

INDEX OF SHEETS	
No.	DESCRIPTION
A Sheets	Title Sheets
A.1	Title Sheet
A.2	Location Map Sheet
A.3 - 19	Concept Statement
B Sheets	Typical Cross Sections and Details
B.1	Typical Cross Sections and Details
D Sheets	Mainline Plan and Profile Sheets
D.1	Plan & Profile Legend & Symbol Information Sheet
D.2 - 9	US 151
W Sheets	Mainline Cross Sections
W.1 - 52	Mainline Cross Sections



PLANS OF PROPOSED IMPROVEMENT ON THE

Benton / Linn COUNTY

PCC Pavement - Grade and Replace
Co Rd E66 to Fairfax

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

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



Location Map on A.02

DESIGN DATA RURAL				
2026	AADT	7,800	V.P.D.	
2046	AADT	8,700	V.P.D.	
2046	DHV	920	V.P.H.	
TRUCKS		8	%	
Total Design ESALs		--		

INDEX OF SEALS			
SHEET NO.	NAME	TYPE	BID QUANTITY SHEETS
A.1	Kyle Schrock	Primary Signature Block	C.1

PRELIMINARY PLANS

Subject to change by final design.

D2 PLAN - 07/15/2026

REVISIONS

TOTAL

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PROJECT IDENTIFICATION NUMBER

26-06-151-010

PROJECT NUMBER

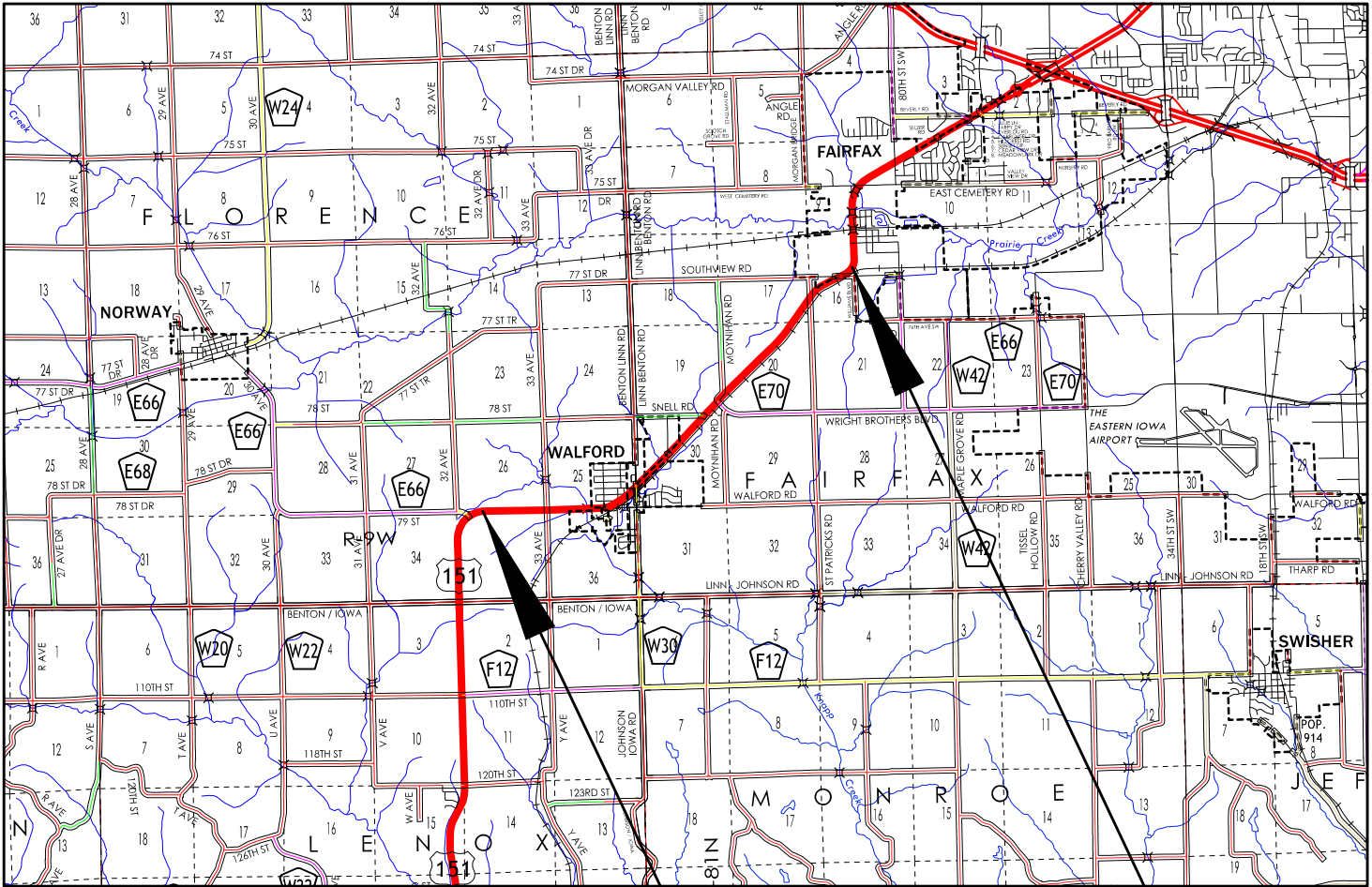
NHSX-151-2(011)--3H-06

R.O.W. PROJECT NUMBER

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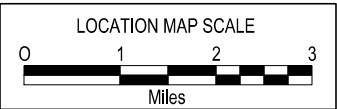
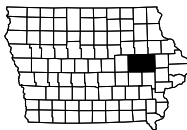
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END CONSTRUCTION
STA. 682+22.00
M.P. 21.45

BEGIN CONSTRUCTION
STA. 406+23.34
M.P. 16.25



PROJECT IMPACTS:

Designed by: District/Design/Consultant

Design Impact	Assistance Requested (Y/N)	Remarks
ADA:	N	
Agreements/Notification Letters:	?	Linn County – WBB?
Bridges and Structures:	N	
Consultant:	N	
Contracts:	N	
Design/Methods:	Y	Request Design Assistance with Project Plans
Location and Environment:	Y	
Maintenance: Cedar Rapids	N	
Project Management:	N	
Railroad:	Y	6 Crossings within 100 ft of project limits
RCE: Cedar Rapids	Y	Field tabulations, survey
Right of Way:	N	Will not acquire new ROW. Request T01 event.
Soils:	N	Widening is mostly within existing road bed
Survey/Photogrammetry:	Y	D01 Survey needed for this project
Systems Planning:	Y	Traffic Forecast provided
Traffic and Safety:	Y	Request AC letter
Utilities:	Y	Point-25 Project for full reconstruct
Other:		

cc:

T. J. Gustafson	M. J. Purcell	K. D. Nicholson
Y. Jia	D. L. Maifield	C. B. Brakke
J. M. Holst	S. S. Nielsen	A. A. Welch
C. C. Poole	C. Carter	M. Nop
M. A. Swenson	R. A. Younie	S. P. Anderson
B. D. Hofer	K. Brink	D. L. Newell
W. W. Musgrove	M. A. Dell	J. W. Laaser-Webb
W. A. Sorenson	J. S. Bacon	T. M. Miller
M. E. Ross	M. L. Sloppy	M. Ortiz-Pagan
M. R. Gordy	D. D. Heeren	J. Bartholomew
N. L. Cuva	E. C. Wright	M. Buttz
S. Cook	G. Karssen	B. P. Struecker
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J. L. Tibodeau	M. Wood	D. L. Alvarez
S. M. Neuhaus	S. J. Shea	H. Torres-Cacho
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S. M. Kjormoe		H. W. Holak
J. Lamping	A. J. Simonson	G. S. Morrell
H. R. Gugler	R. H. Holub	A. J. Stanley
D. Coon	S. R. Martin	
B. Weimar		

CONCEPT ANALYSIS & SUPPORTING DATA:

Necessary supporting data may be linked in the analysis to ProjectWise.

Date of Field Review:

July 9, 2025

Participants:

J. Tibodeau, T. Storey, R. Holub, A.J. Stanley, M. Wood, D. Coon, B. Weimar, S. Neuhaus

PAVEMENT:

Existing Conditions:

US 151 is a two-lane rural highway for most of the project limits, except for a small urban segment passing through the town of Walford. There is curb and gutter with storm sewer on the west side of the highway in Walford from MP 17.79 to MP 18.01. The posted speed limit is 55 mph and drops to 45 mph within the Walford corporate limits. The existing typical section consists of 12 ft. pavement lanes with 4 ft. wide paved shoulders for a total paved width of 32 ft. There is one right-turn lane within the project limits at Wright Brothers Blvd. (MP 19.32).

The pavement surface is a slurry seal that was placed in 2015. The pavement section is composite – consisting of multiple HMA overlays over the original 7” PCC. After the most recent overlay in 2005, the roughness returned after about nine years, at which point fine milling was done to improve the ride. The resulting driving surface was noisy, which necessitated the slurry seal a year later.

The existing pavement exhibits frequent cracking of the surface as well as a rough ride. The pavement does not typically require patching. A portion of the pavement is PCC constructed in 1995 from MP 19.68 to MP 20.55. The PCC is generally in good condition with minor patching and some faulting/spalling, although the HMA shoulders adjacent to the 1995 PCC pavement is in poor condition and would likely fail quickly if traffic was shifted in this section.

Pavement History:

Segment A: Milepost 16.26 to Milepost 18.03

2015	Slurry Seal	NHSN-151-2(10)--2R-06
2005	HMA Resurfacing 4" x 24 ft. w/ .5" milling wide + paved shoulders	STPN-151-1(18)--2J-48
1983	HMA Resurfacing 1.5" x 24 ft. wide (Hot in place recycling)	FR-151-1(3)--2G-48
1966	HMA Resurfacing 3" x 18 ft. wide + 6 ft. PCC widen to 24 ft.	FN-194 / FN-149-2(1)--21-48
1952	3.0" x 18 ft. wide HMA Overlay	P-1027
1931	10"-7"-10" x 18 ft. wide PCC Pavement	P-435

Segment B: Milepost 18.03 to Milepost 21.56

2015	Slurry Seal	NHSN-151-2(10)--2R-06
2005	HMA Resurfacing 4" x 24 ft. w/ .5" milling wide + paved shoulders	STPN-151-1(18)--2J-48
1995	PCC reconstruction (MP 19.68 to MP 20.54 Only)	NHSN-151-2(3)--19-06
1983	HMA Resurfacing 1.5" x 24 ft. wide (Hot in place recycling)	FR-151-1(3)--2G-48
1966	HMA Resurfacing 3" x 18 ft. wide + 6 ft. PCC widen to 24 ft.	FN-255
1952	3.0" x 18 ft. wide HMA Overlay	P-1027
1934	10"-7"-10" x 18 ft. wide PCC Pavement	NRH-NRM-255

PMIS Data:

Segment	Milepost to Milepost	Dir.	Type	Avg. Str. No.	80% Str. No.	PCI	IRI	Ave K Value
A	16.26 to 18.03	1	COM	4.54	0.19	58	141	117
B	18.03 to 21.56	1	COM	4.41	2.9	64	123	109

Pavement Design & Pavement Stewardship Recommendation:

The Pavement Stewardship application splits the Benton and Linn County portions into separate projects. The Benton County segment has received a functional overlay recommendation for 2027. Cost/Benefit scores for various treatment types are displayed in the table below.

Segment	Treatment	Year	Score	Recommended
A	HIPRO	2027	100.0	No
A	Functional Overlay	2027	98.7	Yes (2027)
A	HIPRO2	2027	95.0	No
A	Structural Overlay 1	2027	90.1	No
B	HIPRO	2027	86.8	No
B	Thin Surfacing	2027	82.8	No
B	Cold in-place Recycling	2027	76.4	No
B	Functional Overlay	2027	63.3	No
B	Structural Overlay 1	2027	46.9	No

Project:	TBD								
County:	BENTON & LINN								
Road:	US 151								
Location:	US 151 FROM 0.2 MI N OF E66 (NORWAY CURVE) TO FAIRFAX SCL								
Estimate:	511-150								
Est. Location	US 151 FROM 0.2 MI N OF E66 (NORWAY CURVE) TO FAIRFAX SCL							SN5: Benton = 319, Linn = 219	
Date:	6/24/2024								
MP	MP	DIR	TESTED	80% SR	AVG K (psi/in)	Interpolated Res, Mod. (psi)	Overlay Thickness (in.)	PAVEMENT	
16.26	18.03	B	6/21/2023	2.35	118	3216	7.5	1931 PC7, 1952 BAC 1.5 TBB 1.5, 1966 AAC 3.0, 1983 RAC 1.5, 2001 AAC 4.0 MIL 0.5, W 4.0 AAC BAC 3.0 MIL 0.5	
18.03	21.56	B	6/17/2020	3.09	109	3108	5.0	1934 PC7, 1952 BAC 1.5 TBB 1.5, 1966 AAC 3.0, 1983 RAC 1.5, 2001 AAC 4.0 MIL 0.5, W 4.0 AAC BAC 3.0 MIL 0.5	

Pavement Design provided the above pavement determination, with an overlay thickness of 5-7" noted as the structural requirement for a 20-year design. They also indicated that based on the number of resurfacing projects already completed on this segment, and the likelihood that the proposed design would not meet the structural need, that a PCC overlay or inlay could be considered.

Subdrains:

Subdrains were placed with the shoulder and partial pavement reconstruction project in 1995. New subdrains will be placed with the reconstructed pavement.

Patching/Curb Repairs:

Some full depth patching of the PCC pavement is anticipated. An estimated quantity of 500 SY has been assumed for the concept with the final value to be determined during final design. The box culvert west of Walford (MP 17.5) has EF joints in the pavement that should be replaced with the project.

The existing shoulders are in poor condition, especially in the PCC section from Milepost 19.68 to 20.54. It is assumed that a portion of the existing paved shoulders will need to be replaced, which are expected to fail in several locations during construction if traffic off-tracks onto the shoulders due to lane closures.

ADA/Sidewalk/Trails:

There are no pedestrian facilities or trails within the project limits.

A complete street analysis was completed for this project. The cost of additional paved shoulder width would be excessively disproportionate to the need or probable use per Section 2.4 of the Complete Streets Policy.

SAFETY:

Design Criteria:

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

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

Crash Analysis:

Refer to Concept Appendices for ICAT Crash Report.

Corridor Crash History:

There were 56 crashes observed during the five-year analysis period from 2020-2024, including two fatal crashes, two serious injury crashes, and 15 other injury crashes. The most common crash causes included following too closely (8), failing to yield ROW from stop sign (6), and failing to yield ROW making left turn (6).

The most recent fatal crash occurred on 9/8/21 at MP 18.35. The crash was a head-on collision with drug involvement.

The second fatal crash observed during the five-year period was on 3/7/2020 and located at MP 18.60. The crash was also a head-on collision and had alcohol involved.

Refer to Concept Appendices for crash reports for fatal crashes.

Intersection Crash History:

Location - IA 38 Intersection with	Crash Severity					
	Fatal K	Injury			Property Damage Only O	All Crashes
		Serious A	Minor B	Possible C		
US 151/79 ST and 33 AVE	0	0	0	0	1	1
US 151 and FIFTH ST N	0	0	0	0	0	0
US 151 and 79 ST	0	0	0	1	0	1
US 151 and FOURTH ST N	0	0	0	0	0	0
US 151 and THIRD ST N	0	0	0	0	1	1
US 151 and B AVE W	0	0	0	0	0	0
US 151 and SECOND ST N	0	0	0	0	0	0
US 151/AMANA RD and Co Rd W30/LINN BENTON RD/1ST ST N & C AVE W	0	0	1	1	4	6
US 151/AMANA RD and COMMERCIAL DR	0	0	0	2	3	5
US 151 and G STREET/6th	0	0	0	0	2	2
US 151/AMANA RD and Co Rd E70/WRIGHT BROTHER S BLVD & MOYNIHAN RD	0	1	2	5	11	19
US 151/AMANA RD and ST PATRICKS RD	0	0	0	0	0	0
US 151 and SOUTHVIEW ROAD/SOUTHVIEW DRIVE	0	0	0	0	0	0
US 151 and WILLIAMS BLVD	0	1	0	0	5	6
TOTAL	0	2	3	9	27	41

Intersection Analysis:

The intersection of US 151 and Wright Brothers Blvd. meets both the left and right turn-lane warrants using current year traffic for the northbound right and southbound left. The intersection has a

northbound right, but no left turn lane. Consideration should be given to offsetting the northbound right turn. Refer to Appendix D for turn-lane warrants. Linn County has an upcoming project to repair the surface of the railroad crossing. This is considered a repair project only and safety improvements are not being considered. Linn County does list this intersection on their Local Road Safety Plan, and plans to investigate making low cost improvements (signing, markings) over the next year.

PCR Analysis:

Segment Potential for Crash Reduction (PCR) values are negligible for both severe and all-crash categories, except for milepost 18.05 – 18.35, which is categorized as a Medium for severe crashes.

Intersection PCR values are shown in the table below. One intersection registers as a high priority for both severe and all-crash categories – Wright Brothers Blvd. The Commercial Dr. intersection registers as medium priority for all crashes.

Location	Intersection Potential for Crash Reduction (PCR)	
	Intersection Potential for Crash Reduction (PCR)	
	Injury (KAB)	All Crashes
US 151/79 ST and 33 AVE	-0.25	-0.02
US 151 and FIFTH ST N	0.00	-0.19
US 151 and 79 ST	-0.01	-0.16
US 151 and FOURTH ST N	0.00	0.02
US 151 and THIRD ST N	-0.23	-0.38
US 151 and B AVE W	0.00	-0.04
US 151 and SECOND ST N	0.00	-0.04
US 151/AMANA RD and Co Rd W30/LINN BENTON RD/1ST ST N & C AVE W	-0.23	-0.38
US 151/AMANA RD and COMMERCIAL DR	0.01	0.01
US 151 and G STREET	0.02	0.04
US 151/AMANA RD and Co Rd E70/WRIGHT BROTHER S BLVD & MOYNIHAN RD	0.17	2.51
US 151/AMANA RD and ST PATRICKS RD	-0.01	-0.34
US 151 and SOUTHVIEW ROAD/SOUTHVIEW DRIVE	-0.03	-0.48
US 151 and WILLIAMS BLVD	0.00	0.05

Railroads:

Below is a table listing all RR crossing within project limits or 100 feet of project limits. Federal funding necessitates railroad diagnostic review needed for all of these crossings.

MP	Cross Street	FRA	Railroad
17.61	79 St	376751G	CIC
17.82	Third St N	376750A	CIC
18.04	Linn Benton Rd	376749F	CIC
19.32	Wright Bros Blvd	376746K	CIC
20.87	St Patricks Rd	376742H	CIC
21.30	Southview Rd	376741B	CIC
21.45	Williams Blvd	376740U	CIC

Airports:

The project limits are within a 20,000 ft radius of the Eastern Iowa Airport (CID). Refer to IM 4.190 for additional guidance.

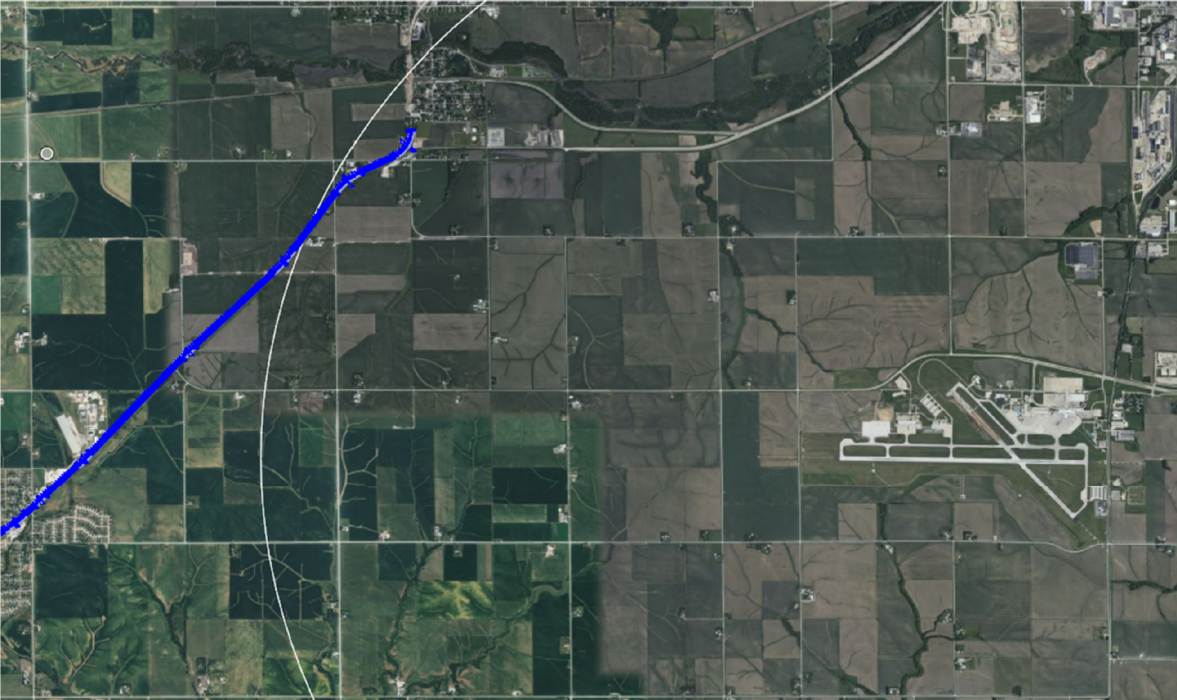


Figure 2: 20,000 ft. radius circle from nearest runway

Additional Safety & Operation Considerations:

This corridor was approved for a Super-2 study from Amana to Fairfax. The results of that study are pending.

A major consideration for any operational concerns is the peak-hour traffic during the AM and PM shift change times at the Whirlpool plant in Middle Amana.

At Wright Brothers Blvd. there is an issue with off-tracking of semis making the northbound right-turn. There is also considerable off-tracking onto the shoulder, causing edge-rut at both Linn-Benton Road in Walford, and at Southview Drive in Fairfax. Consideration should be given to paving the shoulders full width to lessen off-tracking and rutting issues.

A three-lane concept through the corporate limits of Walford has been proposed during prior studies of intersections through town, especially 1st St./C-Ave/W30. Refer to Appendix E for conceptual drawing of intersection improvements.

Blowing and drifting snow issues have been noted at the Norway curve near the beginning of the project and at the Wright Brother Blvd. intersection. A living snow fence project could be requested at the completion of the pavement reconstruction work.

STRUCTURES and DRAINAGE:

Bridges: (from Scoping Tool or SIIMS)

FHWA No.	Maint. No.	Size/Type	Year Built	BDO/Rehab Year	Bridge Rail Height	End Post Type	Vertical Clearance	Future Projects
14521	0617.5S151	Triple 10' x 10' x 84' Reinforced Concrete Box Culvert	1995	NA	NA	NA	NA	

The EF joints at this structure have a rough ride (MP 17.37 and MP 17.41).

Culverts/Pipes:
There are three other large culverts, located at MP 18.10, MP 18.38, and MP 19.02. Issues with the ride were identified at these culverts. Reconstruction of the pavement should address these issues.

Guardrail:
None.

Drainage District:
None Identified.

PROJECT IMPACTS:

Impacts Map:
An Environmental Resource Study Area (ERSA) has been completed with the concept and can be viewed in the [ERSA Experience Builder](#). Location and Environment Bureau to provide a review of any expected impacts.

Environmental:
Clearing and grubbing is not anticipated with this project. Wetlands are not expected to be impacted. Location and Environment to review for impacts to parks and historic/cultural resources.

TSMO/Traffic Control:
Detour possibilities were discussed during the concept review for use during a reconstruction project. I-380 was identified as the best alternative route, with US-30 and the Swisher-Shueyville road being used as part of the detour as well. The Swisher-Shueyville road was noted as possibly having a rough ride.

Whirlpool shift-change times typically experience the highest traffic volumes.

ROW:
Construction of the three-lane section in Walford will be within the existing ROW.

Agreements/Notification Letters:
Benton and Linn Counties could be contacted to gauge interest in paved fillets, although additional RR impacts might be a reason to consider foregoing the offer to add these fillets.

Project Coordination:
I-380 widening and reconstruction from 120th St. to US-30. Presently under construction and ongoing until 2027.

Previous Projects List:

NHSN-151-2(10)--2R-06	Slurry Seal	2015
STPN-151-1(18)--2J-48	HMA Resurfacing	2005
NHS-151-2(3)--19-06	PCC Grade and Replace	1995
FR-151-1(3)--2G-48	HMA Resurfacing	1983
FN-149-2(1)--21-48	HMA Resurfacing	1966
FN-194	HMA Resurfacing + PCC widen to 24 ft.	1961
P-1027	HMA Overlay	1952
NRH-NRM-255	10-7-10 PCC Pavement Linn County	1934
P-435	10-7-10 PCC Pavement Benton County	1931

Future Projects List:
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FEASIBLE ALTERNATIVES & RECOMMENDATION:

Feasible Alternatives:

Two alternatives were studied during the concept phase of this project.

The first alternative is a 2” HMA resurfacing with 2” of milling. This will act as a short-term (7-10 year) pavement repair, which will address the condition and ride for the next few years, allowing time for additional funding to be arranged for safety improvements. The anticipated construction cost of this alternative is \$2,079,000.

The second alternative is pavement replacement, including widening of the pavement to a three-lane section in Walford, and adding turn-lanes at Wright Brothers Blvd. This excludes the segment from MP 19.68 to MP 20.54. This alternative would include the safety improvements now, rather than deferring them. The anticipated cost of this alternative is \$7,600,000 in the 3R category, and \$1,225,000 in the HSIP category.

Detailed cost estimates for each alternative are found in Appendix A of the concept.

Alternatives Not Evaluated:

Two alternatives were discussed but not formally evaluated as part of the concept:

The first included Cold In-place Recycling (CIR) of the existing HMA pavement. While CIR would have been an affective treatment, it would have required multiple inches of overlay, causing additional surface raise, which would be impractical for the curbed segment through Walford.

The second was rubblization of the existing pavement and new HMA added over top (HMA rubblization). There is roughly 11.0” of HMA on top of the PCC, which would need to be removed. Some could be used in the mix and 3.0” could be used as a choke layer, but there would still be quite a bit that would need to be removed off-site. Subdrains would need to be installed a year prior to the rubblization project to help remove the water and provide subgrade support when breaking up the pavement. The original pavement was widened to 24’ and would need to be removed and replaced with macadam stone to help replicate the rubblization on mainline. All of these considerations made this work type less practical than full reconstruction.

Recommendation:

Alternative 2 is recommended as part of this concept. Rather than spend money for a short-term pavement fix, and delay safety improvements, it is recommended that the long-term pavement need and current safety need to addressed with the project.

This project includes reconstruction of the existing pavement including a three-lane section through Walford and turn-lanes at Wright Brothers Blvd.

Funds Programmed:

This project has not been programmed but will be recommended for inclusion in the FY 2027-2031 Highway Program.

It is expected that this project will use two different funding categories. The pavement work will fall within the 3R category and the three-lane widening and turn-lane widening (grade and pave) will use the HSIP category. A cost breakdown into each category is found in Appendix A.

Development Schedule:

Task	Dur.	Start	End
NHSX-151-2(011)--3H-06			
D00 - Pre-Design Concept	136	7/1/2025	11/14/2025
TE0 - Threatened/Endangered Species Review	35	11/14/2025	12/19/2025
U00 - Preliminary Utility Review	35	11/14/2025	12/19/2025
W00 - Preliminary Wetland Review	35	11/14/2025	12/19/2025
D01 - Survey Plan and Photogrammetry (DTM)	126	11/21/2025	3/27/2026
T01 - Existing ROW, Property and Sections Lines in CADD	147	11/21/2025	4/17/2026
D02 - Design Field Exam	182	10/31/2025	5/1/2026
AC5 - Access Control Validation	49	4/17/2026	6/5/2026
H00 - Cultural Resources Assessment	217	10/31/2025	6/5/2026
H06 - SHPO-State Historic Preservation Officer	0	6/5/2026	6/5/2026
RR01 - Initial Railroad Concurrence Review	35	5/1/2026	6/5/2026
A01 - Approval of DOT Commission - Inclusion in 5-Year Program	0	6/9/2026	6/9/2026
NE10 - Signed PCE	231	10/31/2025	6/19/2026
U02 - Project Notification to Utilities	70	5/1/2026	7/10/2026
DM5 - Design Methods Turn-In	0	9/29/2026	9/29/2026
U03 - 1st Plan Submittal to Utilities	93	7/1/2026	10/2/2026
U07 - Utility Bid Attachment	60	9/4/2026	11/3/2026
U10 - Utility clearance	0	11/3/2026	11/3/2026
D08 - Final Grade and Pave Plans	0	11/3/2026	11/3/2026
C02 - Construction Period (Field Work)	302	1/21/2027	11/19/2027
L03 - Letting-Combination Grade and Pave	0	1/20/2027	1/20/2027
D08 - Final Grade and Pave Plans	0	11/3/2026	11/3/2026
L03 - Letting-Combination Grade and Pave	0	1/20/2027	1/20/2027
C02 - Construction Period (Field Work)	302	1/21/2027	11/19/2027

CONCEPT APPENDICES:

[Appendix A: Concept Alternatives Cost Estimates](#)

[Appendix B: Recommended Typical Sections](#)

[Appendix C: Crash History](#)

[Appendix D: Turn Lane Warrants](#)

[Appendix E: Complete Streets Needs Test](#)

Appendix A: Concept Alternatives Cost Estimates

Alternative 1:

NHSX-151-2(011)--3H-06 - Alternative 1 Concept Cost 3R						
#	Item Code	Item Description	Unit	Unit Price	Quantity	Total Cost
1	2121-7425020	GRANULAR SHLD, TYPE B	TON	\$32.74	5542	\$181,445.08
2	2212-5070310	PATCH, FULL-DEPTH REPAIR	SY	\$194.36	500	\$97,180.00
3	2214-5145150	PAV'T, SCARIFICATION, NOM. THICKNESS	SY	\$2.15	90000	\$193,500.00
4	2303-0003380	HMA THIN LIFT SURFACE, 3/8"	TON	\$62.18	9262	\$575,911.16
5	2303-1042500	HMA HT INTERMEDIATE, 1/2"	TON	\$64.55	1371	\$88,498.05
6	2303-1258284	ASPH BINDER, PG 58-28H	TON	\$612.76	82.3	\$50,430.15
7	2303-1264347	ASPH BINDER, PG 64-34E+	TON	\$743.19	555.7	\$412,990.68
8	2502-8212034	SUBDRAIN, LONGITUDINAL, (SHLD) 4"	LF	\$7.78	20,000.00	\$155,600.00
9	2528-8445110	TRAFFIC CONTROL	LS	\$30,000.00	1.00	\$30,000.00
10	2533-4980005	MOBILIZATION	LS	\$102,000.00	1.00	\$102,000.00
11	2599-9999010	MISCELLANEOUS	LS	\$102,000.00	1.00	\$102,000.00
		NHSX-151-2(011)--3H-06 Alt. 2 Sub-total				\$1,989,555.12
		Inflation - (FY 25 to FY 27)				\$89,529.98
		NHSX-151-2(011)--3H-06 Alt. 2 - TOTAL 3R Cost				\$2,079,000.00

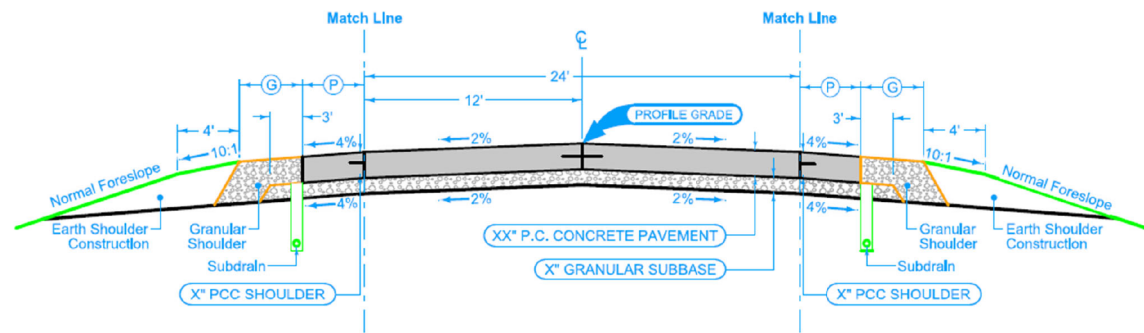
Alternative 2:

NHSX-151-2(011)--3H-06 - Alternative 2 Concept Cost 3R						
#	Item Code	Item Description	Unit	Unit Price	Quantity	Total Cost
1	2102-2713090	EXCAVATION, CL 13, WASTE	CY	\$8.00	9000	\$72,000.00
2	2111-8174100	GRANULAR SUBBASE	SY	\$7.00	105000	\$735,000.00
3	2121-7425010	GRANULAR SHLD, TYPE A	TON	\$20.00	22000	\$440,000.00
4	2122-5190010	PAVED SHLD, PCC, 10"	SY	\$50.00	16000	\$800,000.00
5	2301-1033100	STD/S-F PCC PAV'T, CL C CL 3, 10"	SY	\$65.00	60840	\$3,954,600.00
6	2502-8212034	SUBDRAIN, LONGITUDINAL, (SHLD) 4"	LF	\$6.25	20000	\$125,000.00
7	2510-6745850	RMVL OF PAV'T	SY	\$5.00	86200	\$431,000.00
8	2512-1725256	CURB+GUTTER, PCC, 2.5'	LF	\$42.41	2,000.00	\$84,820.00
9	2528-8445110	TRAFFIC CONTROL	LS	\$45,000.00	1.00	\$45,000.00
10	2529-5070110	PATCH, FULL-DEPTH FINISH, BY AREA	SY	\$180.00	500.00	\$90,000.00
11	2533-4980005	MOBILIZATION	LS	\$200,000.00	1.00	\$200,000.00
12	PCT-010-050	DRAINAGE (010-050)	% of Project	\$0.02	7,387,709.87	\$147,754.20
13	PCT-090-000-04	MISCELLANEOUS (090-000-040)	% of Project	\$0.02	7,387,709.87	\$147,754.20
NHSX-151-2(011)--3H-06 Alt. 2 Sub-total						\$7,272,928.40
Inflation - (FY 25 to FY 27)						\$327,281.78
NHSX-151-2(011)--3H-06 Alt. 2 - TOTAL 3R Cost						\$7,600,000.00

HSIPX-151-2(012)--3L-06 - Alternative 2 Concept Cost HSIP						
#	Item Code	Item Description	Unit	Unit Price	Quantity	Total Cost
1	2102-2625000	EMBANKMENT-IN-PLACE	CY	\$13.41	7500	\$100,575.00
2	2102-2710070	EXCAVATION, CL 10, RDWY+BORROW	CY	\$8.00	2000	\$16,000.00
3	2111-8174100	GRANULAR SUBBASE	SY	\$7.30	11835	\$86,395.50
4	2123-7450000	SHLD CONSTRUCTION, EARTH	STA	\$339.93	32	\$10,877.76
5	2301-1033100	STD/S-F PCC PAV'T, CL C CL 3, 10"	SY	\$70.00	11835	\$828,450.00
6	2528-8445110	TRAFFIC CONTROL	LS	\$20,000.00	1	\$20,000.00
7	2533-4980005	MOBILIZATION	LS	\$55,000.00	1	\$55,000.00
8	2599-9999010	MISCELLANEOUS 5%	LS	\$55,000.00	1.00	\$55,000.00
HSIPX-151-2(012)--3L-06 Alt. 2 Sub-total						\$1,172,298.26
Inflation - (FY 25 to FY 27)						\$52,753.42
HSIPX-151-2(012)--3L-06 Alt. 2 - TOTAL HSIP Cost						\$1,225,000.00

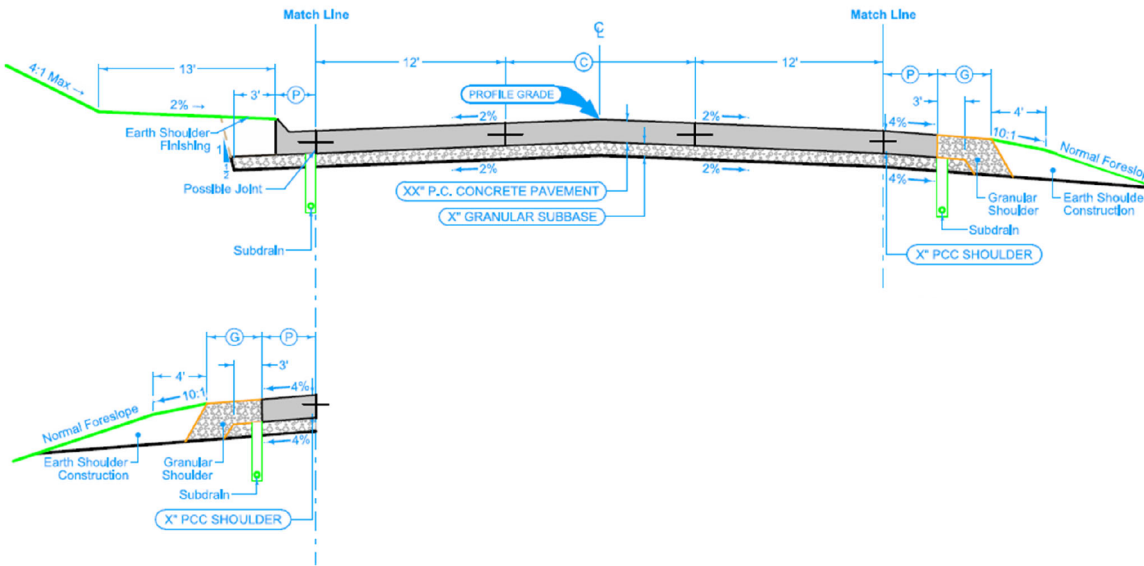
Appendix B: Recommended Typical Sections

Rural Two-Lane Section:



P = 4', G = 6'

Three-Lane Section in Walford:





Iowa Crash Analysis Tool
Quick Report
2020-2024

Major Cause			56
Animal	6	Ran traffic signal	0
Ran stop sign	2	Failed to yield to emergency vehicle	0
FTYROW: At uncontrolled intersection	0	FTYROW: Making right turn on red signal	0
FTYROW: From stop sign	6	FTYROW: From yield sign	0
FTYROW: Making left turn	6	FTYROW: From driveway	0
FTYROW: From parked position	0	FTYROW: To pedestrian	0
FTYROW: Other	0	Drove around RR grade crossing gates	0
Disregarded RR Signal	0	Crossed centerline (undivided)	3
Crossed median (divided)	0	Traveling wrong way or on wrong side of road	1
Aggressive driving/road rage	0	Driving too fast for conditions	2
Exceeded authorized speed	2	Improper or erratic lane changing	0
Operating vehicle in an reckless/erratic/careless manner	0	Followed too close	8
Passing: On wrong side	0	Passing: Where prohibited by signs/markings	0
Passing: With insufficient distance/inadequate passing sight distance	0	Passing: Through/around barrier	0
Passing: Other passing	1	Made improper turn	2
Driver Distraction: Manual operation of an electronic device	0	Driver Distraction: Talking on a hand-held device	0
Driver Distraction: Talking on a hands free device	0	Driver Distraction: Adjusting devices (radio, GPS, etc.)	0
Driver Distraction: Other electronic device use	0	Driver Distraction: Passenger	0
Driver Distraction: Unrestrained animal	0	Driver Distraction: Reaching for object(s)/failing to maintain proper lane position	0
Driver Distraction: Inattentive/lost in thought	2	Driver Distraction: Other interior distractions	2
Driver Distraction: Exterior distraction	0	Ran off road - right	3
Ran off road - straight	0	Ran off road - left	1
Lost control	2	Swerving/Evasive Action	2
Over correcting/over steering	1	Failed to keep in proper lane	1
Failure to signal intentions	0	Traveling on prohibited traffic way	0
Vehicle stopped on railroad tracks	0	Other: Vision obstructed	0
Other: Improper operation	0	Other: Disregarded warning sign	0
Other: Disregarded signs/road markings	0	Other: Illegal off-road driving	0
Downhill runaway	0	Separation of units	0
Towing improperly	0	Cargo/equipment loss or shift	0
Equipment failure	0	Oversized load/vehicle	0
Other: Getting off/out of vehicle	0	Failure to dim lights/have lights on	0
Improper backing	0	Improper starting	0
Illegally parked/unattended	0	Driving less than the posted speed limit	0
Operator inexperience	0	Other	2
Unknown	1	Not reported	0
Other: No improper action	0		

10/21/2025

2 of 7



Iowa Crash Analysis Tool
Quick Report
2020-2024

Time of Day/Day of Week															
	12 AM to 2 AM	2 AM to 4 AM	4 AM to 6 AM	6 AM to 8 AM	8 AM to 10 AM	10 AM to Noon	Noon to 2 PM	2 PM to 4 PM	4 PM to 6 PM	6 PM to 8 PM	8 PM to 10 PM	10 PM to 12 AM	Not reporte d	Total	
Day of Week															
Sunday	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
Monday	0	0	0	3	0	0	1	2	1	2	0	0	0	9	
Tuesday	1	0	0	3	0	1	1	2	2	0	0	0	0	10	
Wednesday	0	0	0	2	1	1	1	4	1	1	0	0	0	11	
Thursday	0	0	1	3	1	0	1	0	3	1	0	1	0	11	
Friday	2	0	0	1	0	0	2	0	2	0	0	0	0	7	
Saturday	3	0	2	0	1	0	0	0	0	0	1	0	0	7	
Total	6	1	3	12	3	2	6	8	9	4	1	1	0	56	

Manner of Crash Collision	56	Surface Conditions	56
Non-collision (single vehicle)	10	Dry	40
Head-on (front to front)	5	Wet	5
Rear-end (front to rear)	15	Ice/frost	1
Angle (oncoming left turn)	7	Snow	2
Broadside (front to side)	7	Slush	1
Sideswipe (same direction)	1	Mud/dirt	0
Sideswipe (opposite direction)	6	Water (standing or moving)	0
Rear to rear	0	Sand	1
Rear to side	0	Oil	0
Not reported	3	Gravel	0
Other	2	Not reported	6
Unknown	0	Other	0
		Unknown	0

Fixed Object Struck			102
Bridge overhead structure	0	Bridge pier or support	0
Bridge/bridge rail parapet	0	Curb/island/raised median	0
Ditch	5	Embankment	0
Ground	1	Culvert/pipe opening	0
Guardrail - face	0	Guardrail - end	0
Concrete traffic barrier (median or right side)	0	Other traffic barrier	0
Cable barrier	0	Impact attenuator/crash cushion	0
Utility pole/light support	2	Traffic sign support	1
Traffic signal support	0	Other post/pole/support	0
Fire hydrant	0	Mailbox	0
Tree	0	Landscape/shrubbery	0
Snow bank	2	Fence	0
Wall	0	Building	0
Other fixed object	0	None (no fixed object struck)	91

10/21/2025

3 of 7



Iowa Crash Analysis Tool
Quick Report
2020-2024

Driver Age/Driver Gender					
Driver Age - 5 year Bins	Female	Male	Not reported	Unknown	Total
< 14	0	0	0	0	0
= 14	0	0	0	0	0
= 15	1	0	0	0	1
= 16	1	3	0	0	4
= 17	0	1	0	0	1
= 18	2	1	0	0	3
= 19	0	1	0	0	1
= 20	0	1	0	0	1
>= 21 and <= 24	4	6	0	0	10
>= 25 and <= 29	2	10	0	0	12
>= 30 and <= 34	5	8	0	0	13
>= 35 and <= 39	1	6	0	0	7
>= 40 and <= 44	7	4	0	0	11
>= 45 and <= 49	2	1	0	0	3
>= 50 and <= 54	2	5	0	0	7
>= 55 and <= 59	1	8	0	0	9
>= 60 and <= 64	2	6	0	0	8
>= 65 and <= 69	2	4	0	0	6
>= 70 and <= 74	1	0	0	0	1
>= 75 and <= 79	0	0	0	0	0
>= 80 and <= 84	0	0	0	0	0
>= 85 and <= 89	0	1	0	0	1
>= 90 and <= 94	0	0	0	0	0
>= 95	0	0	0	0	0
Not reported	0	0	0	0	0
Unknown	0	0	3	0	3
Total	33	66	3	0	102

Drug/Alcohol Related		56
Drug		1
Alcohol (< Statutory)		0
Alcohol (Statutory)		2
Drug and Alcohol (< Statutory)		0
Drug and Alcohol (Statutory)		0
Refused		0
Under Influence of Alcohol/Drugs/Medications		0
None Indicated		53

Alcohol Test Given		102
None		95
Blood		2
Urine		0
Breath		1
Vitreous		1
Refused		0
Not reported		3

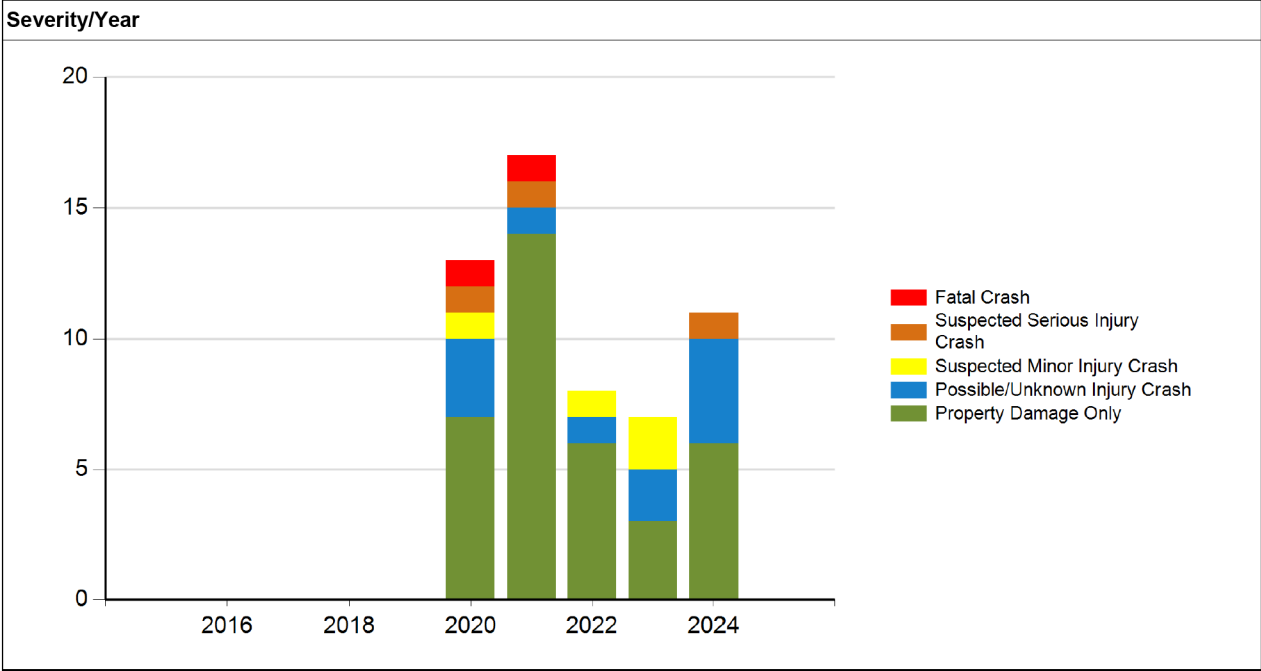
Drug Test Given		102
None		97
Blood		2
Urine		0
Breath		0
Vitreous		0
Refused		0
Not reported		3

Drug Test Result		102
Negative		0
Cannabis		0
Central Nervous System depressants		0
Central Nervous System stimulants		0
Hallucinogens		0
Inhalants		0
Narcotic Analgesics		0
Dissociative Anesthetic (PCP)		0
Prescription Drug		0
Not reported		102
Other		0



Iowa Crash Analysis Tool
Quick Report
2020-2024

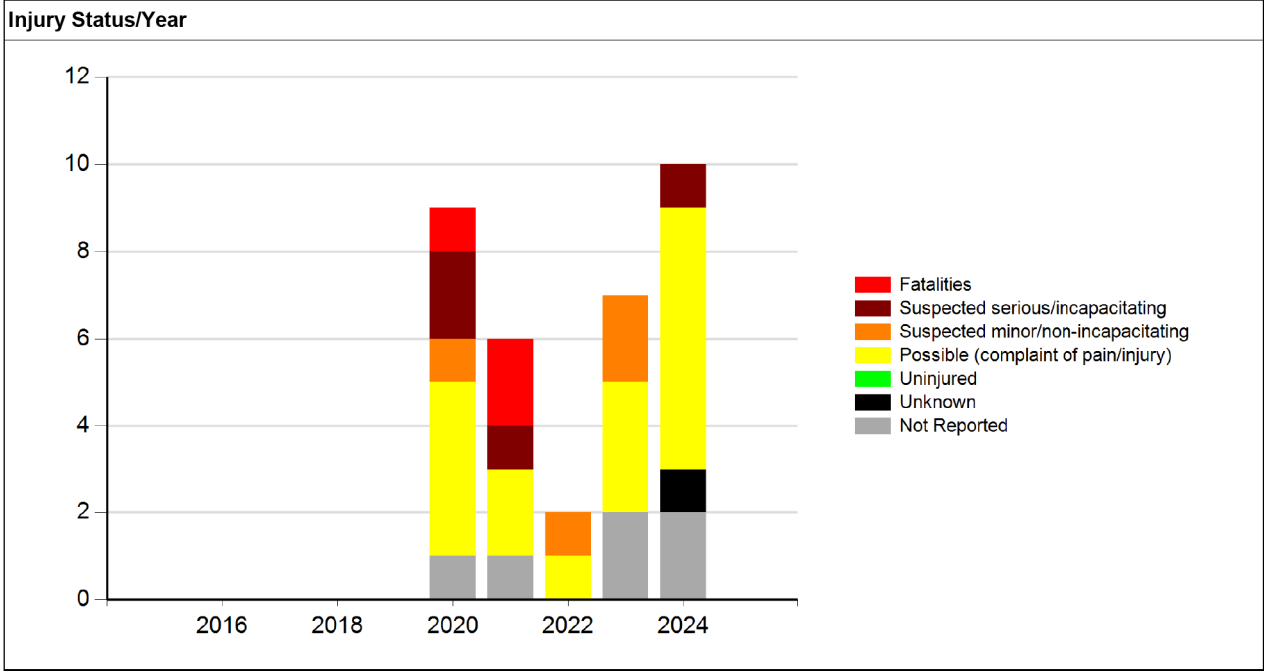
Crash Severity - Annual						
Crash Year	Fatal Crash	Suspected Serious Injury Crash	Suspected Minor Injury Crash	Possible/Unknown Injury Crash	Property Damage Only	Total
2015	0	0	0	0	0	0
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	0	0	0	0	0	0
2019	0	0	0	0	0	0
2020	1	1	1	3	7	13
2021	1	1	0	1	14	17
2022	0	0	1	1	6	8
2023	0	0	2	2	3	7
2024	0	1	0	4	6	11
2025	0	0	0	0	0	0
Total	2	3	4	11	36	56





Iowa Crash Analysis Tool
Quick Report
2020-2024

Injury Status - Annual								
Crash Year	Fatalities	Suspected serious/incapacitating	Suspected minor/non-incapacitating	Possible (complaint of pain/injury)	Uninjured	Unknown	Not Reported	Total
2015	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0
2020	1	2	1	4	0	0	1	9
2021	2	1	0	2	0	0	1	6
2022	0	0	1	1	0	0	0	2
2023	0	0	2	3	0	0	2	7
2024	0	1	0	6	0	1	2	10
2025	0	0	0	0	0	0	0	0
Total	3	4	4	16	0	1	6	34



Iowa Crash Analysis Tool
Quick Report
2020-2024

Meeting the following criteria
Jurisdiction: Statewide Year: 2020, 2021, 2022, 2023, 2024 Map Selection: Yes Filter: None

Analyst Information



Crash Detail Report

2020116659503/07/2020 05:54US 151/AMANA RD

County: LinnCity:

Major Cause: Other

Roadway Type: Feature: Non-junction/no special feature

Severity:: Fatal CrashManner of Crash: Head-on (front to front)

Fatalities: 1Surface Conditions: Dry

Major Injuries: 1Light Conditions: Dawn

Minor Injuries: 0Weather Conditions: Clear

Possible Injuries: 0Drug/Alc Involved: Alcohol (Statutory)

Severity:: Fatal CrashProperty Damage: \$10,500Number of Vehicles: 2

	Unit	Unit	Unit
Init Trav Dir:			
Veh Action:			
Configuration:			
Driver Age:			
Driver Gender:			
Driver Cond:			
Driver Contr 1:			
Driver Contr 2:			
Fixed Object:			

2021126421109/08/2021 12:29US 0151 / AMANA RD and Illinois Central Railroad

County: LinnCity:

Major Cause: Exceeded authorized speed

Roadway Type: Feature: Non-junction/no special feature

Severity:: Fatal CrashManner of Crash: Head-on (front to front)

Fatalities: 2Surface Conditions: Dry

Major Injuries: 0Light Conditions: Daylight

Minor Injuries: 0Weather Conditions: Clear

Possible Injuries: 1Drug/Alc Involved: Drug

Severity:: Fatal CrashProperty Damage: \$7,688Number of Vehicles: 2

	Unit	Unit	Unit
Init Trav Dir:			
Veh Action:			
Configuration:			
Driver Age:			
Driver Gender:			
Driver Cond:			
Driver Contr 1:			
Driver Contr 2:			
Fixed Object:			

May 24, 2024

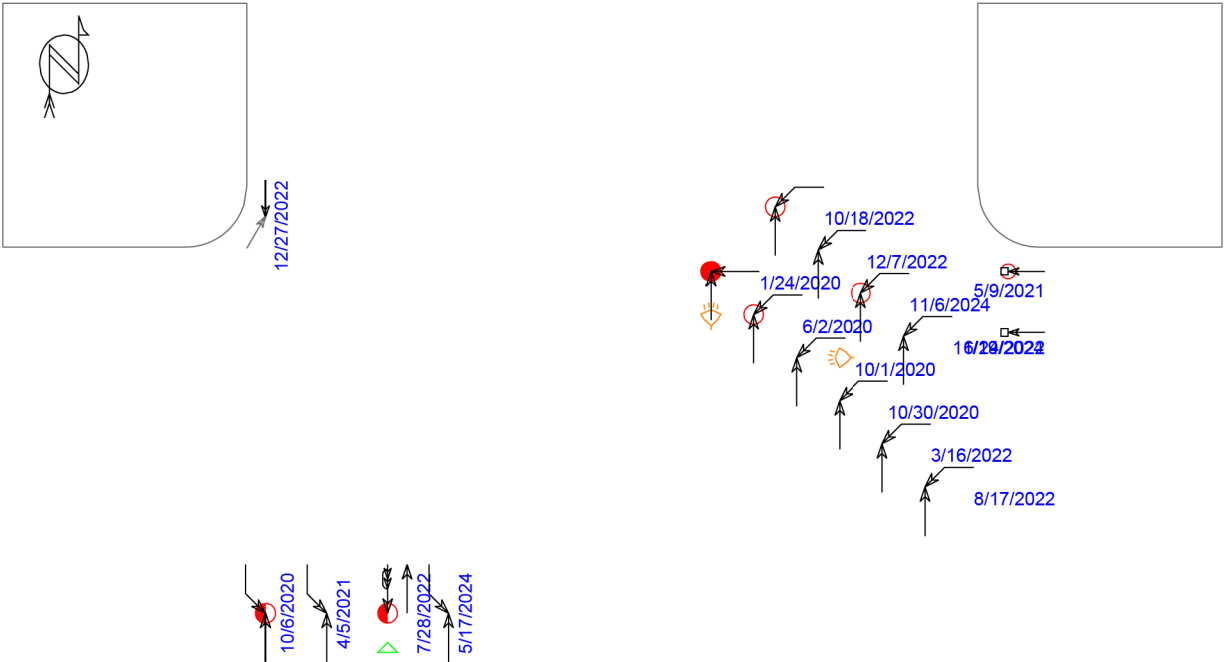
Iowa Crash Analysis Tool

Page 1

Collision Diagram

19 Crashes

Clear



- ← Straight

←+ Stopped

← Unknown

↔ Backing

↔↔ Overtaking

↔↔ Sideswipe
- ▭ Parked

↗ Erratic

↗ Out of control

↗ Right turn

↗ Left turn

↗ U-turn
- ★ Fatal

● Major

○ Minor

○ Injury

× Pedestrian

× Bicycle
- Fixed objects:

□ General

▣ Signal

▣ Tree

▽ DUI

▽ 3rd vehicle

▽ Nighttime

□ Pole

□ Curb

✕ Animal

Crash Magic Online 6/27/2025

Crash Magic Online

[illegible]

Exposure Index Factors

Right Turns

Factors:

A = Approach Volume
 B = Turning Volume
 A - B = Thru Volume

Left Turns

Factors:

A = Approach Volume
 B = Turning Volume
 A - B = Thru Volume

Thru Volume* (A - B)	Turning Volume* (B)	Warrant Level
2173	1124	Minor Right Turn Warranted
3097	199	Left Turn or Major Right Turn Warranted

****At gravel road intersections, use minor right turn.**

COMPLETE STREETS RURAL NEEDS TEST CHECKLIST

PROJECT/PIN NUMBER/FOLDER: NHSX-151-2(011)--3H-06, HSIPX-151-2(012)--3L-06/26-06-151-010/0615101026										
ROUTE	DISTRICT	COUNTY	LOCATION	BICYCLE COMPATIBILITY RATING (BCR) ¹	PROJECT WORK	PROJECT LENGTH	PROJECT COST	POTENTIAL ACCOMMODATION TYPE	ESTIMATED ADDITIONAL COST ²	ADDITIONAL COST PERCENTAGE
US 151	6	Benton/Linn	From north of E66 Fairfax (MP 16.25 to MP 21.45)	Moderate	Pave, 4-foot paved shoulders	5.2 miles	\$8,825,000	Additional 2-foot paved shoulders	\$1,200,000	15%

COST EXCEPTION NEEDS TEST					
The following need tests may be electively performed to attempt to achieve a lower cost exception threshold for a project. If these tests are not performed, the cost exception threshold defaults to twenty percent.				TEST PASSES	COMMENTS
1	A BIKEWAY ALONG THE PROJECT IS INCLUDED IN A BICYCLE OR PEDESTRIAN PLAN		CITY ☐ COUNTY ☐ REGIONAL ☐ STATE ☒	YES ☒ NO ☐	A bikeway along the project is included in a bicycle or pedestrian plan.
2	THE PROJECT CREATES A CONNECTION BETWEEN TWO OR MORE EXISTING, PROGRAMMED, OR PLANNED BIKEWAYS OR TRAILS (unless a more desirable route or trail exists nearby within 1 to 2 miles)		YES ☐ NO ☒	YES ☐ NO ☒	The project does not create a connection between two or more existing, programmed, or planned bikeways or trails.
3	THE PROJECT IS NEAR A CITY (within 1 mile of corporate limits for cities < 5,000 pop., within 2 miles of corporate limits for cities 5,000 to 15,000 pop., and within 3 miles of corporate limits for cities > 15,000 pop.)		YES ☒ NO ☐	YES ☒ NO ☐	The project goes through Waldorf. (1,366 – 2020 population)9225
4	THERE ARE EMPLOYMENT CENTERS, PARKS, SCHOOLS, RESIDENTIAL AREAS, OR OTHER DESTINATIONS WITHIN 0.5 MILES OF THE PROJECT		YES ☒ NO ☐	YES ☒ NO ☐	There are businesses, parks, schools, residential areas, or other destinations within 0.5 miles of the project.
5	THE PROJECT IS PART OF AN OFFICIAL OR RECOGNIZED BIKE ROUTE USED REGULARLY BY A GROUP OF BICYCLISTS, OR THERE IS PROBABILITY THAT 25 OR MORE BICYCLISTS PER DAY ³		BIKE ROUTE ☐ BICYCLISTS ☒	YES ☒ NO ☐	Probability of 39 bicyclists (7,800*0.5%) 2026 AADT
] COST EXCEPTION THRESHOLD			TESTS PASSED	4 OUT OF 5	

Current Condition
Bicycle Compatibility
Rating

Need Tests Passed (See below)				
	3 or more	2 out of 5	1 out of 5	0 out of 5
Poor	20%*	15%	10%	0%
Moderate	15%	10%	5%	0%
Good	10%	5%	3%	0%

*The percentage of a project’s budget may exceed 20% if high bicycle and/or pedestrian demand exists.

SUMMARY

- Bicycle Compatibility Rating ¹: Moderate
- 4 out 5 needs tests were passed.
- Resulting cost exception threshold is 15%.
- Additional bicycle accommodations (paved shoulders) represent an estimated 15% of the total cost of the project.
- For additional Complete Streets Policy Exceptions, check Chapter 6, Section 2.2 of the Iowa Bicycle and Pedestrian Long-Range Plan.

RECOMMENDATION:

- The cost of additional paved shoulder width would be excessively disproportionate to the need or probable use per Section 2.4 of the Complete Streets Policy.
- Needs Test requested by Mark Harley on 1/30/2026
- Needs Test done by Milly Ortiz, 01/30/2026, milly.ortiz@iowadot.us, 515-233-7733.

1. Bicycle Compatibility Rating (BCR) considers average daily traffic volume, roadway width, percent yellow center line, and percent truck traffic. Based on these factors, roadway segments are rated “good,” “moderate,” or “poor.”
2. The Estimated Additional Cost provided by District 6.
3. American Community Survey (ACS) 2017-2021 Mode Share (Journey to Work) reported 0.5% bicycling to work trips.

Full Depth PCC Combination Shoulder

Shoulder Jointing:
Longitudinal joint: BT-2, or L-2
Transverse joints: C at 17' spacing

2_C_FullPCC_04-15-25			
STATION TO STATION		(P) Feet	(G) Feet
406+23.16	467+00.00	4	6
506+40.00	507+29.09	4	0
507+29.09	561+00.00	4	6
583+27.31	681+76.63	4	6

Curbed Shoulder

Shoulder Jointing:
Longitudinal joint not required when distance from back of curb to nearest joint is less than 15':

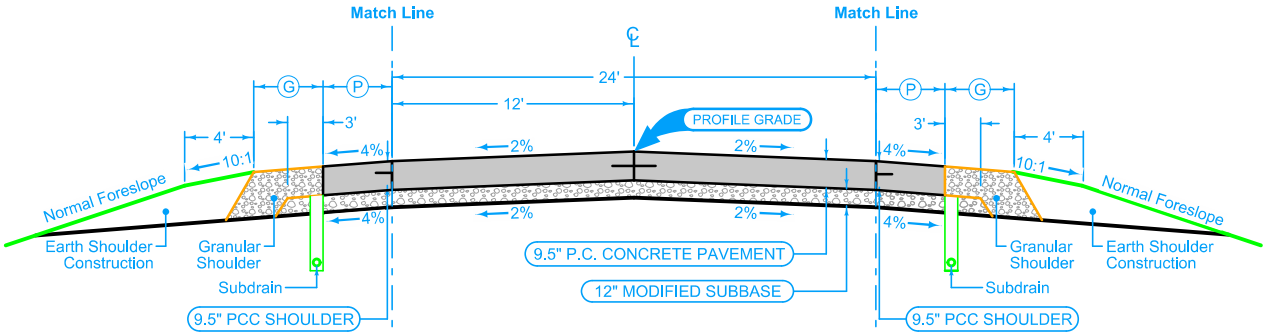
Single pour: L-2
Staged : BT-2
Transverse: C at 17' spacing

2_Curb_Modified			
STATION TO STATION		(P) Feet	Curb Type See PV-102
681+76.63	682+22.00	4	6" Sloped

Full Depth PCC Combination Shoulder

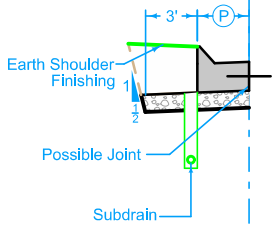
Shoulder Jointing:
Longitudinal joint: BT-2, or L-2
Transverse joints: C at 17' spacing

2_C_FullPCC_04-15-25			
STATION TO STATION		(P) Feet	(G) Feet
406+23.16	467+00.00	4	6
506+40.00	561+00.00	4	6
583+27.31	682+22.00	4	6



Mainline Jointing:
Transverse joints: CD at 17' spacing
Longitudinal joint: L-2

2P_04-21-20			
STATION TO STATION			
406+23.16	467+00.00		
506+40.00	561+00.00		
583+27.31	682+22.00		



Full Depth PCC Combination Shoulder

Shoulder Jointing:
Longitudinal joint: BT-2, or L-2
Transverse joints: C at 17' spacing

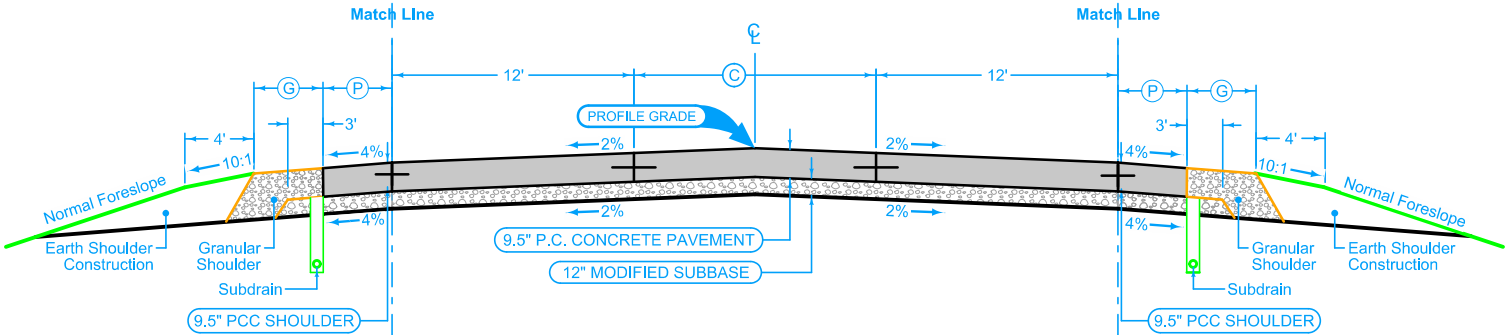
2_C_FullPCC_04-15-25			
STATION TO STATION		(P) Feet	(G) Feet
467+00.00	469+40.00	4	6 - 2
469+40.00	485+62.23	4	2
497+66.08	504+60.07	4	2
504+60.07	505+37.10	4	2 - 3.71
505+37.10	506+40.00	4	0

Curbed Shoulder

Shoulder Jointing:
Longitudinal joint not required when distance from back of curb to nearest joint is less than 15':

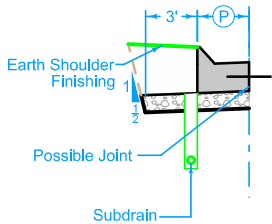
Single pour: L-2
Staged : BT-2
Transverse: C at 17' spacing

2_Curb_Modified			
STATION TO STATION		(P) Feet	Curb Type See PV-102
486+22.63	497+66.08	2.5	6" Sloped



Mainline Jointing:
Transverse joints: CD at 17' spacing
Longitudinal joint: L-2

2P_TWLTL_04-21-20			
STATION TO STATION			(C) Feet
467+00.00	471+20.00		0 - 14
471+20.00	503+25.00		14
503+25.00	506+40.00		14 - 0



Full Depth PCC Combination Shoulder

Shoulder Jointing:
Longitudinal joint: BT-2, or L-2
Transverse joints: C at 17' spacing

2_C_FullPCC_04-15-25			
STATION TO STATION		(P) Feet	(G) Feet
467+00.00	469+40.00	4	6 - 2
469+40.00	504+60.07	4	2
504+60.07	506+40.00	4	2 - 6

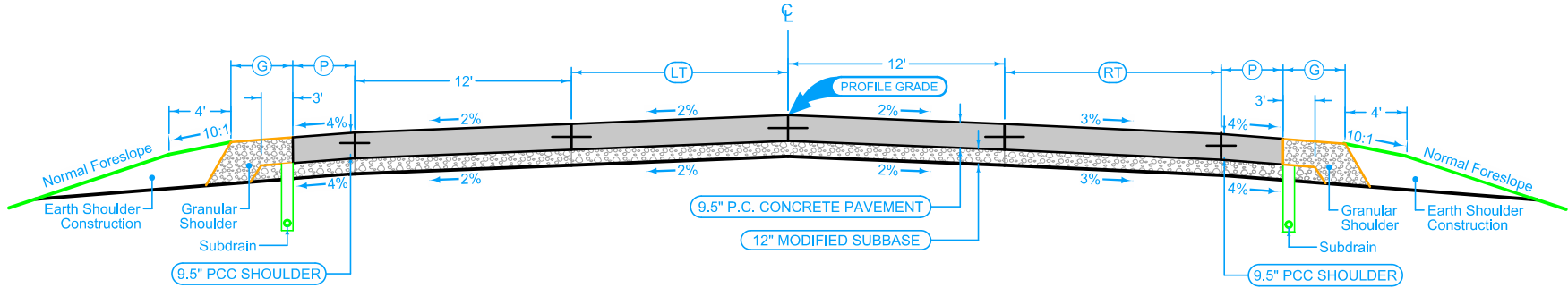
See Tab 100-24 or 100-25 for pavement quantities.
See Tab 112-9 for shoulder quantities.

US 151

Full Depth PCC Combination Shoulder

Shoulder Jointing:
Longitudinal joint: BT-2, or L-2
Transverse joints: C at 17' spacing

2_C_FullPCC_ 04-15-25			
STATION TO STATION		(P) Feet	(G) Feet
561+00.00	563+40.00	4	6 - 2
563+40.00	580+87.33	4	2
580+87.33	583+27.31	4	2 - 6



Mainline Jointing:
Transverse joints: CD at 17' spacing
Longitudinal joint: L-2

2P_ Modified			
STATION TO STATION		(LT) Feet	(RT) Feet
561+00.00	561+92.05	0 - 1.53	0
561+92.05	564+32.05	1.53 - 5.53	0 - 12
564+32.05	568+09.72	5.53 - 11.83	12
568+09.72	568+20.00	11.83 - 12	0
568+20.00	576+07.31	12	0
576+07.31	583+27.31	12 - 0	0

Full Depth PCC Combination Shoulder

Shoulder Jointing:
Longitudinal joint: BT-2, or L-2
Transverse joints: C at 17' spacing

2_C_FullPCC_ 04-15-25			
STATION TO STATION		(P) Feet	(G) Feet
561+00.00	583+27.31	4	6

See Tab 100-24 or 100-25 for pavement quantities.
See Tab 112-9 for shoulder quantities.

US 151

	Interstate Highway Symbol
	U.S. Highway Symbol
	Iowa Highway Symbol
	County Road Highway Symbol
	Evergreen Tree
	Deciduous Tree
	Fruit Tree
	Shrub (Bushes)
	Timber
	Hedge
	Stump
	Swamp
	Rock Outcrop
	Broken Concrete
	Revetment (Rip Rap)
	Cemetery
	Grave
	Cave
	Sink Hole
	Board Fence
	Chain Link or Security Fence
	Wire Fence
	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)

	Septic Tank
	Cistern
	L.P. Gas Tank (No Footing)
	Underground Storage Tank
	Latrine
	Satellite TV Dish
	WHU Water Hook Up
	RT Radio Tower
	TA Tower Anchor
	Guardrail (Beam or Cable)
	GP Guard Post (one or two)
	Guard Post (over two)
	FP Filler Pipe
	GV Gas Valve
	WV Water Valve
	SL Speed Limit Sign
	MM Mile Marker Post
	SIGN Sign
	TCB Traffic Signal Control Box
	RRB Rail Road Signal Control Box
	TSB Telephone Switch Box
	EB Electric Box

E1 — Alliant Energy Electric Distribution
Breanna Vandemark, Manager Real Estate & ROW
200 1st Street SE Cedar Rapids, IA, 52401
ph: 319-786-5941
BreannaVandemark@alliantenergy.com

FO — Aureon Network Services Fiber Distribution
Jeff Klocko, OSP Engineer
7760 Office Plaza Drive South West Des Moines, IA, 50266
ph: 5158300445
jeff.klocko@aureon.com

SAN — FAIRFAX, City of Sanitary Sewer
SAN.(B) — FAIRFAX, City of Water
Cynthia Stimson, City Clerk
ST S — 525 Vanderbilt Street Fairfax, IA, 52228-0337
W — ph: 5198462204
cstimson@cityoffairfax.org

TI — MCI/Verizon Business Fiber Transmission
Thanh (TK) Nguyen, Outside Plant Engineer
2600 Westown Pkwy STE 100 West Des Moines, IA, 50266
ph: 5157837177 cell: 5157837177
thanh.nguyen3@verizon.com

FO — Mediacom Communications Corporation Fiber Distribution
Brent Fox, Construction Tech 1
3033 Asbury Rd Dubuque, IA, 52001
ph: (563) 557-8020 cell: (563) 213-0247
bfox@mediacomcc.com

F03 — MidAmerican Energy Company Fiber Distribution
G2 — MidAmerican Energy Company Gas Distribution
Adam Fritz, Electric Distribution Engineer
3003 S. 11th St., Council Bluffs, IA, 51501
ph: 712-366-5627 cell: 712-310-1575
Adam.Fritz@MidAmerican.com

F05 — South Slope Cooperative Communications Fiber Distribution
Brian Hamacher, Director of Operations
980 N Front St North Liberty, IA, 52317
ph: 3196655440 cell: 7128302843
brian.hamacher@southslope.com

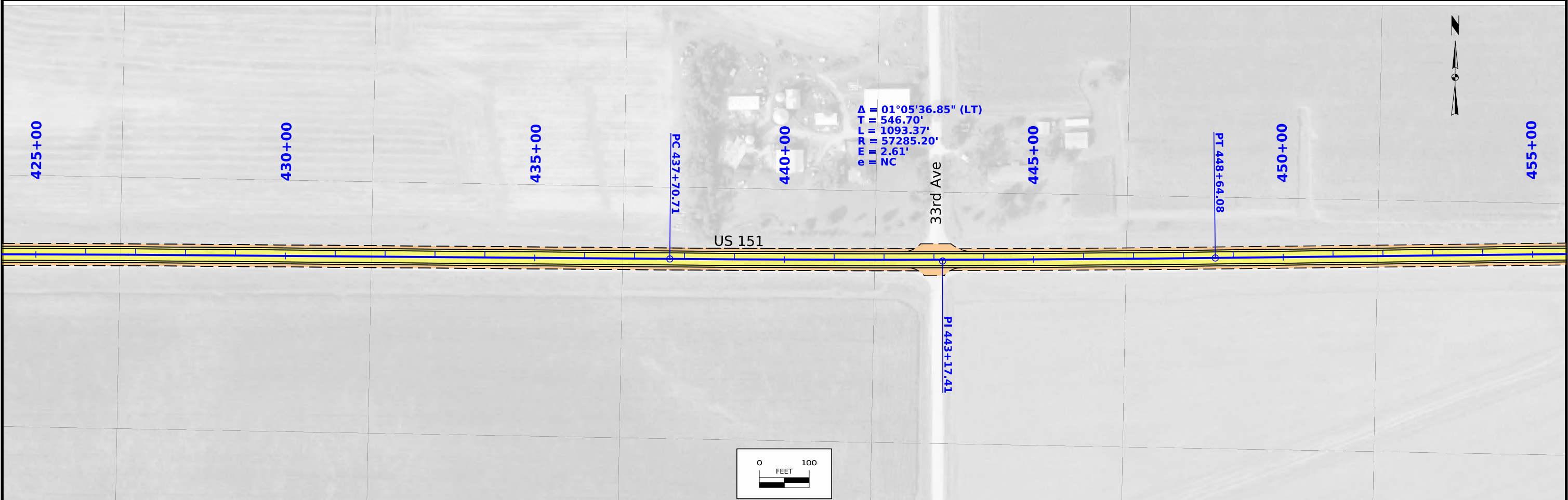
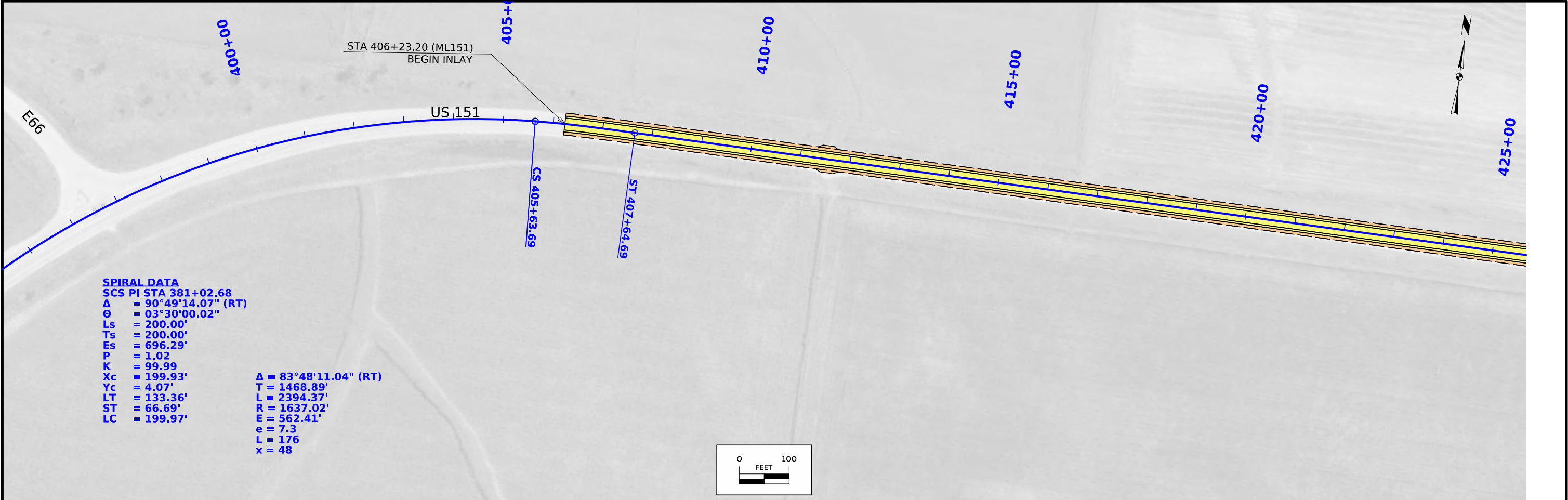
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Blue	(1)		Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation	
Magenta	(5)		Existing Utilities	
SHADING		Design Color No.		Transparency
Pink, Dark	(13)		Temporary Pavement Shading	50%
Yellow	(4)		Proposed Pavement Shading	50%
Orange	(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%

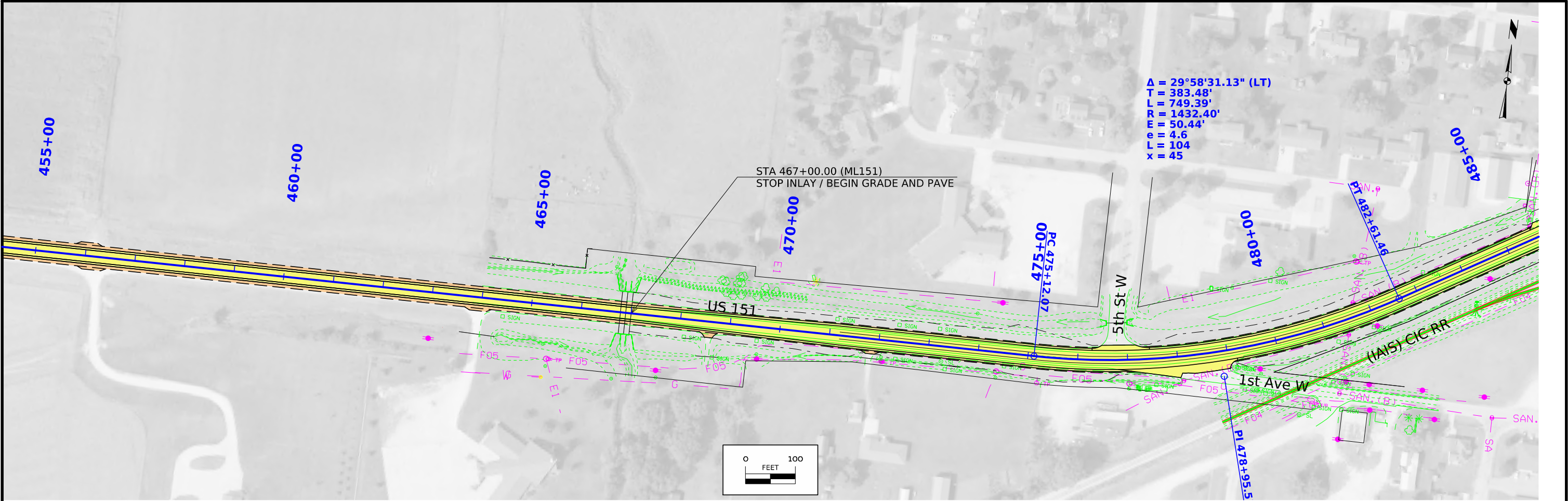
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Blue	(1)	Proposed Profile and Annotation
Magenta	(5)	Existing Utilities
Blue, Light	(230)	Proposed Ditch Grades, Left
Black	(0)	Proposed Ditch Grades, Median
Rust	(14)	Proposed Ditch Grades, Right

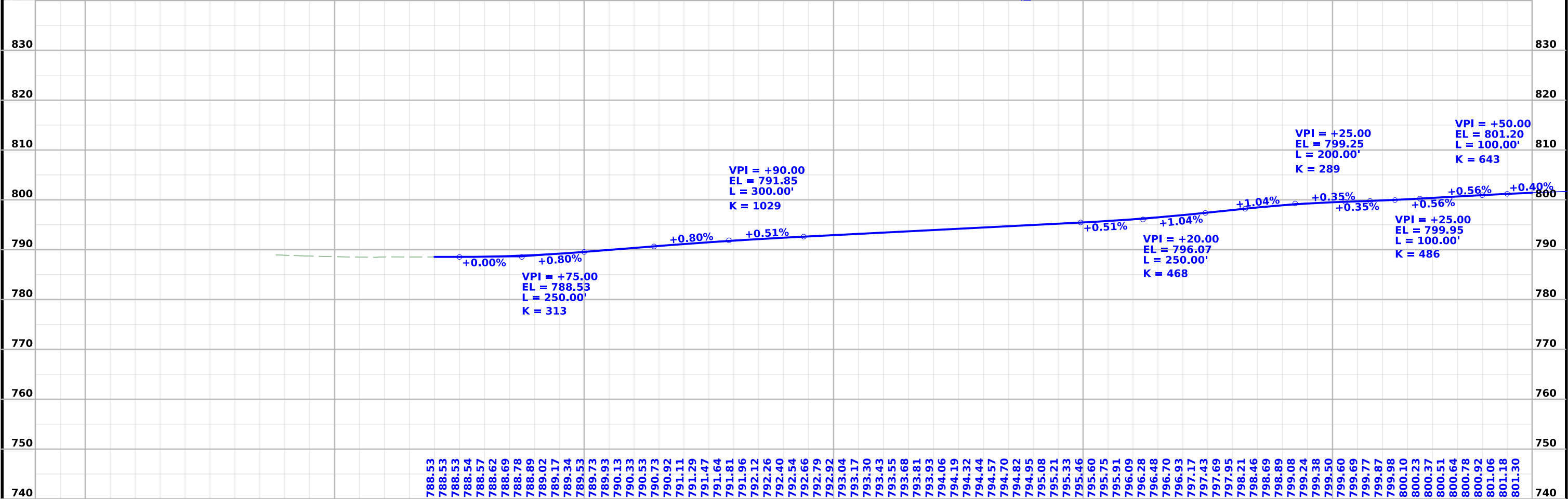
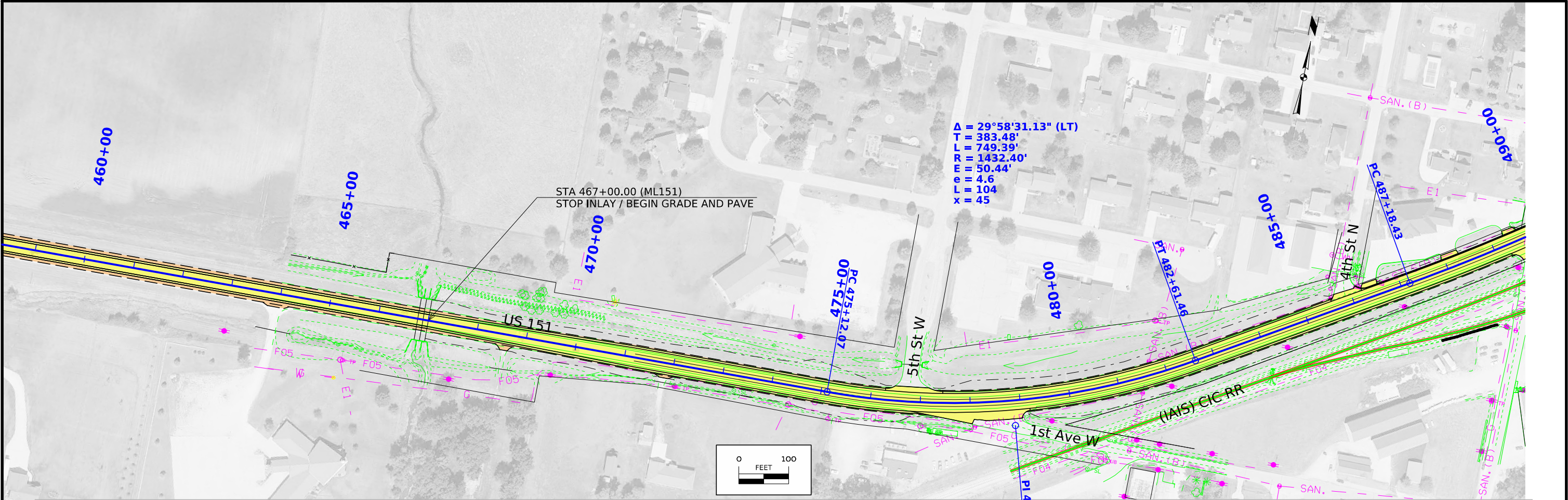
RIGHT-OF-WAY LEGEND

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

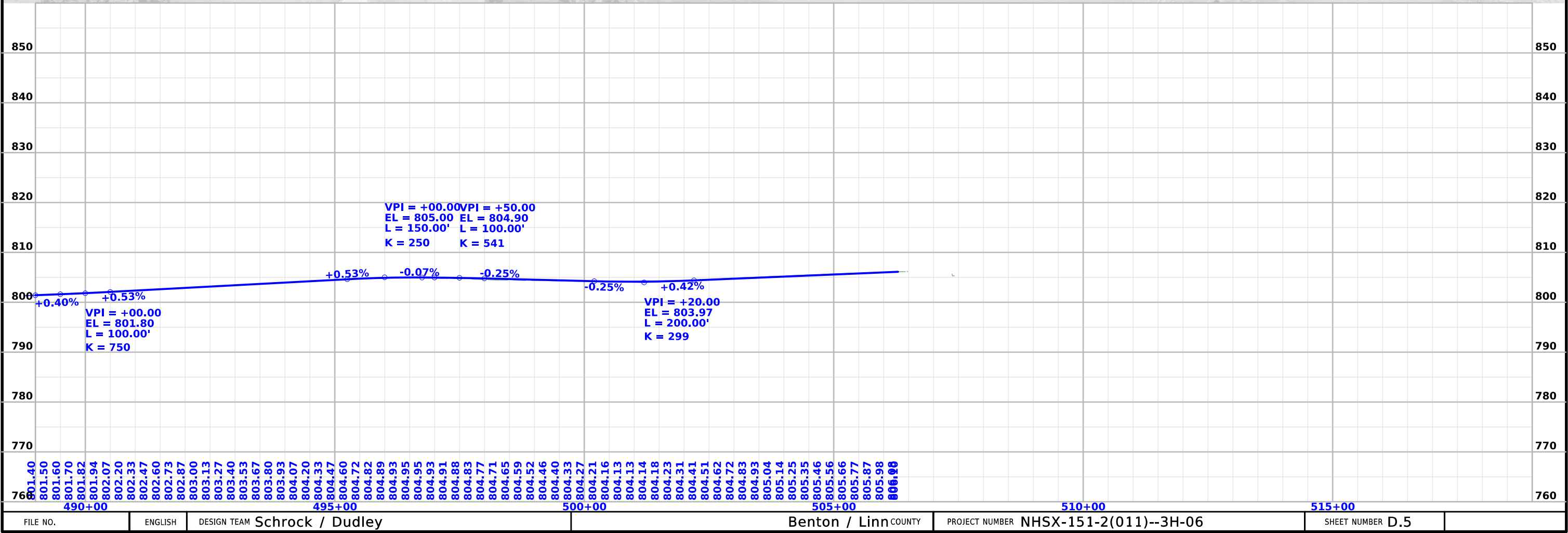
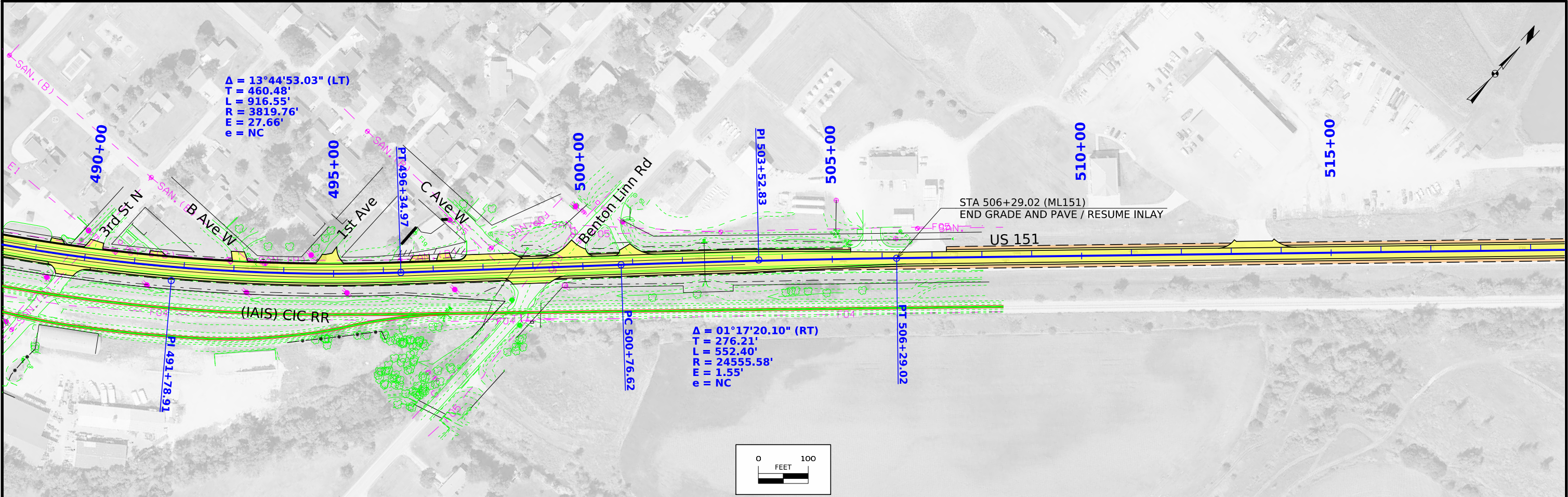
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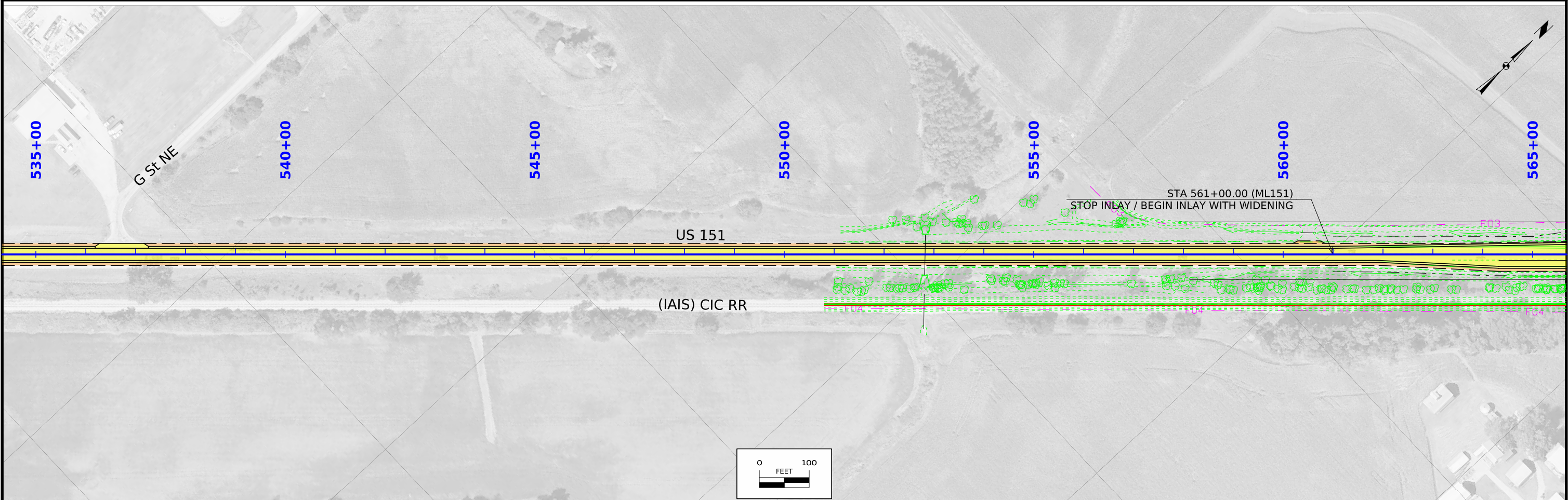
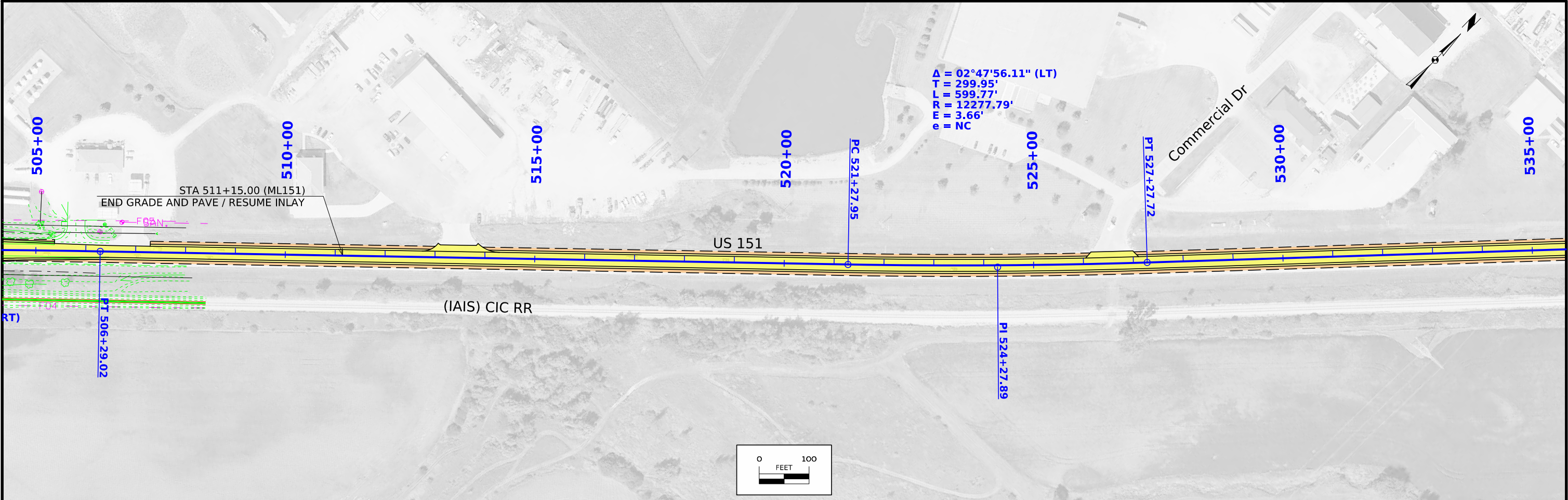


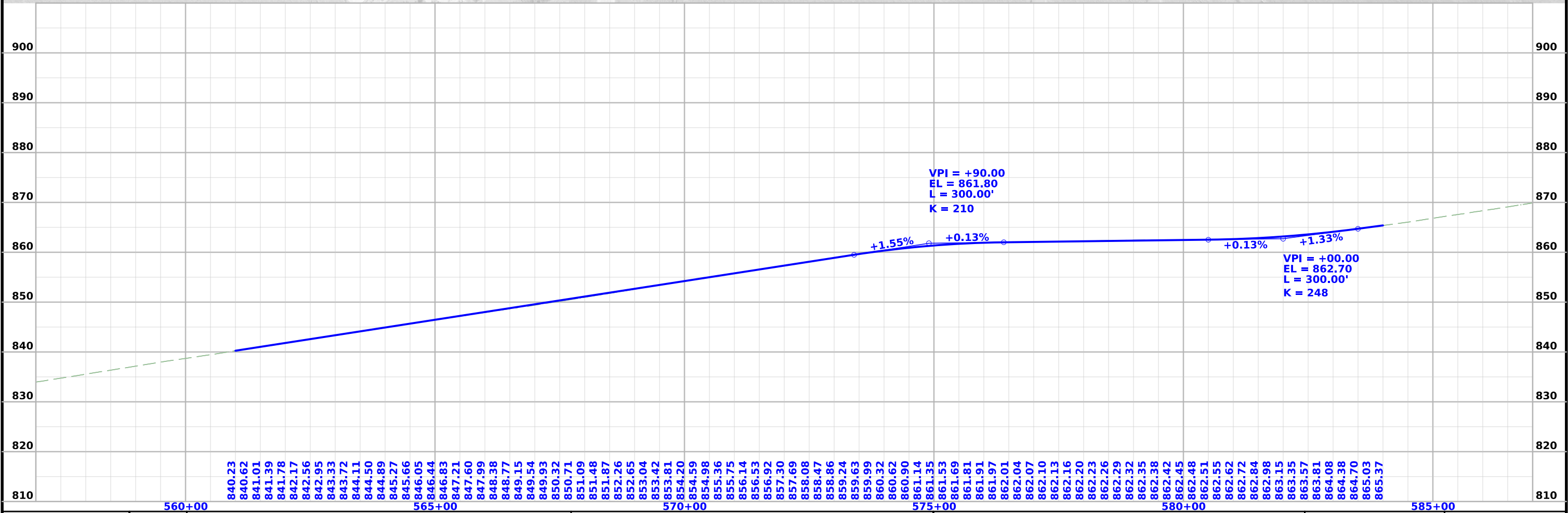
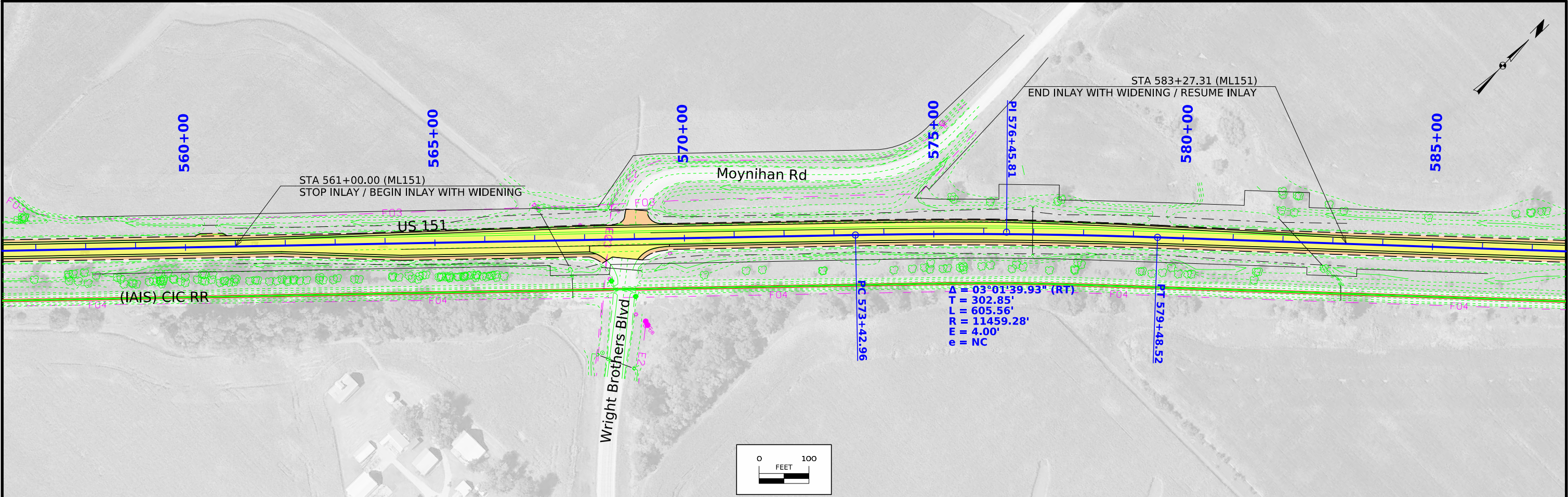


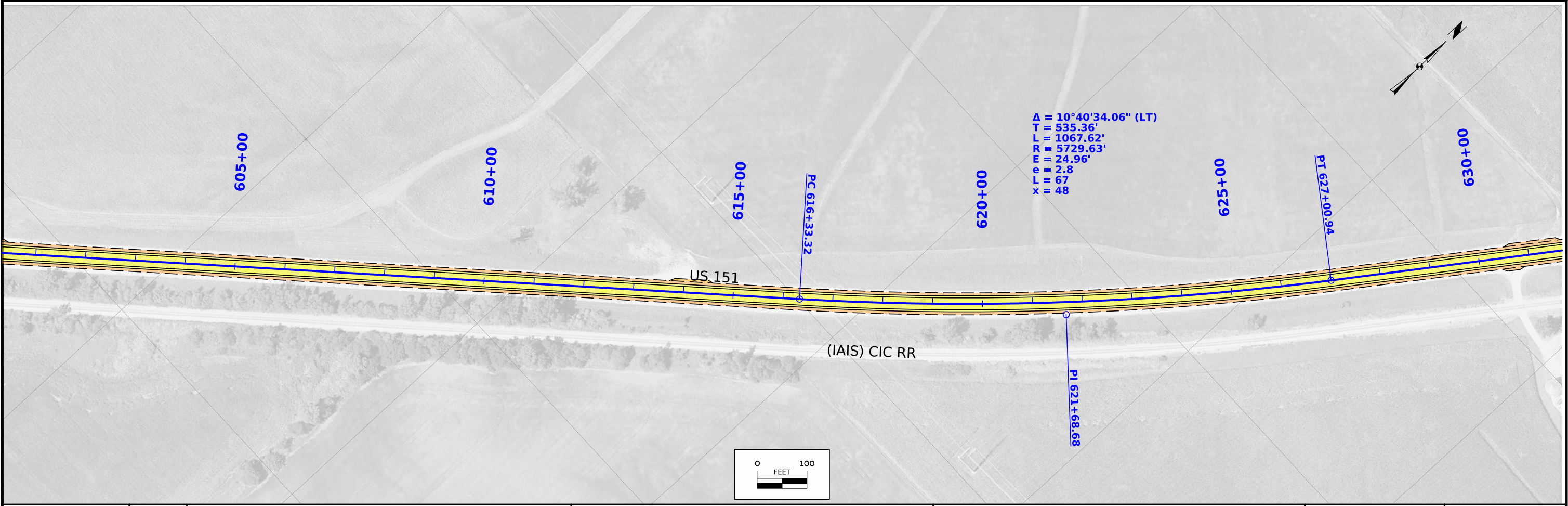
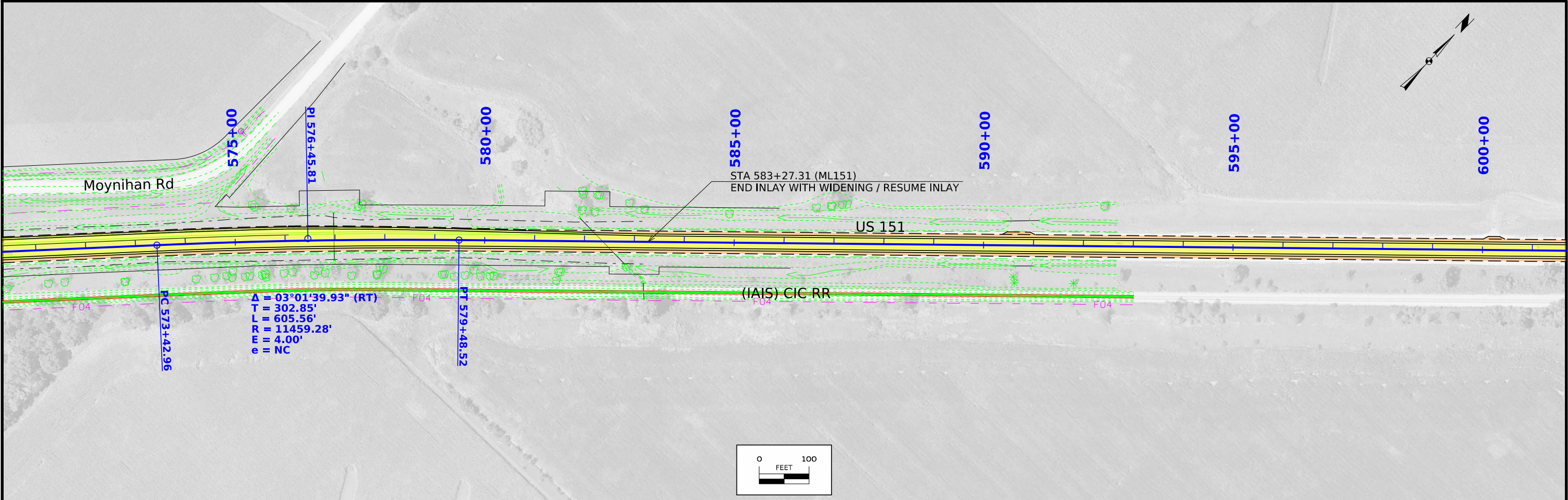


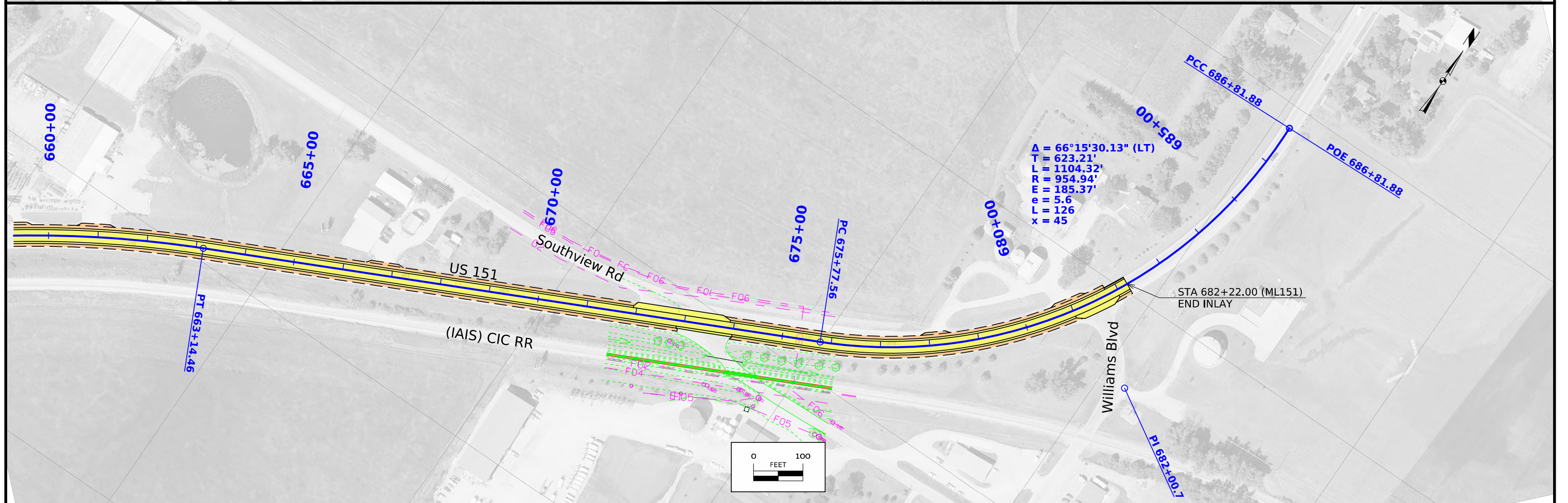
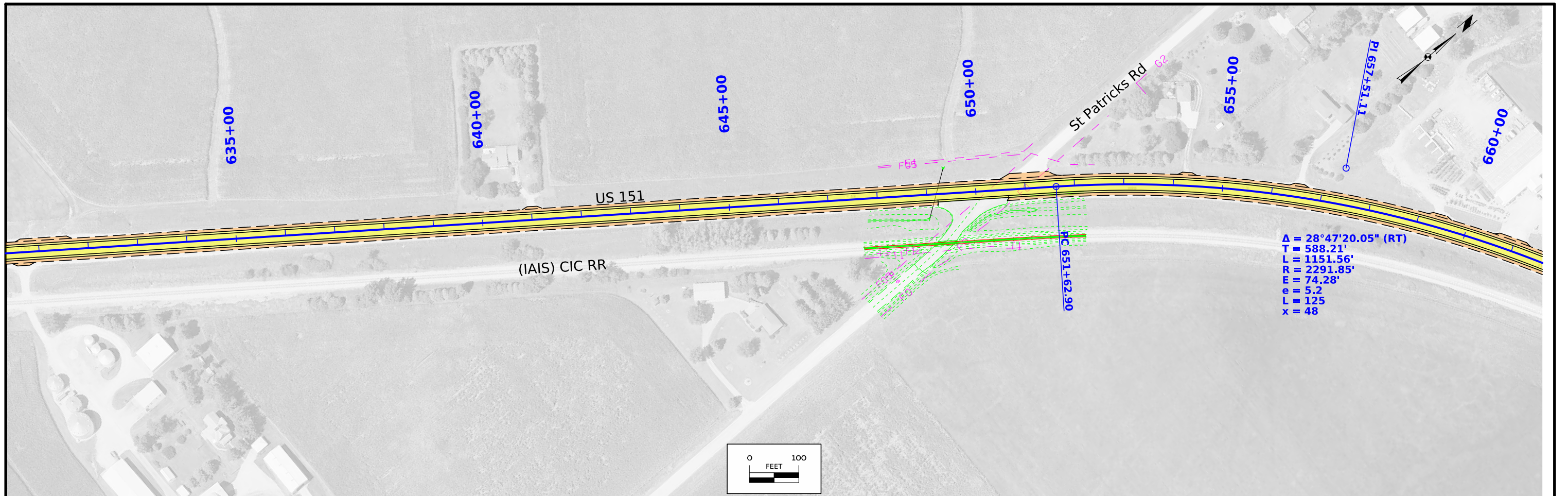
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CROSS SECTION VIEW COLOR LEGEND			
Design Color No.	Feature	Design Color No.	Feature
Aggregate		Grading	
(64)	Choke Stone	(8)	Behind Curb Cut
(42)	Engineering Fabric	(6)	Granular
(8)	Flooded Backfill	(13)	Granular Back Fill
(92)	Macadam Stone	(48)	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

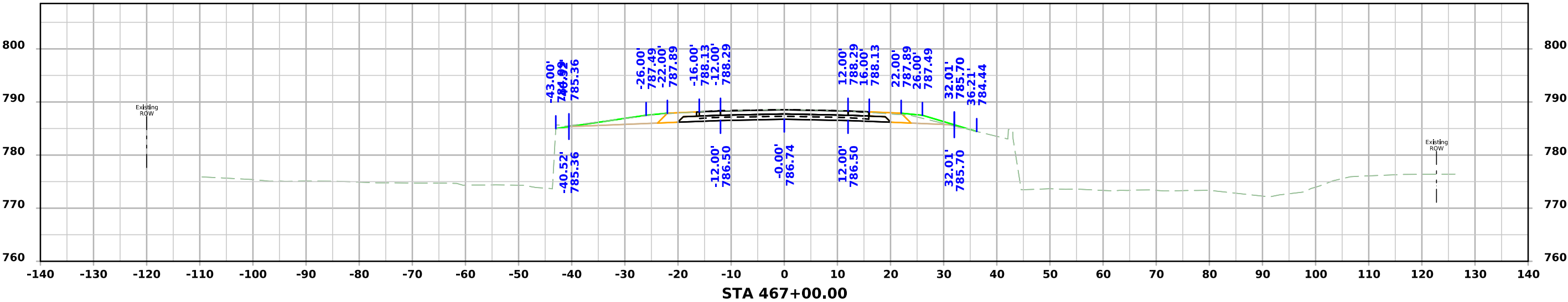
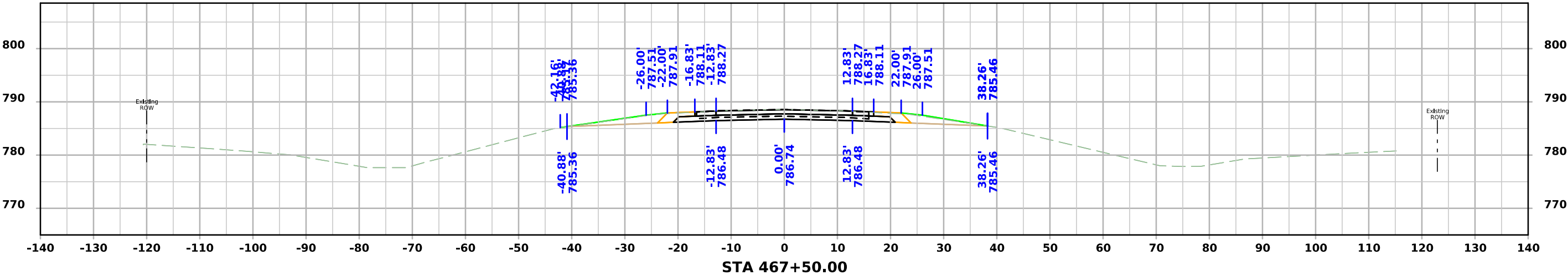
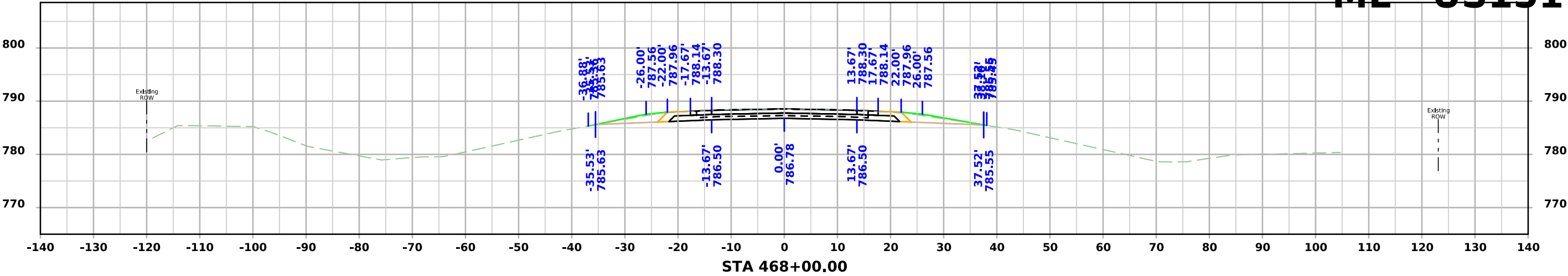
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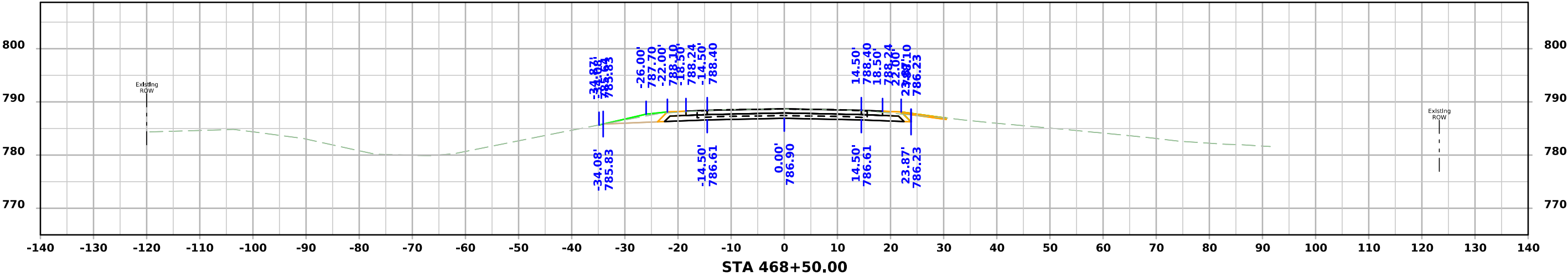
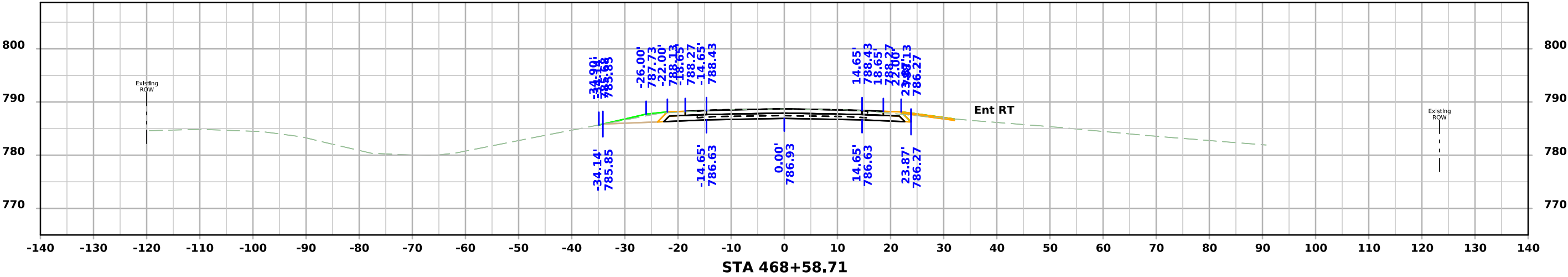
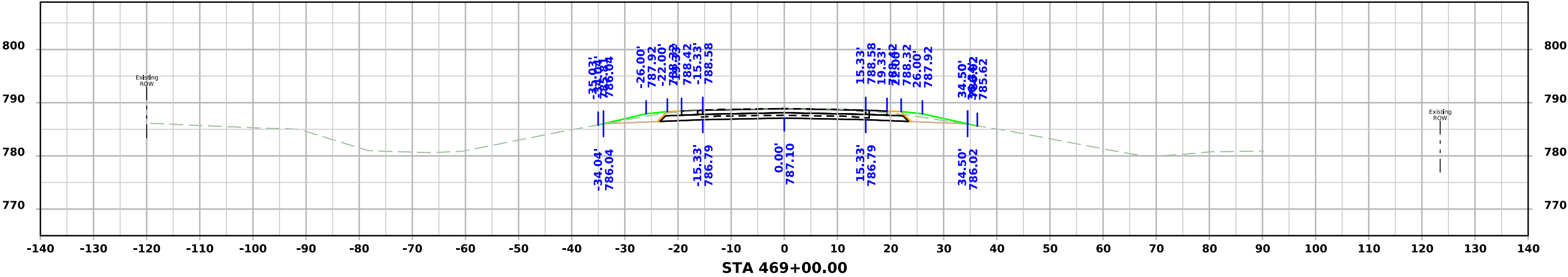
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LEGEND AND INFORMATION SHEET

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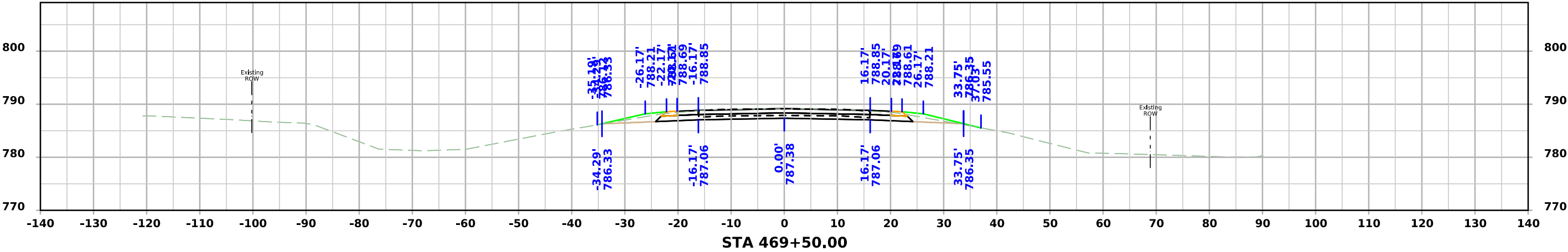
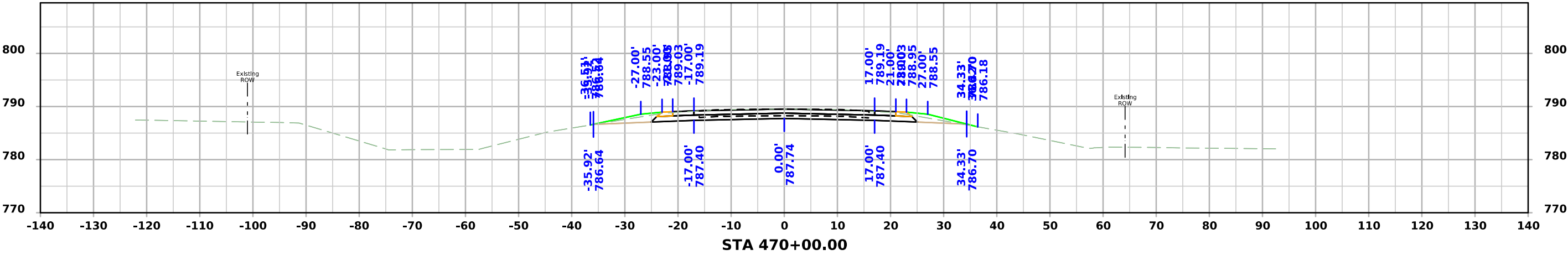
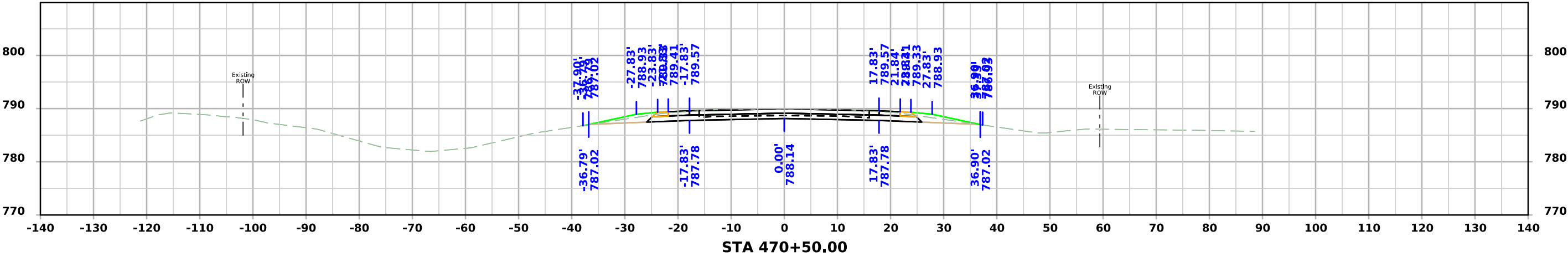
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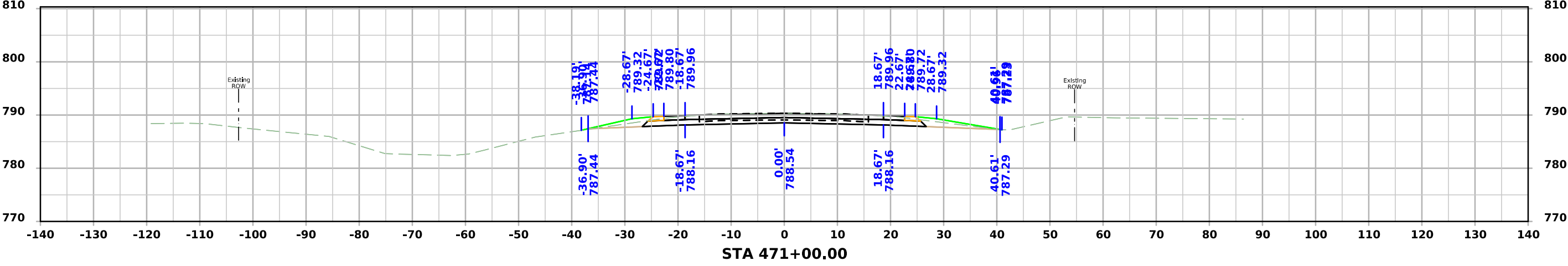
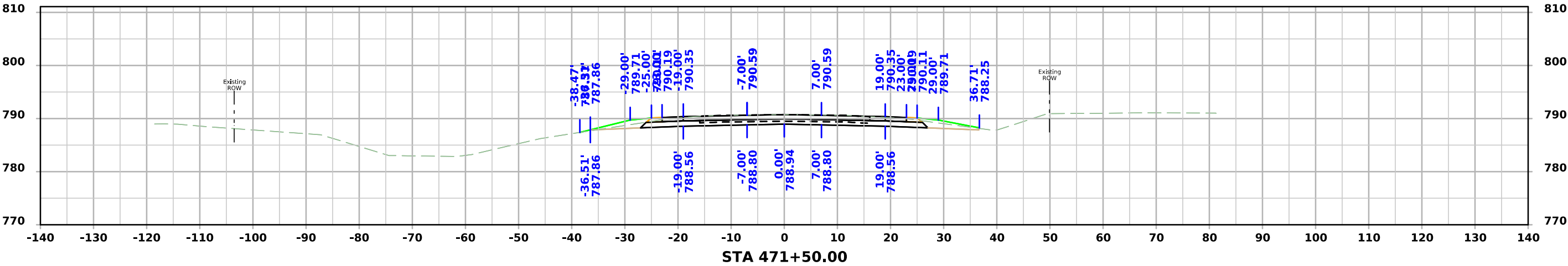
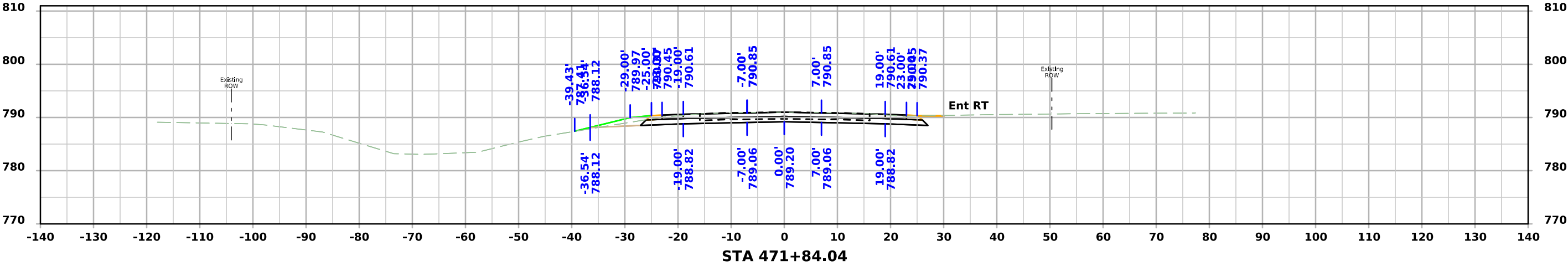
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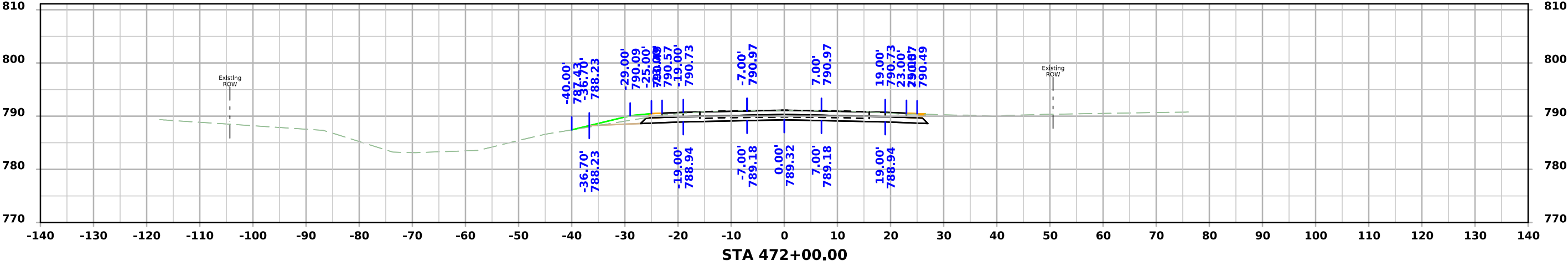
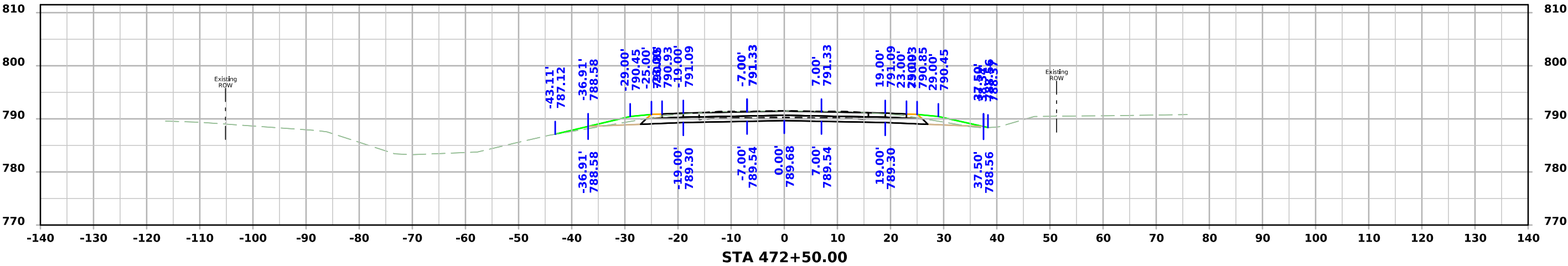
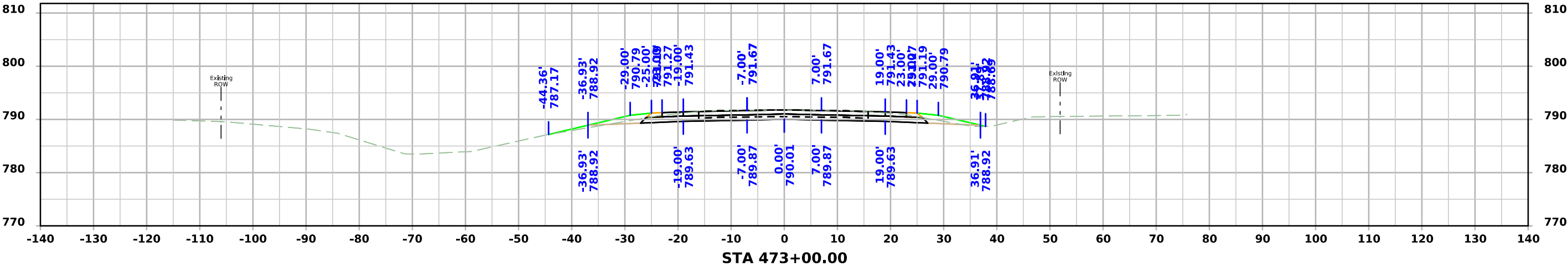
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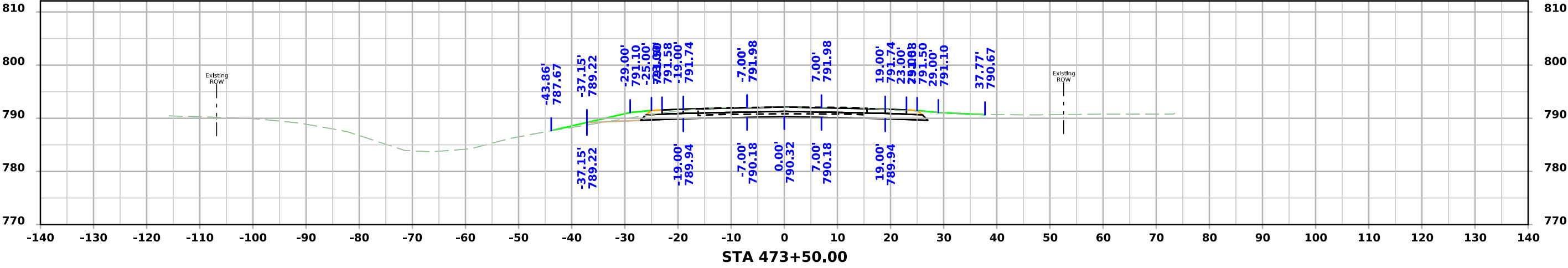
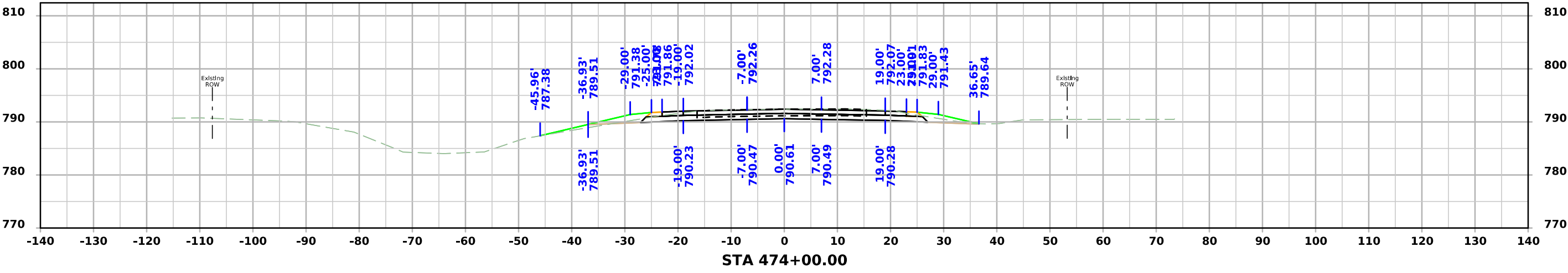
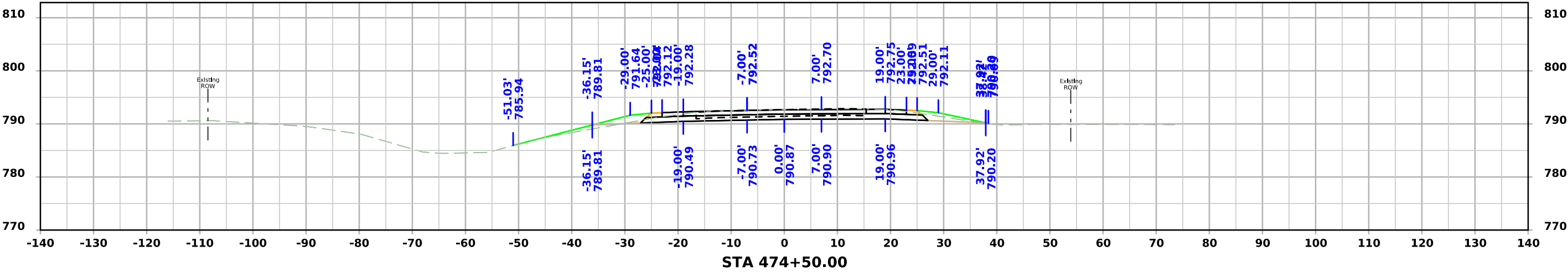
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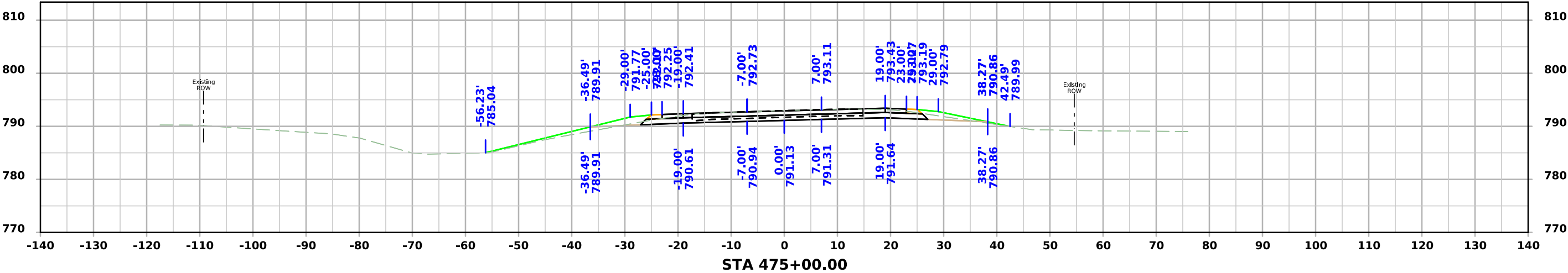
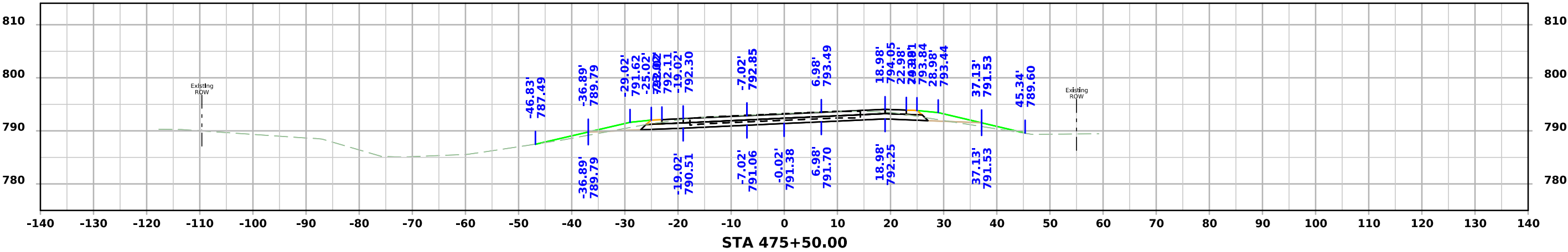
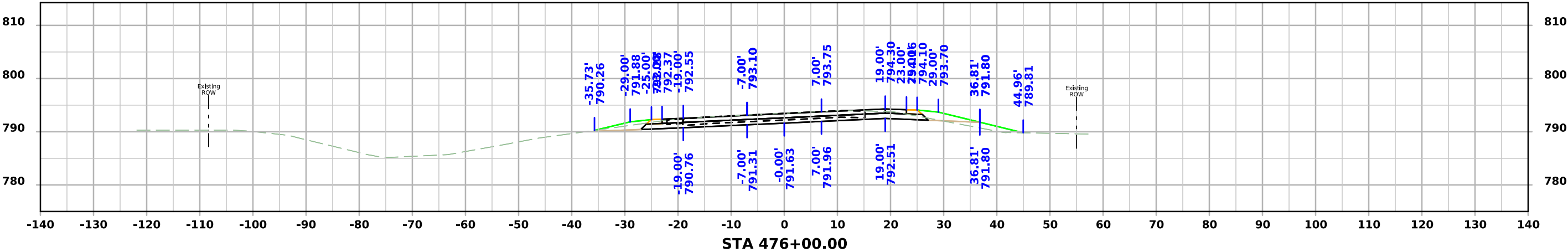
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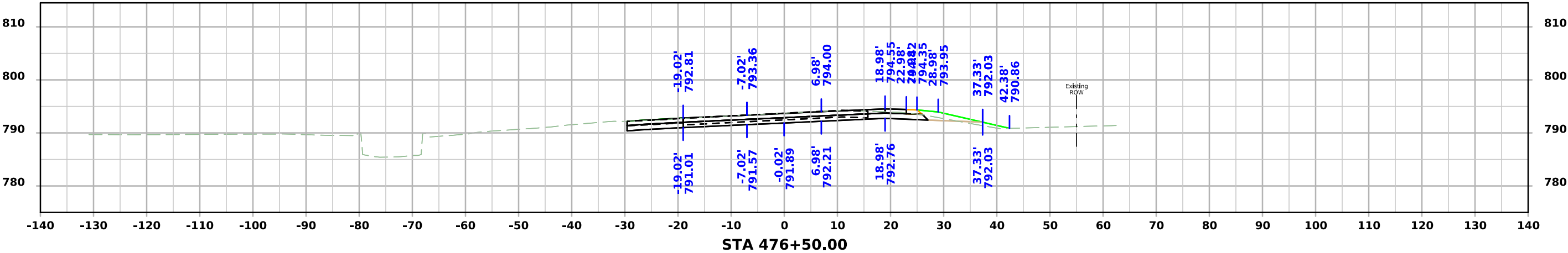
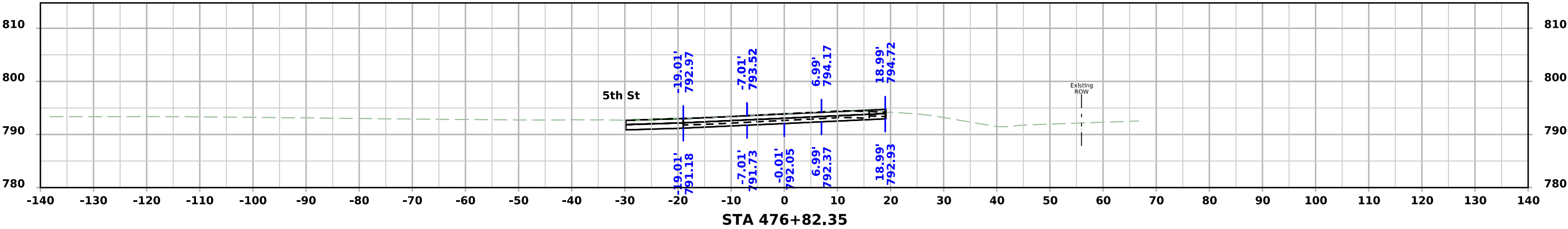
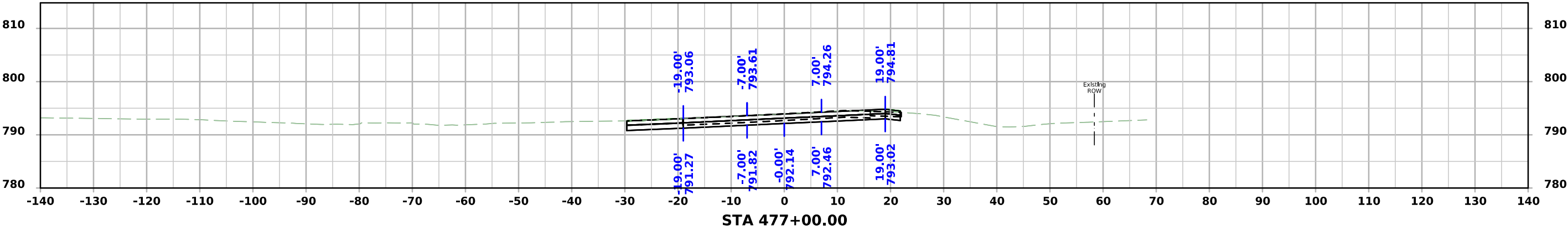
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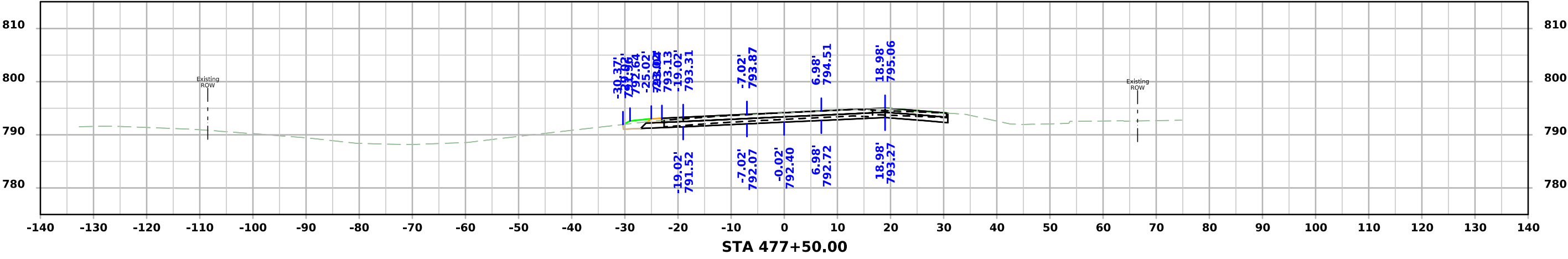
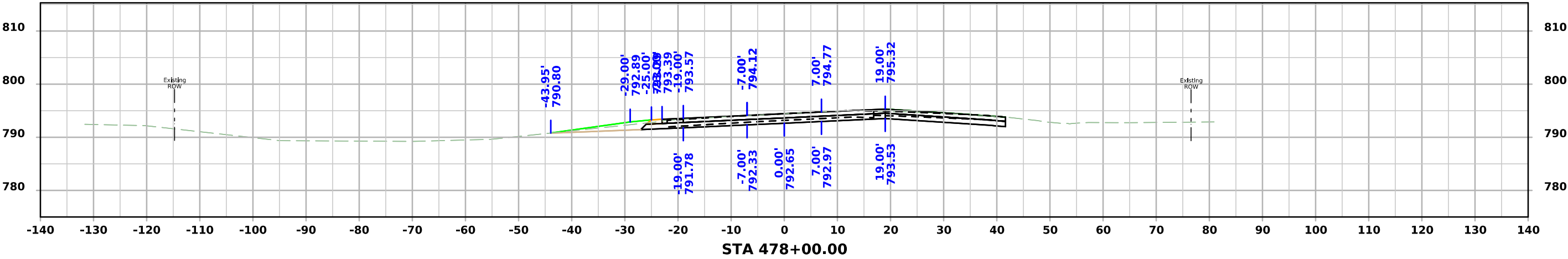
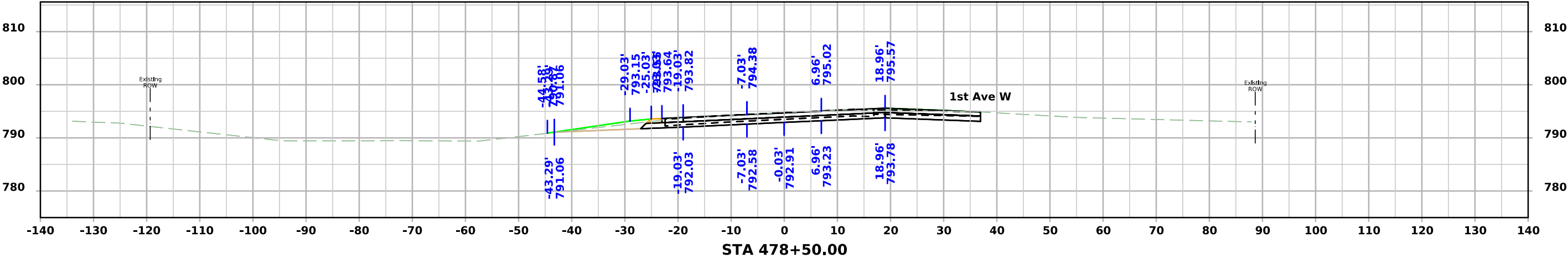
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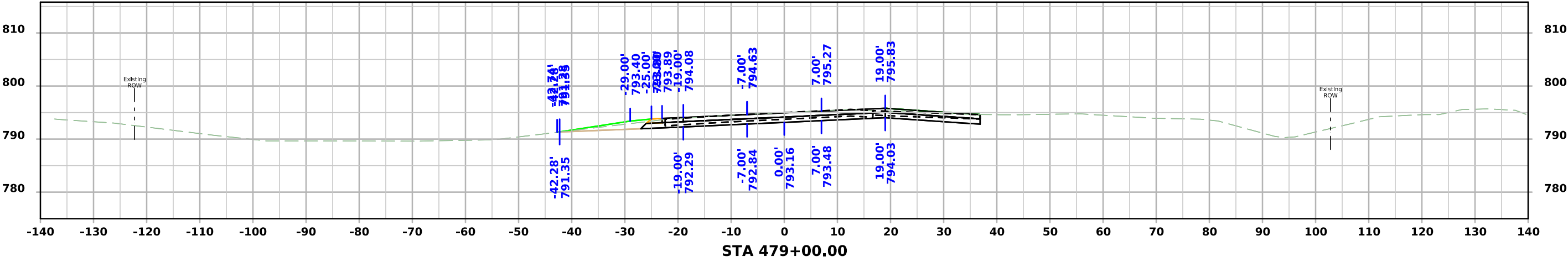
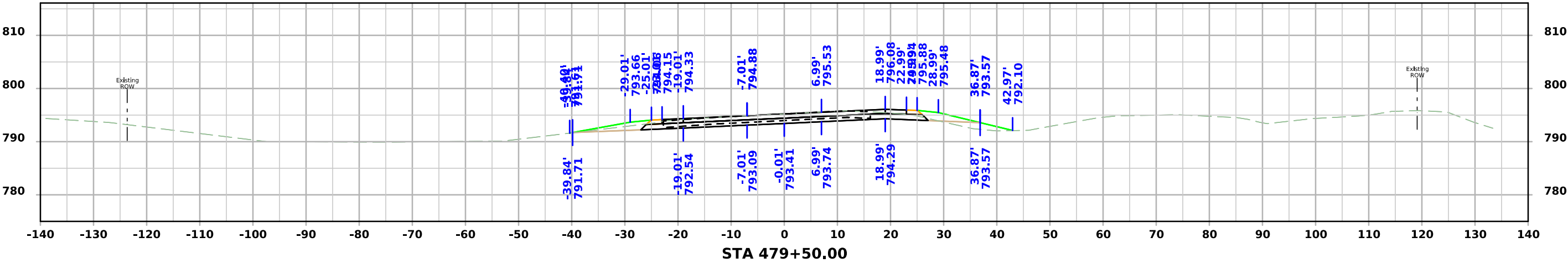
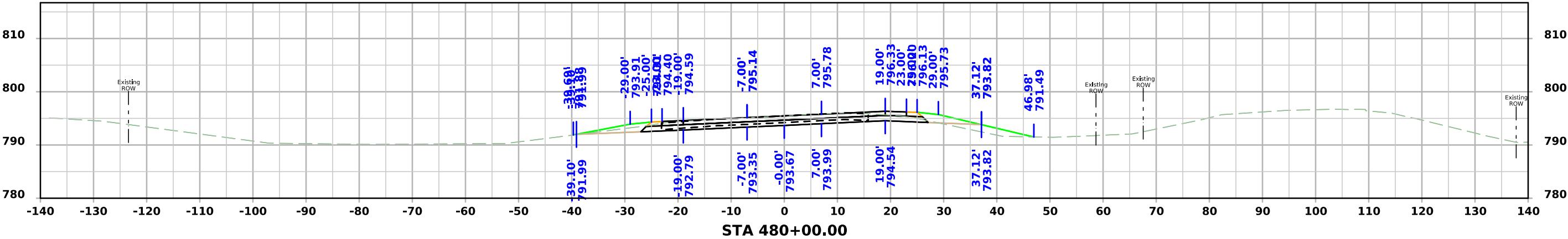
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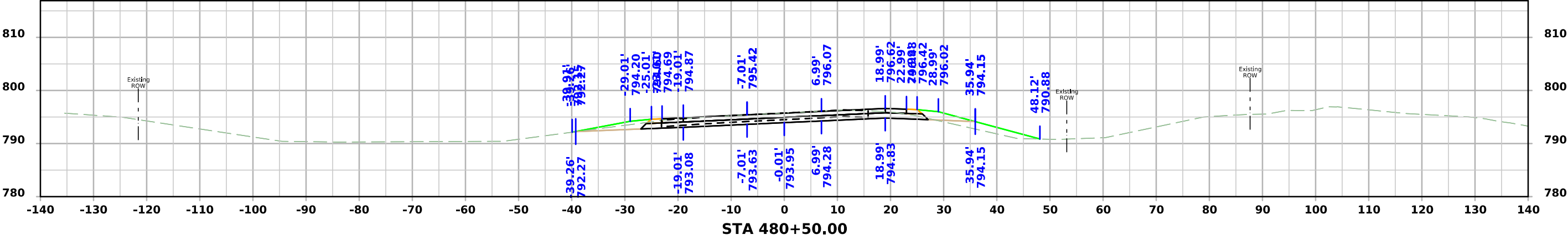
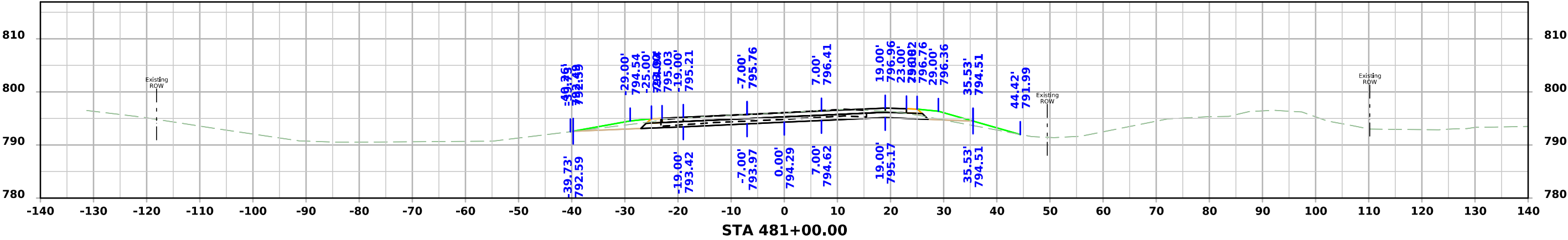
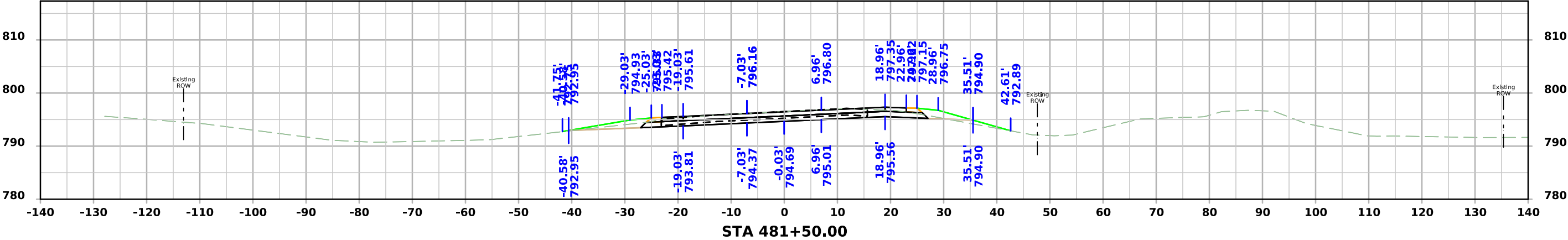
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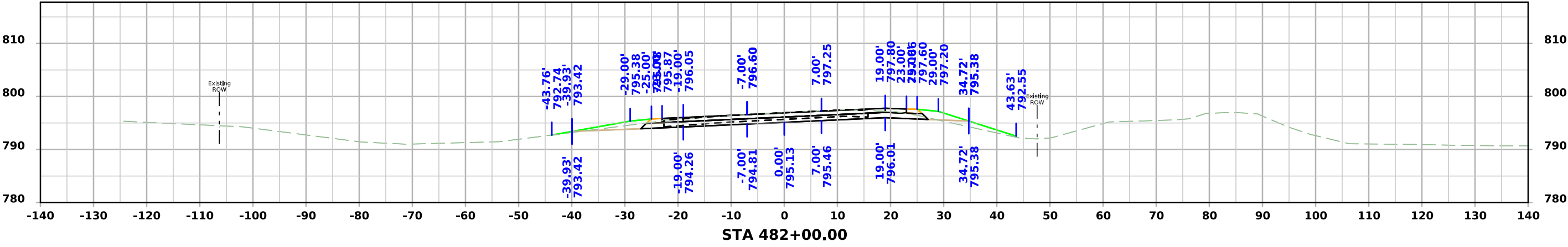
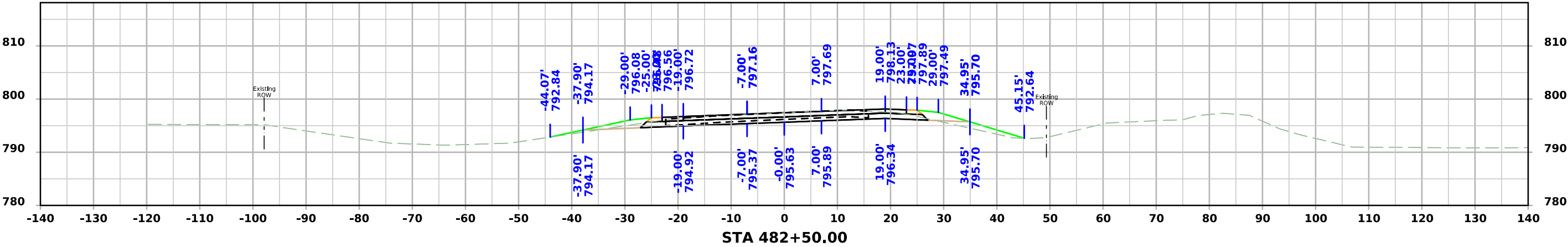
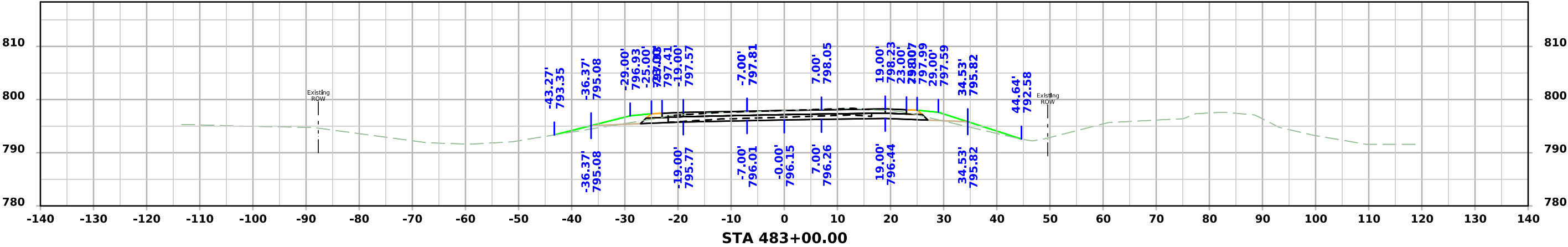
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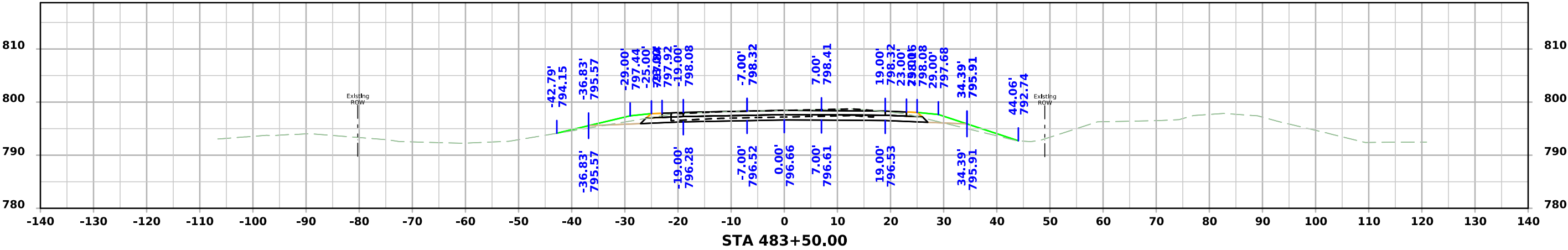
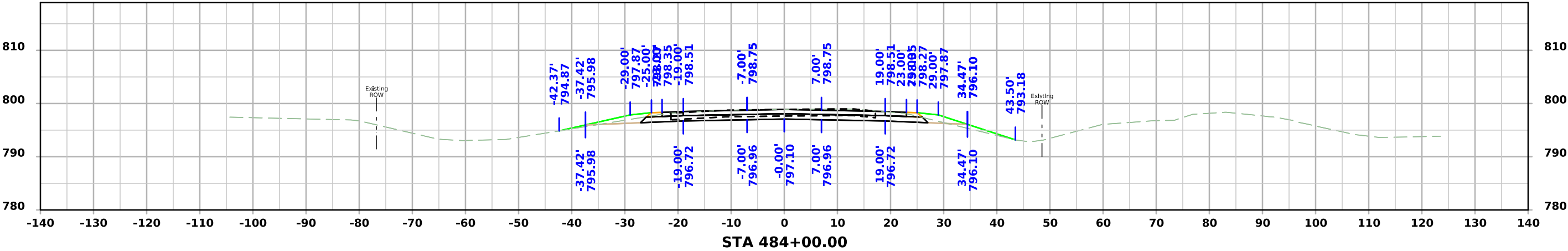
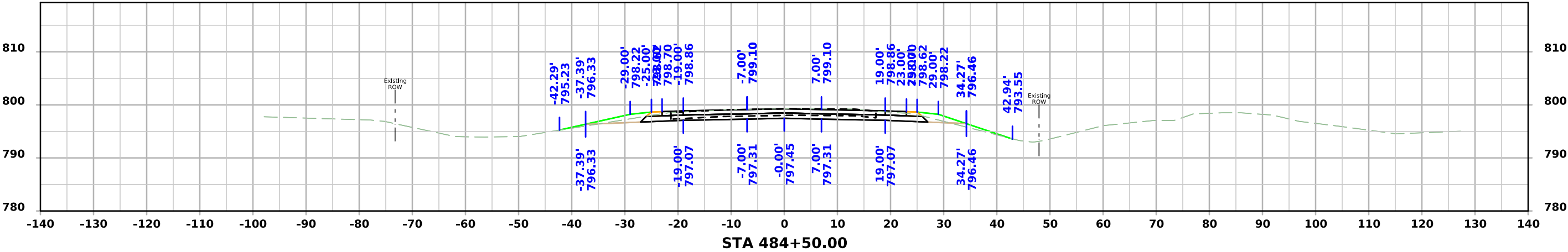
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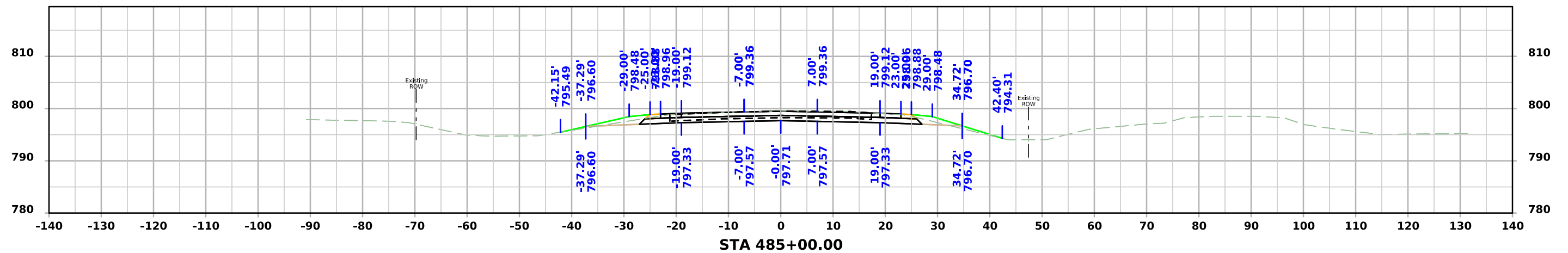
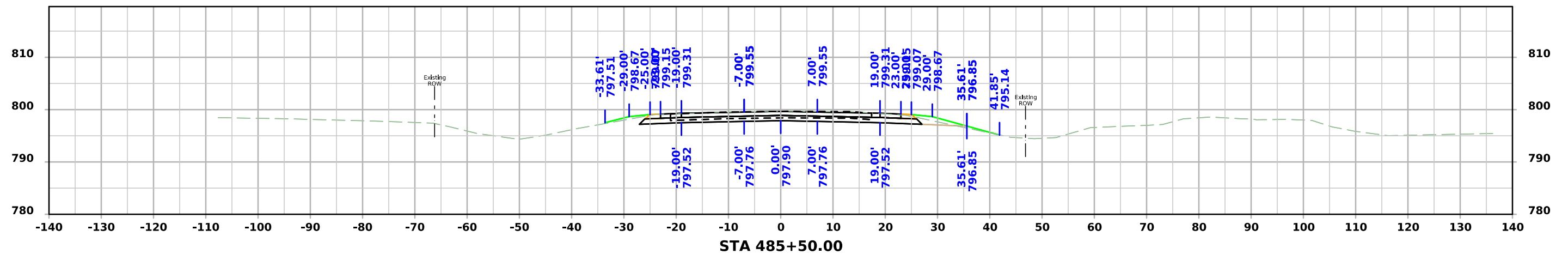
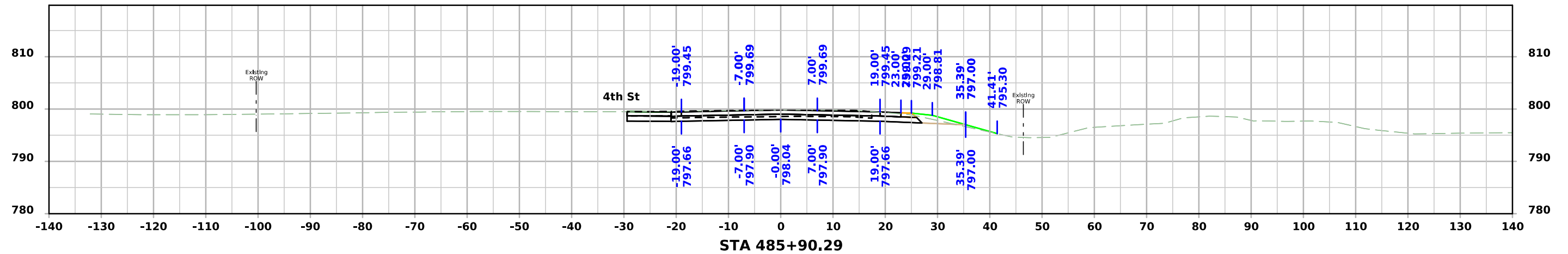
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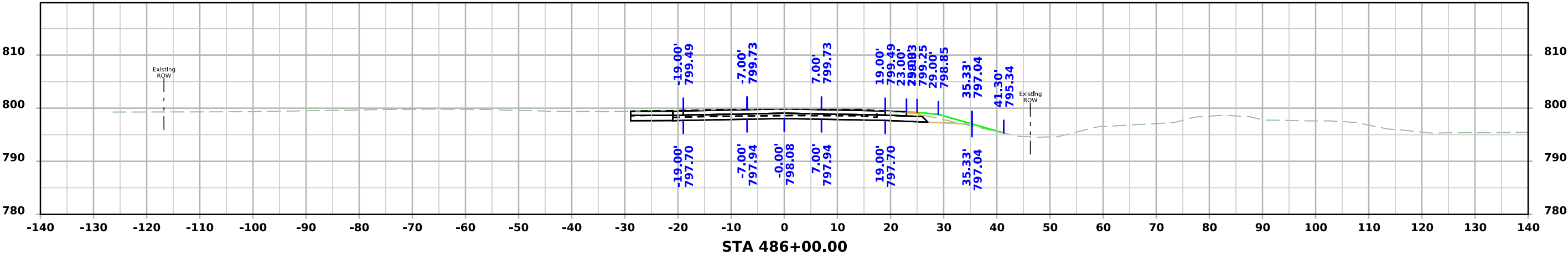
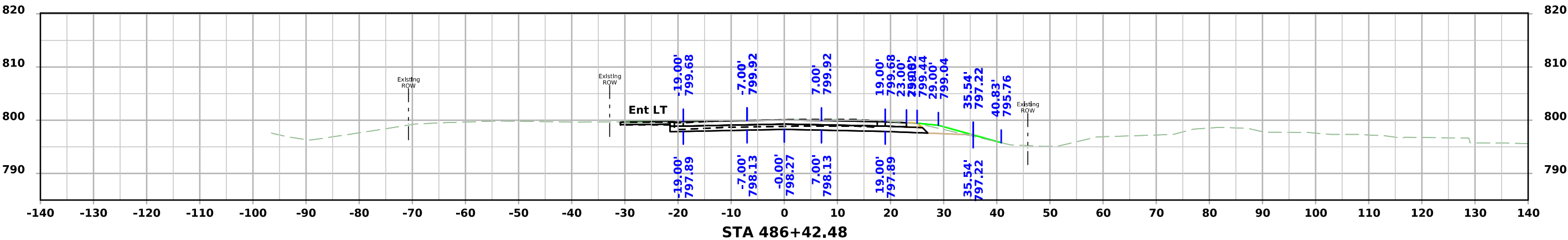
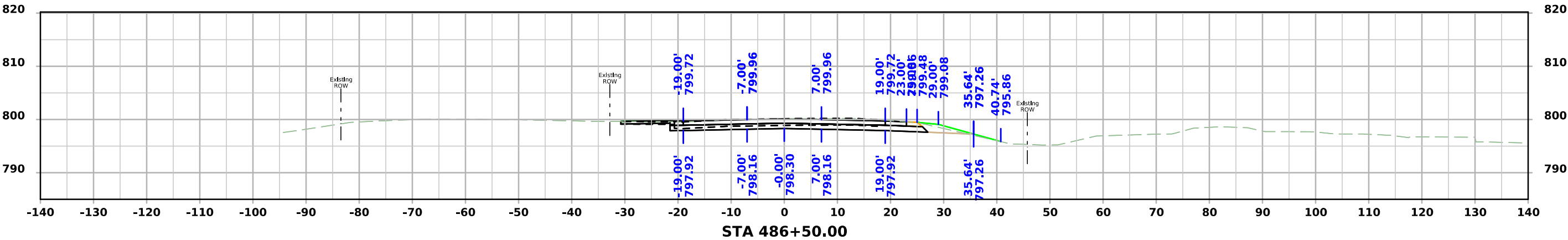
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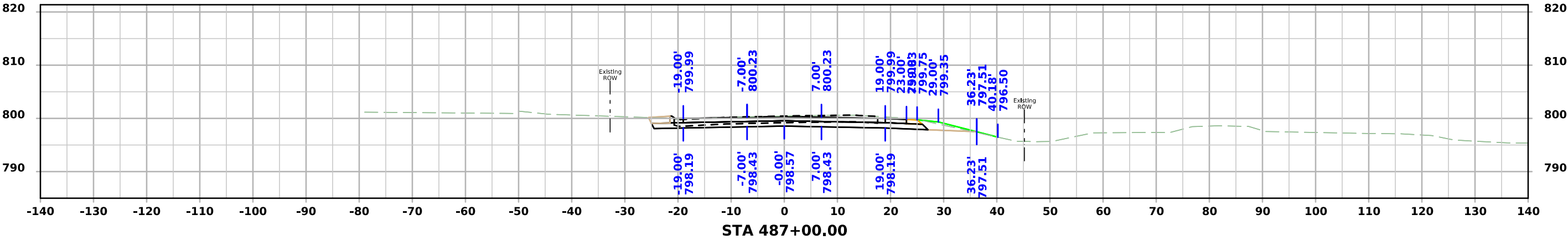
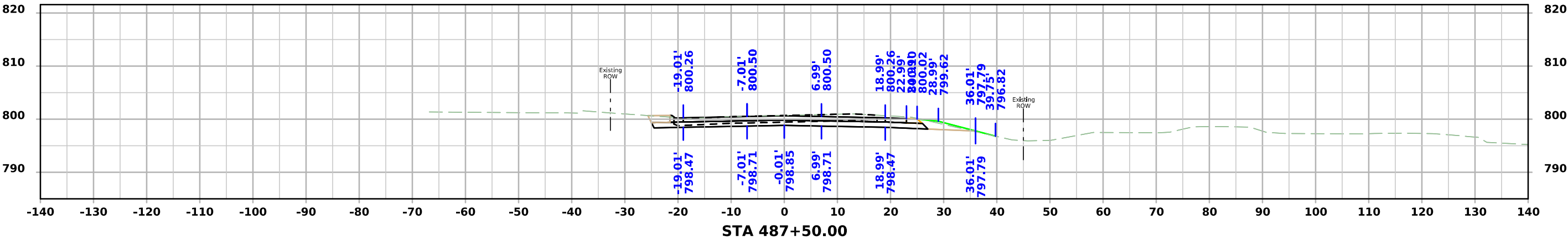
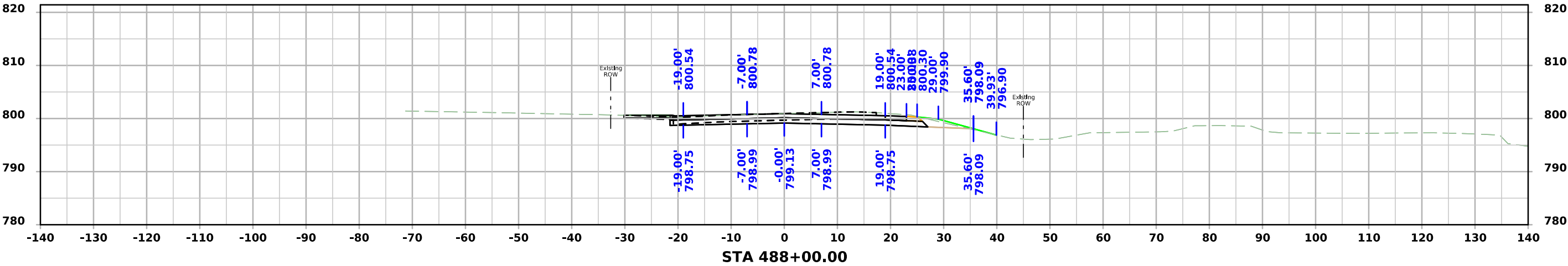
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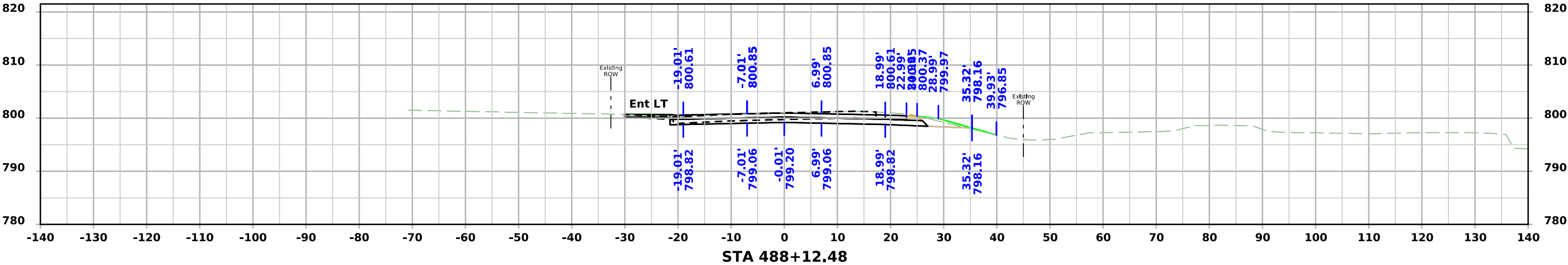
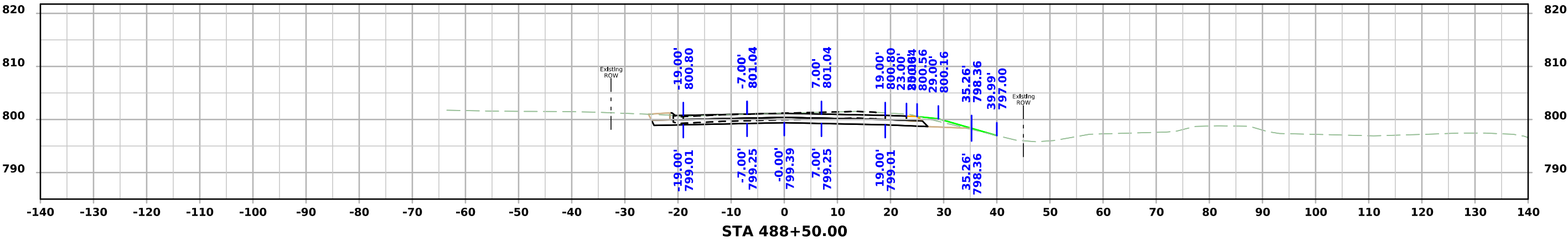
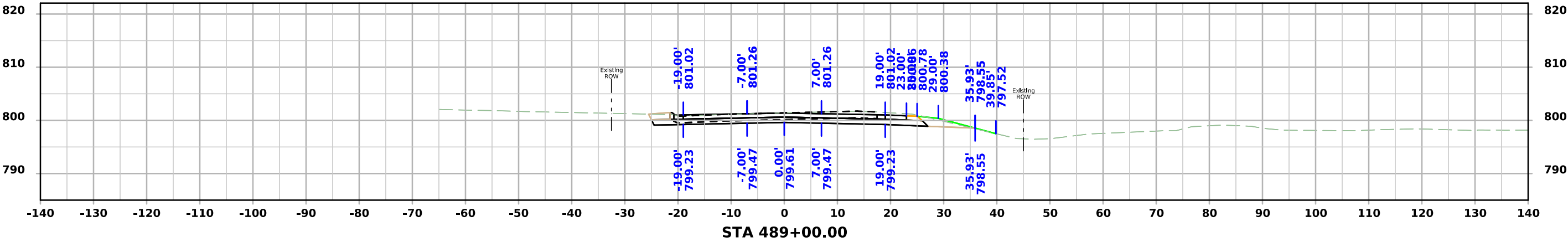
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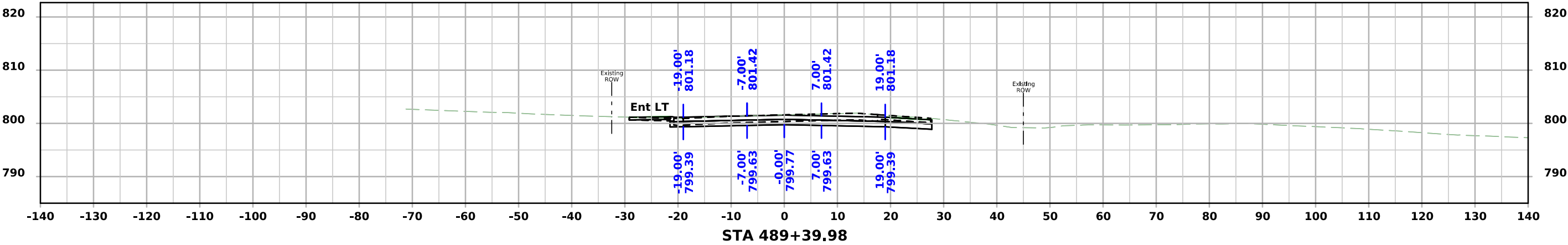
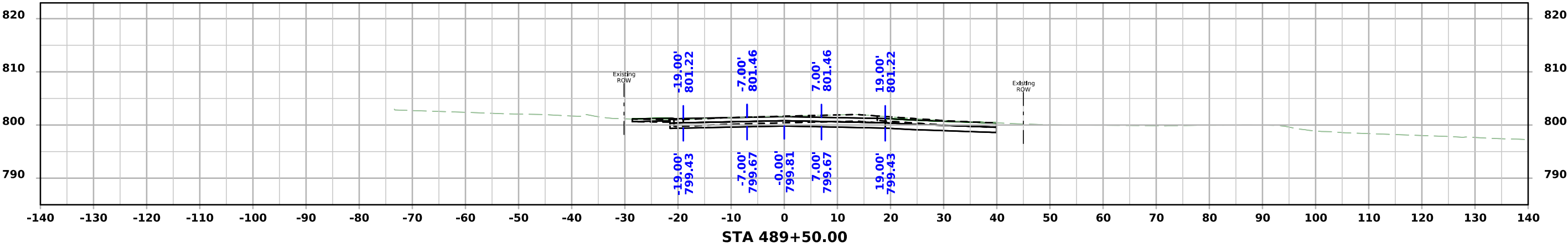
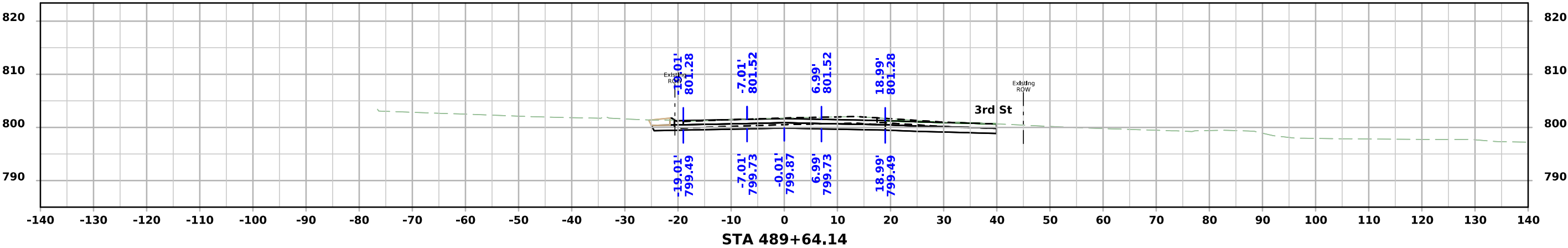
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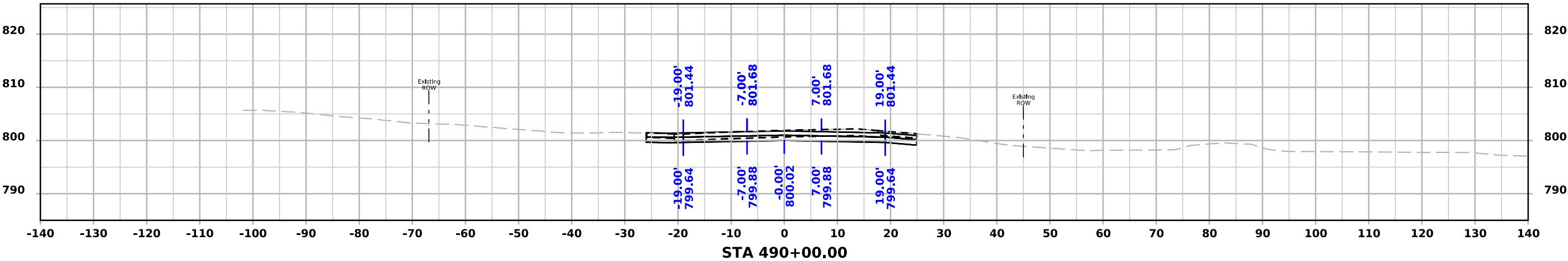
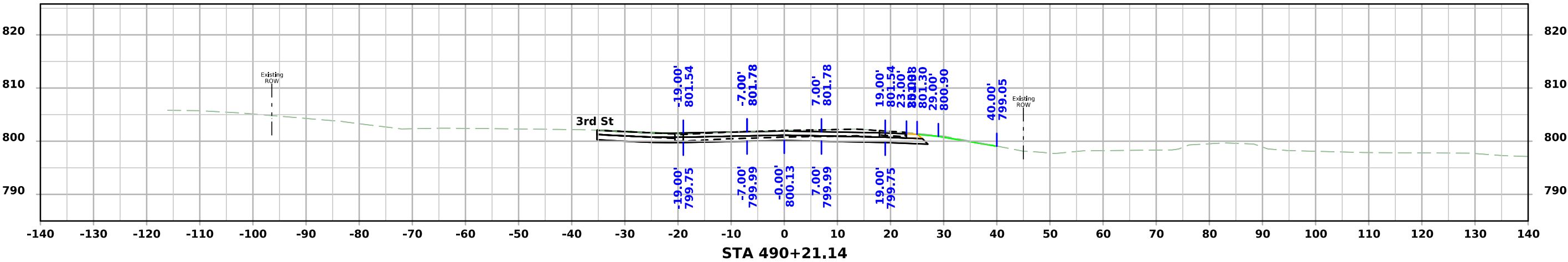
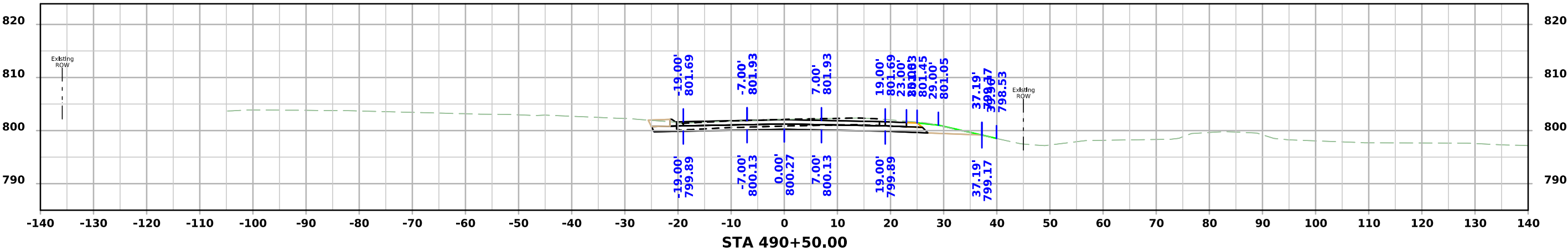
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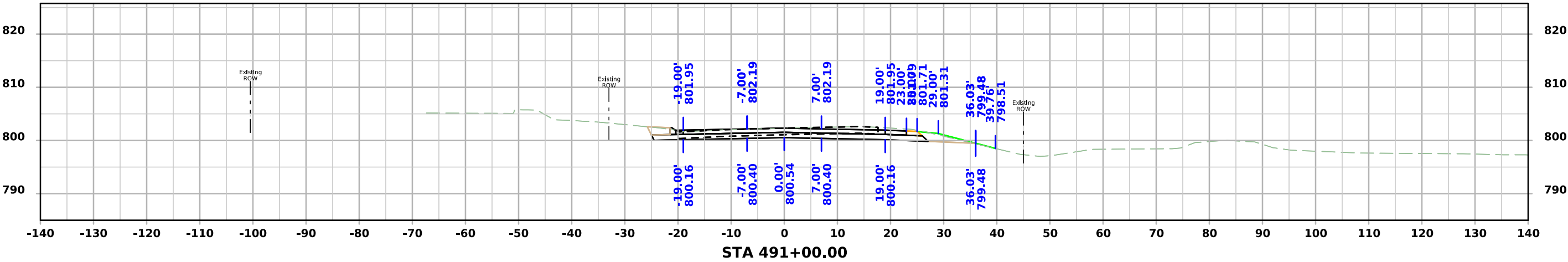
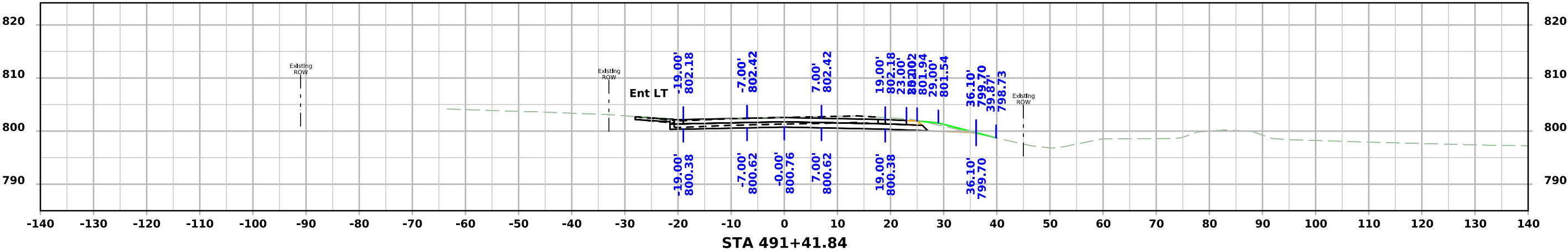
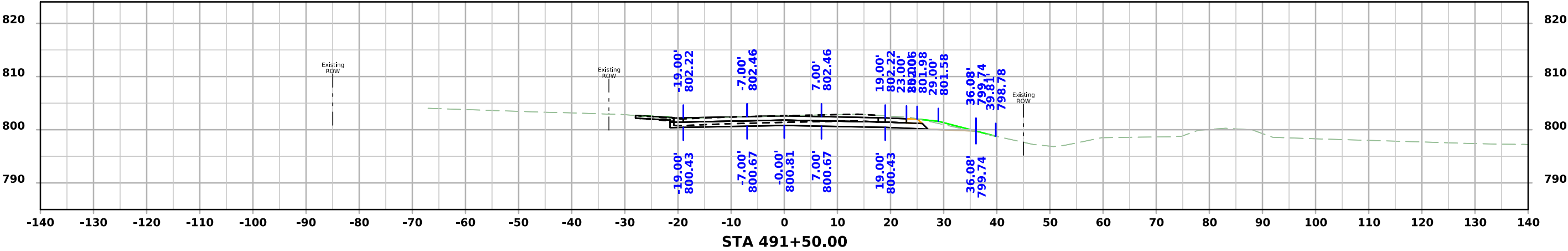
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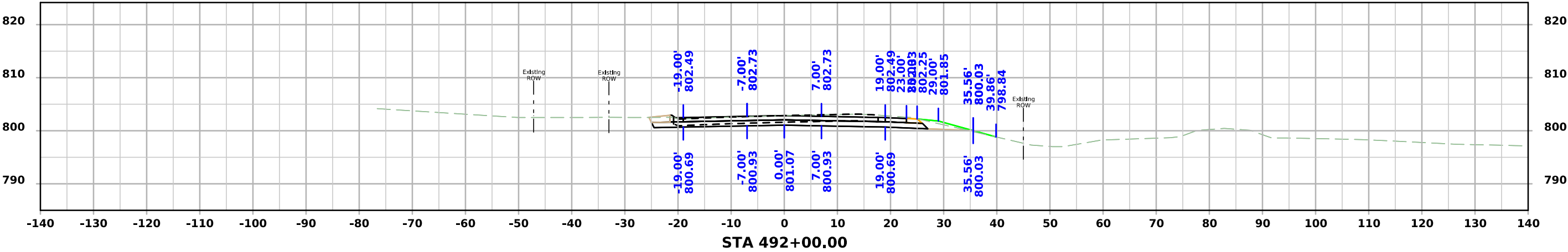
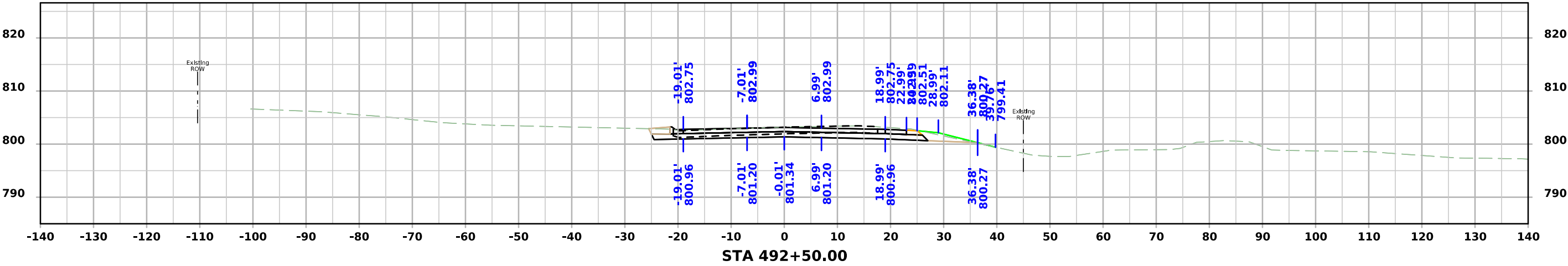
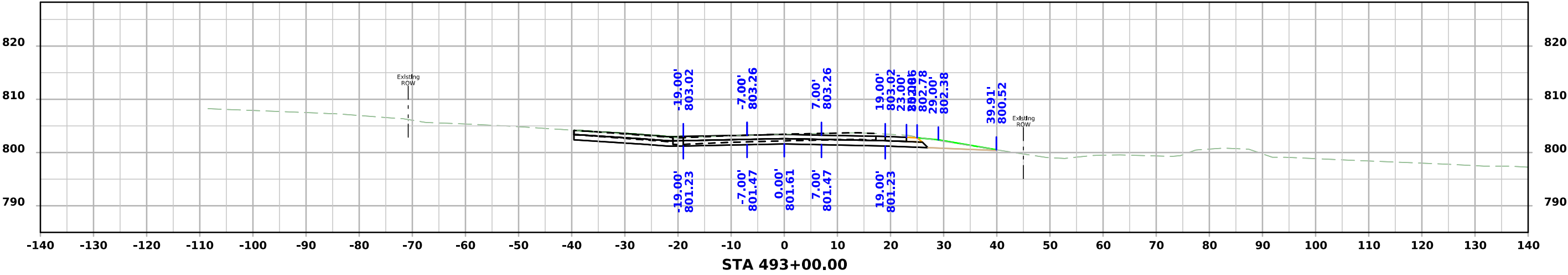
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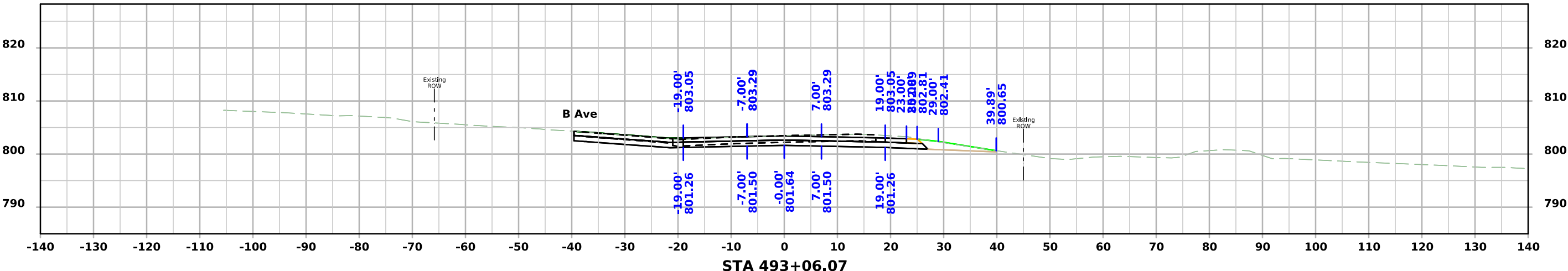
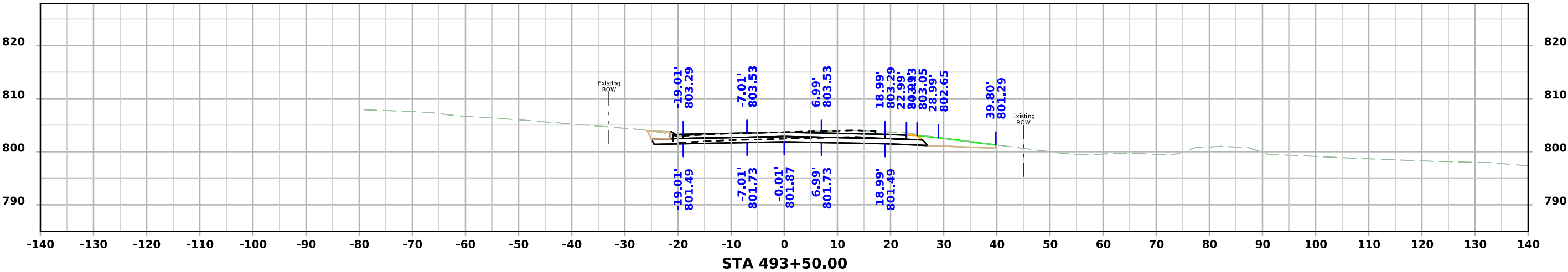
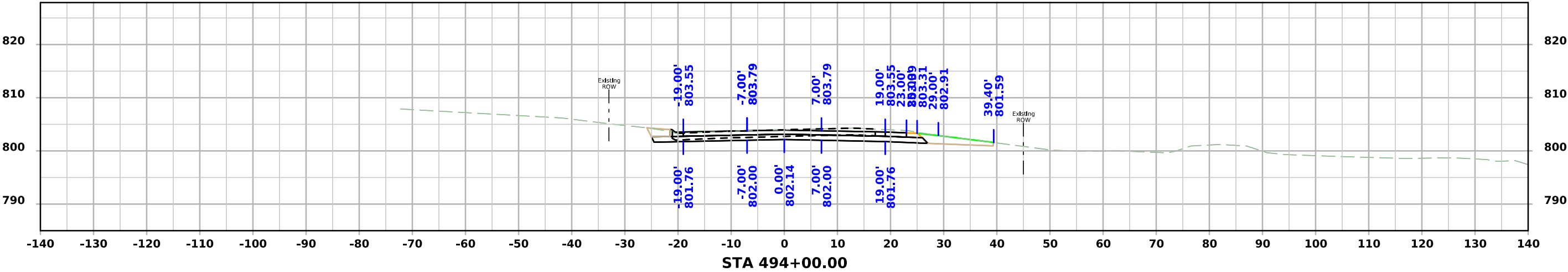
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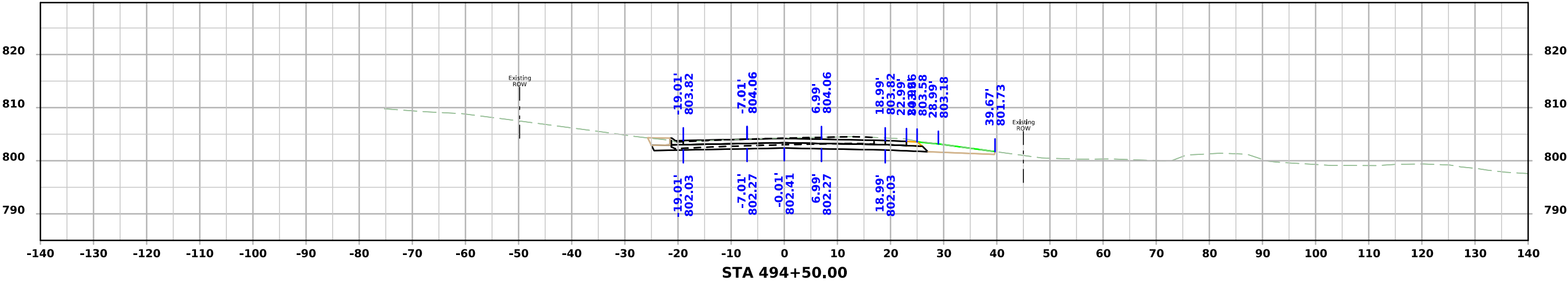
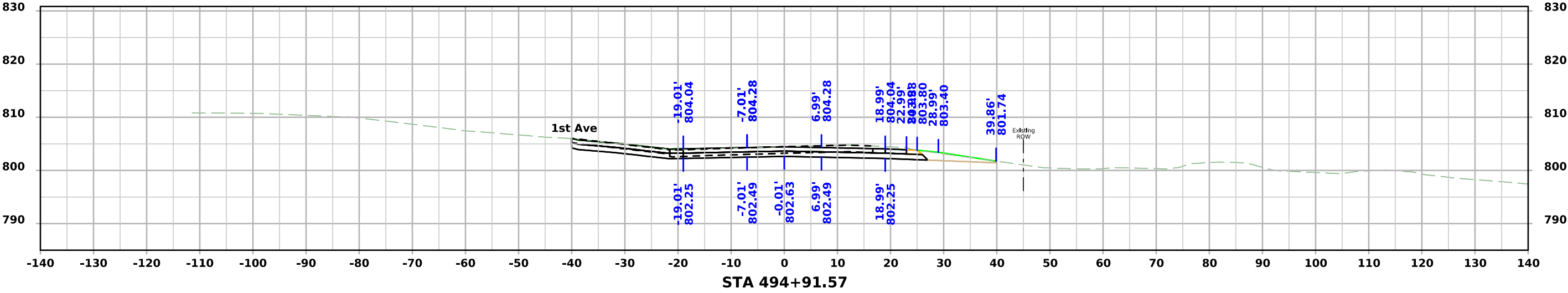
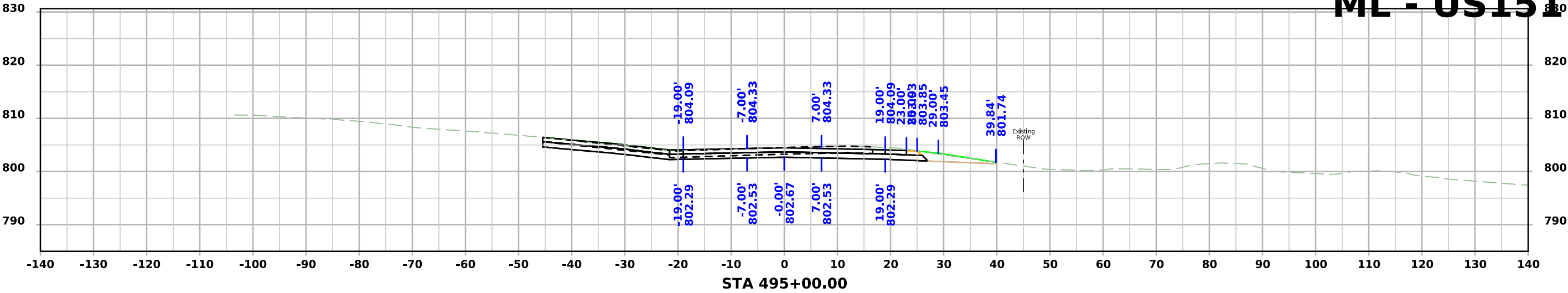
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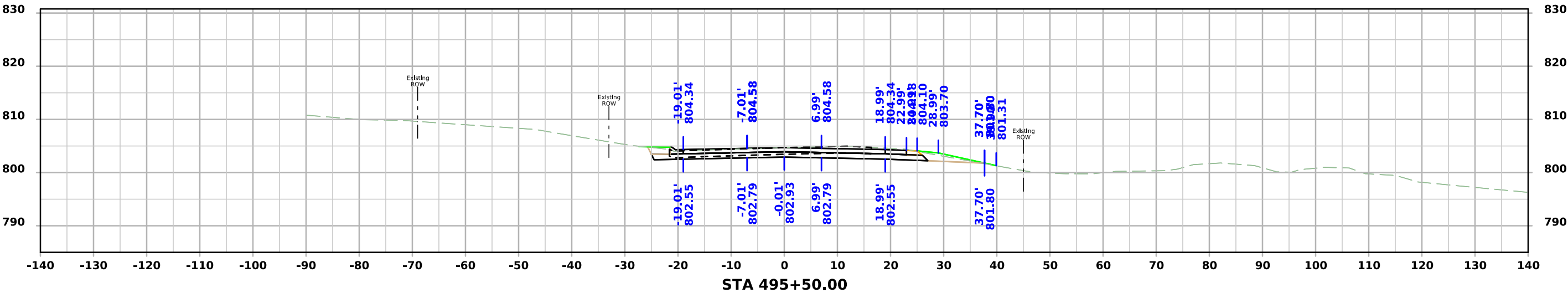
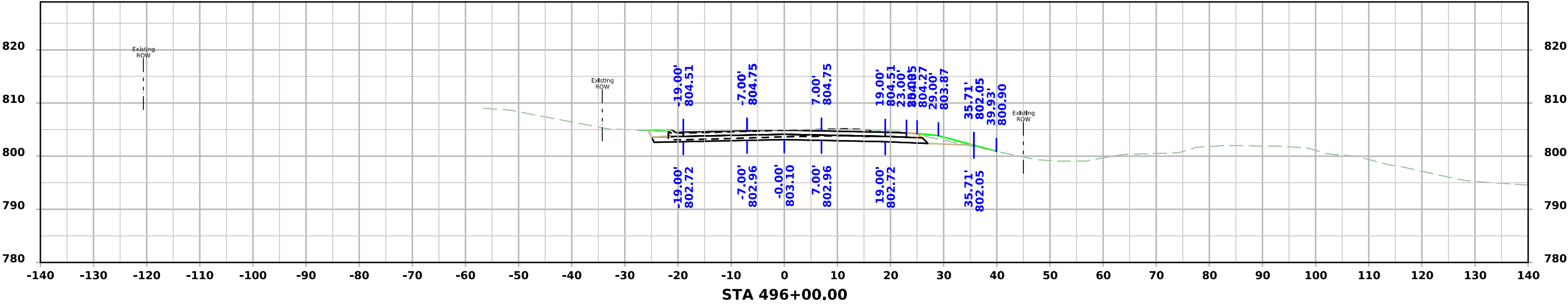
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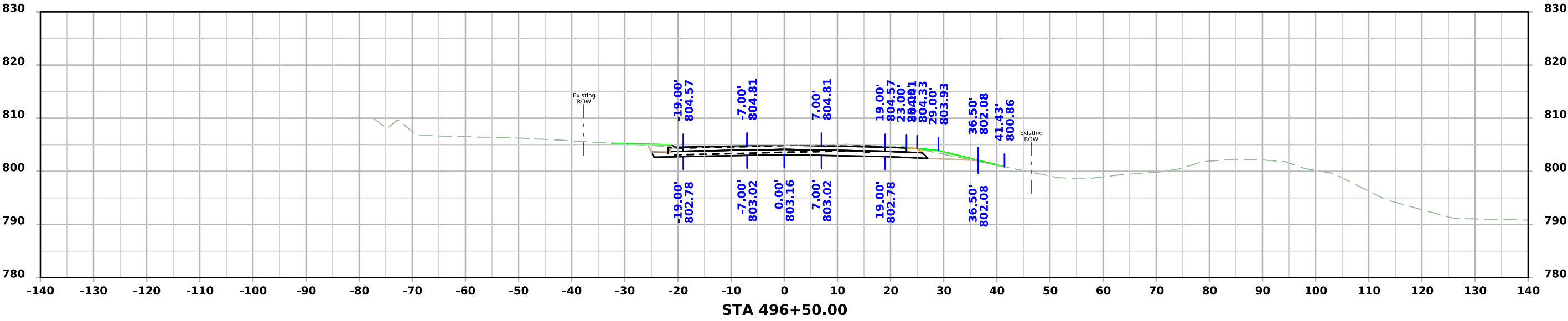
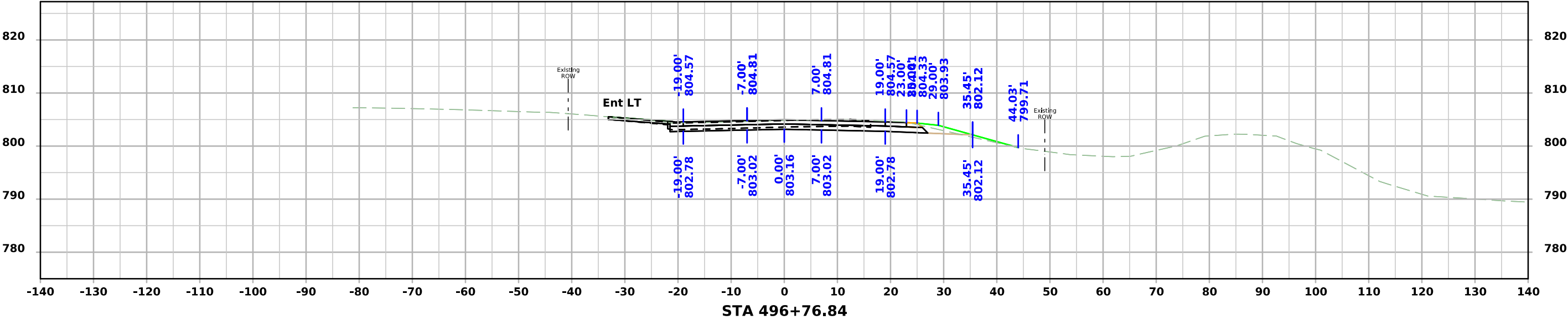
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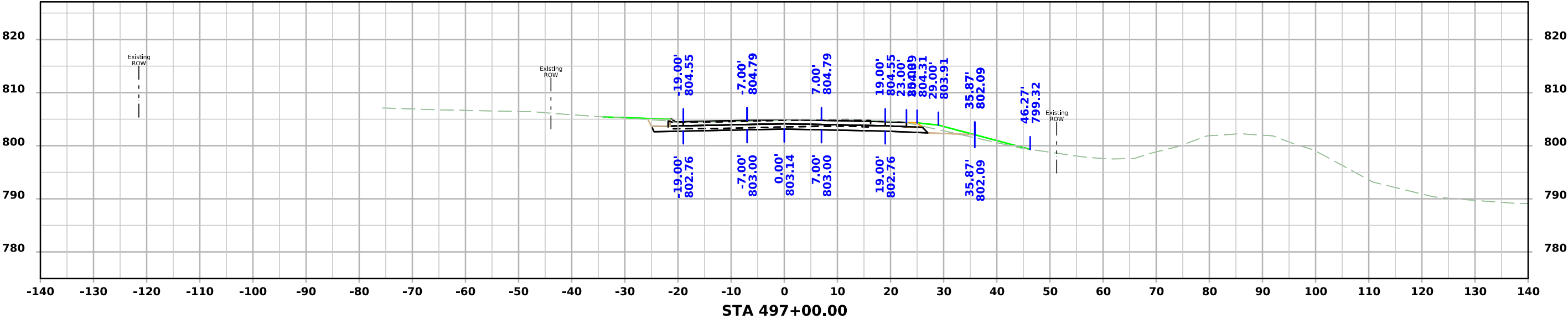
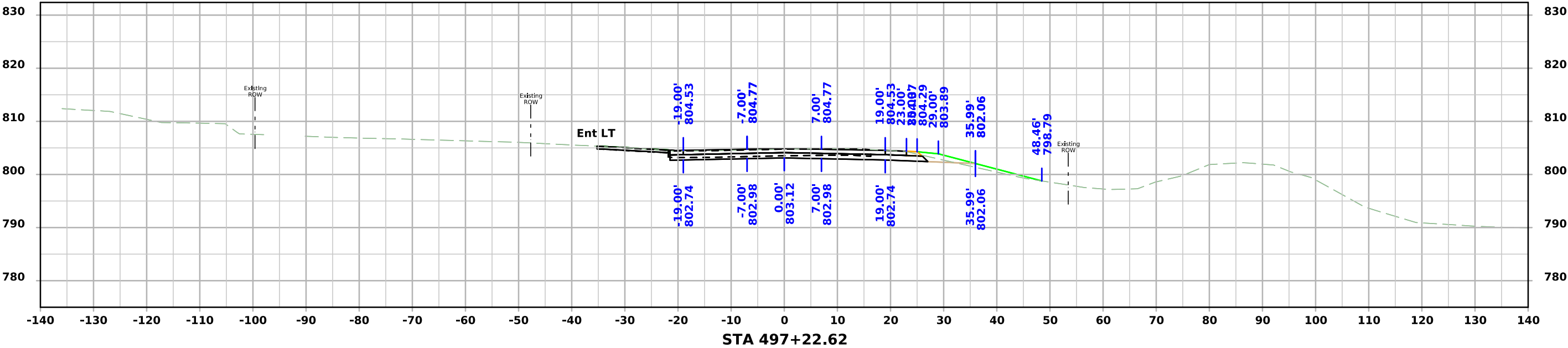
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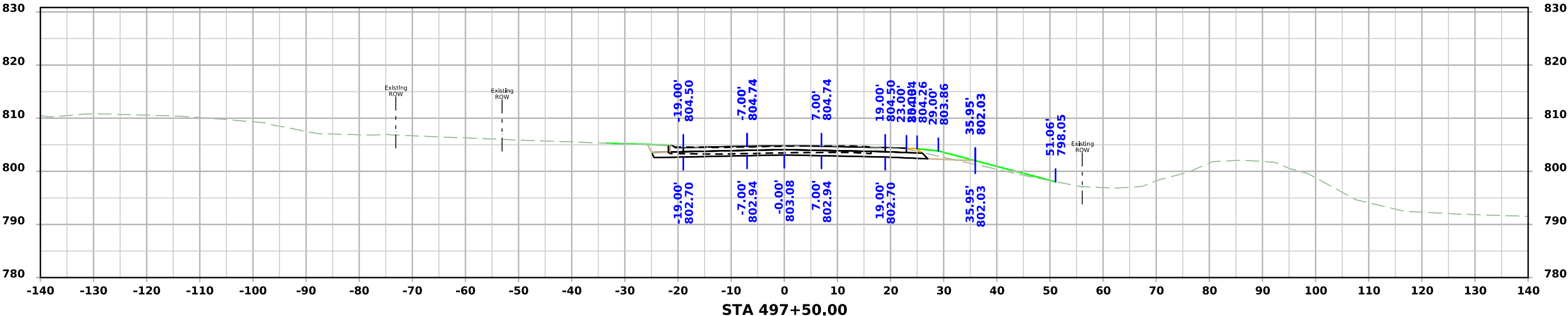
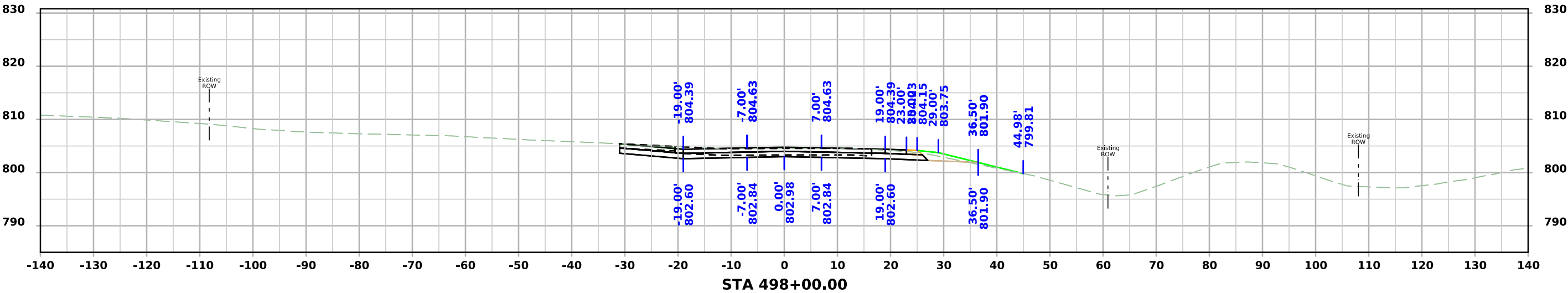
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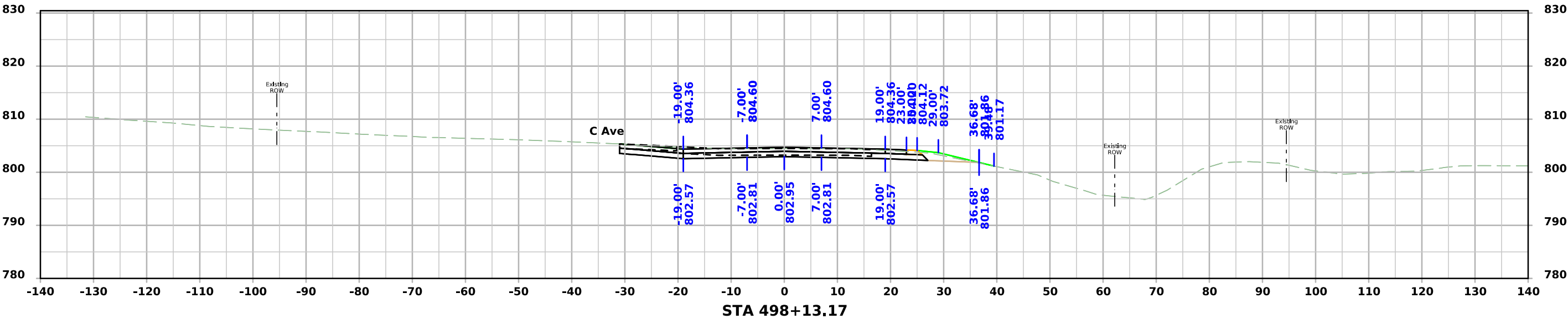
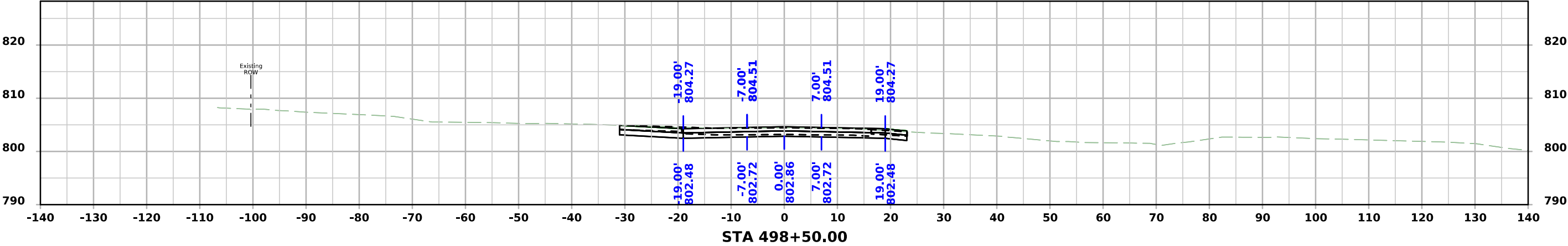
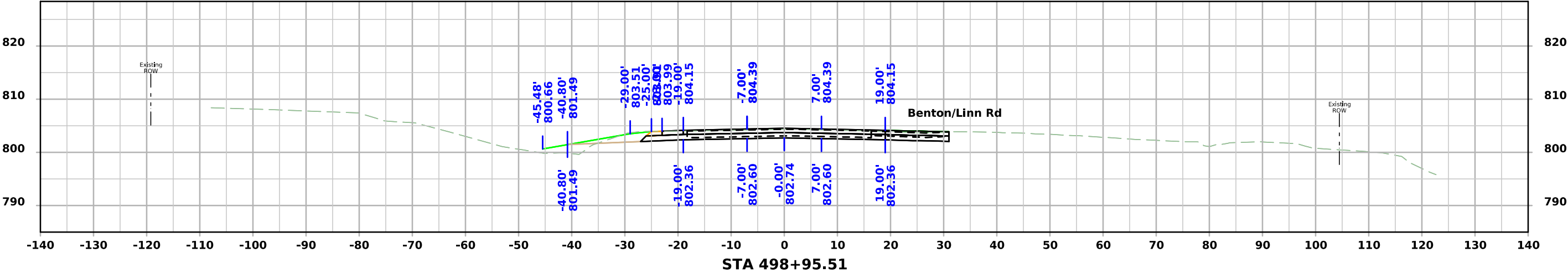
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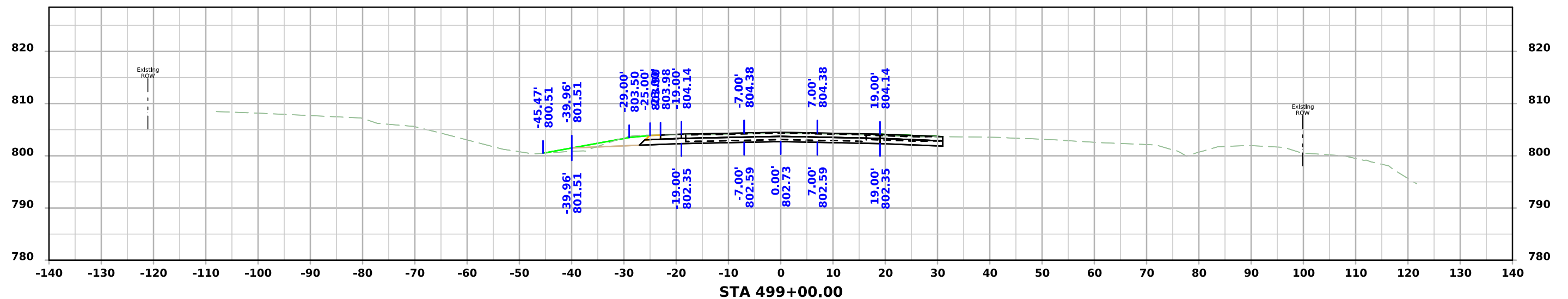
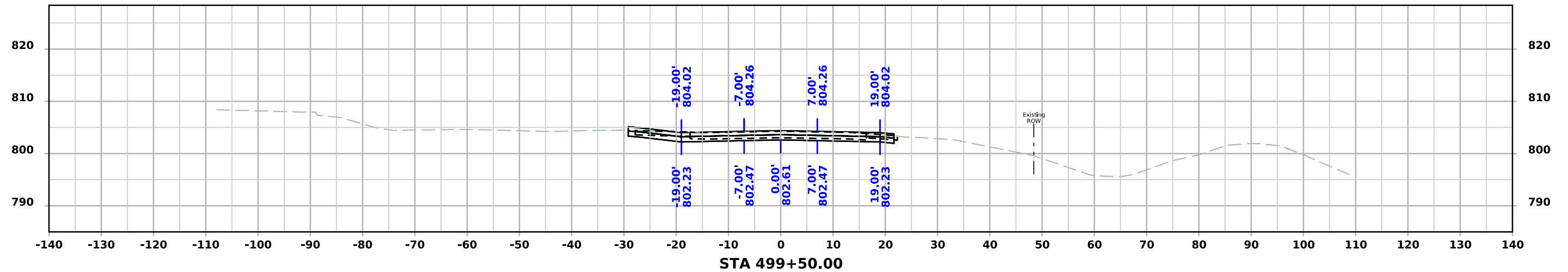
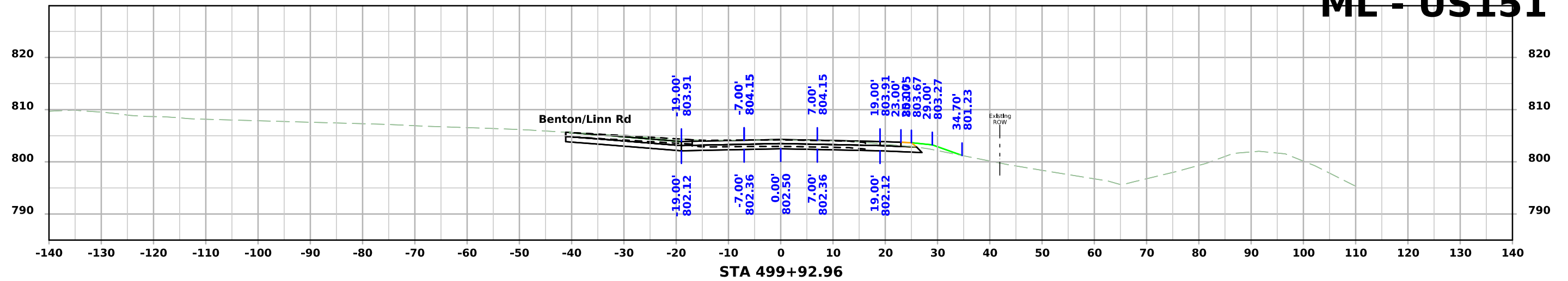
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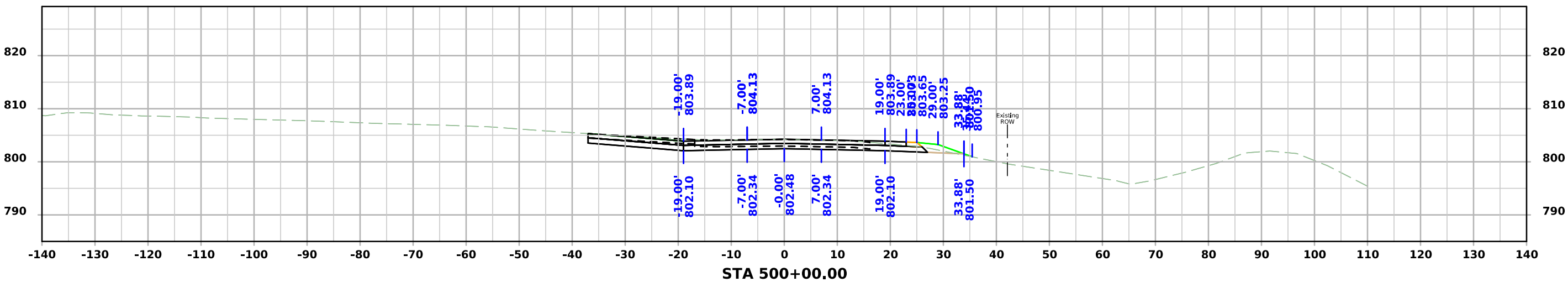
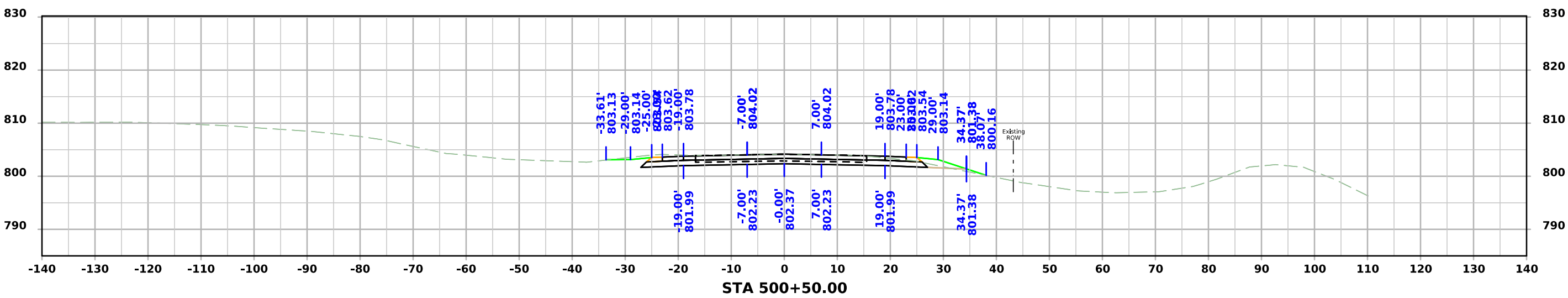
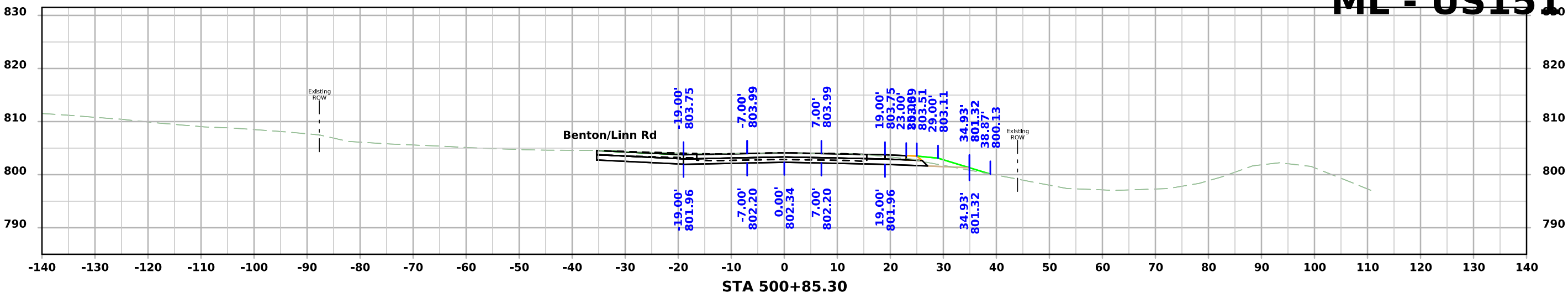
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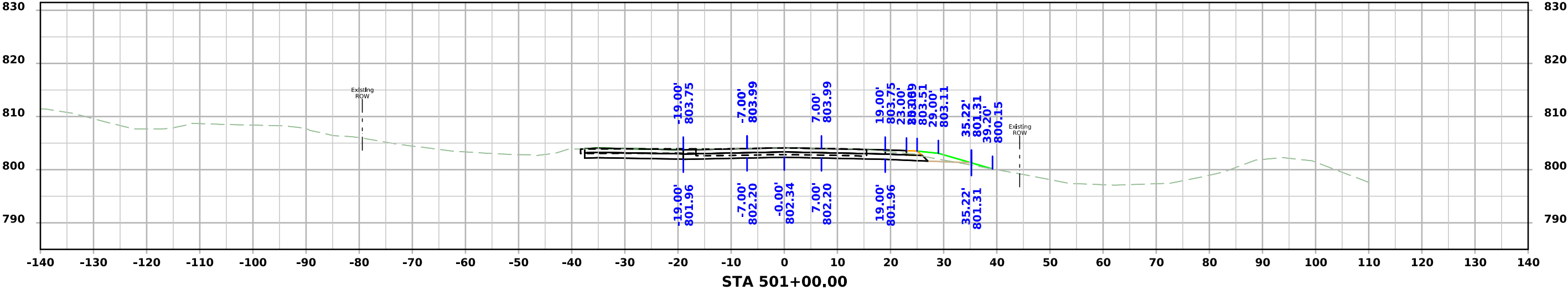
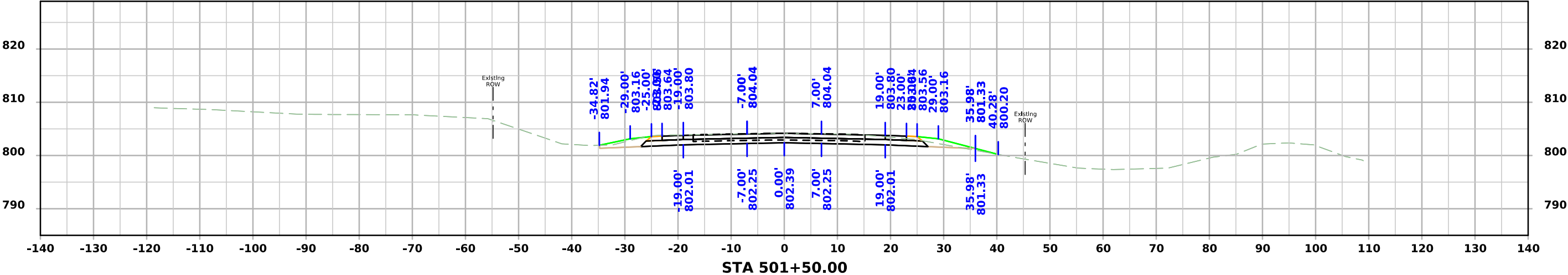
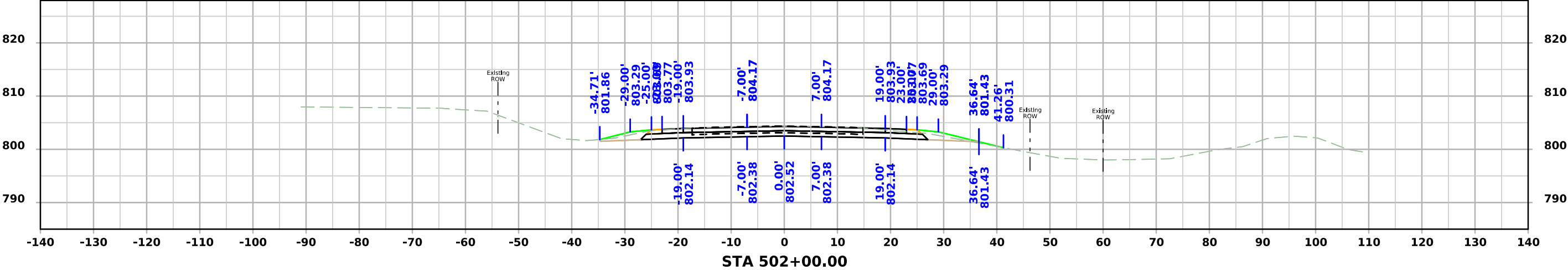
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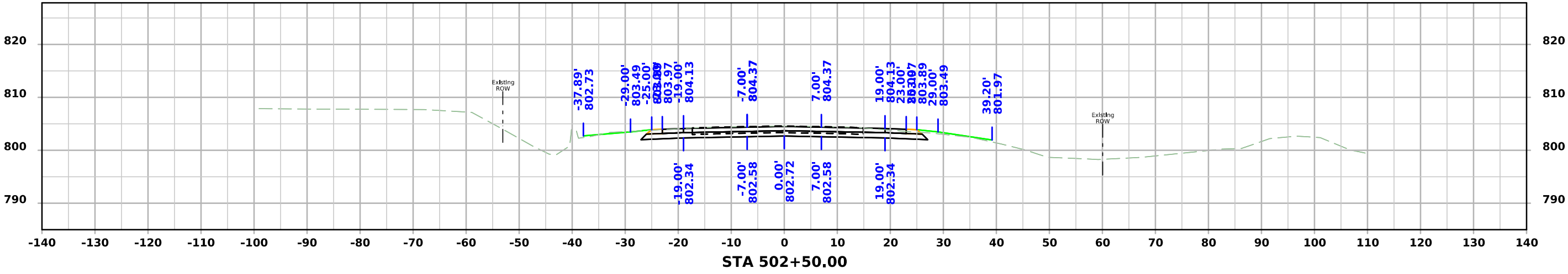
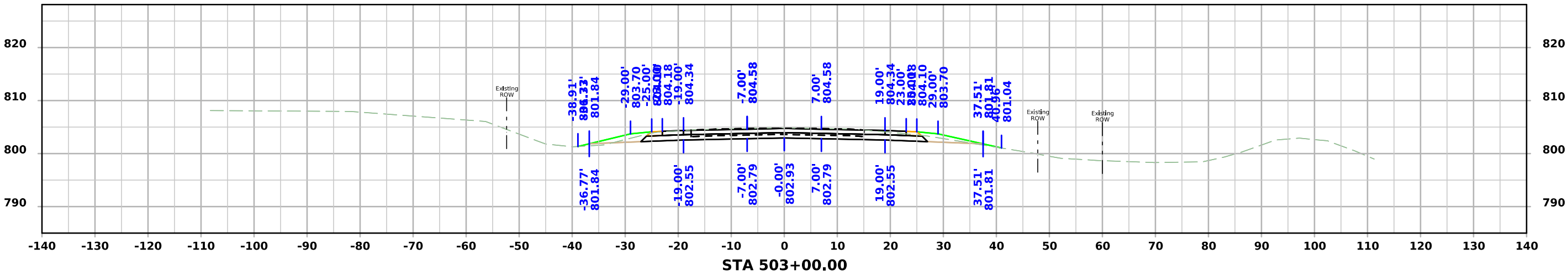
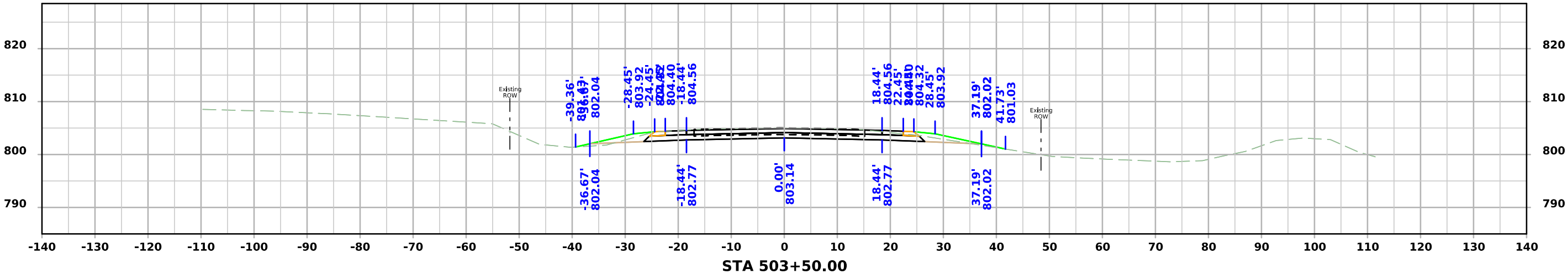
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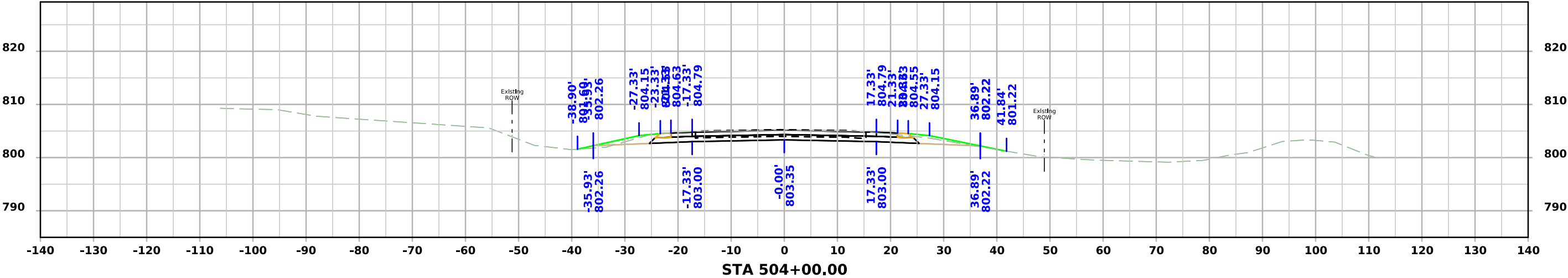
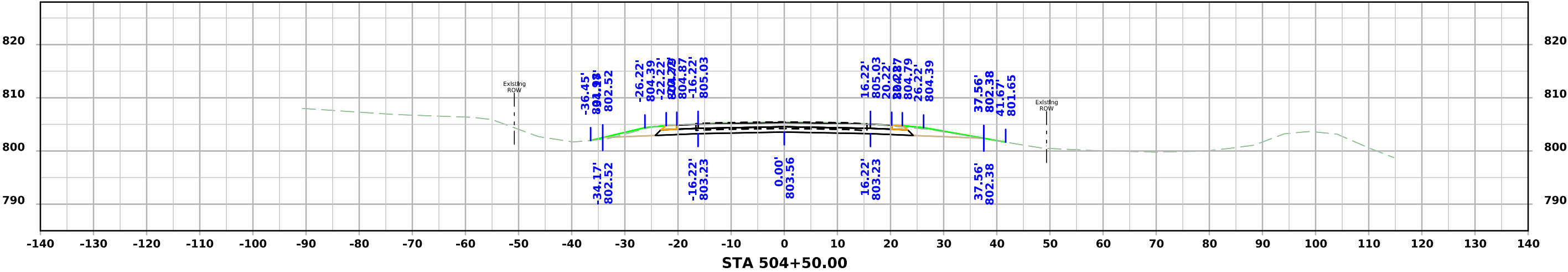
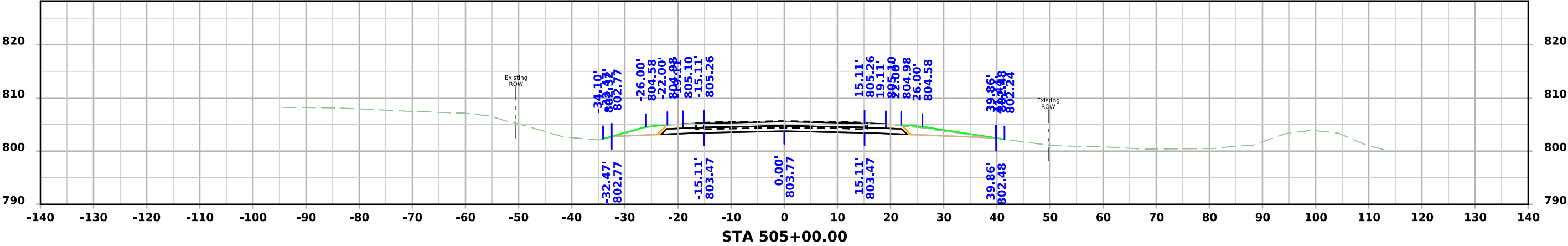
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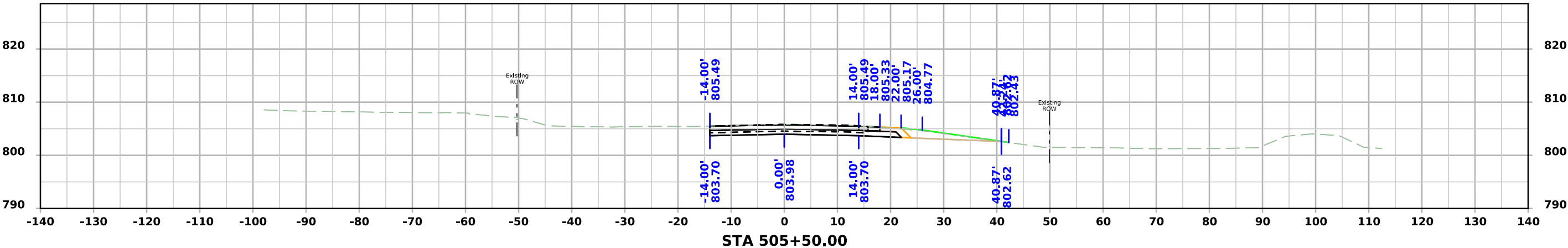
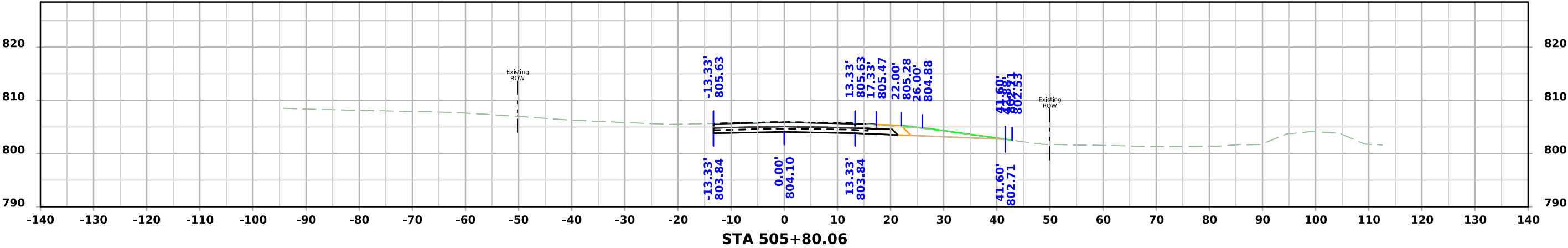
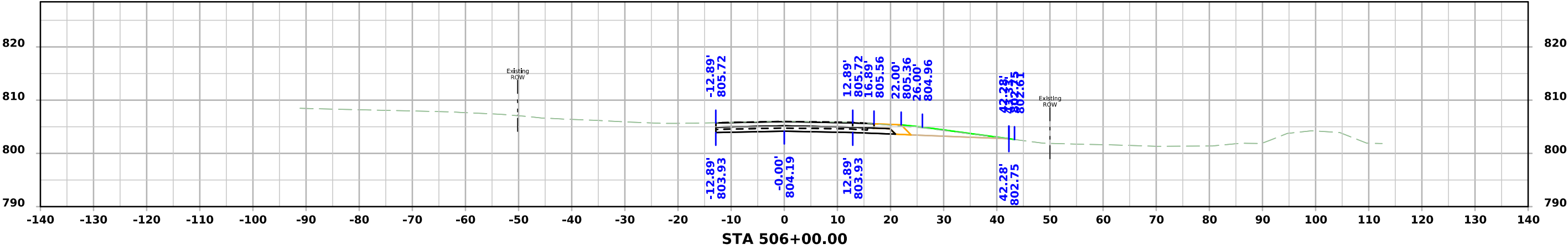
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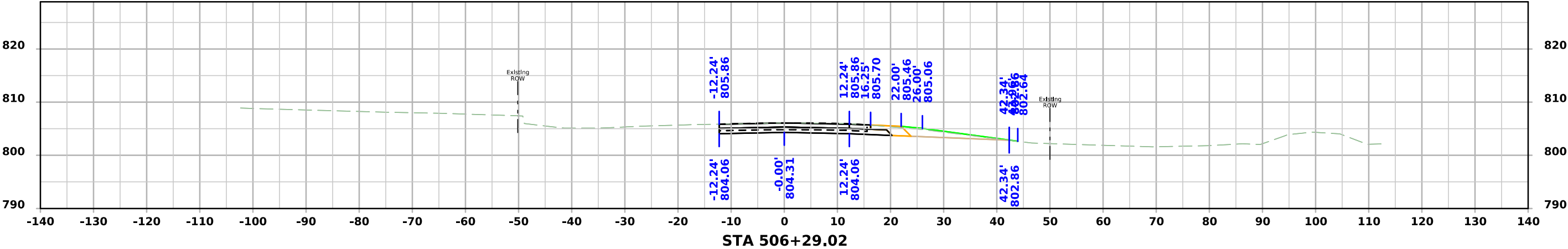
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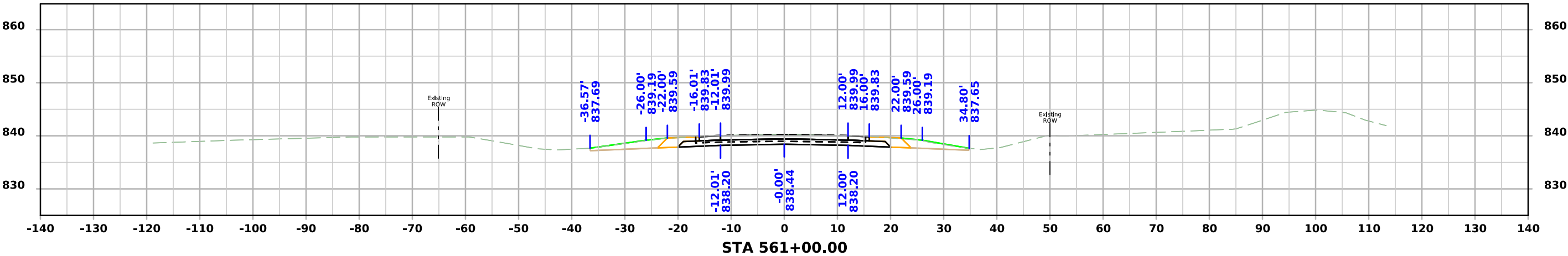
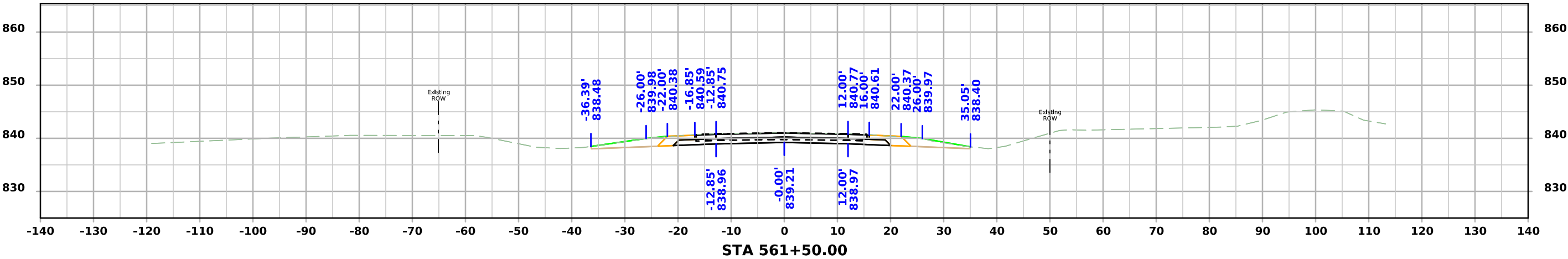
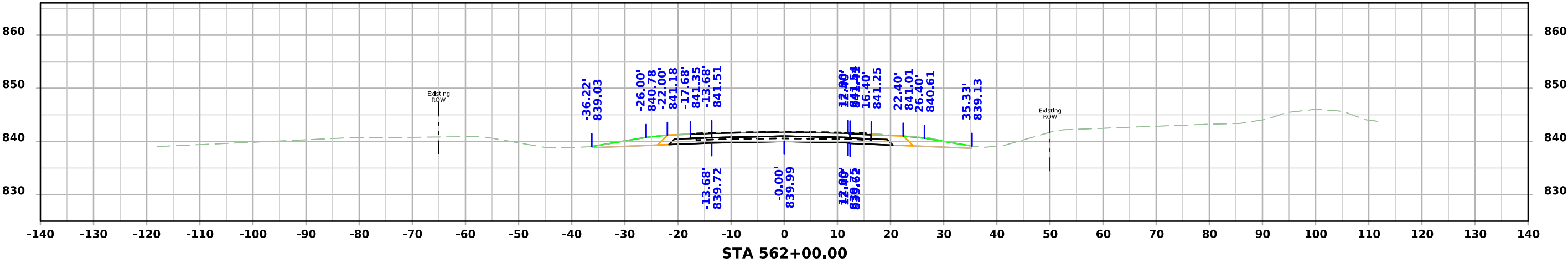
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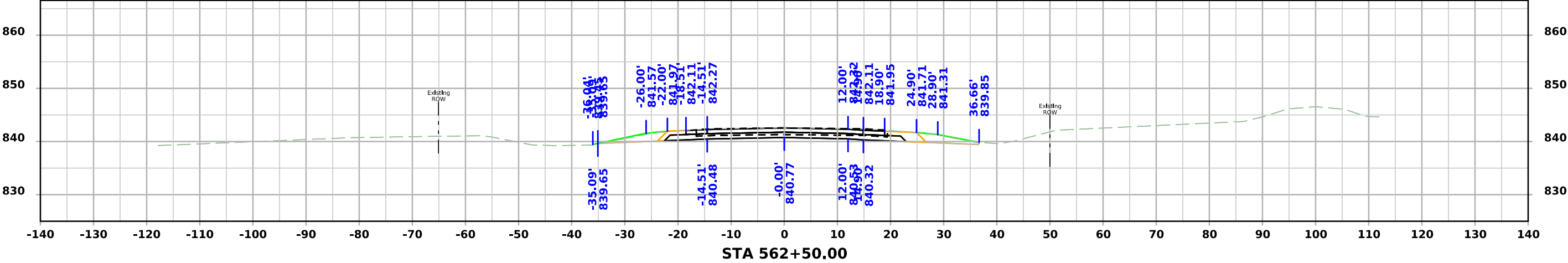
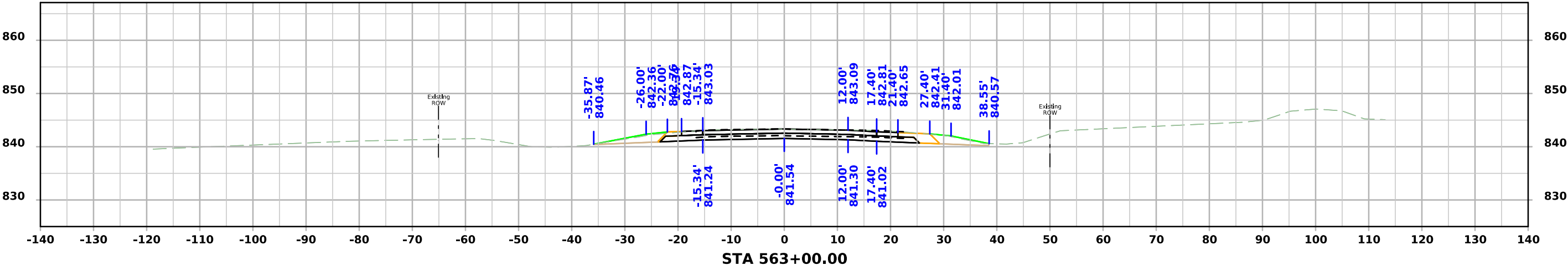
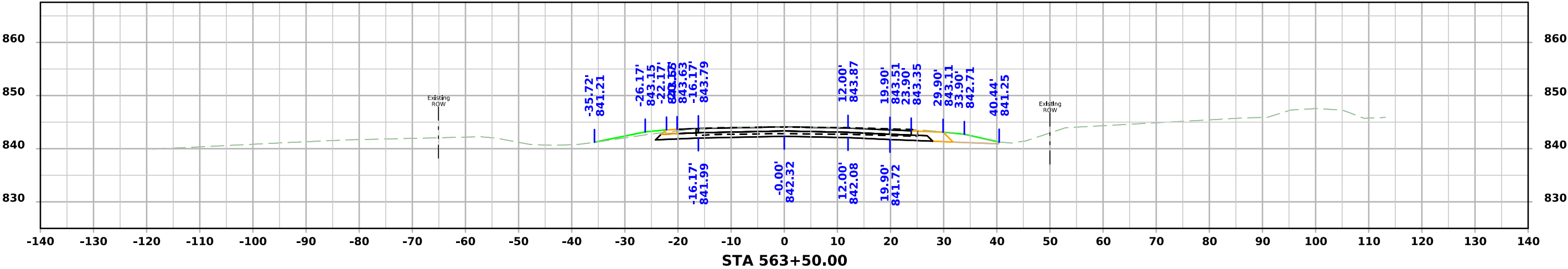
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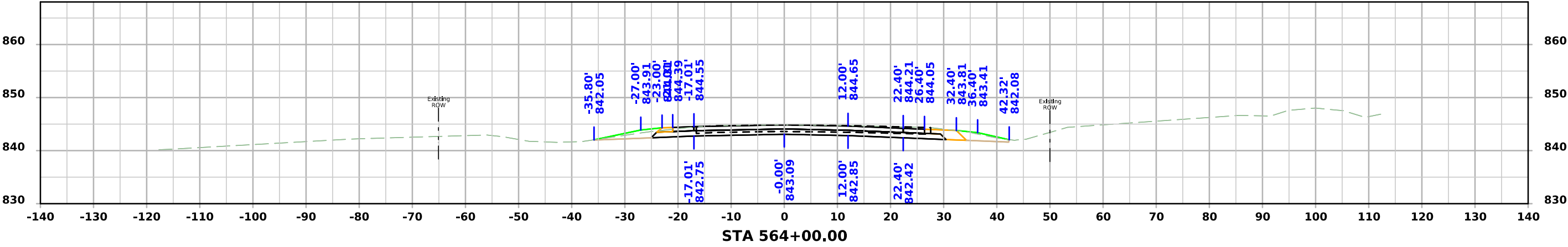
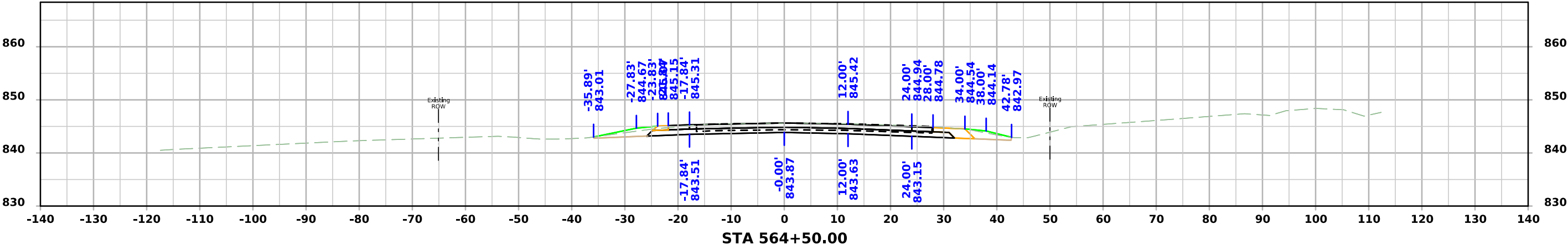
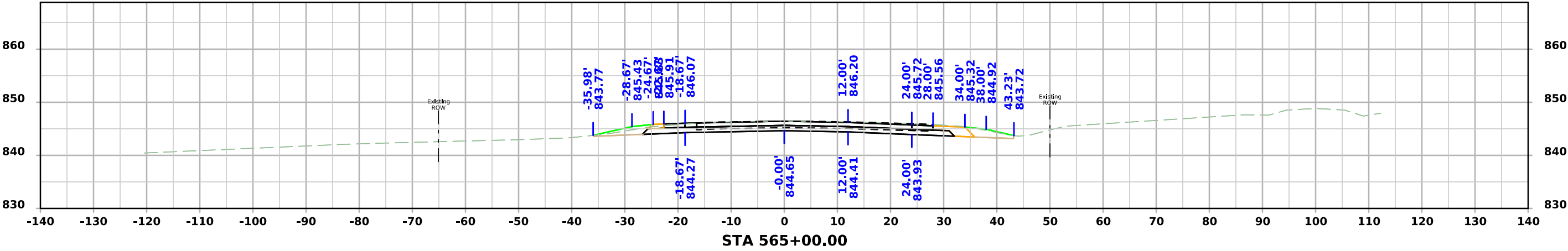
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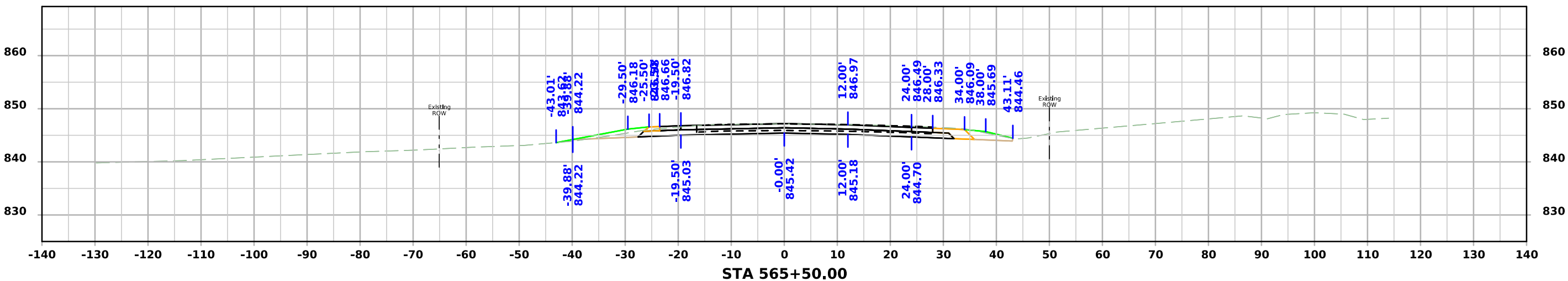
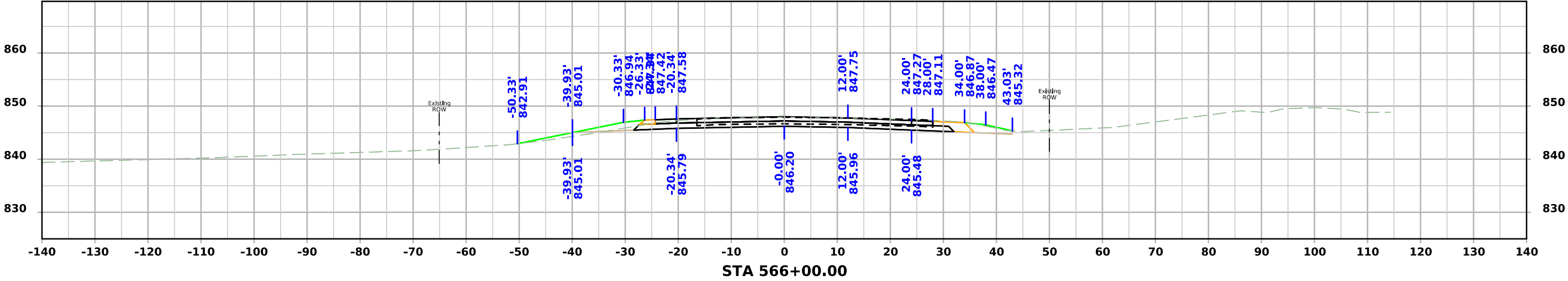
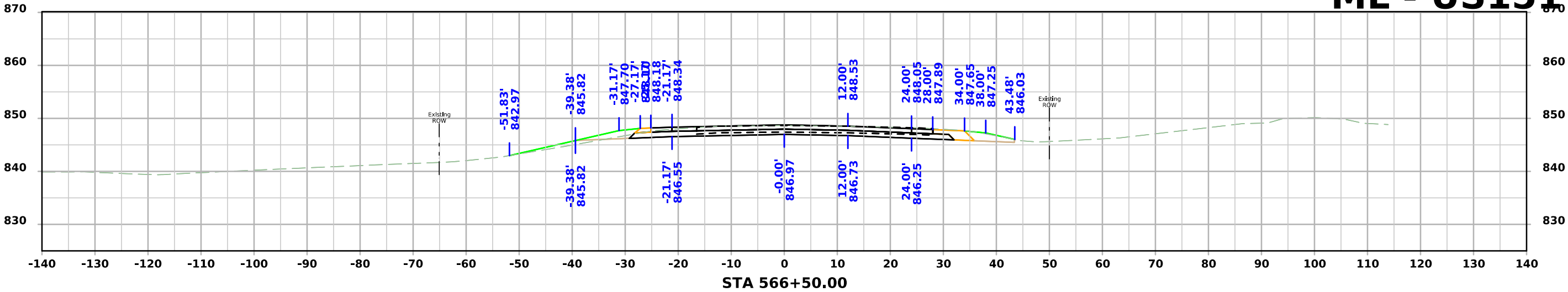
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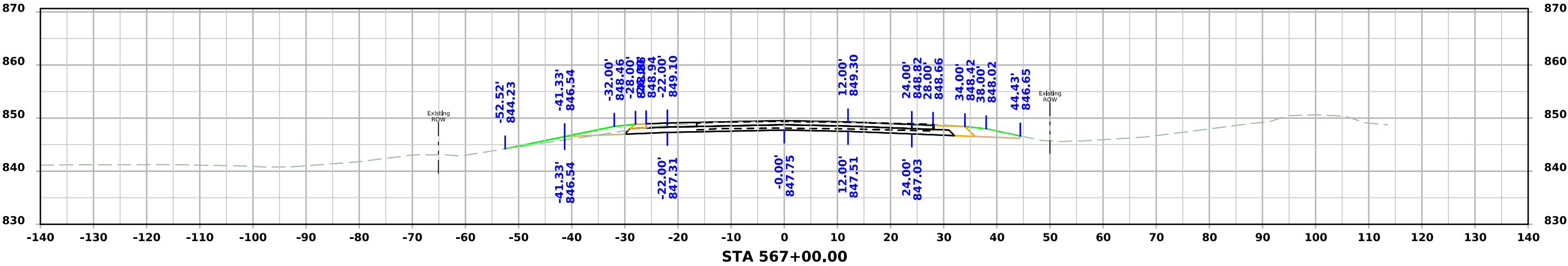
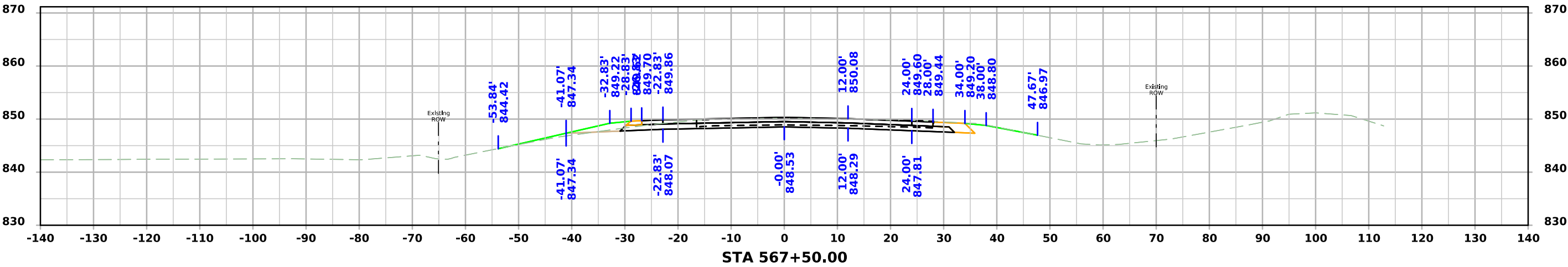
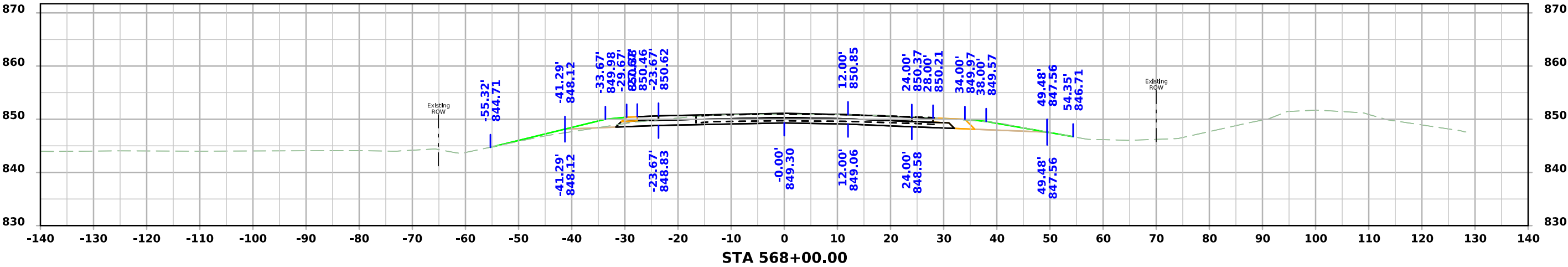
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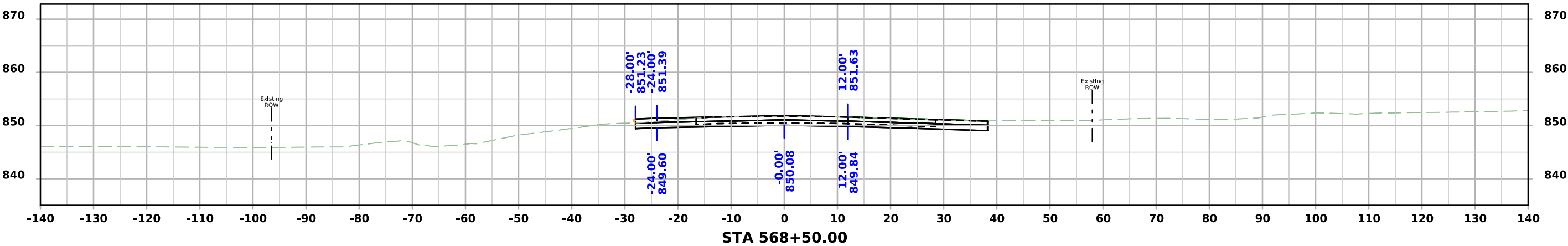
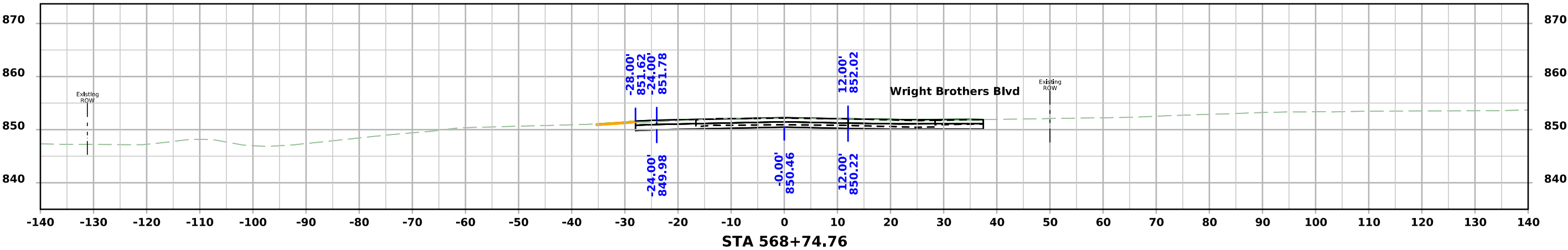
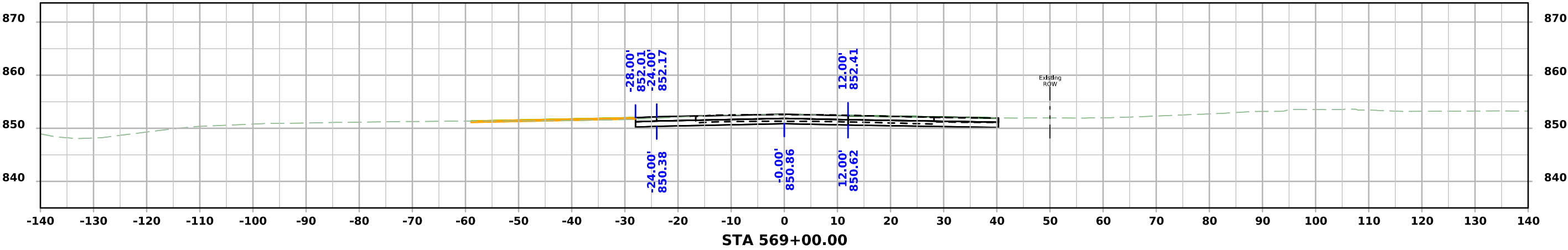
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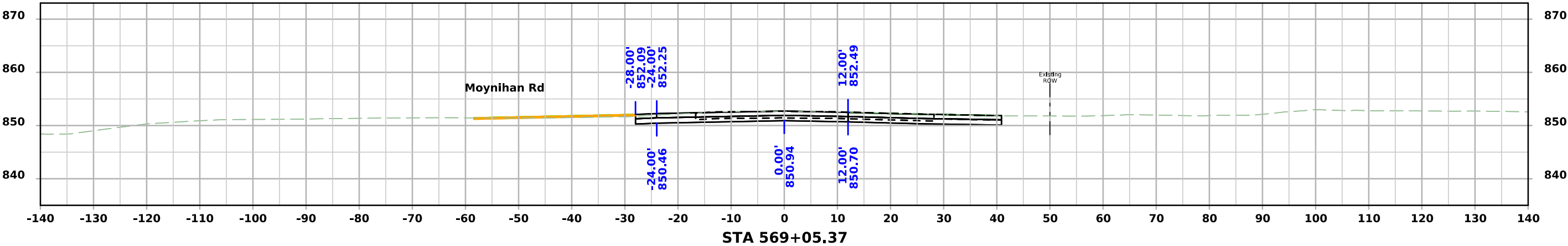
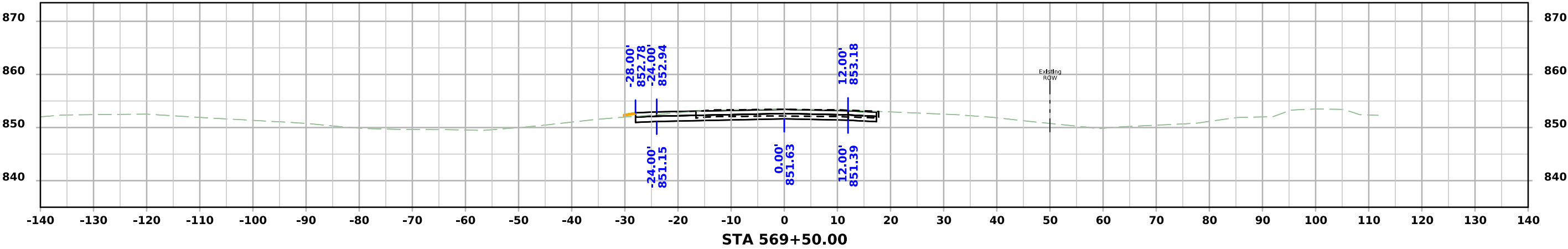
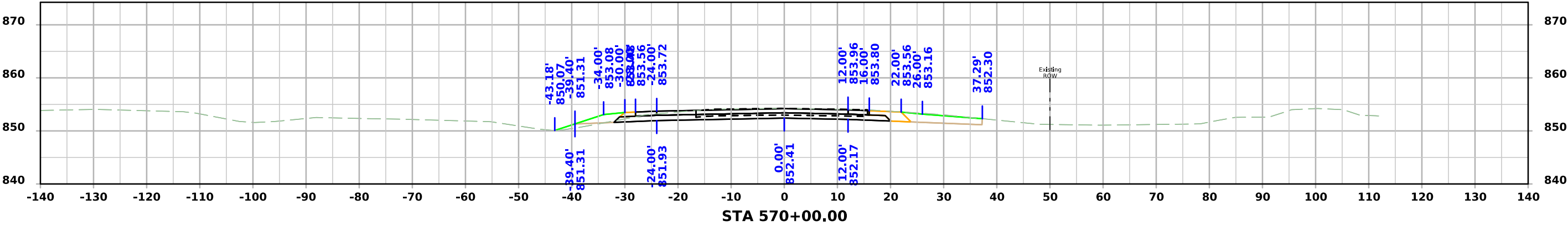
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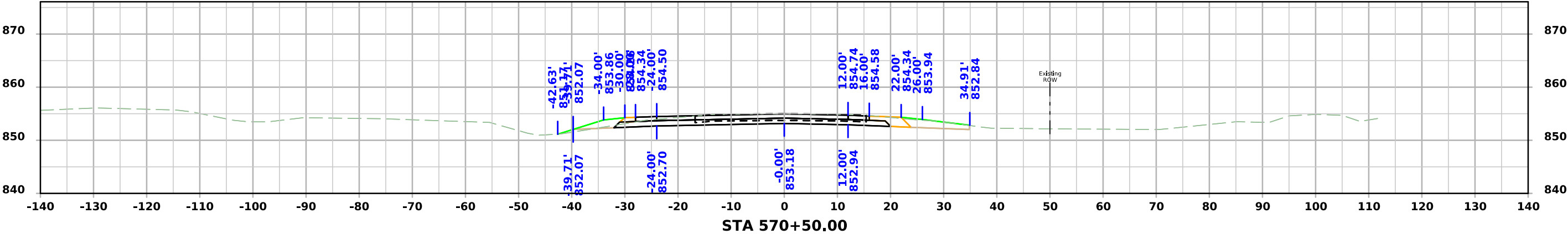
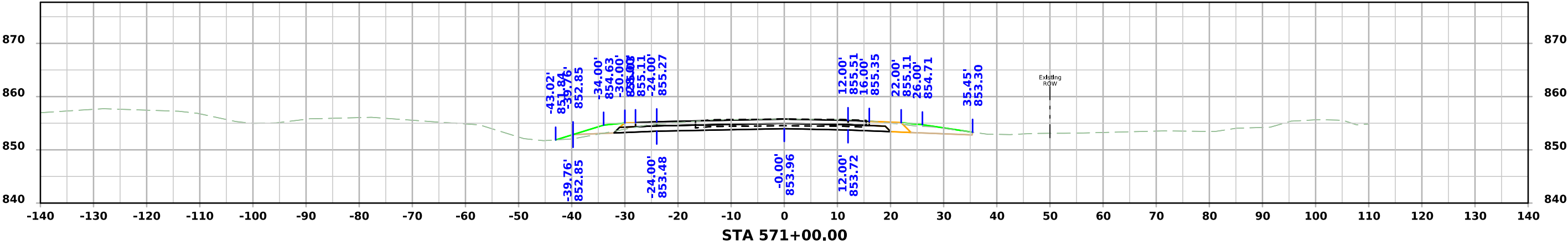
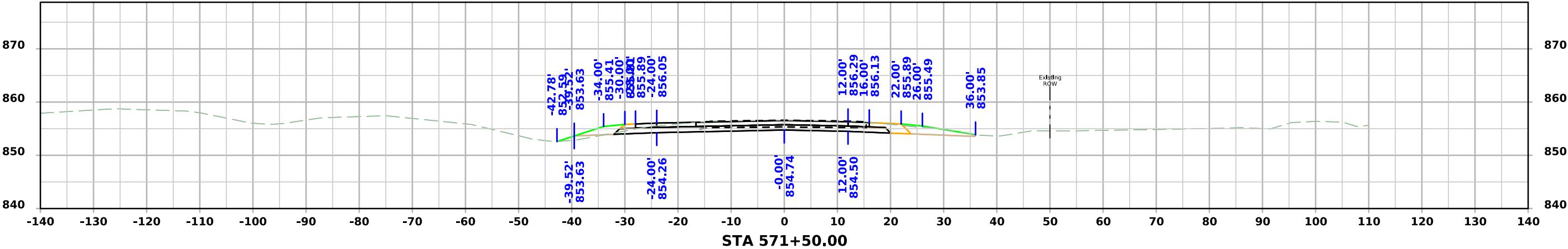
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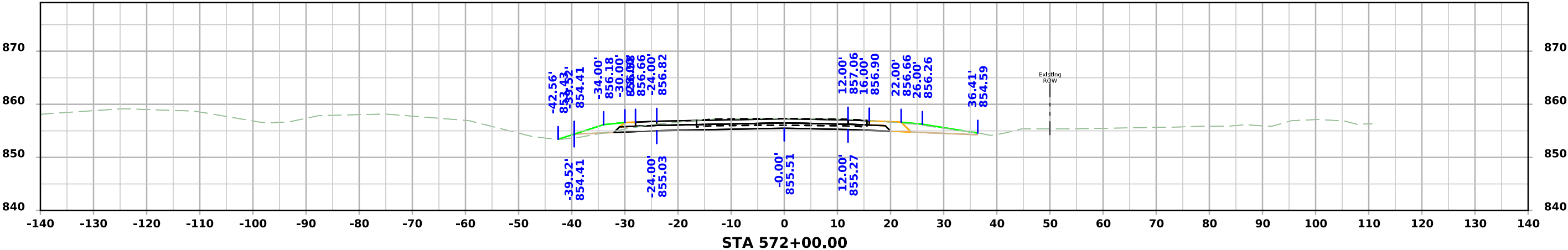
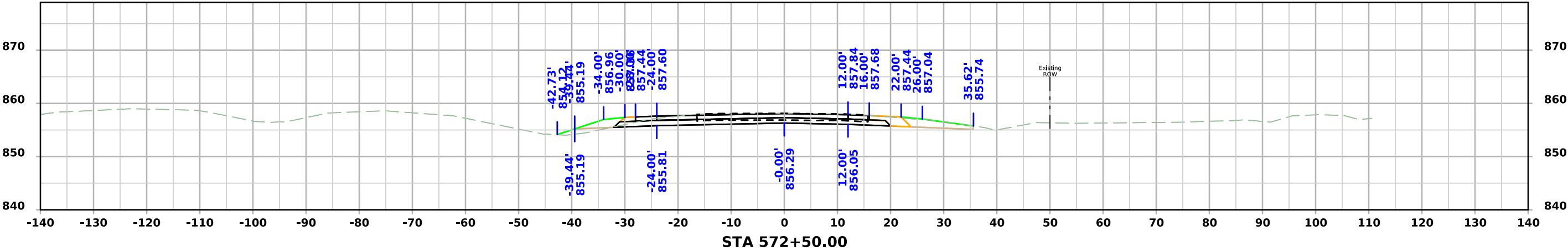
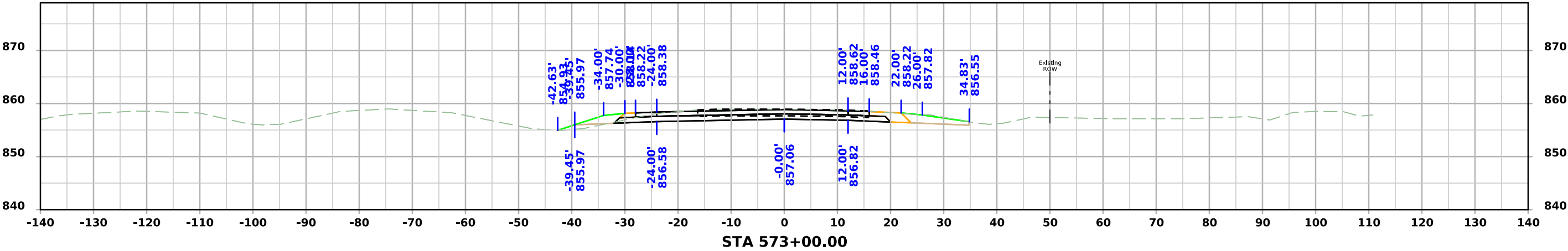
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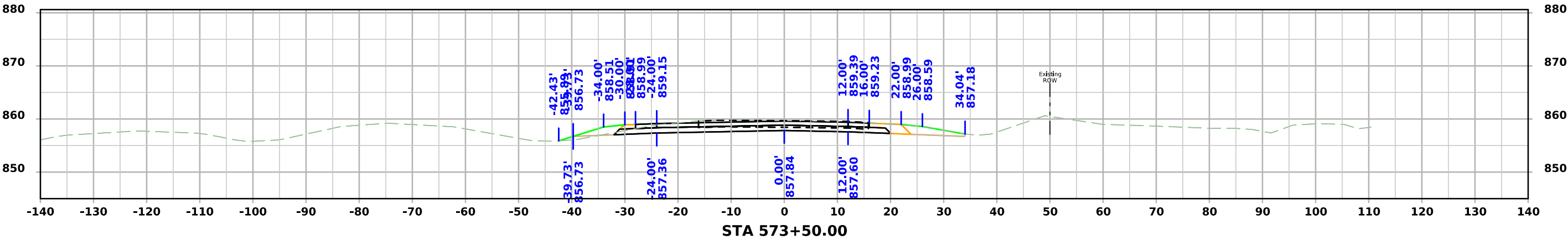
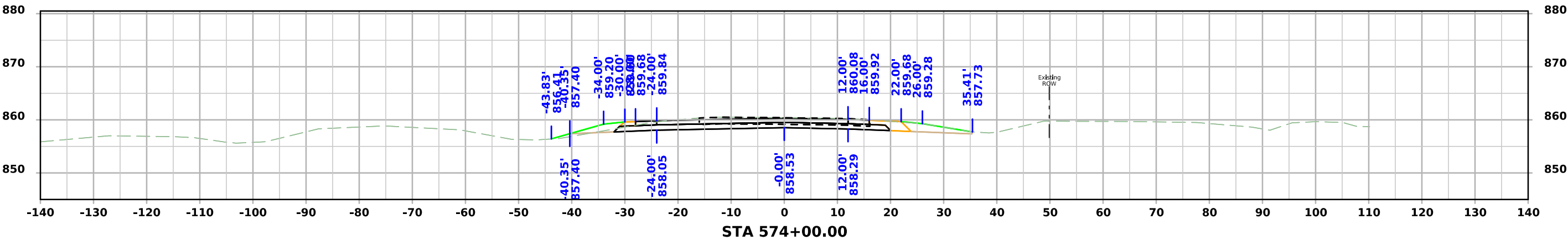
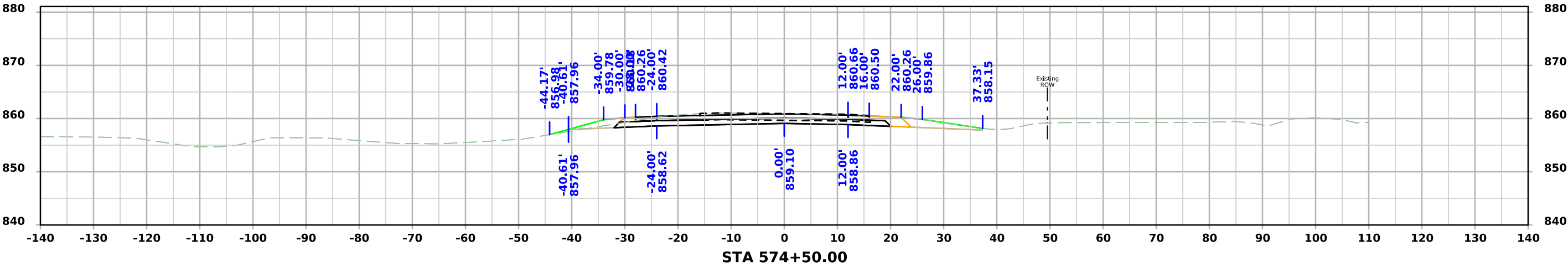
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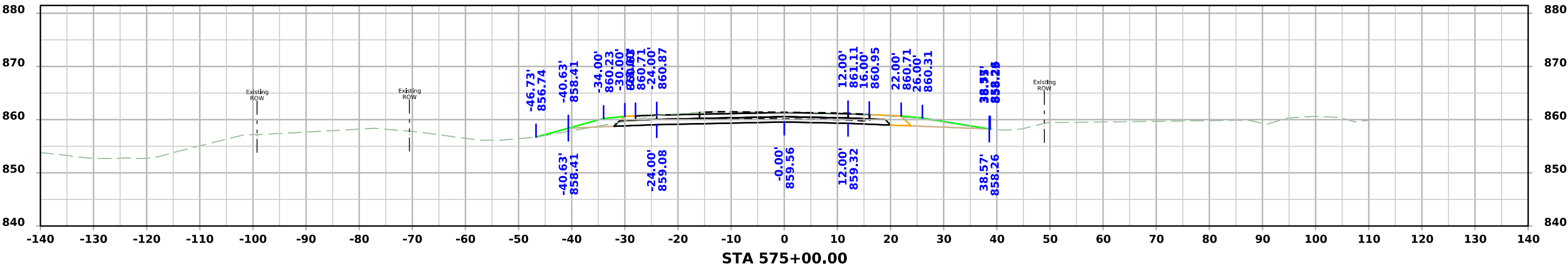
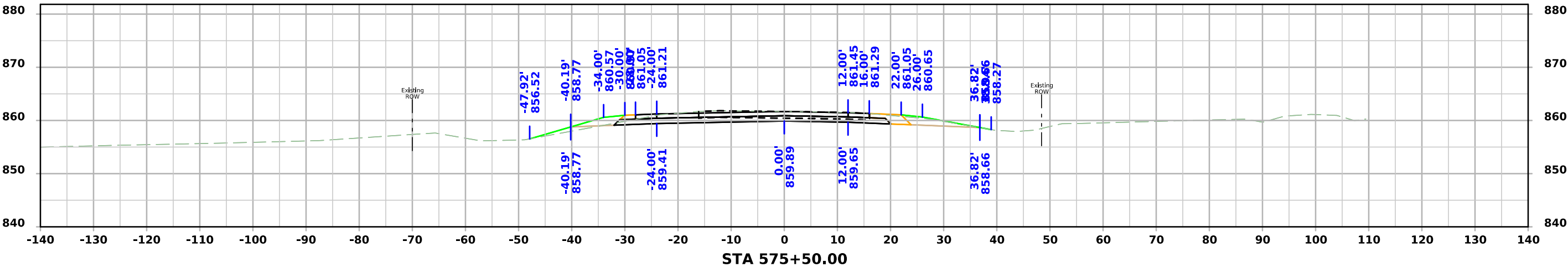
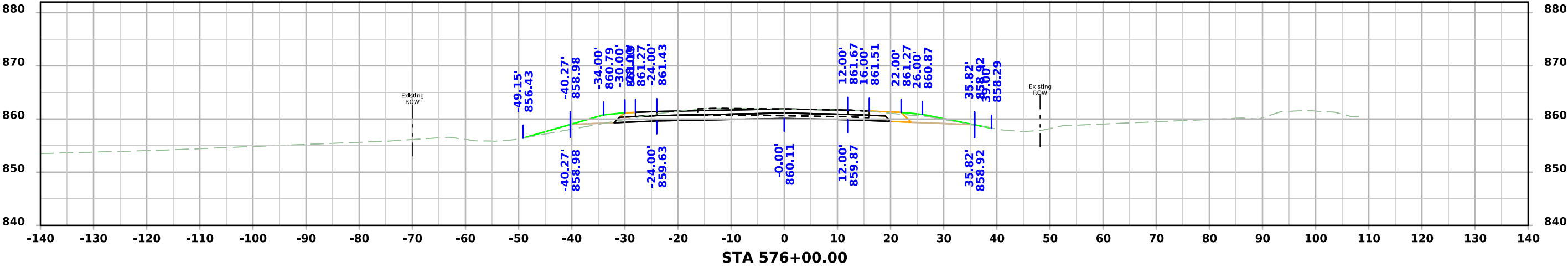
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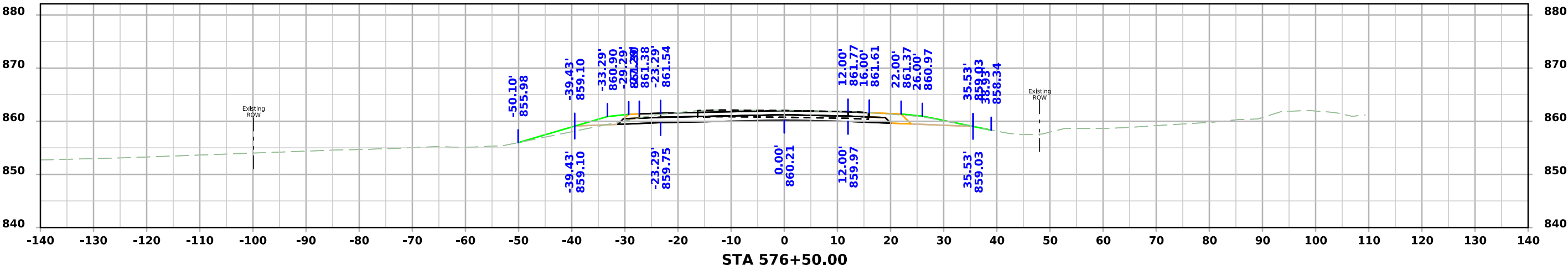
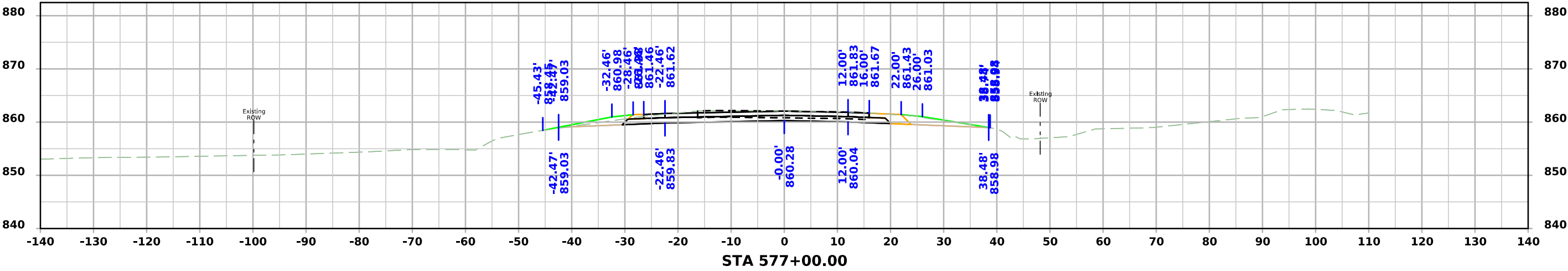
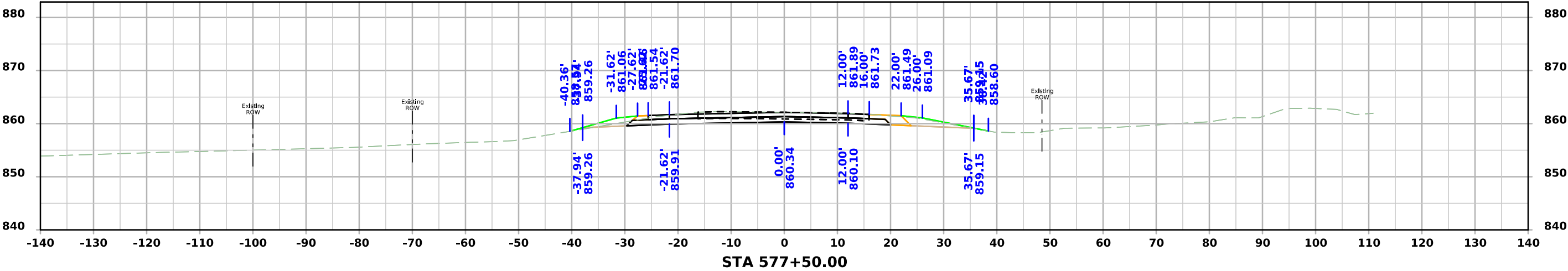
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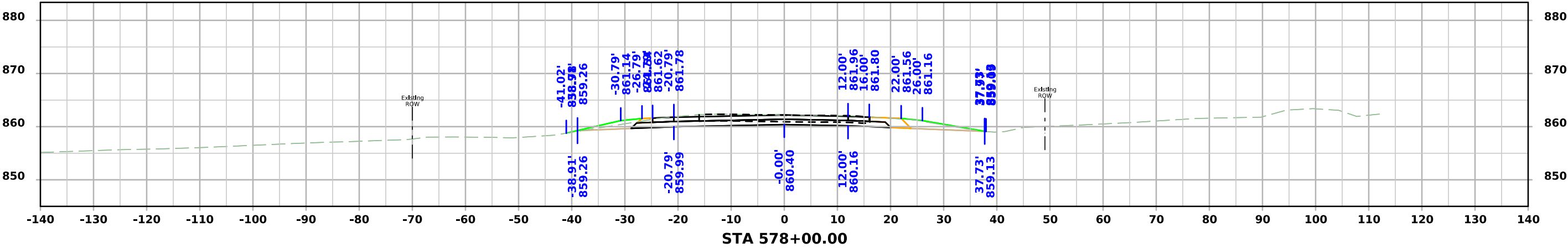
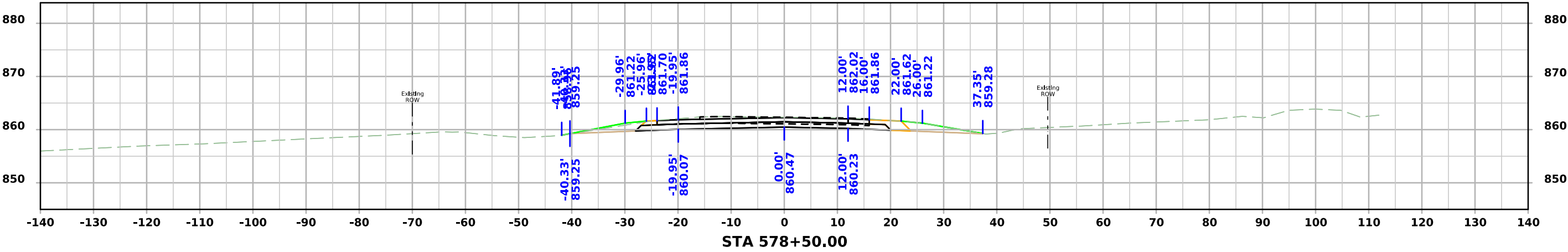
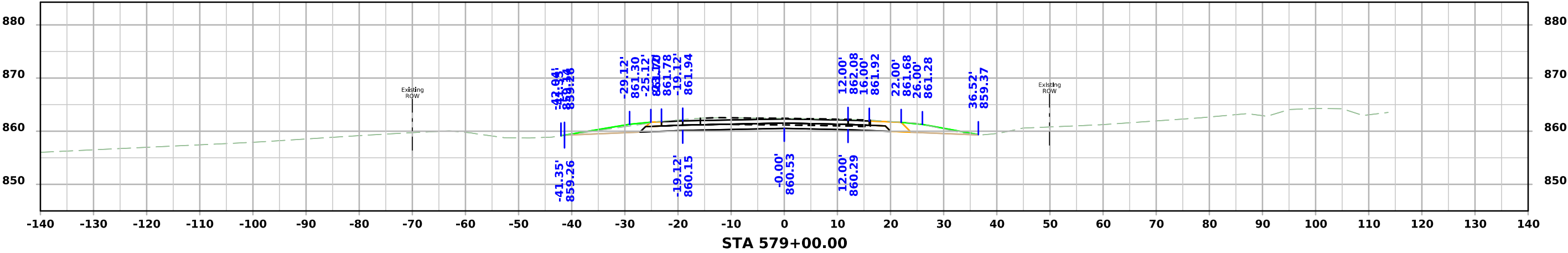
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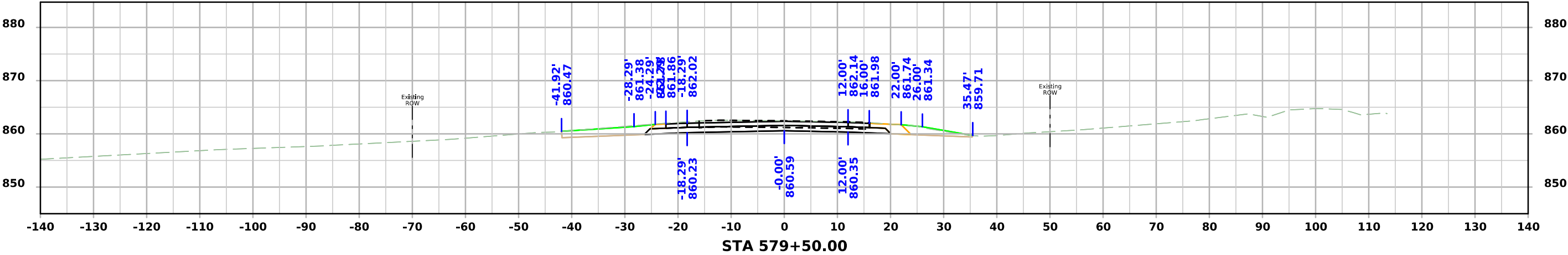
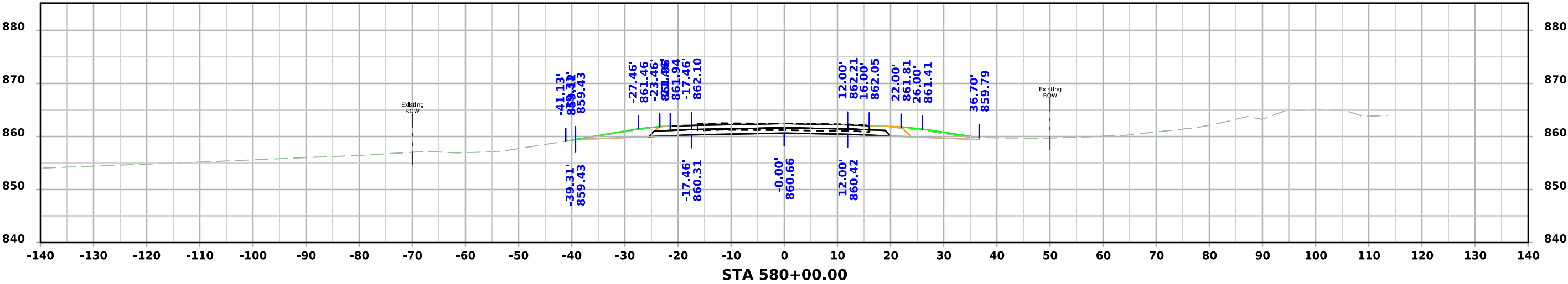
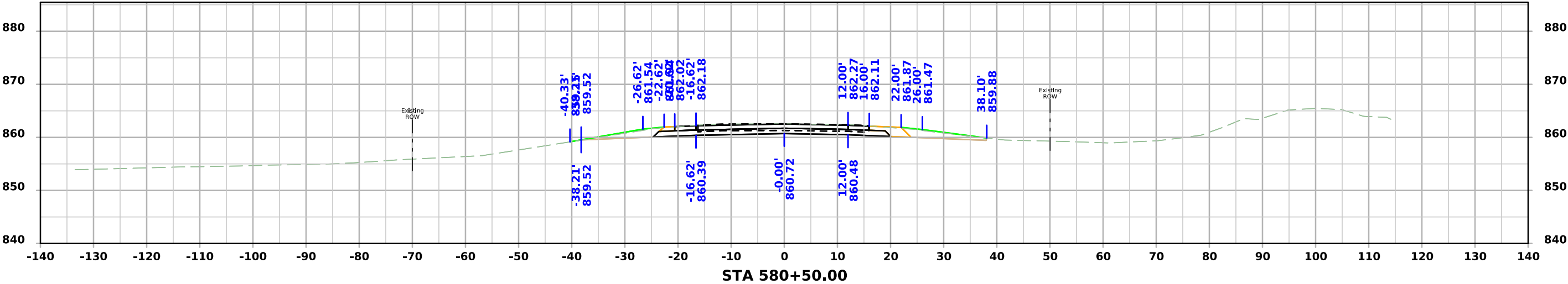
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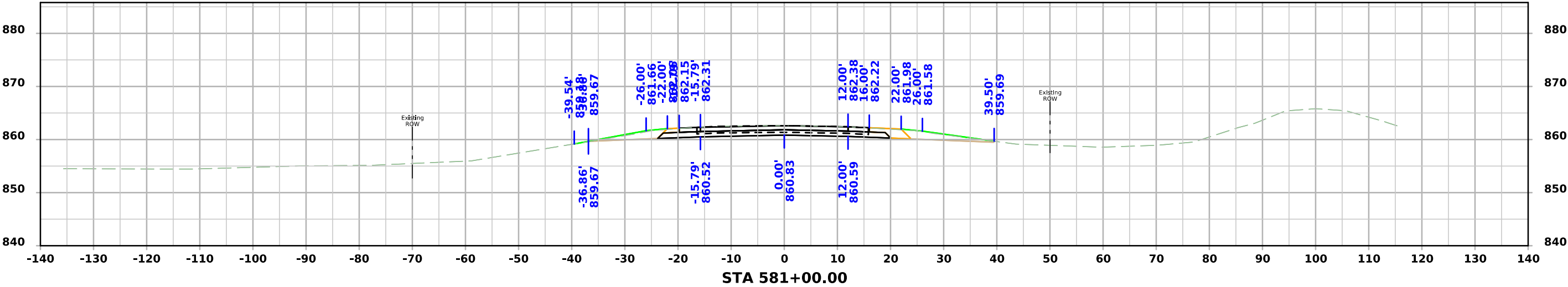
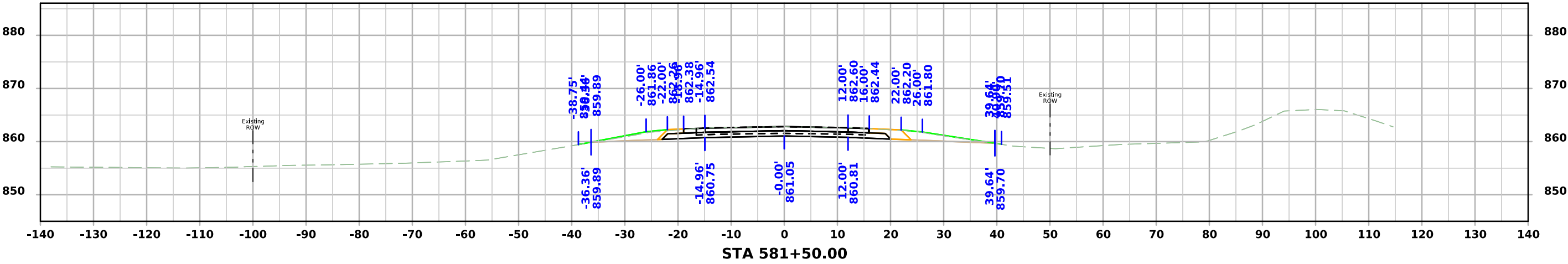
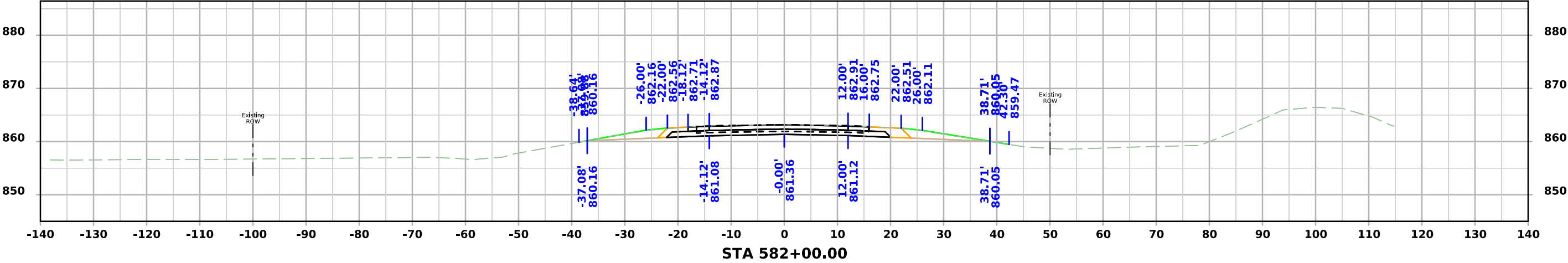
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