the bottom of the box to silt in and provide a natural bottom for fish passage. The existing ditches will need to be relocated to meet the inlet and outlet flowlines of the new RCB. Class E revetment will be placed at the ends of the RCB.

There is a pre-cast RCB option for this alternative.

Apply erosion control and rural seeding and fertilizing to all disturbed areas.

Right of way may be required for this project.

Due to the approximately 14' of black, soft alluvial clay in the area, there is a concern with potential excessive settlement. Since the existing bridge is two span, it will need to be removed first before installing the RCB. Thus, two lanes of traffic will be maintained by a temporary runaround and construction will be staged. The RCB will be extended to allow extra space for this runaround.

Bridge Items	Estimated Costs
Twin RCB - 2.786 cy/ft @ \$850 cu. yd	\$291,277
Remove Exist. Bridge 1284 sf @ \$10.00/sf	12,840
Cofferdam – 1 EA @ \$25,000/EA	25,000
Revetment	5,000
Mobilization (10%)	33,412
Staged RCB (10%)	33,412
Contingency and Misc. (20%)	80,188
Bridge Costs	\$481,129

Roadway Items	Estimated Costs
Removal of Pavement	\$11,300
PCC Pavement	53,500
Modified Subbase	19,000
Flooded Backfill	30,900
Embankment in Place, Contractor Furnished	99,500
Paved Shoulder	36,800
Temporary Pavement	18,400
Excavation Class 13 Waste	53,600
Guardrail Removal	3,600
Clearing and Grubbing	3,600
Seeding and Fertilizing	1,200
Erosion Control	9,700
Right of Way	10,000
Preliminary Engineering	25,000
Traffic Control - 5%	25,100
Mobilization - 5%	25,100
M & C - 20%	100,200
Roadway Costs	\$526,500

Project Total	\$1,007,629
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B. Staging Analysis

There will be no off-site detour. A temporary runaround will be placed in Stage 1 to maintain two lanes of traffic at all times. In Stage 2, the existing bridge will be removed and the new RCB will be constructed. Staging diagrams are attached to this concept.

C. Recommendations

It is recommended that the present structure be replaced with a twin RCB utilizing staged construction and a temporary runaround, as described in Alternative No. 1.

D. Construction Sequence

It is anticipated that all work on this project will be awarded to one prime contractor. The Bridges and Structures Bureau will coordinate the plan preparation with assistance from the Design Bureau.

E. ADA Accommodations

There are no bike paths or sidewalks adjacent to IA 5; therefore, no ADA accommodations are planned in conjunction with this project.

F. Special Considerations

This will not be a traffic critical project.

The ABC Rating Score of 43 is less than the first stage filter threshold of 50; this bridge will be constructed utilizing traditional methods.

No bike path or sidewalk will be required as part of this project.

Waterway is not on a state water trail or paddling route.

No special survey requests.

Right of Way may be required for this project.

The Location and Environment Bureau has not reviewed this project at this time.

G. Program Status

Site data has been developed by the Design Bureau. This project is listed in the 2025-2029 Iowa Transportation Improvement Program, with \$10,000 programmed for right of way in FY 2028, and \$630,000 for replacement in FY 2028. Costs for this project may be eligible for bridge replacement funds. A schedule of events will be developed following approval of the Project Concept.

JEB:YG

Utilities

Farmers Mutual Telephone
Tammy Wheeler
101 N. Main
Moulton, IA 52572
641-642-3249
twheeler@netins.net

Rathbun Regional Water
Kelly Carel
16166 Hwy J29
Centerville, IA 52544'
641-647-2416
kcarel@rrwa.net

Windstream Communications
Kelly Wingfield
2650 SW 61st St.
Des Moines, IA 50321
Kelly.wingfield@windstream.com

Windstream Communications
Dan Hogan
1614 230th St
Manchester, IA 52057
563-920-2428
Dan.Hogan@windstream.com

Bridge Bureau Attachment for Concept Statement

Date: October 30, 2024
By: Tom Lovan
Location: IA 5 bridge (Maint. No. 0408.6S005) over Drainage Ditch 0.4 mi N of Co Rd T30

County: Appanoose County
Phase No.: BRF-005-1(082)--38-04
Project Code: 23-04-005-010

1. Regulatory/Coordination
- a. Iowa DNR Flood Plain permit = No

b. Iowa DNR Sovereign Lands permit = No

c. Local Record of Coordination = Yes

d. Flood Insurance Study = Yes, Zone A/19007C0275C/2/15/2018

e. Drainage District = No

f. Corps of Engineers Section 408 = No

g. State Water Trail or Paddling Route = No

h. Historic Structure = No

i. Federally owned land in vicinity = No

j. USGS or Iowa Flood Center (IFC) gage or sensor impacted? No
2. Hydrologic/Hydraulic Analysis/RIDB Dataset
- a. Design discharges determined =Yes, 87-4132 Methodology

b. Hydraulic analysis done = Yes

c. If DA > 10 sq. mi. Riverine Infrastructure Database (RIDB) dataset is required with B1 submittal = No
3. Structure/Roadway Layout Considerations
- a. None
4. Special construction issues
- a. Staged construction of RCB with temporary runaround placed on top of completed Stage 1 RCB construction. Stage 2 will remove existing bridge and build remainder of RCB (88').
5. Special survey = No
6. Aesthetic enhancements = No
7. Other
- a. Maintenance of Traffic

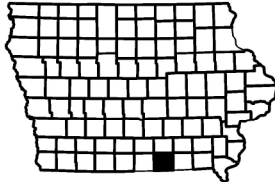
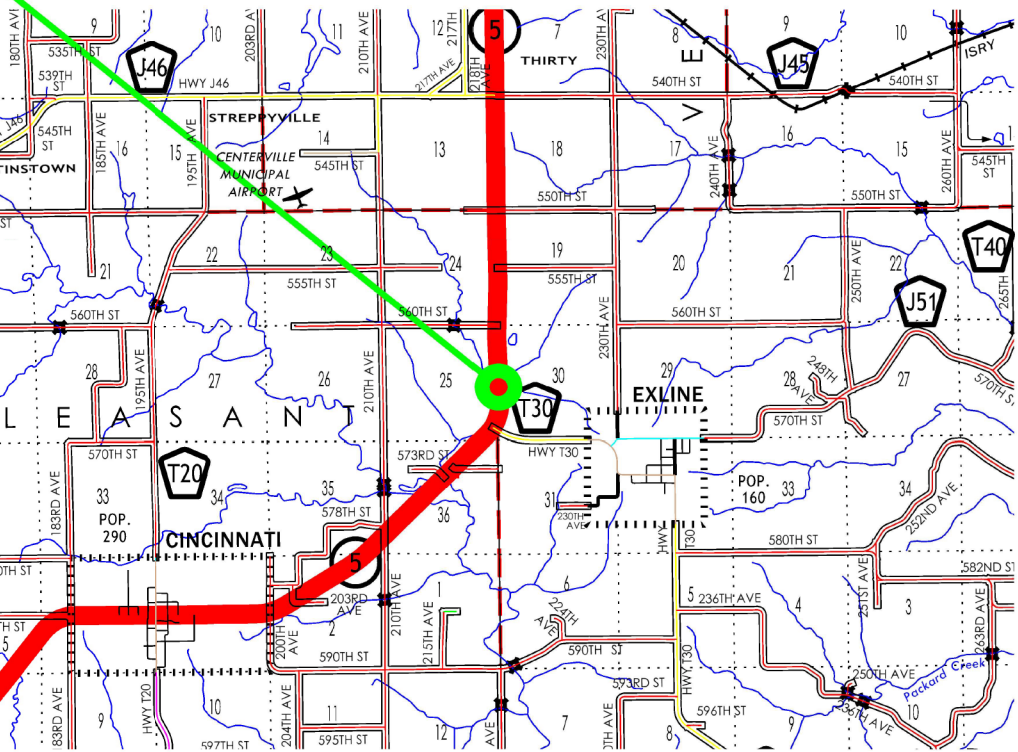
i. Option #1 for On-Site detour (Temporary Run-Around), Staged construction.

Special Survey:

None

STA 594 + 61.25
FHWA 13190
MAINT. 0408.6S005
DESIGN 110

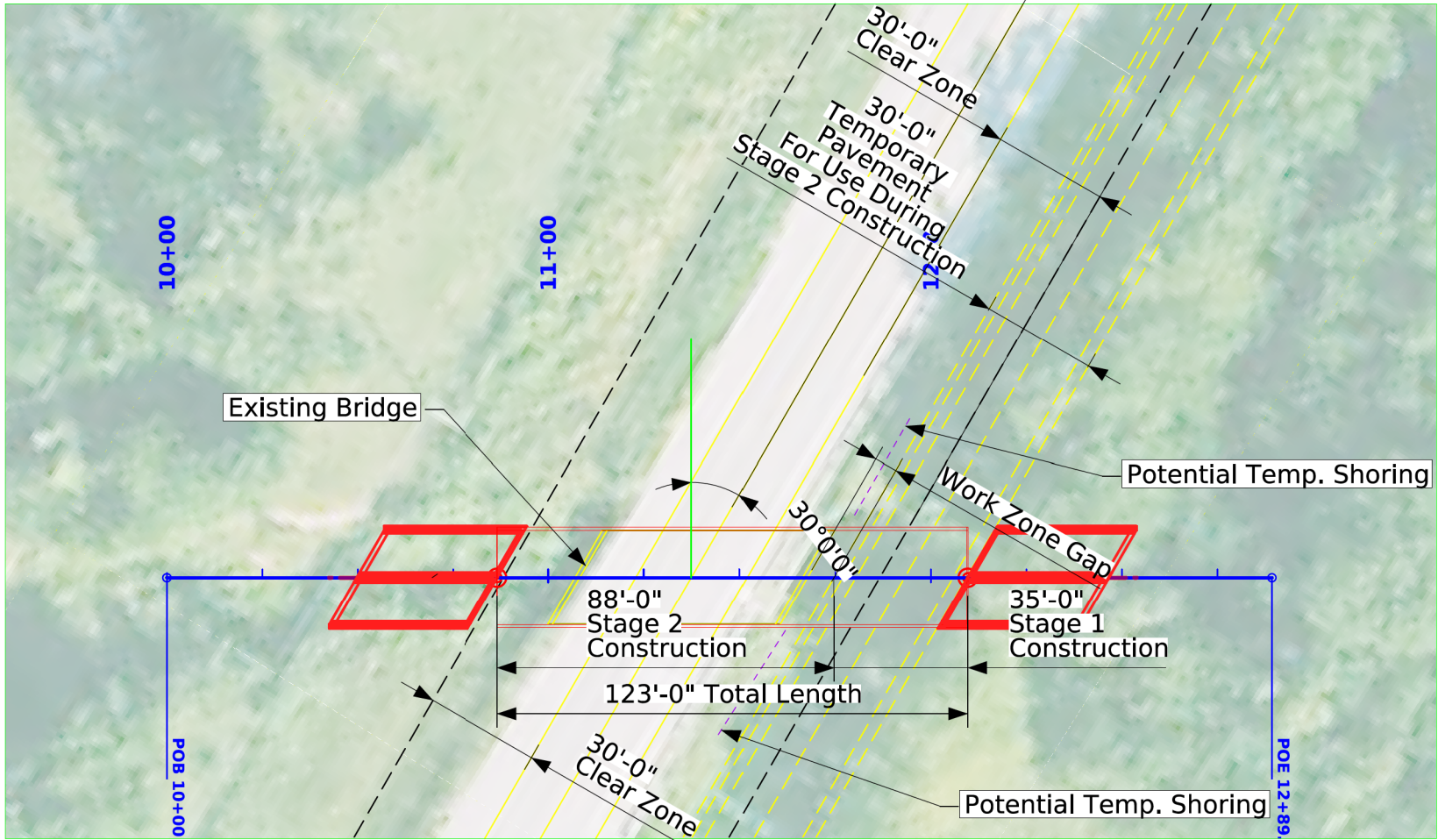
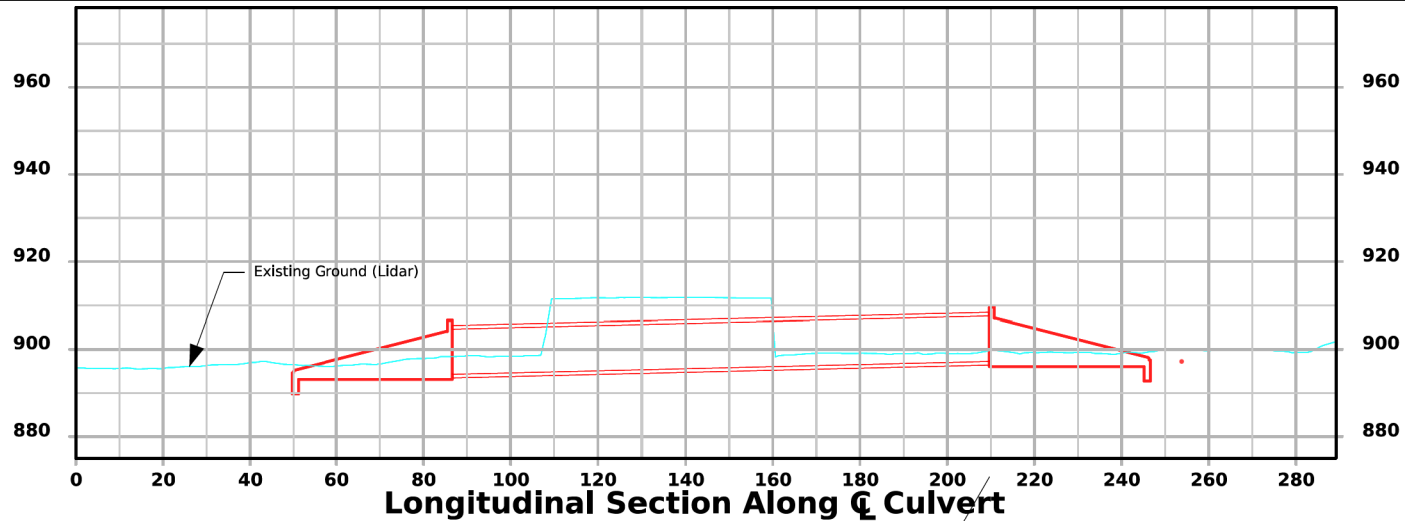
APPANOOSE COUNTY



ON IA 5, OVER DRAINAGE DITCH 0.4 MIN
OF CO RD T30
BRF-005-1(082)—38-04
PROJECT CODE: 23-04-005-010



Control Point:



Hydraulic Data

Drainage Area = 1.6 Sq. Mi.
Stream Slope (HGL) = 29.04 ft./Mi.
Avg. Low Water Stage = ????

$Q_{25} = 711$ cfs
Stage = 902.48

$Q_{50} = 887$ cfs
Stage = 903.69
Operational Freeboard = N/A
Avg. Bridge Velocity = 1.63 fps

$Q_{100} = 1081$ cfs
Stage = 904.65
Operational Freeboard = N/A
Backwater = X.XX ft.
Avg. Bridge Velocity = 2.36 fps

$Q_{200} = 1250$ cfs
Stage = 905.35
Calculated Design Scour = ????

$Q_{\text{Overtop}} = \text{XXXX}$ cfs
Avg. Bridge Velocity = X.XX fps
Calculated Check Scour = ????

$Q_{500} = 1481$ cfs
Channel Freeboard = N/A

Roadway Overtop N/A
Sta. ???+??

Extreme HW Stage = ????
Date = ????

Location

IA 5 over Drainage Ditch
T-68N, R-17W
Section 30
Caldwell Township
Appanoose County
FHWA No. 013910 (existing)
FHWA No. 013911 (proposed)
Maint. No. 0408.65005
Latitude 40.659340° (SIA)
Longitude -92.867495° (SIA)

IA 5 Traffic Est.

20?? AADT 0000 V.P.D.
20?? AADT 0000 V.P.D.
20?? DHV 000 V.P.H.
Trucks 00 %
Total
Design ESALs ---

General Notes

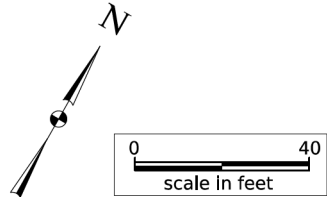
-This design is for the replacement of the existing 25'-3 x 50'-10 Continuous Concrete Slab Bridge, Design No. 347, FHWA No. 013910, Maint. No. 0408.65005

-Roadway alignments are not designed.

-Pre-Cast Option will be evaluated

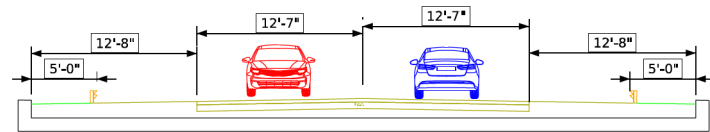
Situation Plan

TSL_04_XXX-1

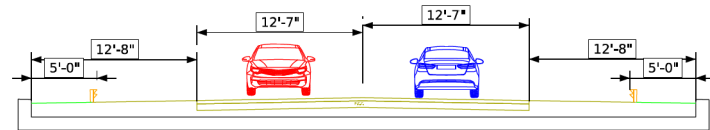


Design For 30 Degree RA
TWIN 12'X10'X123'
REINFORCED CONCRETE BOX
Situation Plan - FINAL CONCEPT
STA. 11+37.47 (IA 5) Turn-In Date: October 2024
Appanoose County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 128 Design Sheet No. 1 of 1 FHWA/Asset 013911

FILE NO. 98765	ENGLISH	DESIGN TEAM Iowa DOT	Appanoose COUNTY	PROJECT NUMBER BRF-005-1(082)--38-04	SHEET NUMBER V.1
SYSTEMTIME	SYSTEMDATE	USERNAME	DGNSPEC		



Typical Section - Existing
(Maintenance Report Dimensions)



6'-0" Work Zone Gap

30'-3 3/4" (Perpendicular) Stage 1 Construction

*Temporary Shoring will need to be evaluated at Stage 1

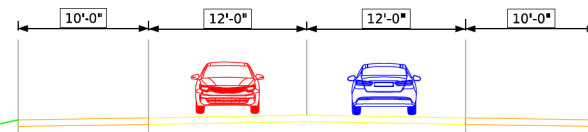
Typical Section
Stage 1 - 30' - 3 3/4" (35'-0" Skewed) RCB Construction



Temporary Runaround
on Stage 1 Constructed RCB

76'-2 1/2" (Perpendicular) Stage 2 Construction

Typical Section
Stage 2 - 76' - 2 1/2" (88'-0" Skewed) RCB Construction



Typical Section
Full Build Out - 106' - 6 1/4" (123'-0" Skewed) RCB Construction

Roadway			
PIN Number	23-04-005-010	Submittal Date	12/02/24
Project Number	BRF-005-1(082)--38-04		Approval Date
District	District 5	Assistant District Engineer	Steve McElmeel
County	APPANOOSE	or	
Route	IA 5	Office Director	
Location	Drainage Ditch 0.4 mi N of Co Rd T30		
Work Type	2001-Bridge-Unspecified		
Segment Manager			
Designer			

[Design Manual Section 1C-1](#)
[Last Updated: 04-29-19](#)

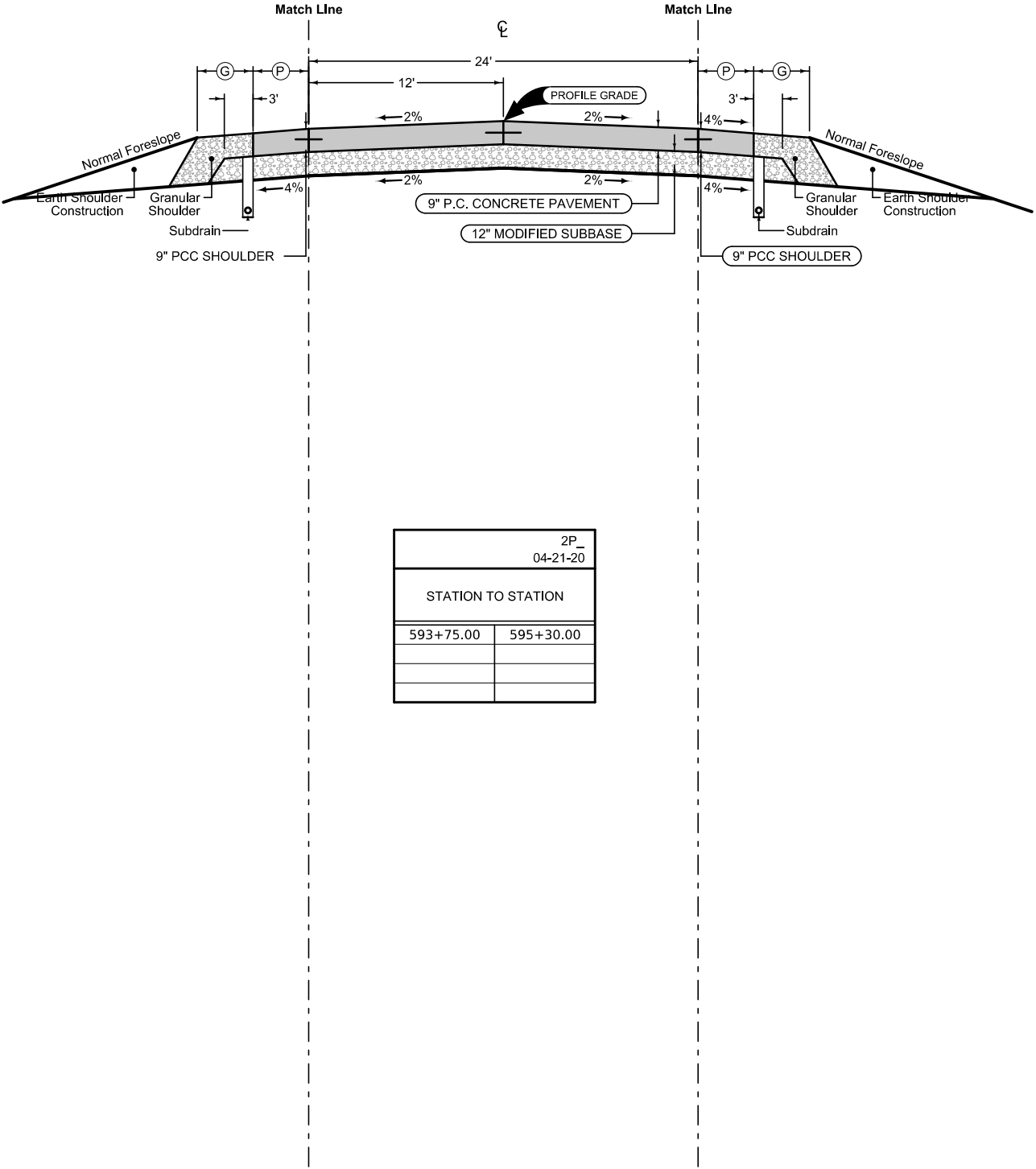
Rural Two-Lane Highways (Rural Arterials)

Design Element		Preferred	Acceptable	Project Values
Design speed (mph)		60	50	60
Maximum superelevation rate (Refer to Section 2A-2)		6%	8%	6%
Design lane width (ft)		12	12	12
Full depth paved width (ft)		12	12	12
Right turn lane (ft)		12	10	N/A
Climbing Lane (ft)		12	12	N/A
Left turn lane (ft)		12	10	N/A
Pavement cross-slope (on tangent sections)	Through lanes	2%	1.5% minimum, 2% maximum	2%
	Auxiliary and turn lanes	3%	3% maximum	N/A
	Crown break at centerline	4%	4% maximum	4%
Shoulder cross-slope (on tangent sections)		4%	Shoulder cross-slope cannot be less than the adjacent lane, 6% max for paved or granular shoulders, 8% max for earth shoulders	4%
Curb type (Refer to Section 3C-2)	Design speed = 50 or 55 mph	6-inch sloped	6-inch standard	N/A
	Design speed ≥ 60 mph	4-inch sloped	6-inch sloped	N/A
Foreslope (For fill areas greater than 40 ft, contact the Soils Design Section for assistance)	Adjacent to shoulder	10:1 for 4' then 6:1	3:1	10:1 for 4' then 6:1
	Beyond standard ditch depth and design clear zone	3.5:1	3:1	3.5:1
	Curbed roadways	2%	not steeper than 3:1	N/A
Backslope (For cut areas greater than 25 feet, contact the Soils Design Section for assistance with backslope benches.)		3:1	2.5:1	3:1
Transverse Slopes	w/ drainage structures	8:1	6:1	8:1
	w/o drainage structures	10:1	6:1	10:1
Ditches (Refer to Section 3G-1)	Outside ditch (depth x width) (ft)	5 x 10	--	5 x 10
Bridge width—new*	Bridge length ≤ 200 ft	design lane widths + effective shoulder widths	design lane widths + effective shoulder widths	N/A
	Bridge length > 200 ft	design lane widths + effective shoulder widths	design lane width + 4' right and left of the design lane widths	N/A
Bridge width—existing*		design lane widths + no less than 2 ft left and right	design lane widths + 2 ft. offset left and right	31'
Vertical clearance (ft) (above lanes, shoulders and 25 feet left and right of the center of railroad tracks)	Over primary	16.5	16	N/A
	Over non-primary	16.5 at interchange locations, 15 at all other locations	14	N/A
	Over railroad	23.3	23.3	N/A
	Sign trusses and pedestrian bridges	17.5	17	N/A
Structural Capacity		Contact Office of Bridges and Structures	Contact Office of Bridges and Structures	Contact Office of Bridges and Structures
Level of Service		B	B	C

*FHWA notification via email is required if acceptable critera is not met on the NHS system (No formal design exeption is required)

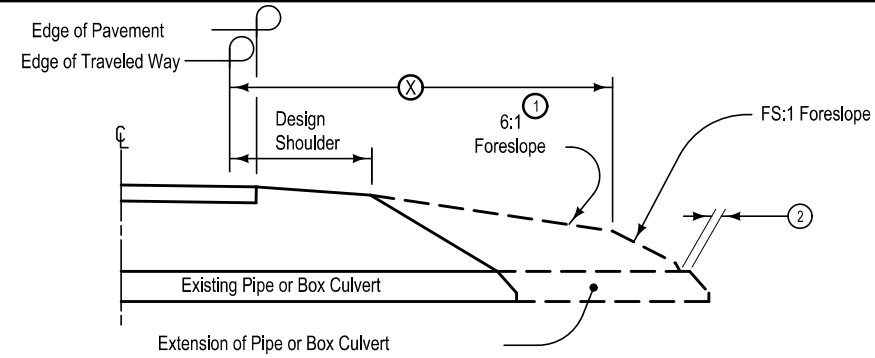
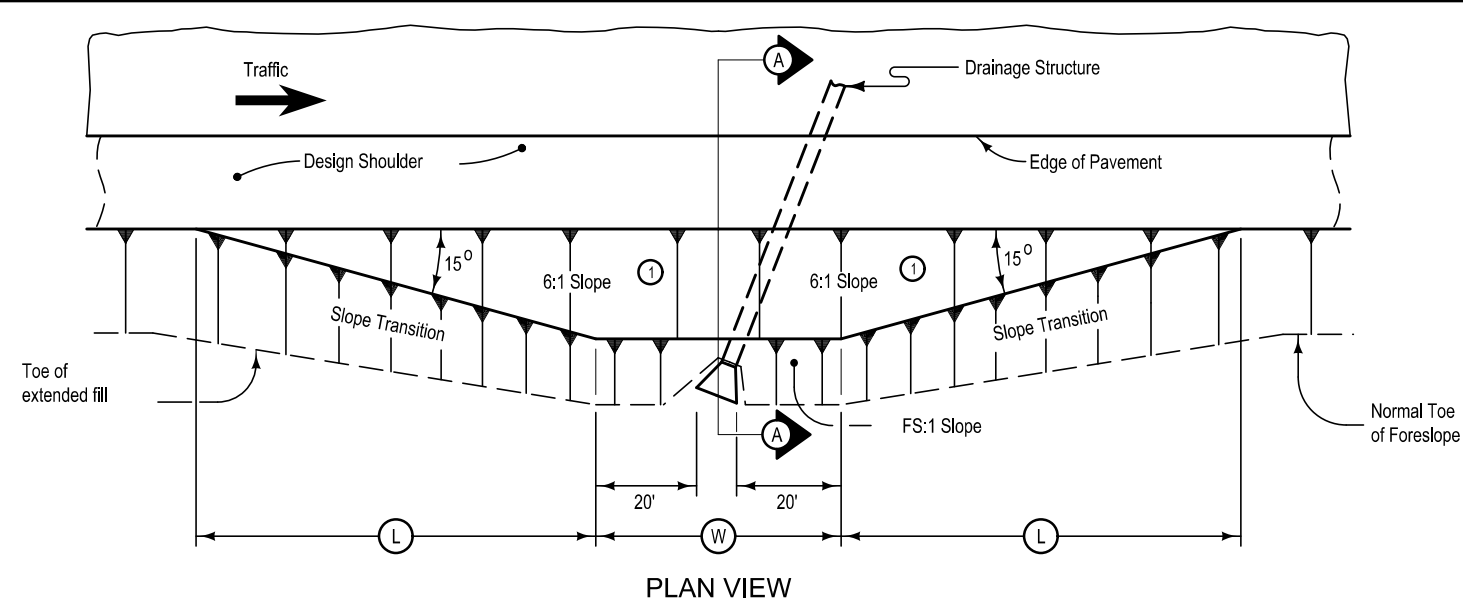
Roadway Design Speed (mph) =			60												
Design Manual Section 1C-1 Last Updated: 04-29-19			Design Criteria for High Speed Roadways												
Design Element			Preferred Criteria						Acceptable Criteria						Project Values
			Design Speed, mph						Design Speed, mph						
			50	55	60	65	70	75	50	55	60	65	70	75	
Stopping sight distance (ft) (Refer to Section 6D-1)			425	495	570	645	730	820	425	495	570	645	730	820	570
Minimum horizontal curve radius (ft) (Refer to Sections 2A-2 and 2A-3)	Method 5 superelevation and side friction distribution	e _{max} = 6%	833	1060	1330	1660	2040	2500	833	1060	1330	1660	2040	2500	1330
		e _{max} = 8%	--	--	--	--	--	--	758	960	1200	1480	1810	2210	--
Minimum vertical curve length (ft) (Refer to Section 2B-1)			150	165	180	195	210	225	150	165	180	195	210	225	180
Minimum rate of vertical curvature (K) (Refer to Section 2B-1)	crest vertical curves		84	114	151	193	247	312	84	114	151	193	247	312	151
	sag vertical curves	roadways without fixed-source lighting	96	115	136	157	181	206	96	115	136	157	181	206	136
		roadways with fixed-source lighting	96	115	136	157	181	206	54	66	78	91	106	121	N/A
Minimum gradient (%) (Refer to Section 2B-1)			0.5						0.3% with a curb, 0.0% without a curb						0.5
Maximum gradient (%) (Refer to Section 2B-1)	Urban roadways		4	3				7	6	6	—	—	—	N/A	
	Rural roadways							5	5	4	4	4	4	3	
	Interstates							5	5	4	4	4	4	N/A	
Clear zone			See "Preferred Clear Zone" table in Section 8A-2						See "Acceptable Clear Zone" table in Section 8A-2						40'

2_C_FullPCC_ 04-15-25			
STATION TO STATION		(P) Feet	(G) Feet
593+75.00	595+30.00	4	6



2_C_FullPCC_ 04-15-25			
STATION TO STATION		(P) Feet	(G) Feet
593+75.00	595+30.00	4	6

2P_ 04-21-20	
STATION TO STATION	
593+75.00	595+30.00



STRUCTURE LOCATION		(W)	(L)	(X)	(FS)
STATION (3)	SIDE	Feet	Feet	Feet	
594+55.52	RIGHT	71	170	56	3.5
594+55.52	LEFT	71	84	32	3.5

- At locations where an extended or newly constructed drainage structure extends beyond the normal foreslope cover, flatten as indicated so as to cover the structure. Minimum earth cover is 6 inches.
- (1) Slope may be flatter than 6:1.
 - (2) 6 inch minimum for pipe installations or to top of headwall on RCB.
 - (3) At ϕ of roadway.
 - (W) = Pipe or RCB opening width plus 20 feet each side.

BARNROOF FORESLOPE AT
SKEWED DRAINAGE STRUCTURE

	Interstate Highway Symbol		Septic Tank
	U.S. Highway Symbol		Cistern
	Iowa Highway Symbol		L.P. Gas Tank (No Footing)
	County Road Highway Symbol		Underground Storage Tank
	Evergreen Tree		Latrine
	Deciduous Tree		Satellite TV Dish
	Fruit Tree		Water Hook Up
	Shrub (Bushes)		Radio Tower
	Timber		Tower Anchor
	Hedge		Guardrail (Beam or Cable)
	Stump		Guard Post (one or two)
	Swamp		Guard Post (over two)
	Rock Outcrop		Filler Pipe
	Broken Concrete		Gas Valve
	Revetment (Rip Rap)		Water Valve
	Cemetery		Speed Limit Sign
	Grave		Mile Marker Post
	Cave		SIGN Sign
	Sink Hole		TCB Traffic Signal Control Box
	Board Fence		RRB Rail Road Signal Control Box
	Chain Link or Security Fence		TSB Telephone Switch Box
	Wire Fence		Electric Box
	Terrace		
	Earth Dam or Dike (Existing)		
	Tile Outlet		
	Edge of Water		
	Existing Drainage		
	Right of Way Rail or Lot Corner		
	Concrete Monument		
	Well		
	Windmill		
	Beehive Intake		
	Existing Intake		
	Existing Utility Access (Manhole)		
	Fire Hydrant		
	Water Hydrant (Rural)		

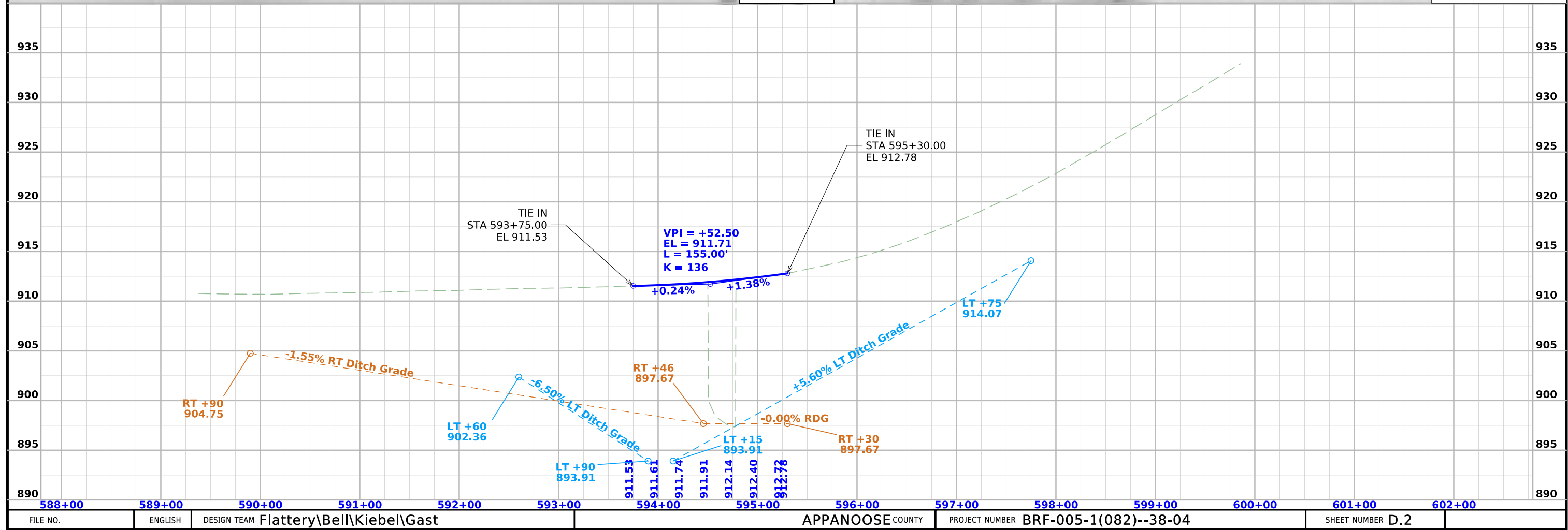
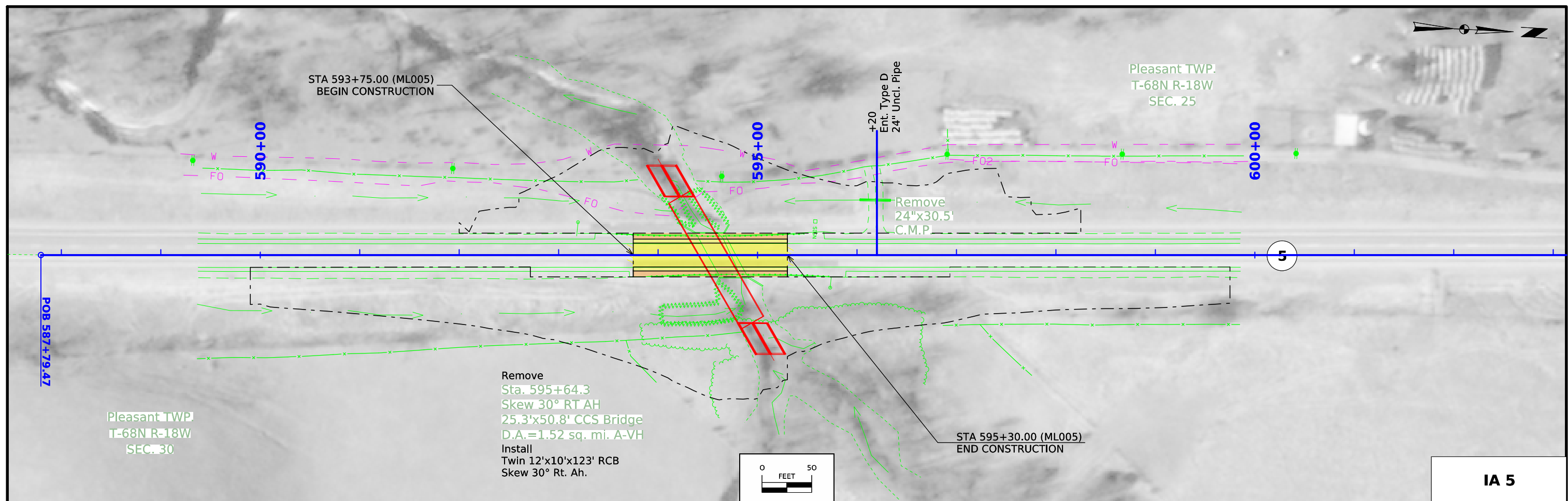
— F0 — FO1D, Farmers Mutual Communication - Quality D
 — F02 — FO2D, Windstream - Quality D
 — PPA — PPA, Chariton Valley Cooperative
 — W — WL1D, Rathbun Rural Water - Quality D

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.		Transparency
Pink, Dark	(13)		Temporary Pavement Shading	50%
Yellow	(4)		Proposed Pavement Shading	50%
Orange	(6)		Proposed Granular Shading	50%
Orange	(70)		Proposed Shoulder Granular Shading	50%
Yellow	(68)		Proposed Shoulder Paved Full Depth Shading	50%
Yellow	(132)		Proposed Shoulder Paved Partial Depth Shading	50%
Brown, Light	(236)		Grading Shading	50%
Orange, Light	(134)		Proposed Granular Entrance Shading	50%
Yellow	(220)		Proposed Paved Entrance Shading	50%
Tan	(8)		Proposed Sidewalk Shading	50%
Blue, Light	(230)		Proposed Sidewalk Landing Shading	50%
Pink	(11)		Proposed Sidewalk Ramp Shading	50%
Red	(3)		Proposed Structure Shading	50%
Red	(3)		Delineates Restricted Areas	0%

LINEWORK	Design Color No.	
Green	(10)	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

	Survey Line		Proposed Right-of-Way Symbol
	Station		Proposed Right-of-Way Line
	Section Corner		Existing Right of Way
	Ground Line Intercept		Existing and Proposed Right-of-Way
	Saw Cut		Easement and Existing Right-of-Way
	Guardrail		Easement (Temporary) Symbol
	Trench Drain		Easement (Temporary) Line
	HighTension Cable Guardrail		Easement
	Sheet Pile		C/A Access Control
	Pavement Removal		Property Line Symbol
	Clearing & Grubbing Area		Property Line

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



Survey Information

SURVEY INDEX

County: Appanoose
Project Code: 23-04-005-010
Phase Number: BRF-005-1(082)--38-04
Location: Drainage Ditch 0.4 mi N of Co Rd T30
Type of Work: Bridge Replacement
Project Directory: 0400501023

Survey Personnel

Sam Schilb – Survey Party Chief

Date(s) of Survey

Begin Date 02/25/2025
End Date 03/11/2025

General Information

This survey is for the replacement of the IA 5 bridge (Maint. No 0408.6S005) over Drainage Ditch, 0.4 mi N of Co Rd T30. This survey request was for the IA 5 corridor only. This project is a Full Field DTM survey.

Utility Information

For logging data and other utility details see Utility Survey and Ownership Report in the Utility folder of the PrelimSurvey project directory.

Project Control

Ellipsoidal Height was computed at project Pt. CP001 by doing 6-hour static observations. The project control is relative to nearby Iowa RTN and Missouri RTN Base Stations. Additional control was set using three five-minute observations taken with a minimum two-hour time span using Base Rover and used in a weighted average to obtain final coordinate values.

PROJECT DATUM: NAD83(2011) for EPOCH 2010.00 (IaRTN 2019 ADJUSTMENT)
COORDINATE SYSTEM: IOWA REGIONAL COORDINATE SYSTEM ZONE 12
(U.S. SURVEY FOOT)
VERTICAL DATUM: NAVD88
GEOID MODEL: 2018u3

Alignment Information

The alignment for this project was created using information provided by the District 5 Land Survey office. Survey stationing was equated to the plan, F-781(3), PI at Sta. 617+19.6 and carried back without equation throughout the survey.

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) for EPOCH 2010.00 (IaRTN 2019 Adjustment) - Iowa RCS Zone 12 (U.S. Survey Foot)

VERT. DATUM: NAVD88 - Geoid Model: 2018u3

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

HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING
HORIZ. DATUM: NAD83(2011) for EPOCH 2010.00 (IaRTN 2019 Adjustment)
Ia. Regional Coordinate System Zone 12 (U.S. Survey Foot)
VERT. DATUM: NAVD88
Geoid Model: 2018u3

Point Name	Northing	Easting	Elevation	Code Description
CP001	6105670.00	22744730.91	917.43	CP set FENO monument 4" below surface
8035	6115903.25	22744644.05	1008.56	CP FND Appanoose Co. GPS Survey Marker as described
301	6109838.29	22744707.29	991.757	CP 5/8"x 42" rebar 6" below surface

108-23A
08-01-08

TRAFFIC CONTROL PLAN

Iowa 5 traffic maintained using onsite detour.

108-26A
08-01-08

STAGING NOTES

Traffic along IA 5 will be maintained using an onsite detour.
Stage 1: Construction of detour.
Stage 2: Construction of bridge.
Stage 3: Obliterate detour.

511 TRAVEL RESTRICTIONS													108-25 10-21-14
Route	Direction	County	Location Description	Feature Crossed	Object Type	Maint. Bridge No., Structure ID, or FHWA No.	Type of Restriction	Existing Measurement	Construction Measurement	Construction Measurement as Signed	Projected As Built Measurement	Remarks	
			None provided.										

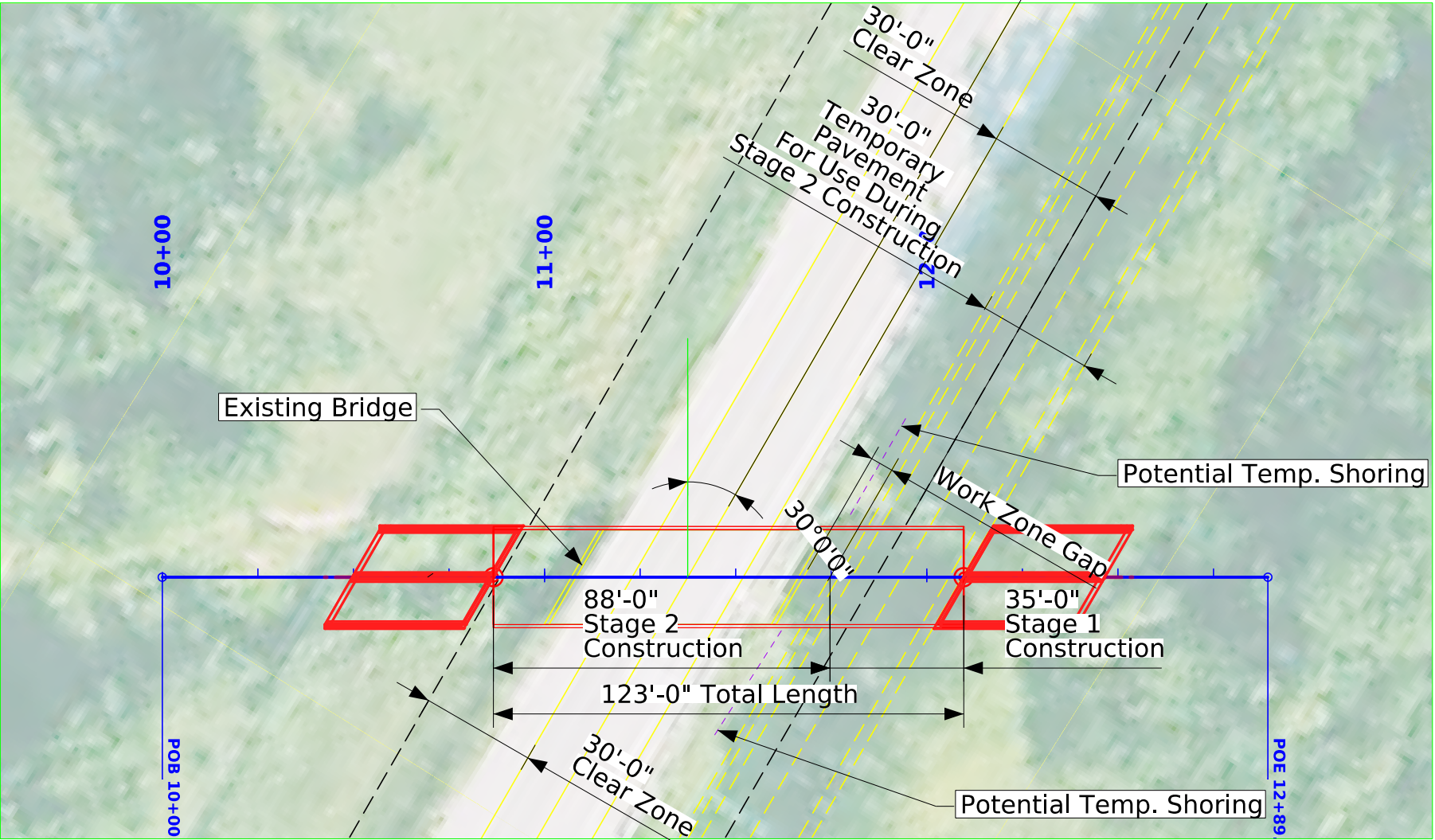
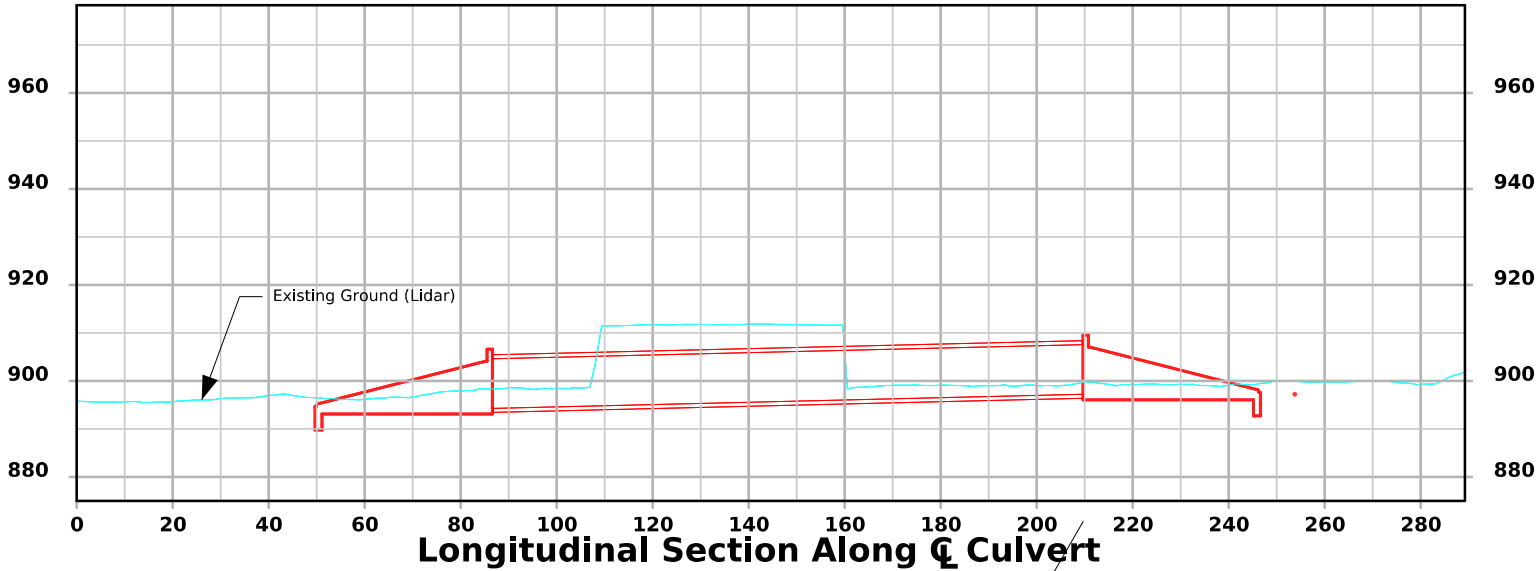
111-01
04-17-12

COORDINATED OPERATIONS

Other work in progress during the same period of time will include the construction of the projects listed. Coordinate operations with those of other contractors working within the same area.

Project	Type of Work
None provided.	

Control Point:



Hydraulic Data

Drainage Area = 1.6 Sq. Mi.
Stream Slope (HGL) = 29.04 ft./Mi.
Avg. Low Water Stage = ????

$Q_{25} = 711$ cfs
Stage = 902.48

$Q_{50} = 887$ cfs
Stage = 903.69
Operational Freeboard = N/A
Avg. Bridge Velocity = 1.63 fps

$Q_{100} = 1081$ cfs
Stage = 904.65
Operational Freeboard = N/A
Backwater = X.XX ft.
Avg. Bridge Velocity = 2.36 fps

$Q_{200} = 1250$ cfs
Stage = 905.35
Calculated Design Scour = ????

Q Overtop= XXXX cfs
Avg. Bridge Velocity = X.XX fps
Calculated Check Scour = ????

$Q_{500} = 1481$ cfs
Channel Freeboard = N/A

Roadway Overtop N/A
Sta. ???+??

Extreme HW Stage = ????
Date = ????

Location

IA 5 over Drainage Ditch
T-68N, R-17W
Section 30
Caldwell Township
Appanoose County
FHWA No. 013910 (existing)
FHWA No. 013911 (proposed)
Maint. No. 0408.6S005
Latitude 40.659340° (SIA)
Longitude -92.867495° (SIA)

IA 5 Traffic Est.

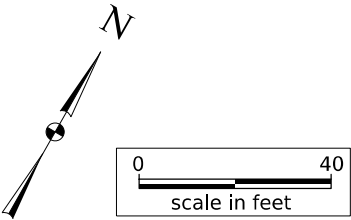
20?? AADT 0000 V.P.D.
20?? AADT 0000 V.P.D.
20?? DHV 000 V.P.H.
Trucks 00 %
Total
Design ESALs ---

General Notes
-This design is for the replacement of the existing 25'-3 x 50'-10 Continuous Concrete Slab Bridge, Design No. 347, FHWA No. 013910, Maint. No. 0408.6S005

-Roadway alignments are not designed.

-Pre-Cast Option will be evaluated

Situation Plan



Design For 30 Degree RA
TWIN 12'X10'X123'
REINFORCED CONCRETE BOX

Situation Plan - FINAL CONCEPT

STA. 11+37.47 (IA 5) Turn-in Date: October 2024

Appanoose County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 128 Design Sheet No. 1 of 1 FHWA/Asset 013911

FILE NO. 98765	ENGLISH	DESIGN TEAM Iowa DOT	Appanoose COUNTY	PROJECT NUMBER BRF-005-1(082)--38-04	SHEET NUMBER V.1
SYSTEMTIME	SYSTEMDATE	USERNAME	DGNSPEC		

CROSS SECTION VIEW COLOR LEGEND			
Design Color No.	Feature	Design Color No.	Feature
Aggregate		Grading	
(64)	Choke Stone	(8)	Behind Curb Cut
(42)	Engineering Fabric	(6)	Granular
(8)	Flooded Backfill	(13)	Granular Back Fill
(92)	Macadam Stone	(48)	Rock Undercut
(20)	Modified	(8)	Shoulder Earth Fill
(12)	Plowing Shaping	(2)	Side Slopes
(14)	Porous Backfill	(226)	Side Slopes Dressing
(8)	Revetment Class A	Substrata	
(6)	Revetment Class B	(128)	Boulder
(62)	Revetment Class C	(209)	Boulder Removed
(188)	Revetment Class D	(48)	Broken Weathered
(28)	Revetment Class E	(210)	Broken Weathered Removed
(12)	Shoulder Special Backfill	(3)	Core Out
(12)	Special Backfill	(115)	Core Out Remove Only
(20)	Subbase	(195)	Core Out Remove and Replace
(20)	Subbase Lower	(203)	Existing Pavement
(20)	Subbase Upper	(184)	Existing Pavement Remove Only
(118)	Subgrade Treatment	(200)	Existing Pavement Remove and Replace
Asphalt		(6)	Loam
(207)	HMA Base Course	(211)	Loam Removed
(207)	HMA Interim Course	(80)	Rock
(207)	HMA Surface Course	(212)	Rock Removed
Bridge		(4)	Select Sand
(0)	Bridge	(214)	Select Sand Removed
Concrete		(3)	Shale
(0)	Barrier Concrete	(215)	Shale Removed
(0)	Barrier Concrete Footing	(10)	Topsoil
(0)	Curb Gutter	(2)	Topsoil Remove Only
(48)	Flowable Mortar	(4)	Topsoil Remove and Replace
(0)	Median Concrete	Unsuitable / Waste	
(0)	PCC Pavement	(3)	Unsuitable Type A
(0)	Sidewalk	(216)	Unsuitable Type A Removed
Existing		(13)	Unsuitable Type B
(0)	Existing Pavement	(217)	Unsuitable Type B Removed
Shoulder		(11)	Unsuitable Type C
(209)	Shoulder HMA	(218)	Unsuitable Type C Removed
(0)	Shoulder PCC	(3)	Waste
(6)	Shoulder Granular	(219)	Waste Removed
Structural			
(112)	Noise Wall		
(112)	Noise Wall Footing		
(112)	Retaining Wall Back		
(112)	Retaining Wall Back Excavate		
(112)	Retaining Wall Face		
(112)	Retaining Wall Front Excavate		
(112)	Retaining Wall Front Footing		
(112)	Retaining Wall MSE Gutter		
(112)	Retaining Wall Reinforced Earth		

NOTES:

Text

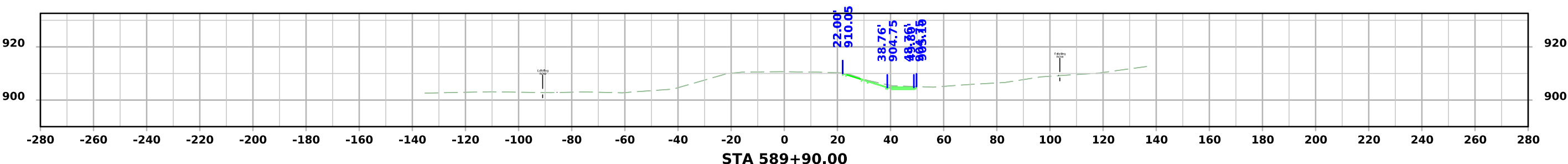
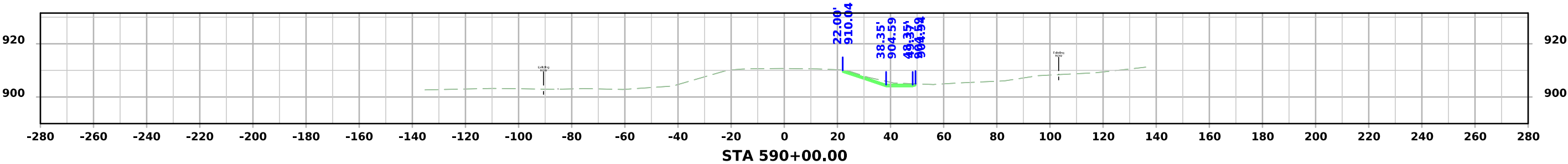
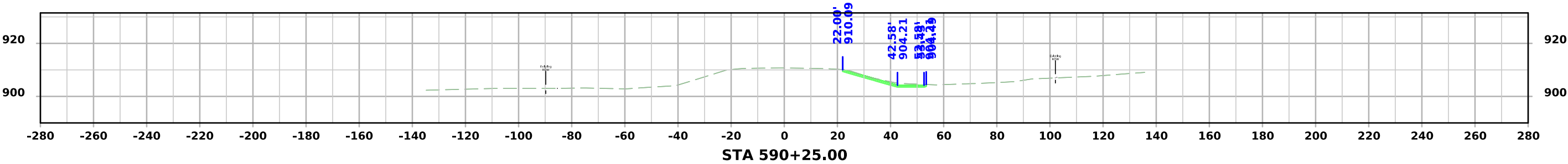
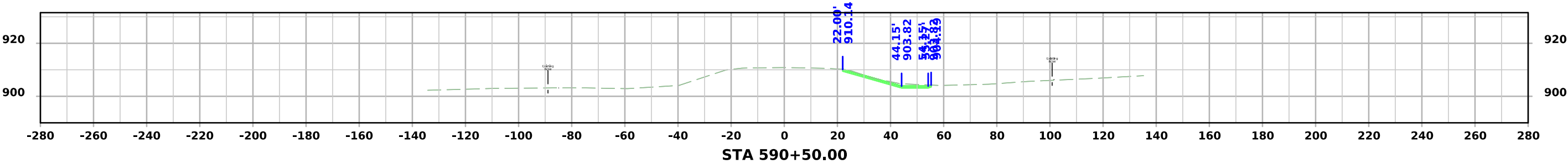
NOTES:

Text

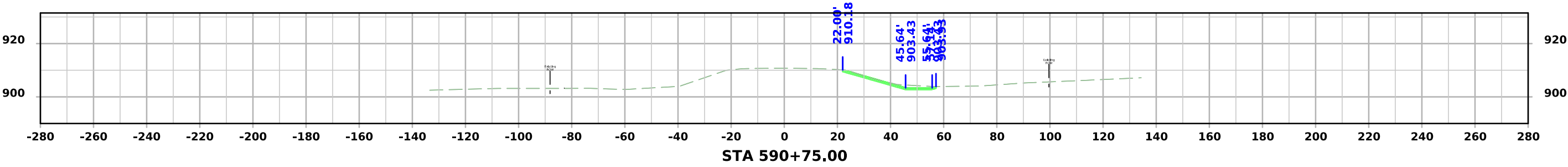
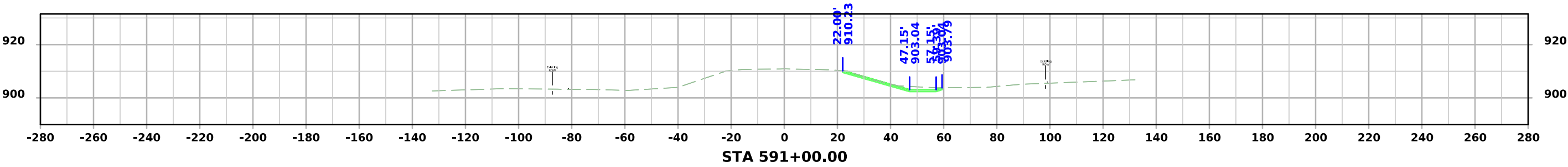
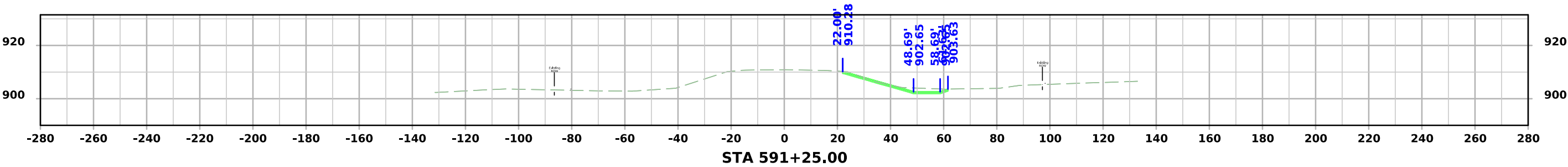
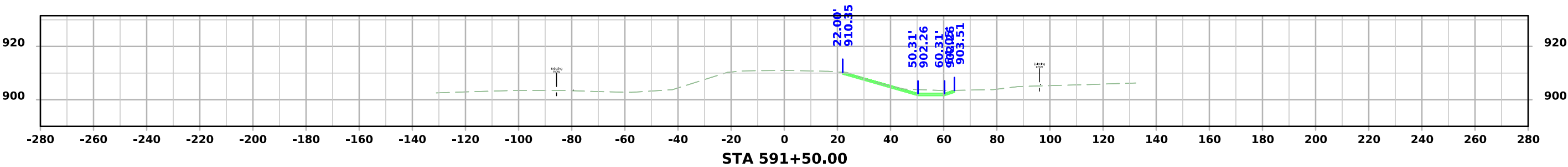
CROSS SECTIONS
LEGEND AND INFORMATION SHEET

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

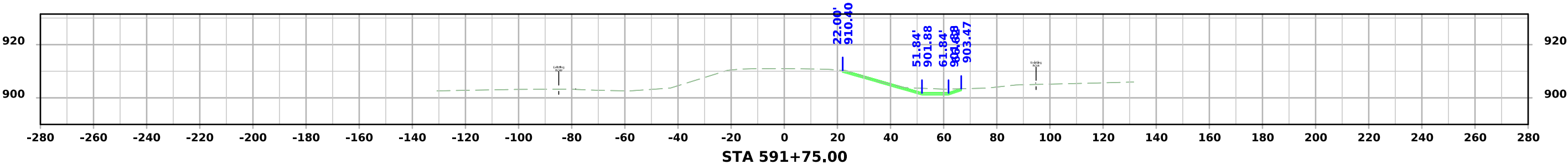
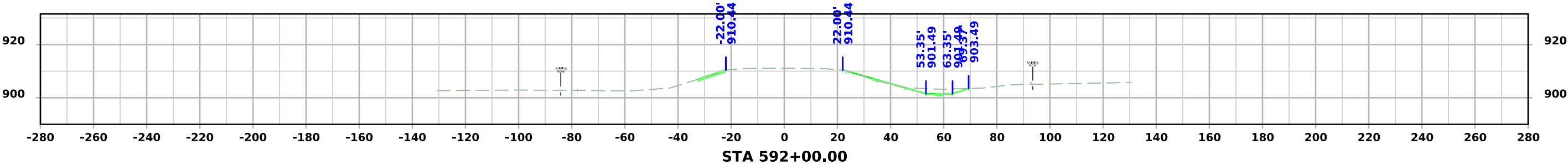
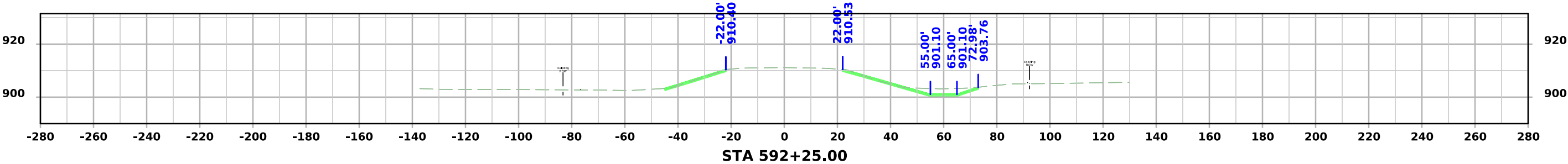
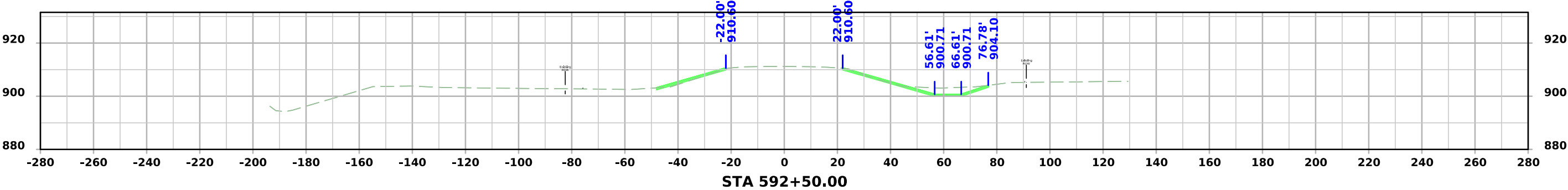
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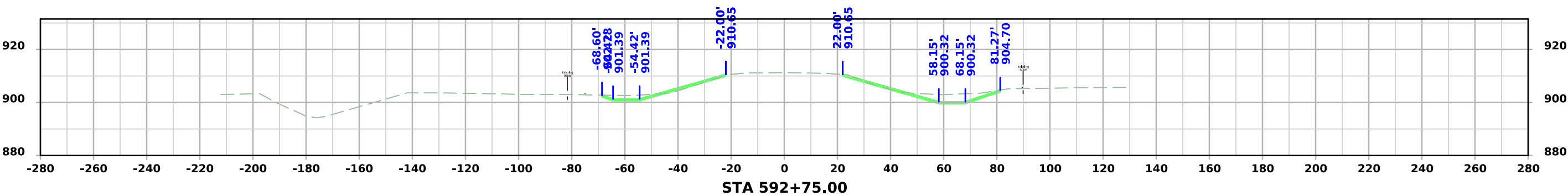
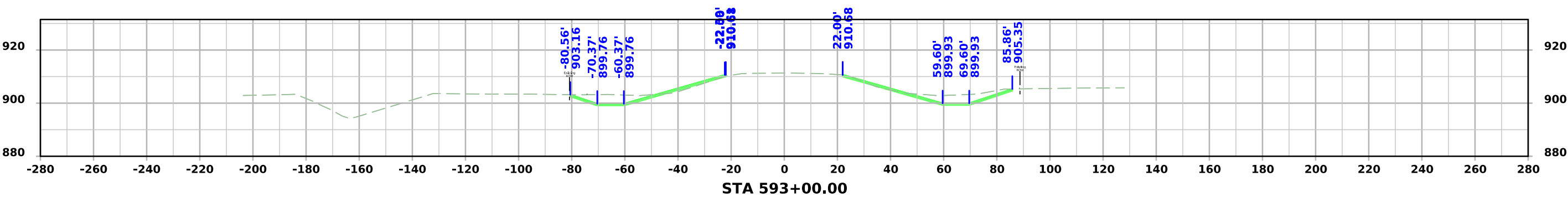
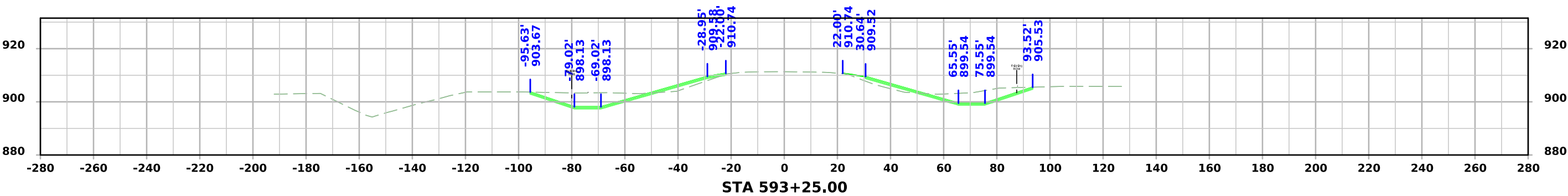
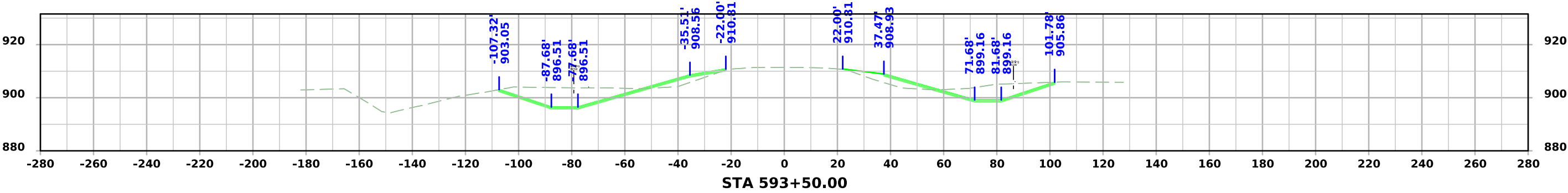
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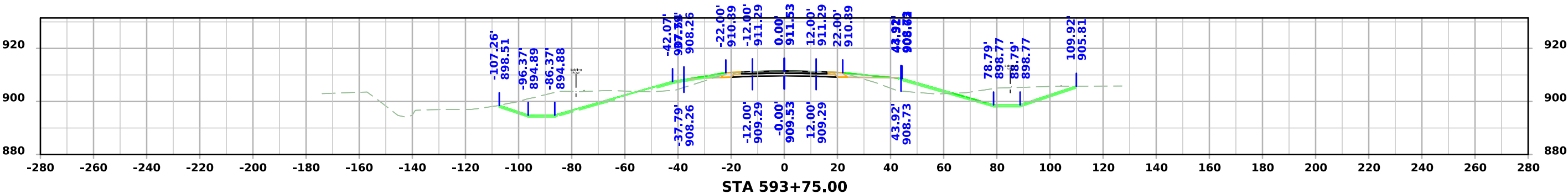
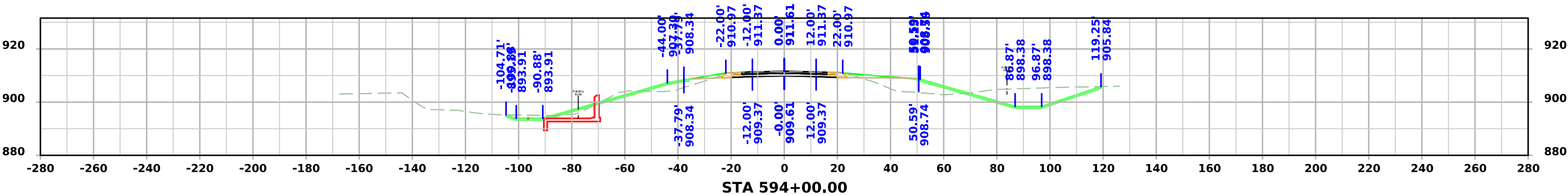
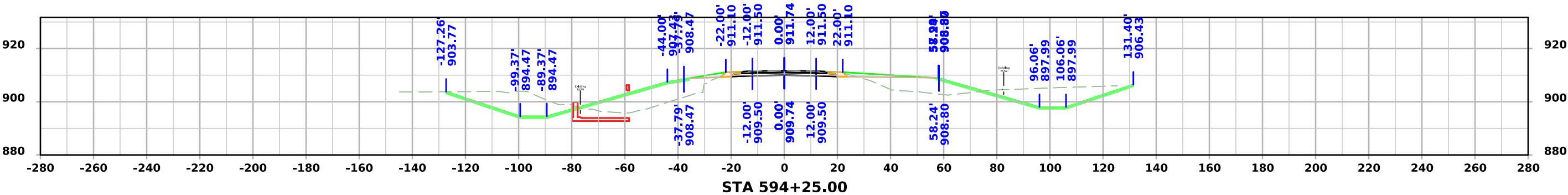
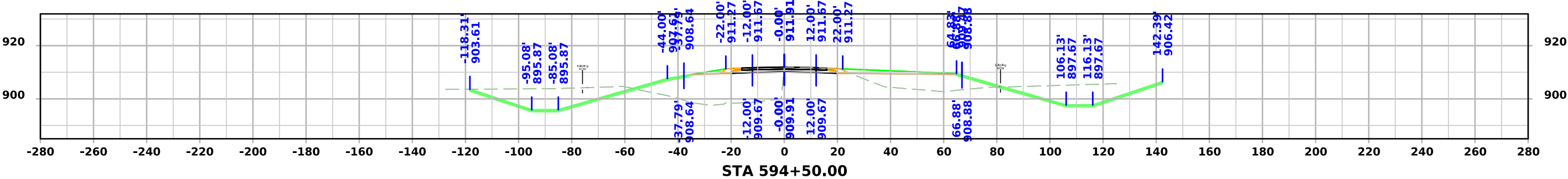
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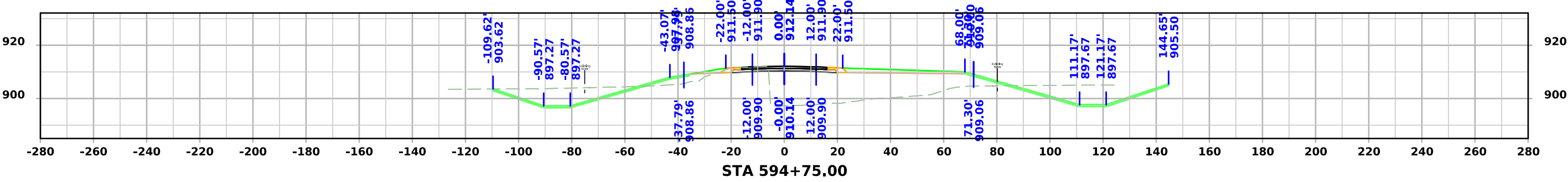
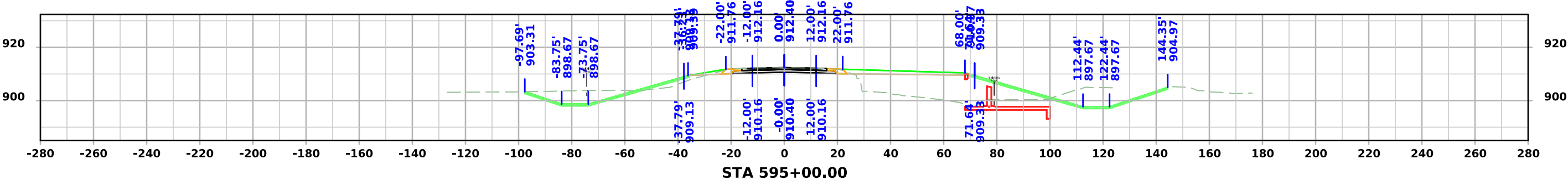
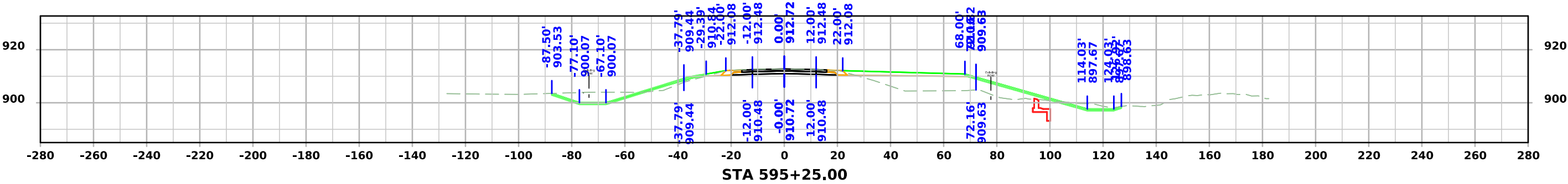
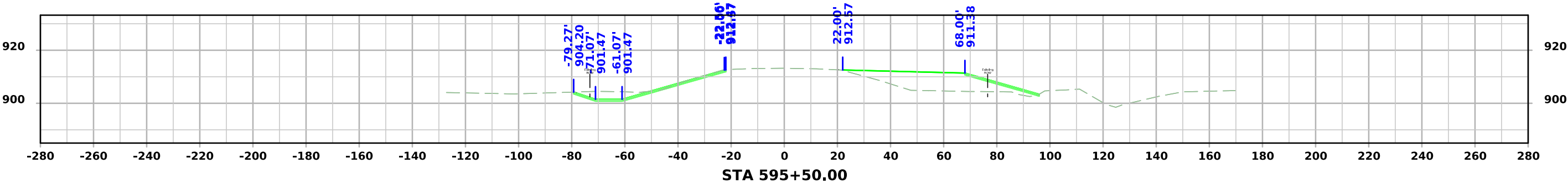
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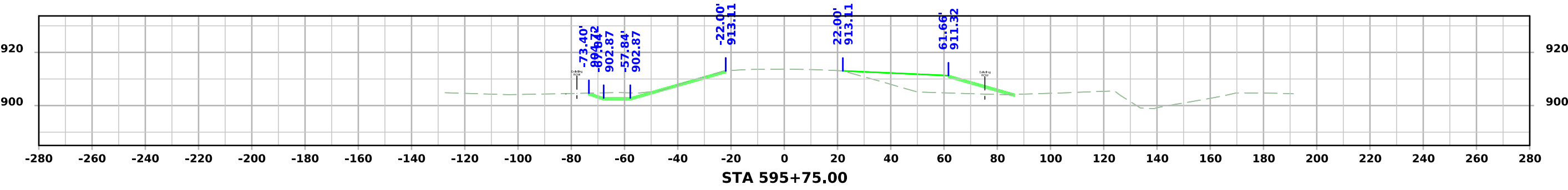
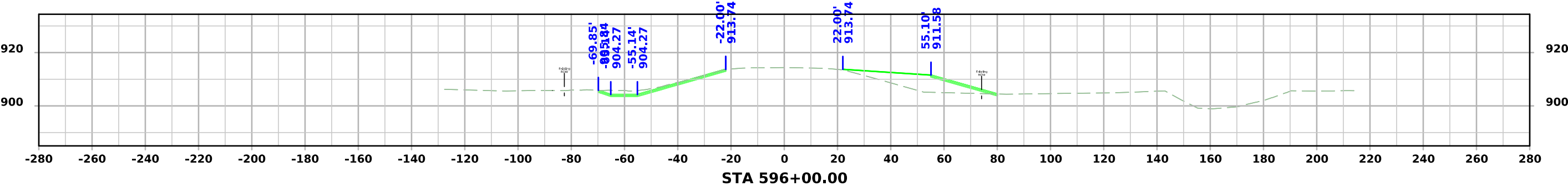
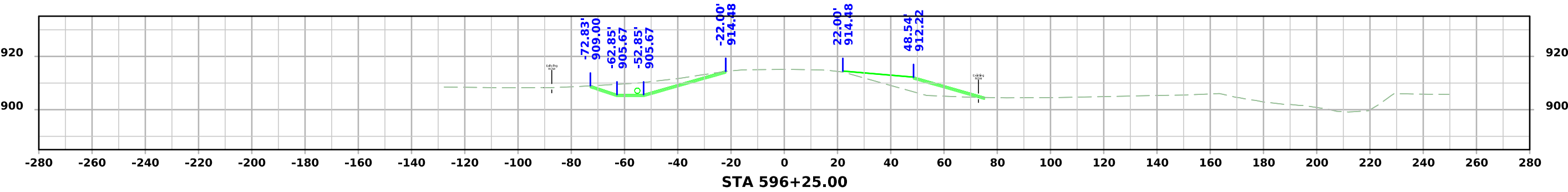
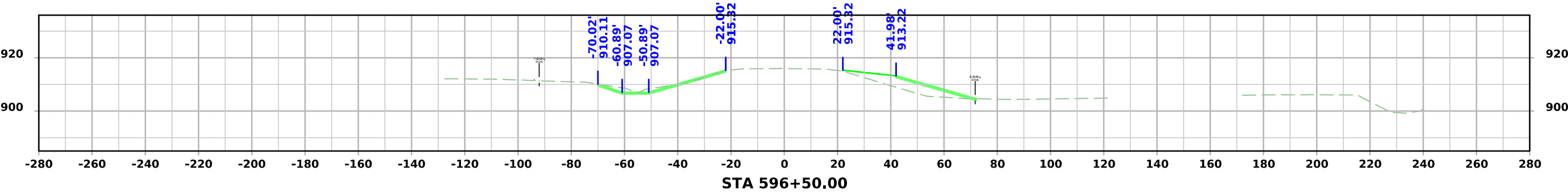
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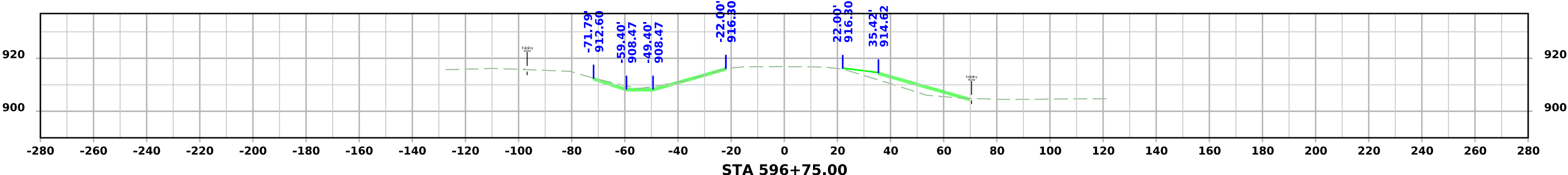
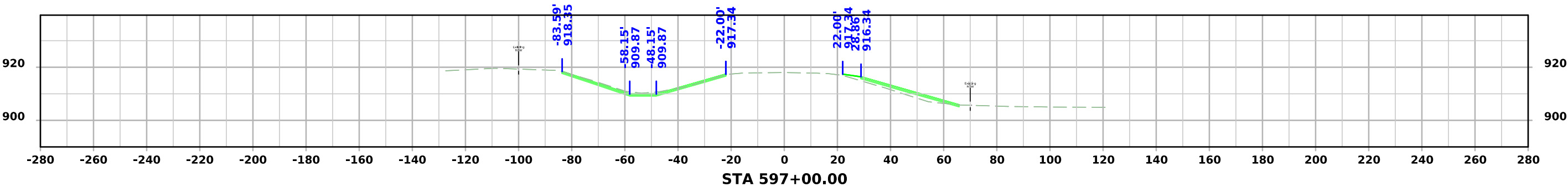
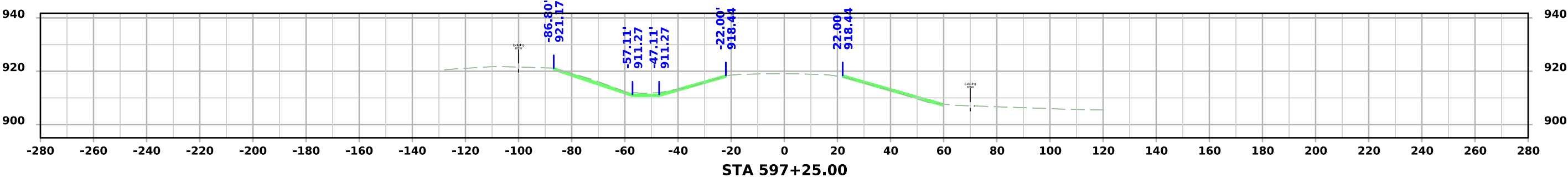
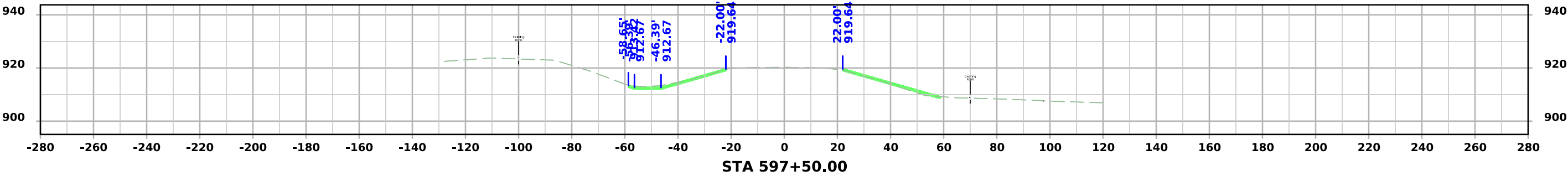
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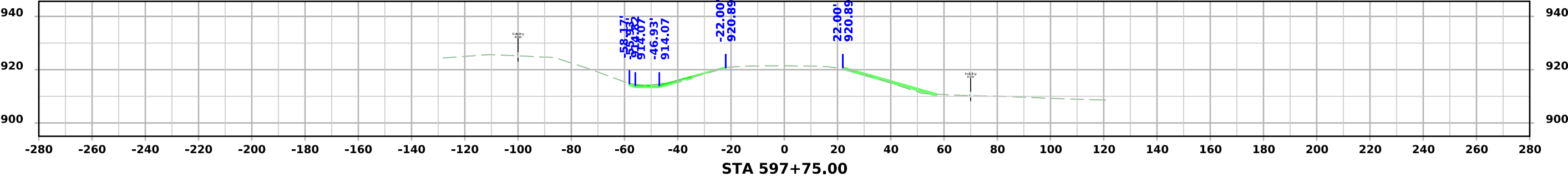
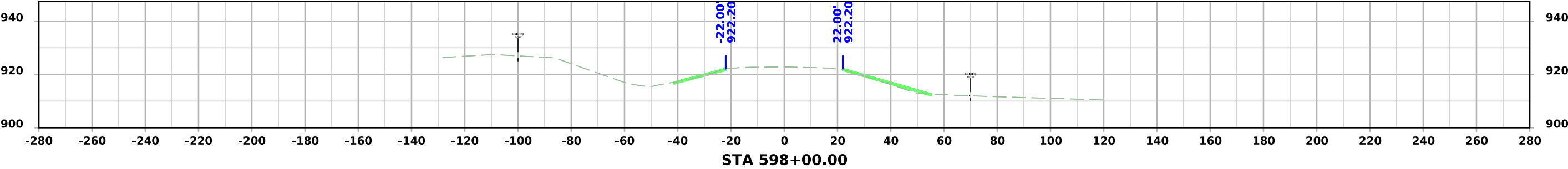
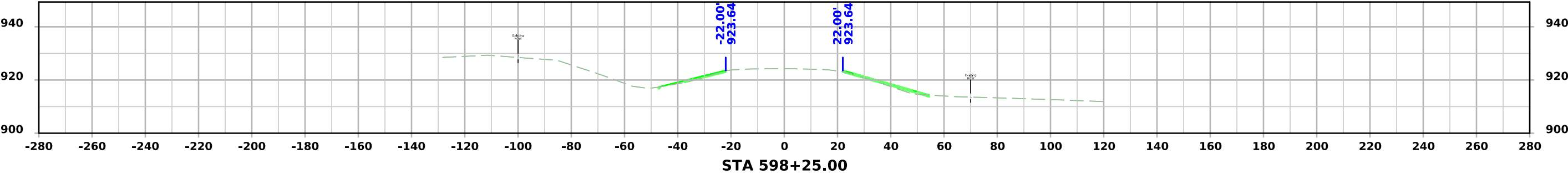
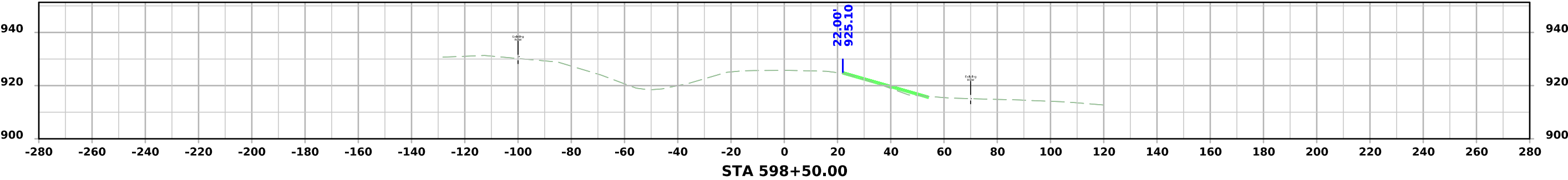
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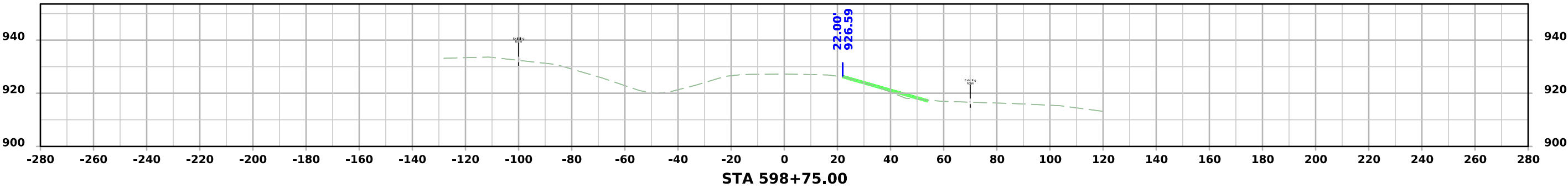
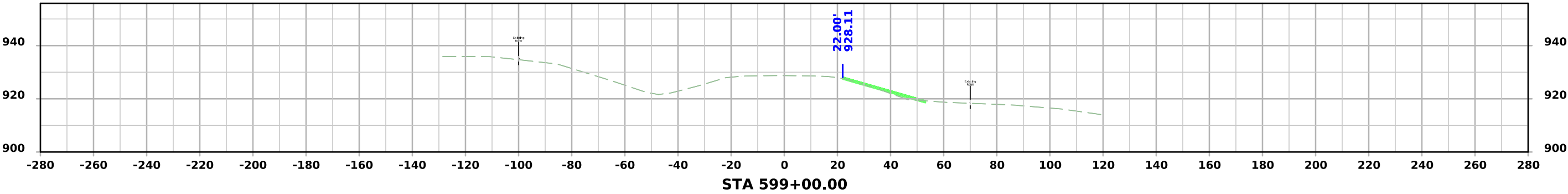
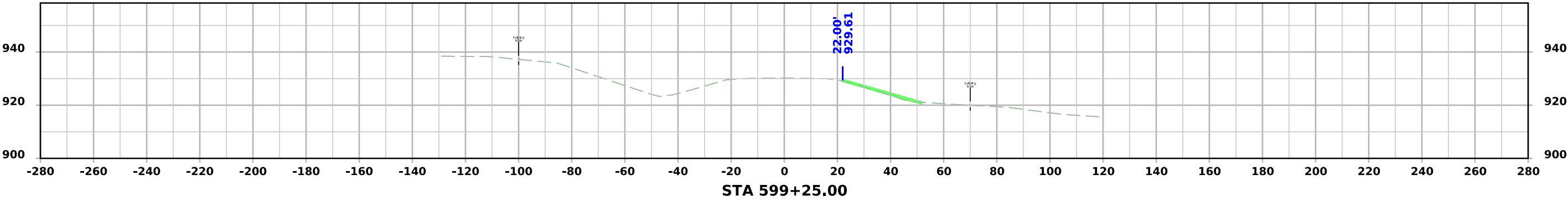
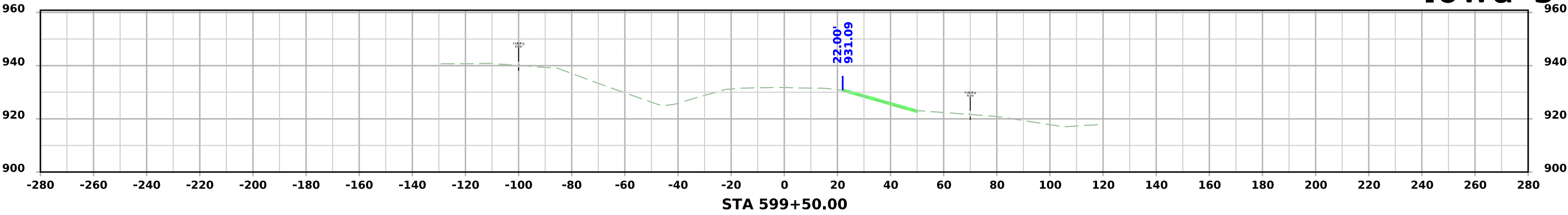


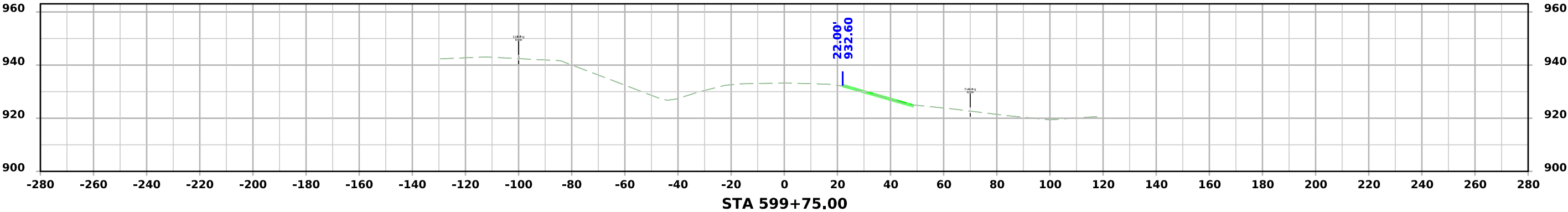
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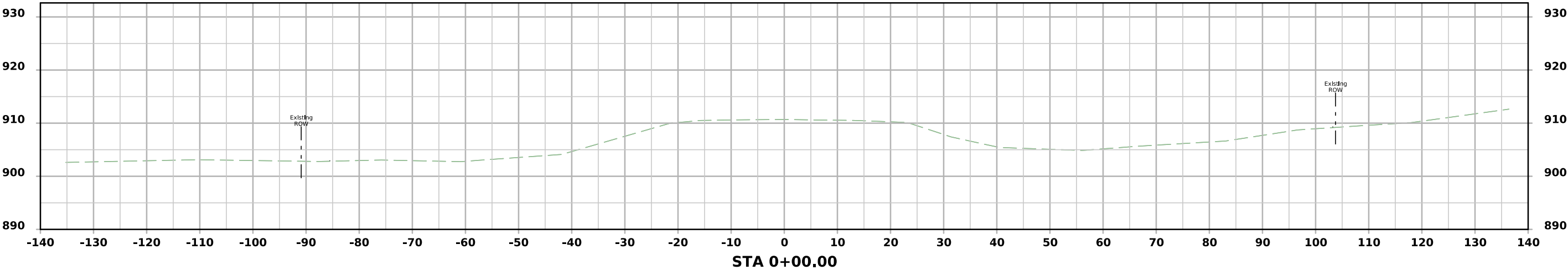
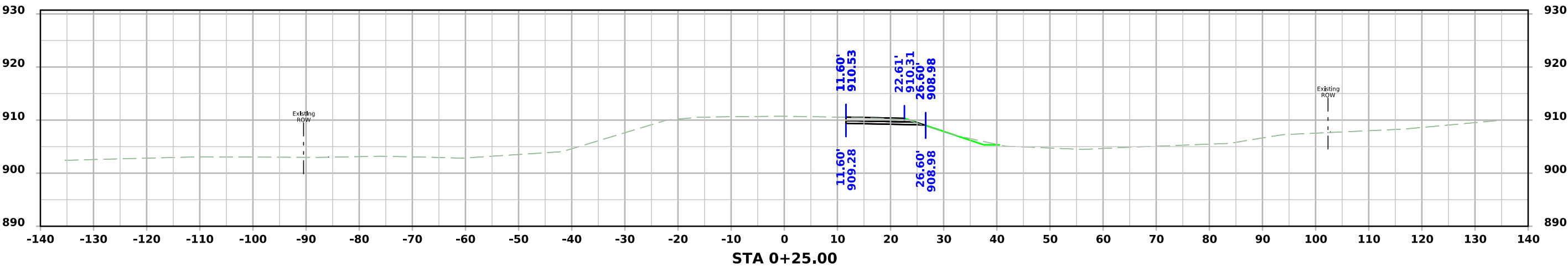
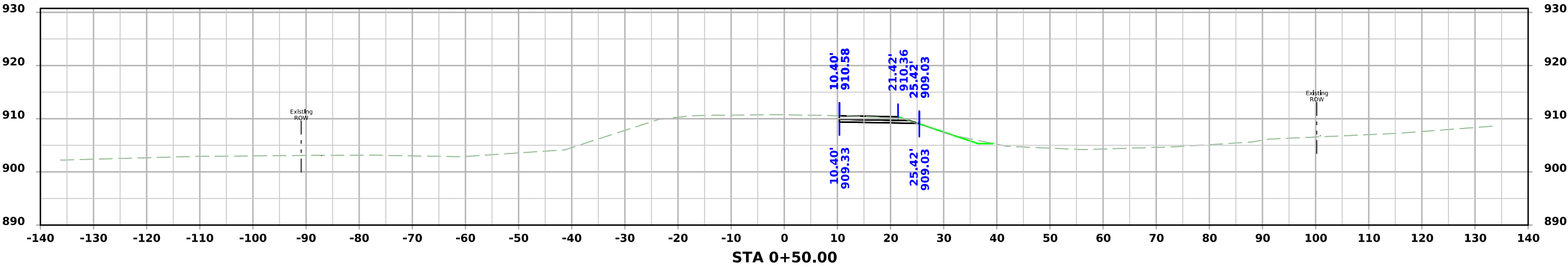
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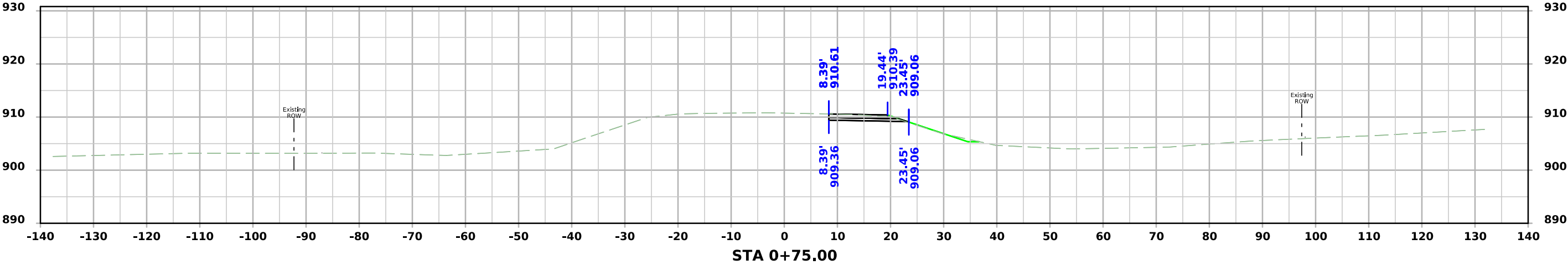
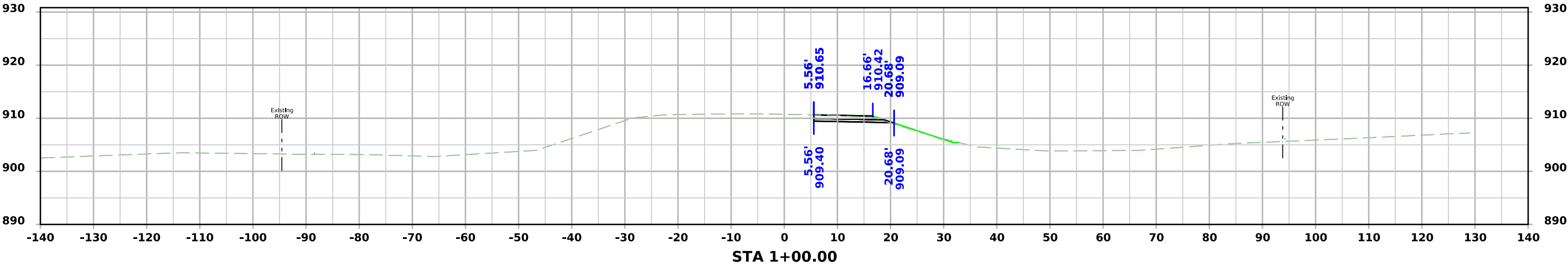
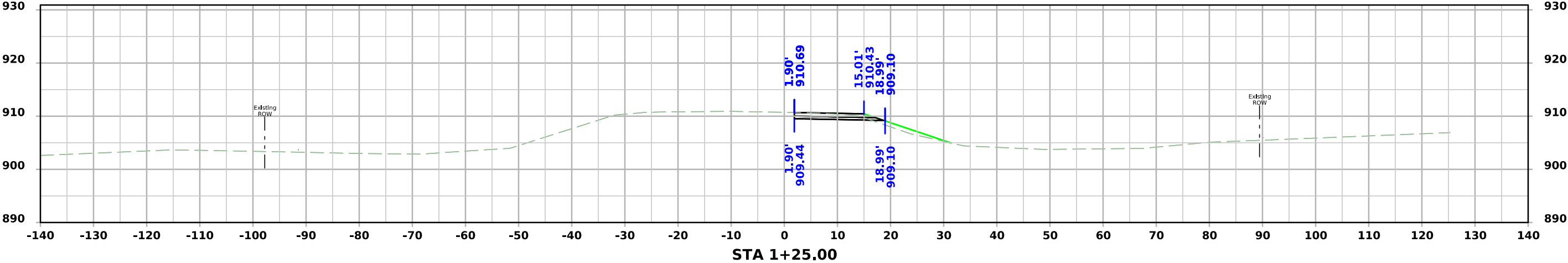




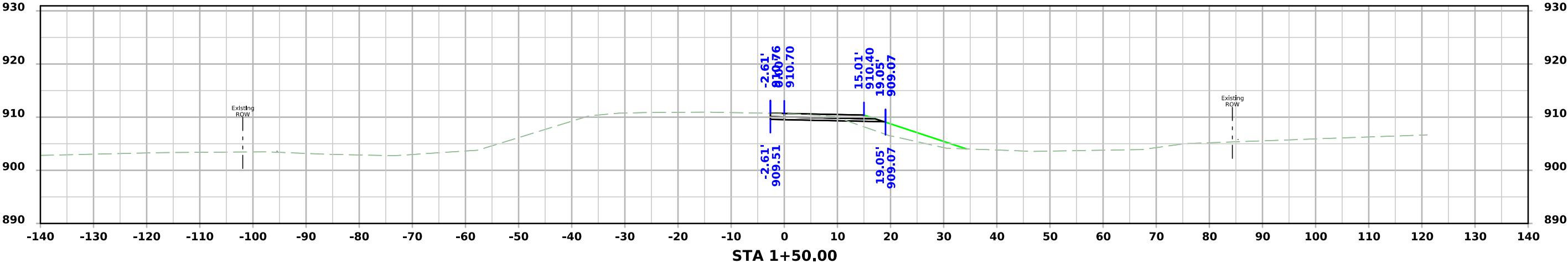
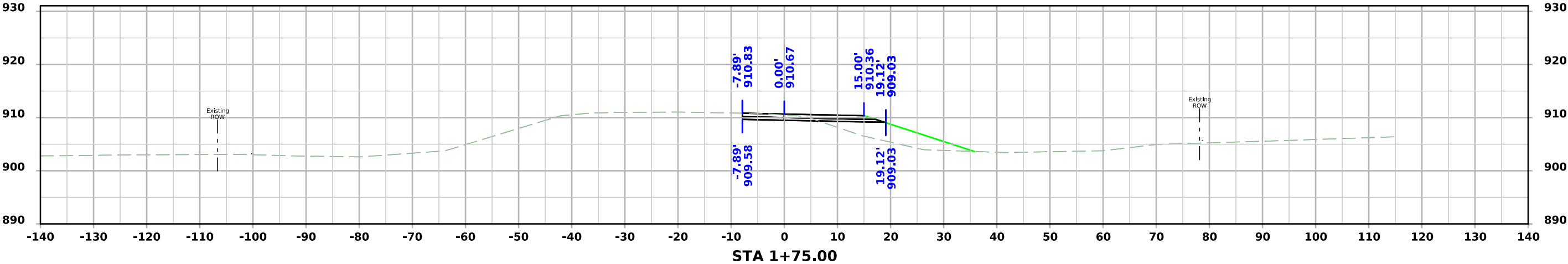
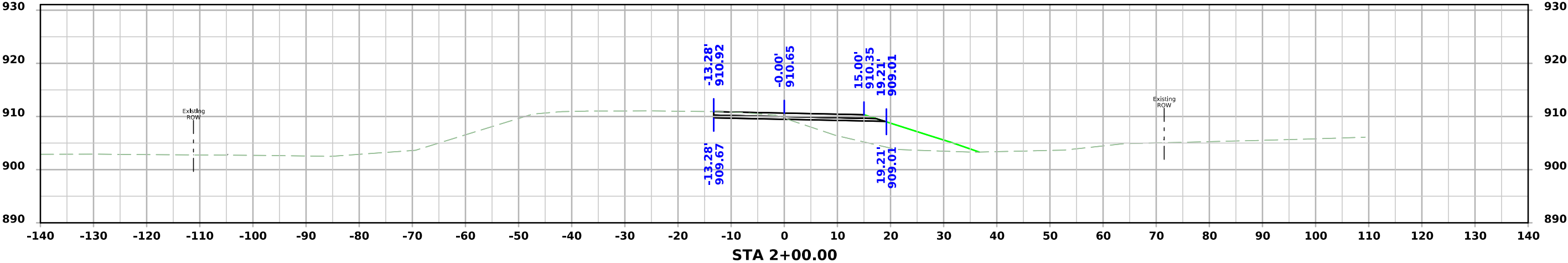
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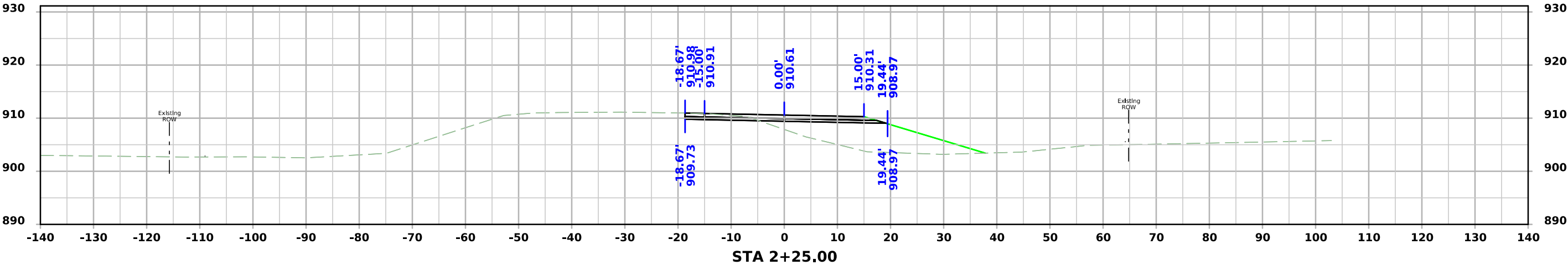
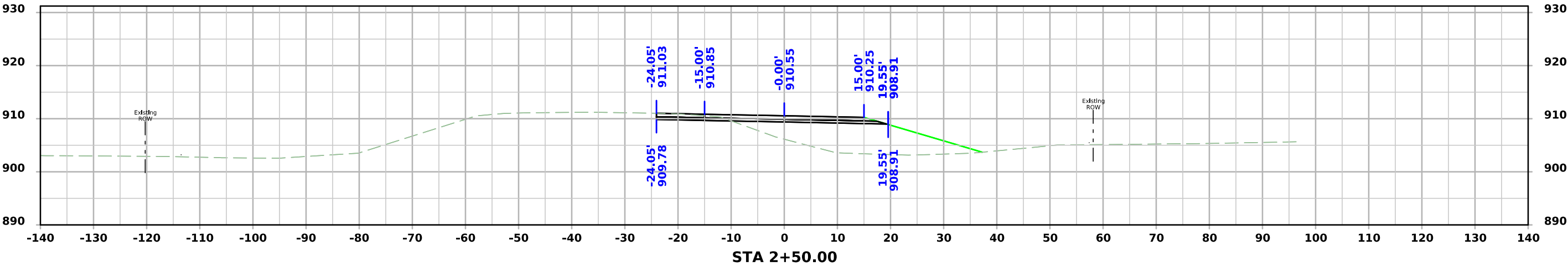
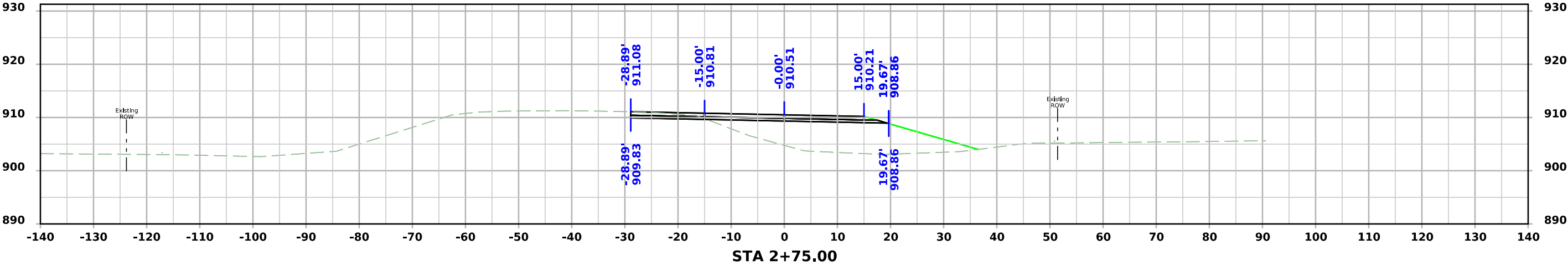
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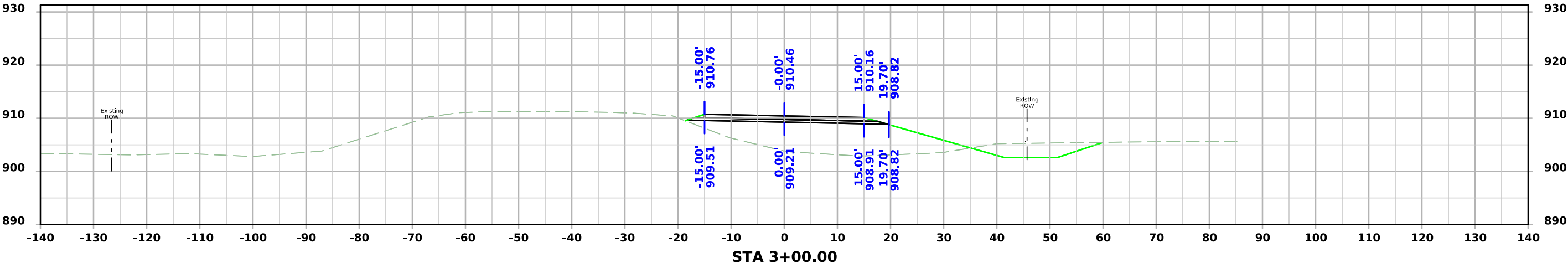
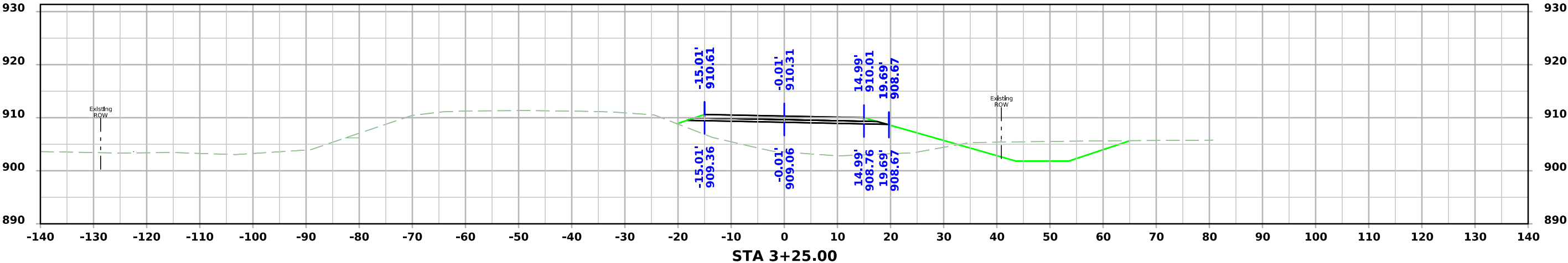
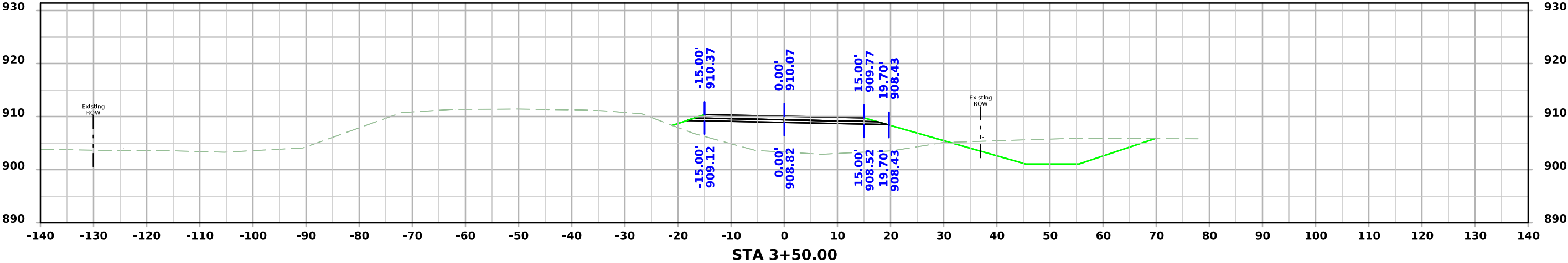
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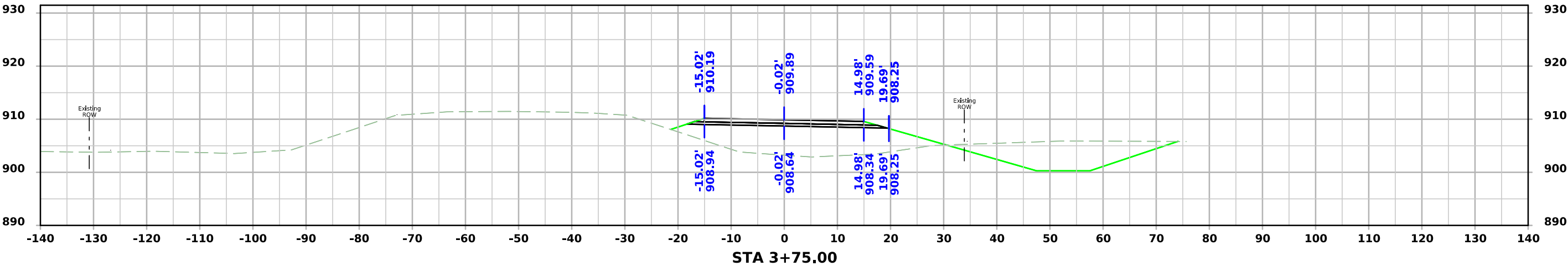
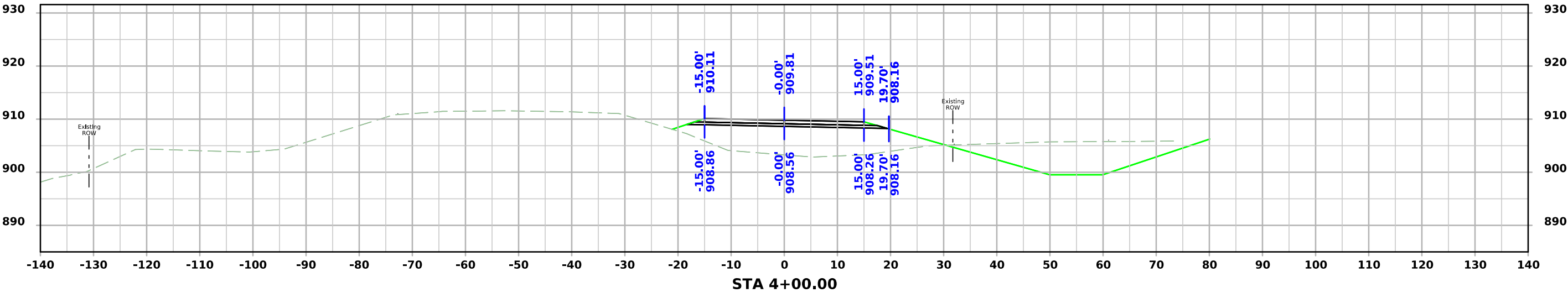
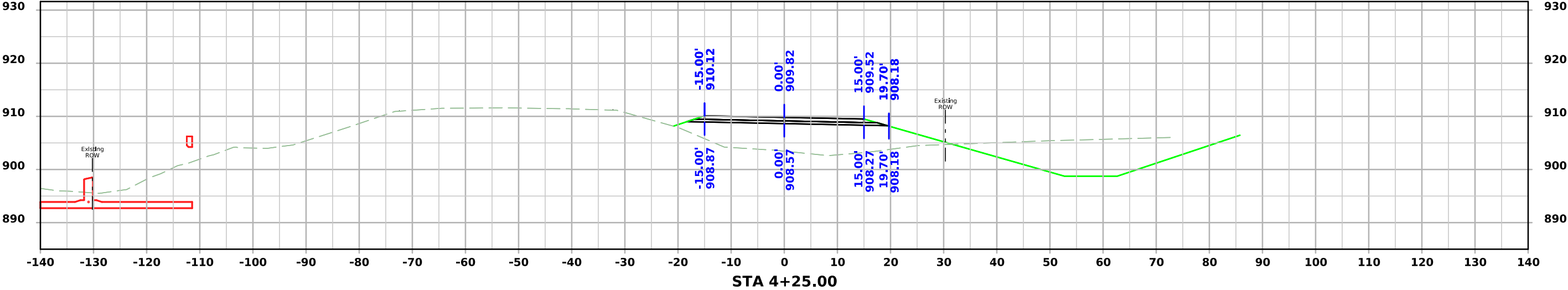
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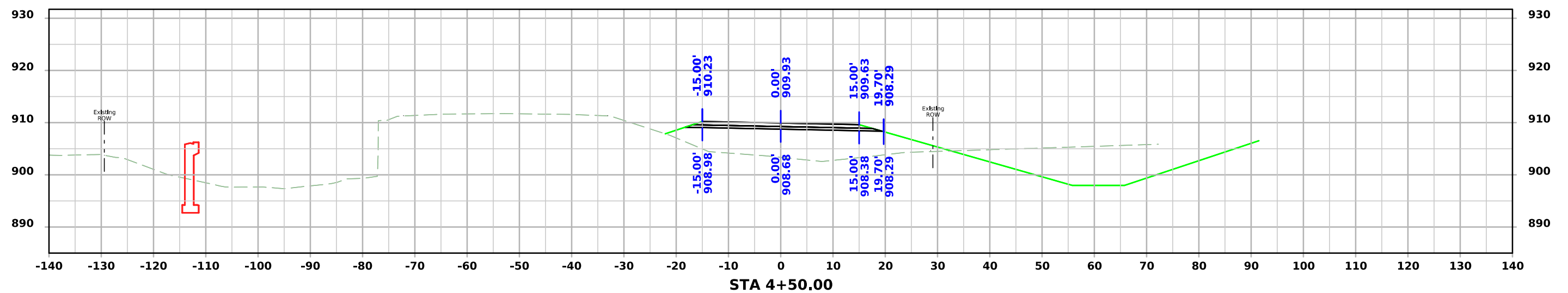
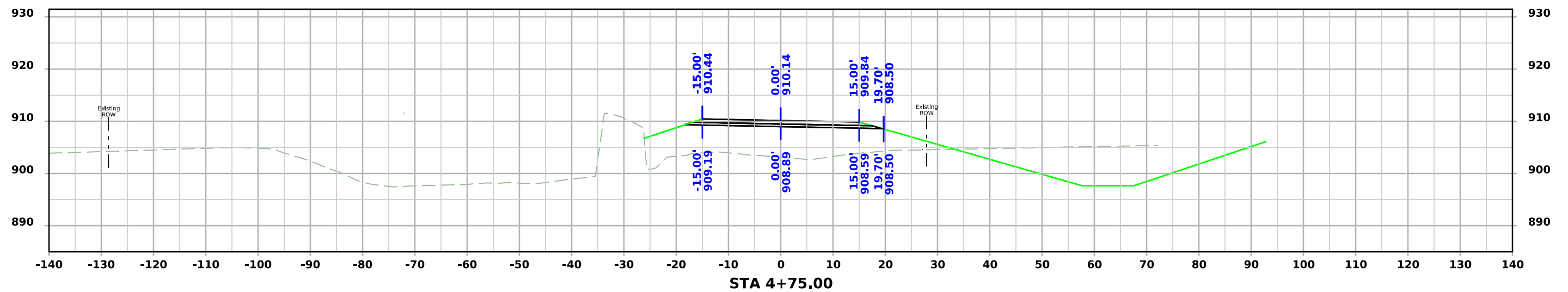
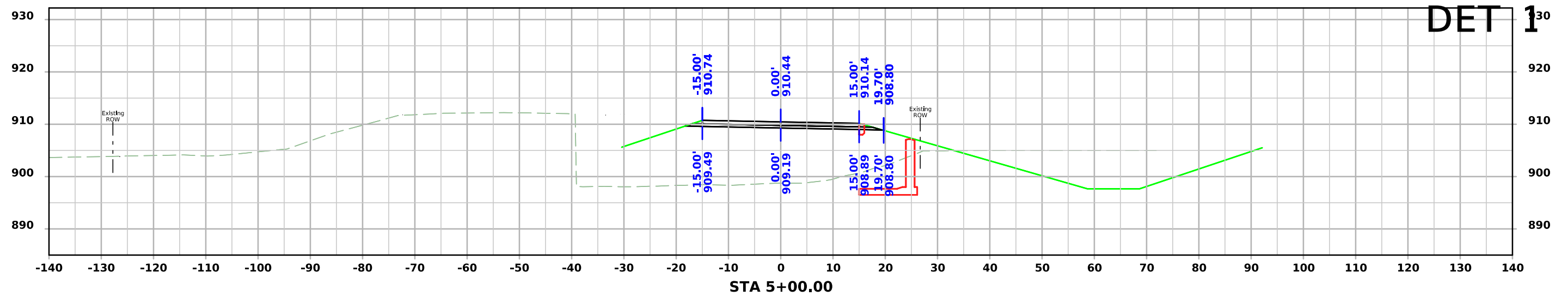


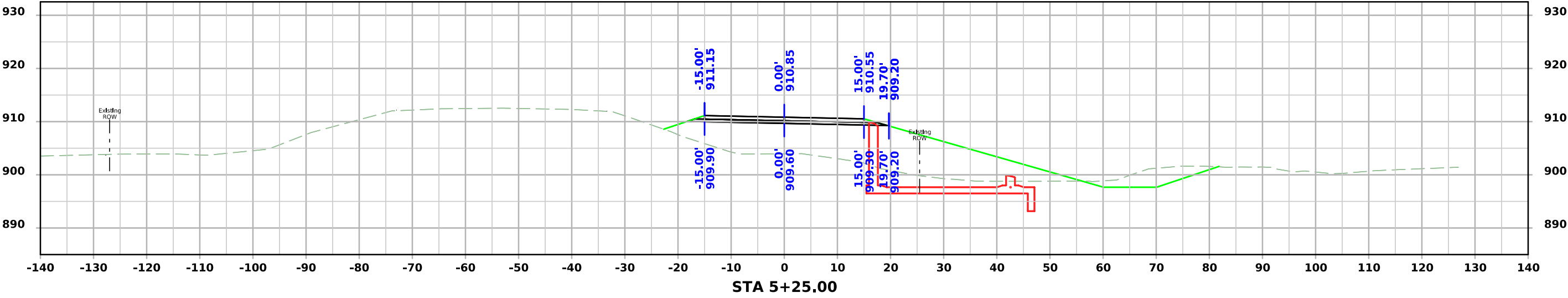
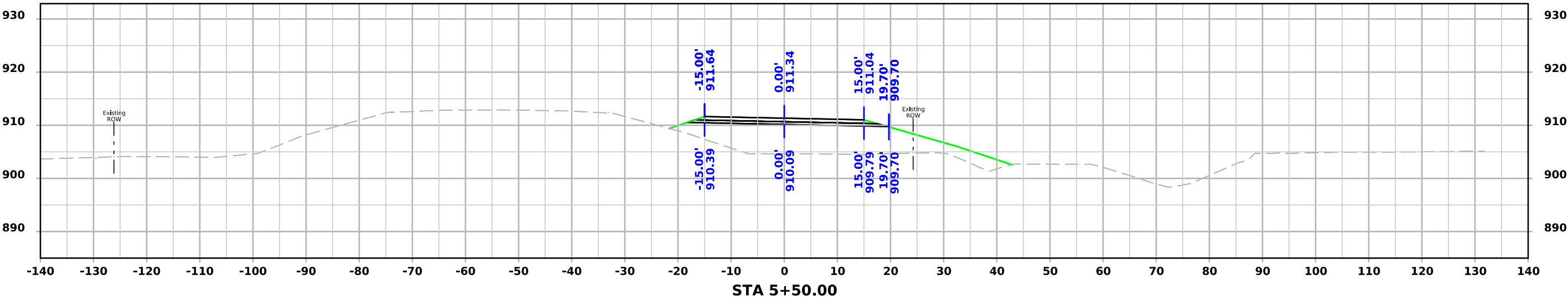
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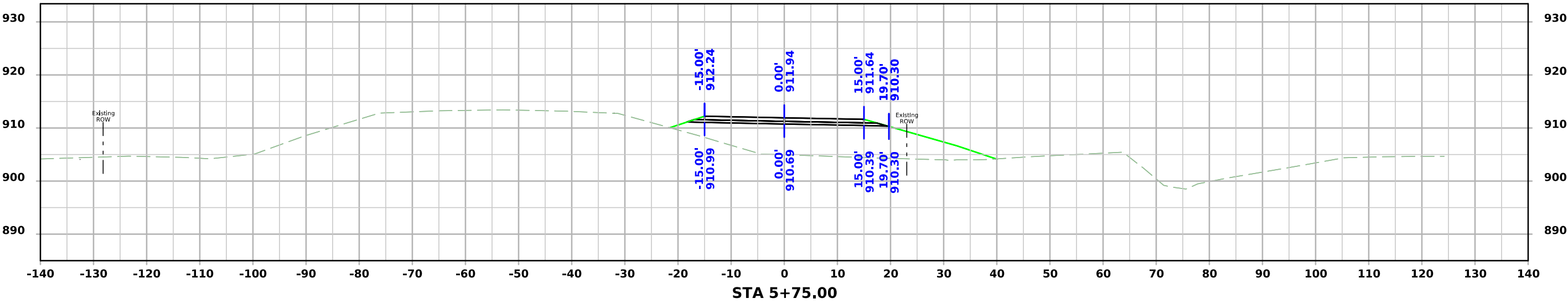
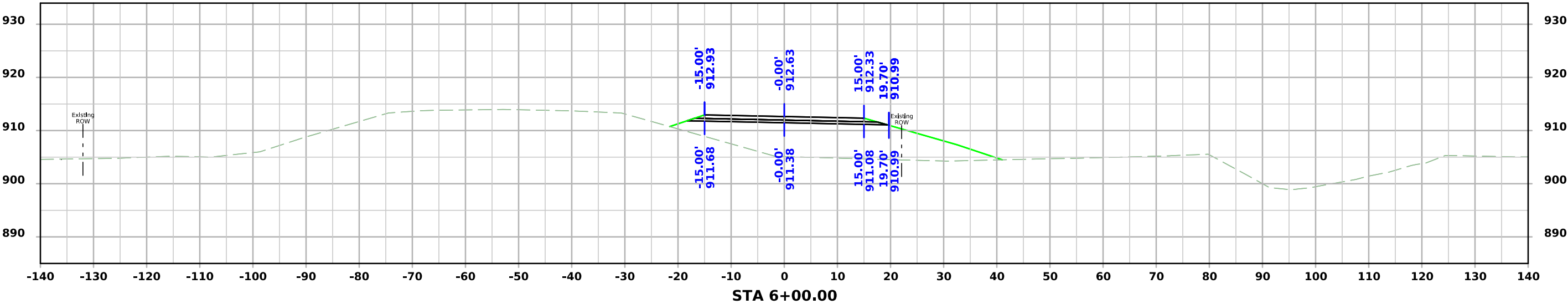


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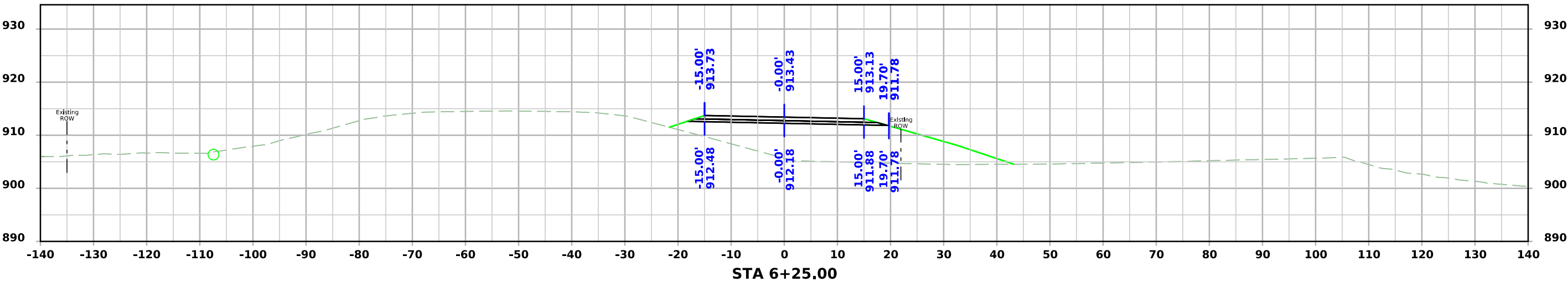
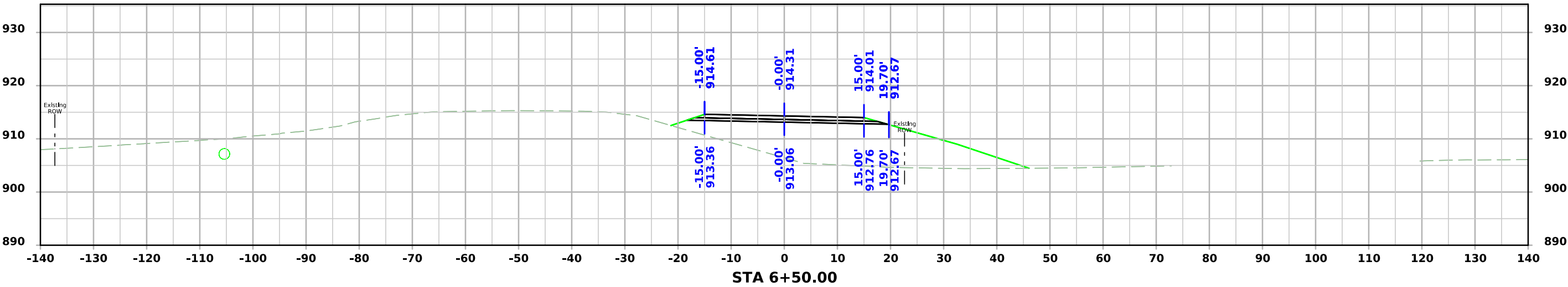
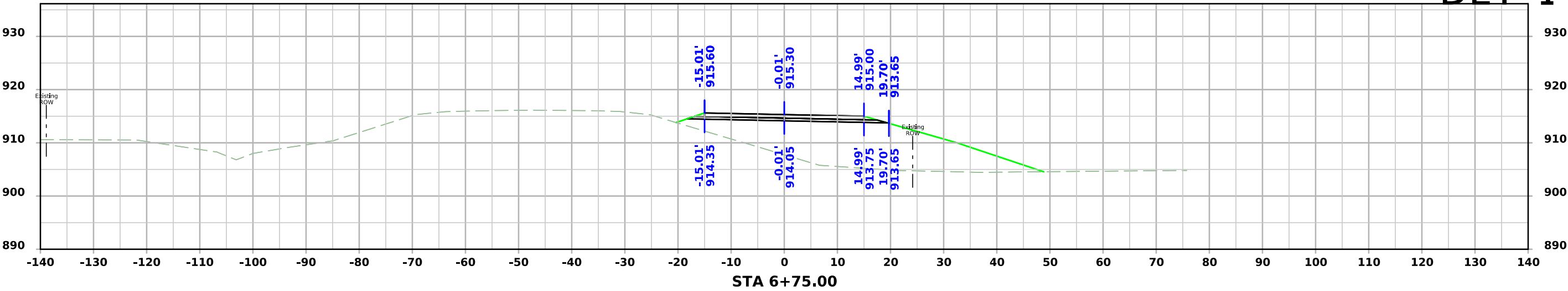




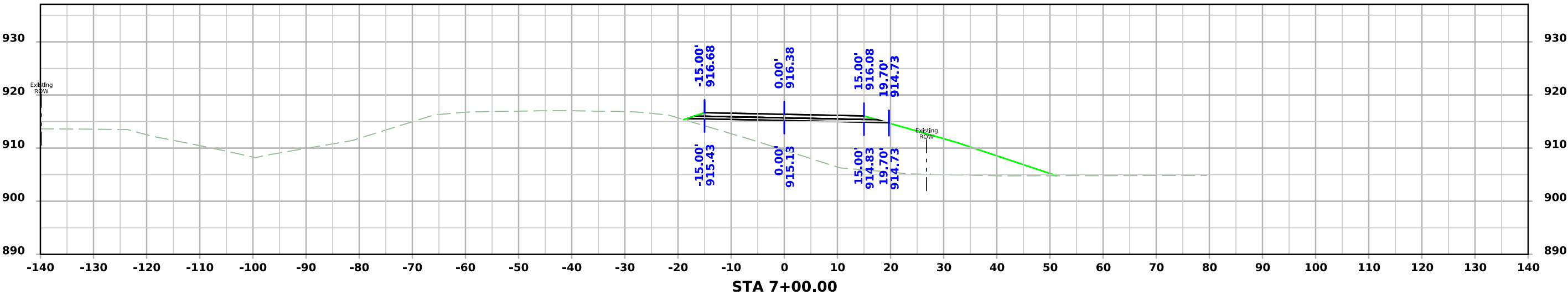
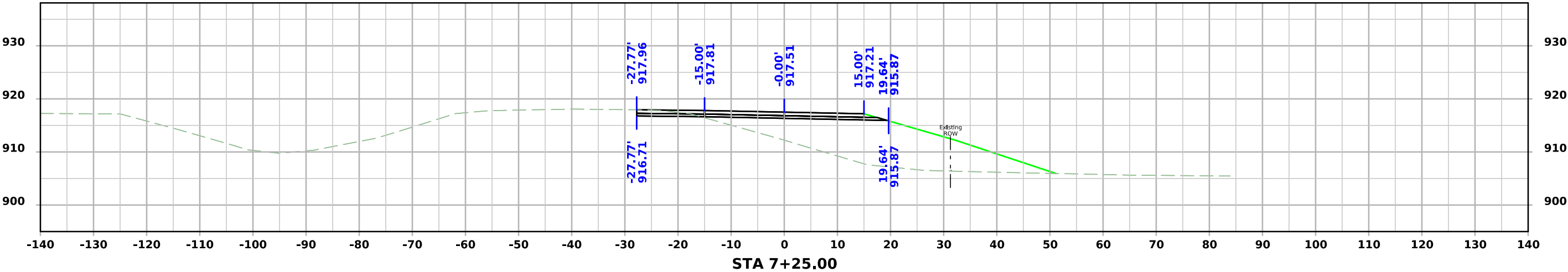
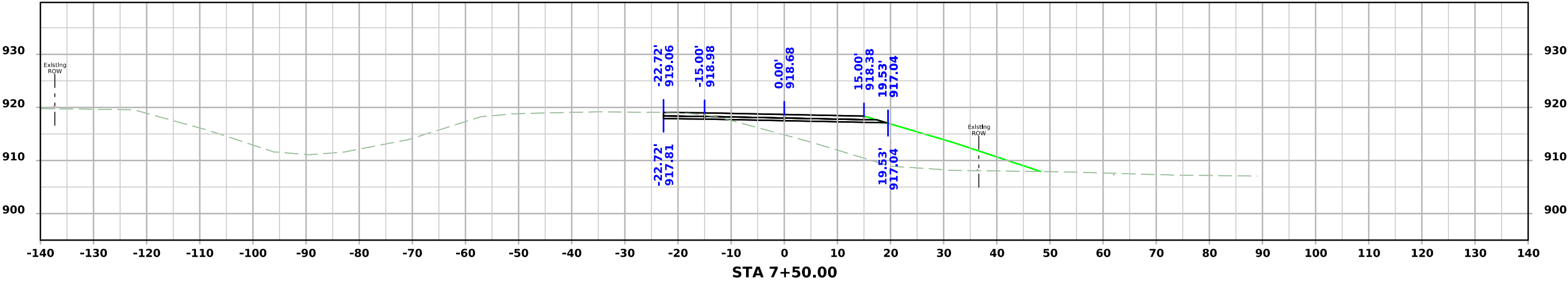




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