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A.3	Quimby Location Map Sheet
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C Sheets	Quantities and General Information
C.1 - 4	Estimated Project Quantities and Reference Information
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PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM

Cherokee COUNTY

RCB Culvert Extension - Single Box

Co Rd C66 in Washta to US 59

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

PROJECT IDENTIFICATION NUMBER	TOTAL
	182
17-97-031-010-01	
PROJECT NUMBER	
STPN-031-3(15)--2J-18	
R.O.W. PROJECT NUMBER	
STPN-031-3(12)--2J-18	

DESIGN DATA RURAL			
2019	AADT	1400	V.P.D.
2039	AADT	1400	V.P.D.
20	- DHV	--	V.P.H.
TRUCKS		14	%
Total			
Design ESALs		598,600	

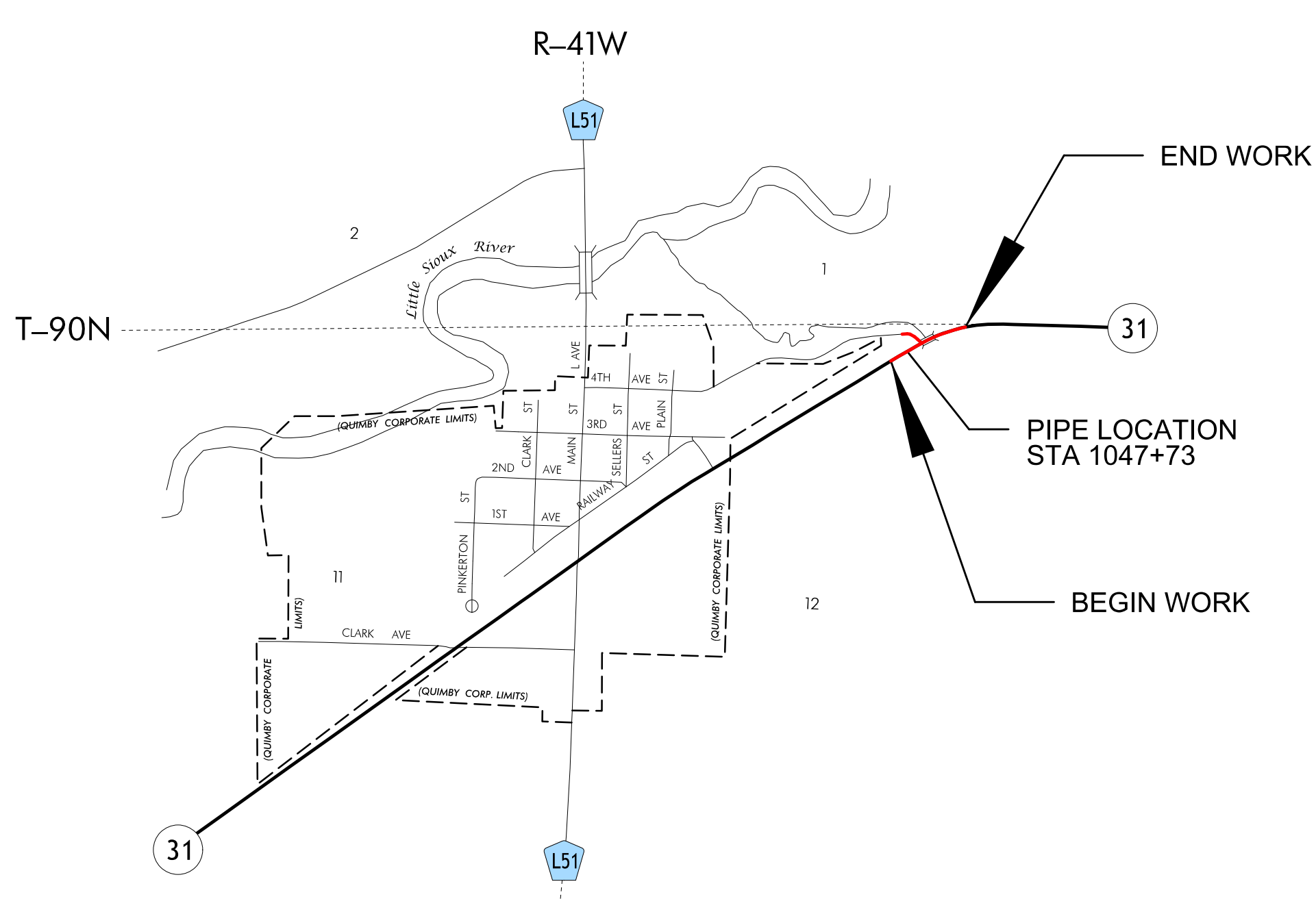
INDEX OF SEALS			
SHEET NO.	NAME	TYPE	BID QUANTITY SHEETS
A.1	Ryan R. Miller	Primary Signature Block	C.1-C.4
CD.1	Jim D. Ellis	Hydraulic Design	
CS.1	Mark A. Dell	Geotechnical Design	
RC.1	Rachel A. Harris	Landscape Design	RC.2-RC.4
V.1	Majellen C. Pitcher	Structural Design	V.1, V.6, V.11, V.16
V.3	Heidi J. Lane	Hydraulic Design	

ROADWAY DESIGN

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

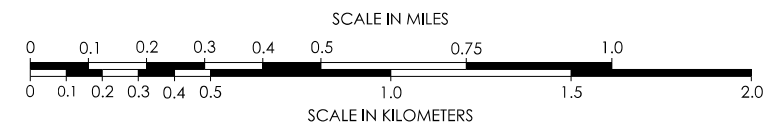
Ryan R. Miller 05-05-2026
Signature Date
Ryan R. Miller
Printed or Typed Name
My license renewal date is December 31, 2026

Pages or sheets covered by this seal: A.1-A.3, B.1-B.11, C.1-C.27, D.1-D.9, E.1, G.1-G.4, H.1-H.7, HE.1, J.1-J.3, T.1-T.6, U.1-U.2, W.1-W.41, X.1-X.6



LEGEND

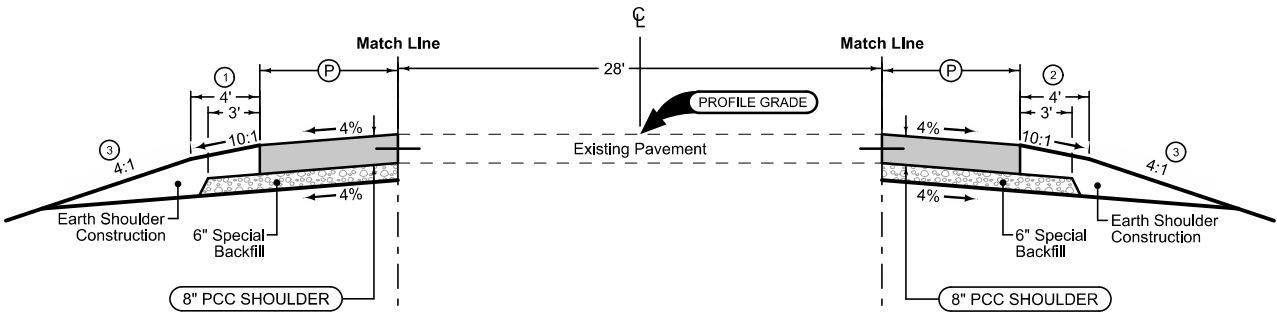
- INTERSTATE ROUTE
- FREEWAY OR EXPRESSWAY ROUTE
- U.S. NUMBERED ROUTE
- BUSINESS ROUTE
- STATE NUMBERED ROUTE
- UNSIGNED ROUTE
- COUNTY NUMBERED ROUTE
- SECONDARY ROAD OR ADJOINING CITY STREET
- CITY STREET
- PARK, INSTITUTION, OR FEDERAL ROAD
- RAILROAD
- CORPORATION LINE
- SECTION LINE
- CUL-DE-SAC
- SECTION, TOWNSHIP & RANGE NUMBERS



HIGHWAY AND STREET MAP
OF

QUIMBY
IOWA

PREPARED BY
IOWA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION DEVELOPMENT DIVISION
SYSTEMS PLANNING BUREAU
PHONE (515) 239-1664
IN COOPERATION WITH
UNITED STATES DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
18-6287

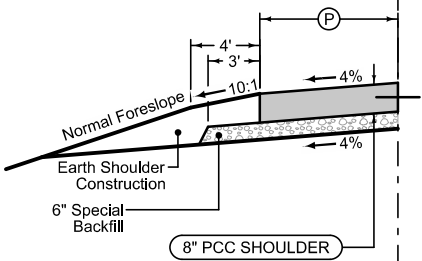


Paved Shoulder at Guardrail

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

2_P_Guard_ Modified		
STATION TO STATION		(P) Feet
1048+62.73	1048+82.73	8.4'
1048+82.73	1049+41.78	Var.
1049+41.78	1051+45.97	5.3'
1051+45.97	1052+05.01	Var.
1052+05.01	1052+25.01	8.4'

- ① Minimum of 3.5' from face of guardrail
- ③ Maximum of 2:1



Full Depth PCC Shoulder

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

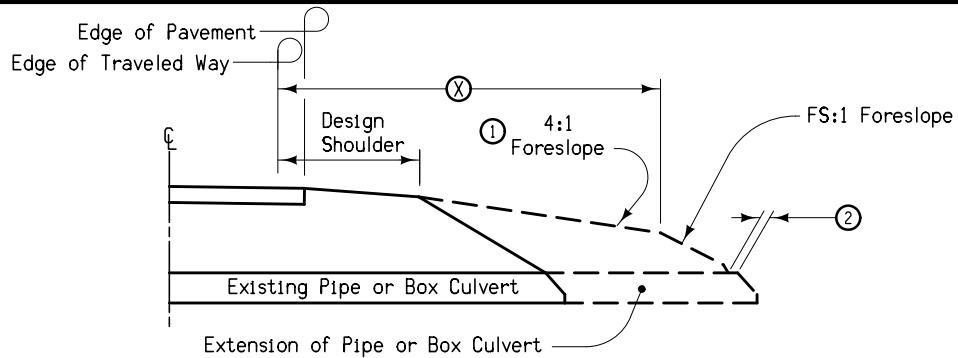
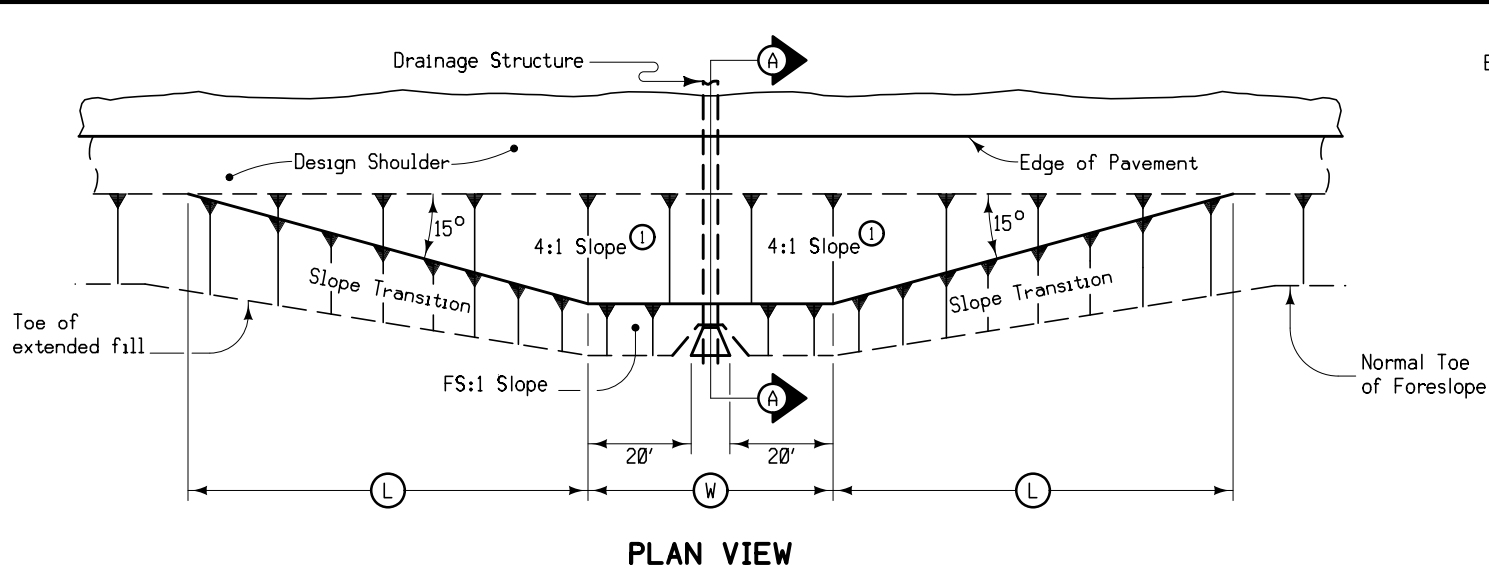
2_P_FullPCC_ 04-15-25		
STATION TO STATION		(P) Feet
1046+24.15	1047+16.01	2.0'

Paved Shoulder at Guardrail

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

2_P_Guard_ Modified		
STATION TO STATION		(P) Feet
1048+41.05	1048+61.05	2.4'
1048+61.05	1049+21.71	Var.
1049+21.71	1051+68.43	1.7'
1051+68.43	1052+29.09	Var.
1052+29.09	1052+49.10	2.4'

- ② Minimum of 4' from face of guardrail

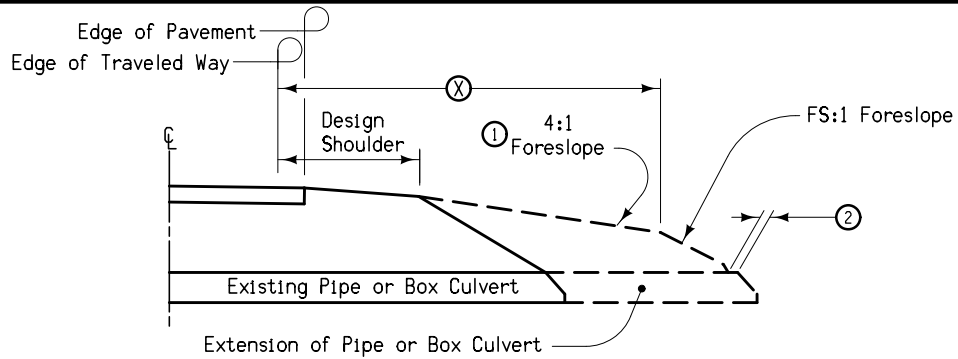
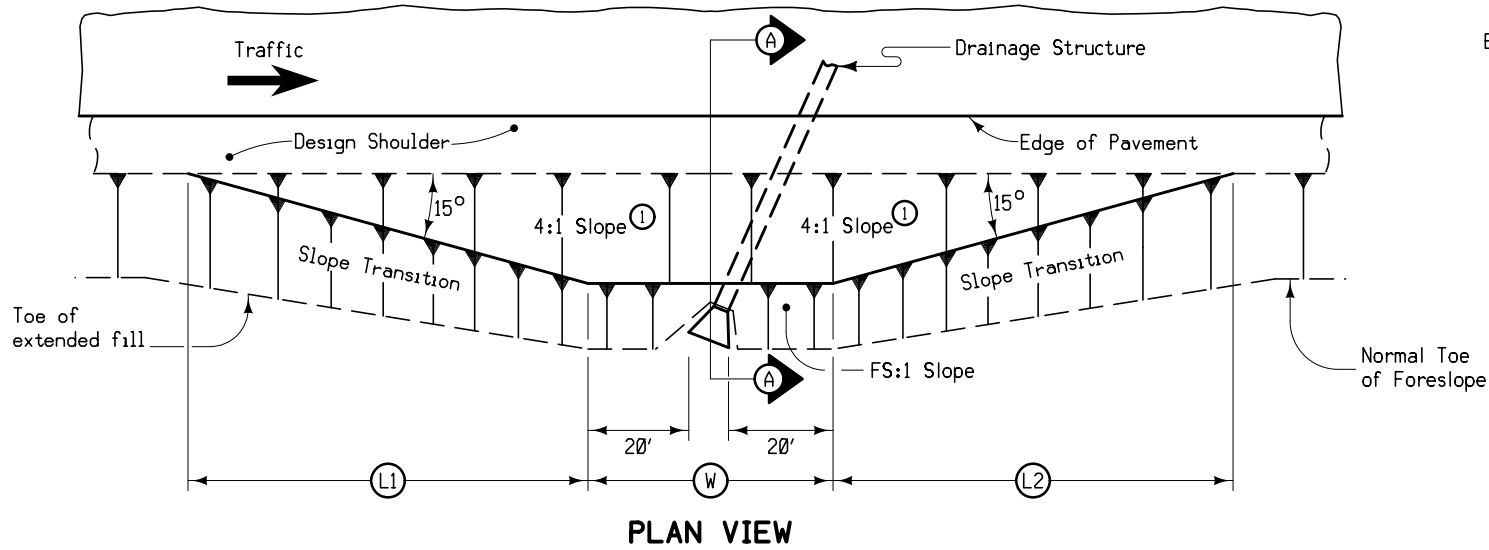


SECTION A-A

STRUCTURE LOCATION		W	L	X	FS
STATION	SIDE	Feet	Feet	Feet	
165+00.47	RT	51.5'	73.8'	25.9'	3
165+00.47	LT	51.5'	65.8'	26.1'	3
173+58.22	RT	58.3'	71.4'	26.2'	3
173+58.22	LT	58.3'	74.4'	26.7'	3
238+31.81	RT	49.5'	73.4'	26.1'	3
238+31.81	LT	49.5'	88.5'	26.6'	3
251+16.75	RT	46.5'	65.0'	24.0'	3
251+16.75	LT	46.5'	66.5'	24.0'	3
1126+73.36	RT	47.5'	55.0'	24.0'	3
1126+73.36	LT	47.5'	53.6'	24.0'	3

- Notes:
- At locations where an extended or newly constructed drainage structure extends beyond the normal foreslope cover, flatten the foreslope as indicated so as to cover the structure. Minimum earth cover is 6".
- ① Slope may be flatter than 4:1.
- ② 6" Minimum for pipe installations or to top of headwall on R.C.B.
- W = Pipe or R.C.B. opening width plus 20 feet each side.

BARNROOF FORESLOPE
AT DRAINAGE STRUCTURE

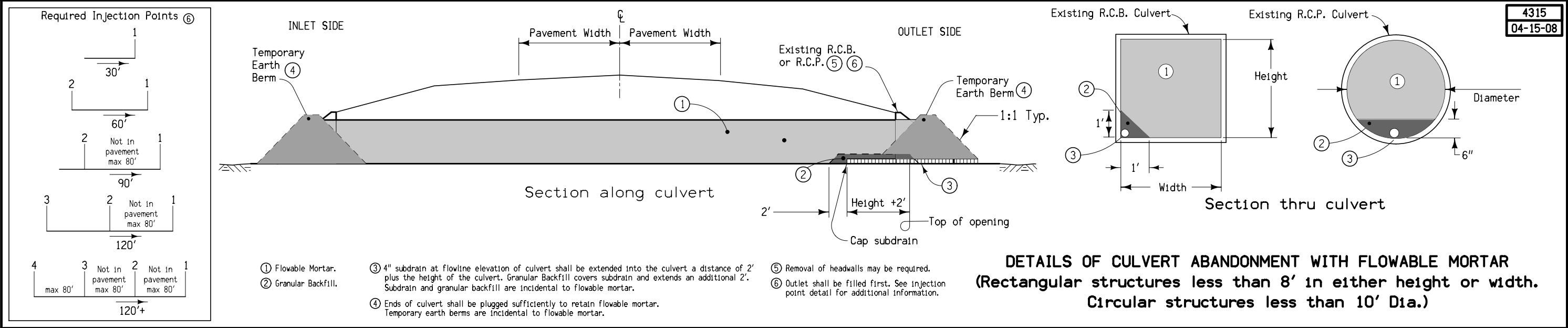


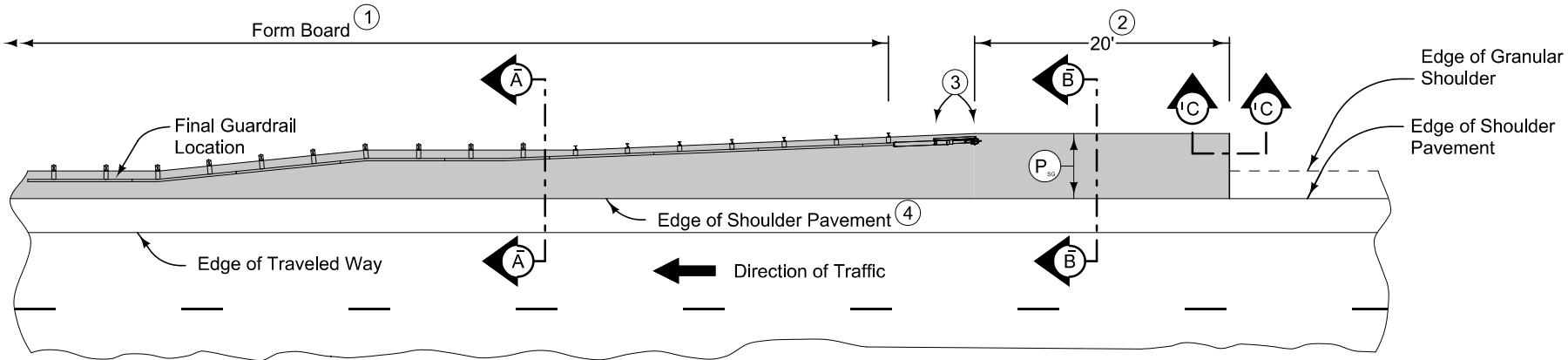
SECTION A-A

STRUCTURE LOCATION		W	L1	L2	X	FS
STATION ③	SIDE	Feet	Feet	Feet	Feet	
55+48.35	RT	47.9'	64.7'	22.8'	24'	3
55+48.35	LT	47.9'	65.2'	67.3'	24'	3
1208+88.09	RT	44.5'	51.9'	46.4'	24'	3

- At locations where an extended or newly constructed drainage structure extends beyond the normal foreslope cover, flatten the foreslope as indicated so as to cover the structure. Minimum earth cover is 6 inches.
- ① Slope may be flatter than 4:1.
- ② 6 inch minimum for pipe installations or to top of headwall on RCB.
- ③ At C of roadway.
- W = Pipe or RCB opening width plus 20 feet each side.

BARNROOF FORESLOPE AT
SKEWED DRAINAGE STRUCTURE





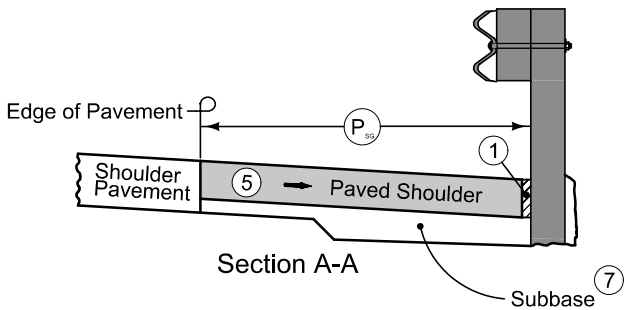
PLAN VIEW

8" PCC Paved Shoulder at guardrail with the following jointing layout:

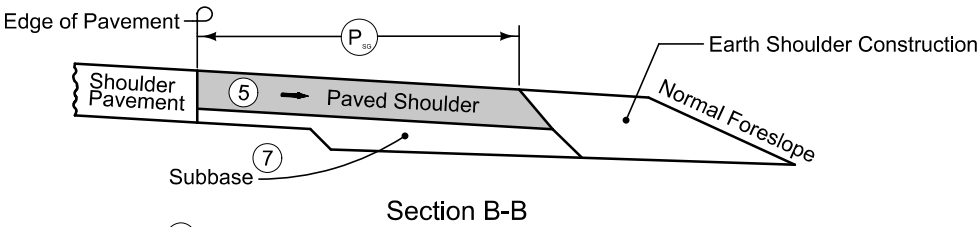
Match mainline pavement joint spacing. When mainline pavement is 8" or greater in thickness, place additional transverse 'C' joints in shoulder at mid-panel of the mainline pavement. Place longitudinal 'C' joint at P/2 from edge of mainline pavement when P is greater than 10' wide. Terminate longitudinal joint at transverse joint less than 10' in length.

Refer to Tabulation 112-9 for shoulder quantities.

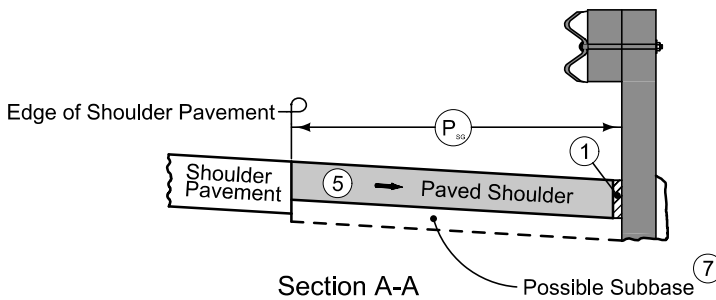
- ① PCC option only: When guardrail posts are installed prior to construction of PCC paved shoulder, fasten form board to the face of guardrail posts for the length shown.
- ② Continue paved shoulder 20 feet beyond the center of the first post.
- ③ Shoulder may be notched for first 2 posts or post sleeves may be installed through pavement. Do not drive posts through pavement.
- ④ 'BT' (per PV-101) joint for PCC shoulder.
- ⑤ Match shoulder slope.
- ⑥ The Contractor has the option to pave the paved shoulder at guardrail and the partial width paved shoulder as one operation.
- ⑦ Refer to other details in the plan.



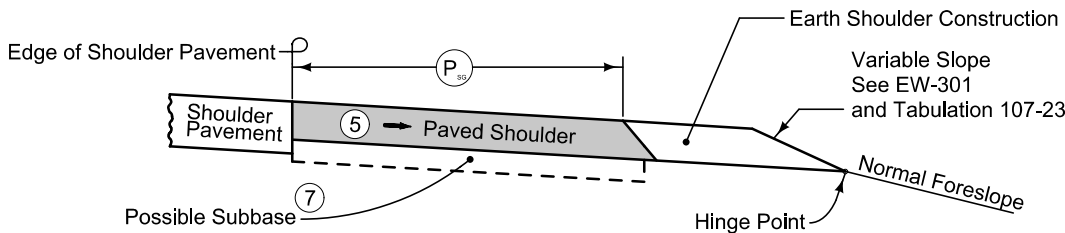
NEW CONSTRUCTION



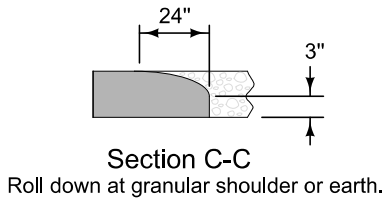
Section B-B



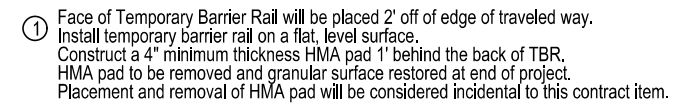
EXISTING SHOULDER



Section B-B

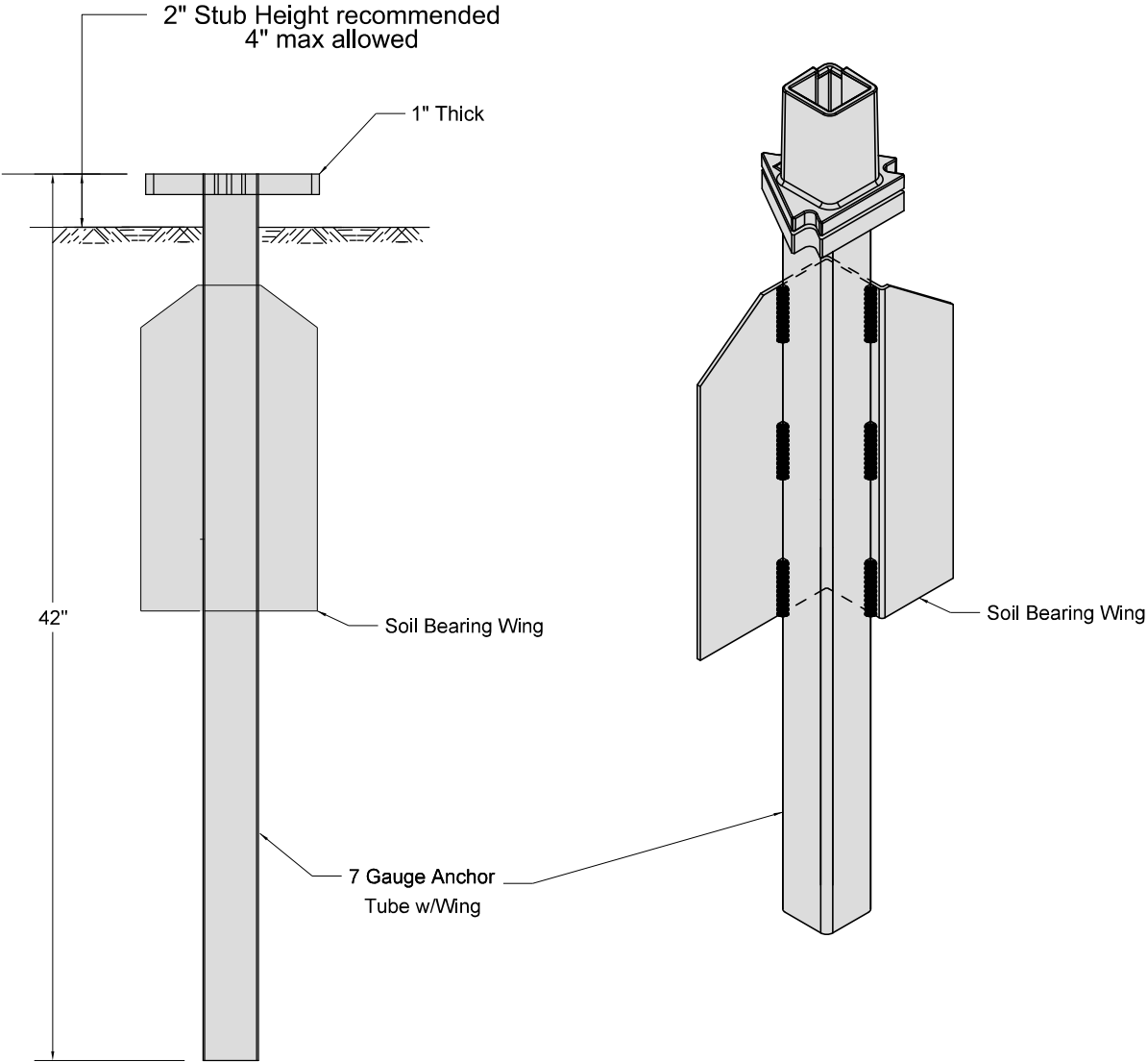


PAVED SHOULDER AT GUARDRAIL
(ADJACENT TO PARTIAL WIDTH PAVED SHOULDER)

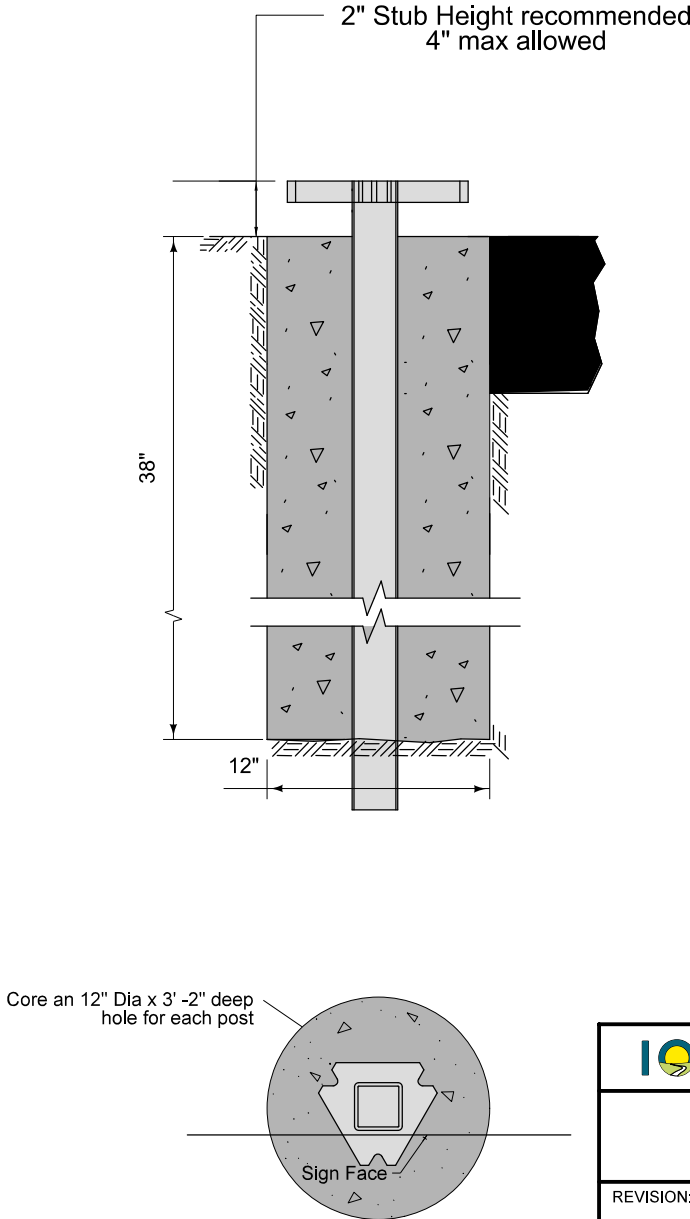



Location Station	Side	AA	WL	TA	L	Anchored		Remarks
		Feet	Feet	Feet	Feet			
165+00.47	Lt.	100'	12.5'	100'	212.5'			Design # 0127
165+00.47	Rt.	100'	12.5'	100'	212.5'			Design # 0127
173+58.22	Lt.	100'	25'	100'	225.0'			Design # 0227
173+58.22	Rt.	100'	25'	100'	225.0'			Design # 0227
238+31.81	Lt.	100'	12.5'	100'	212.5'			Design # 0327
238+31.81	Rt.	100'	12.5'	100'	212.5'			Design # 0327
251+16.75	Lt.	100'	12.5'	100'	212.5'			Design # 0427
251+16.75	Rt.	100'	12.5'	100'	212.5'			Design # 0427

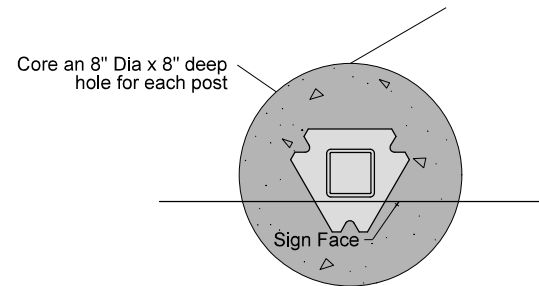
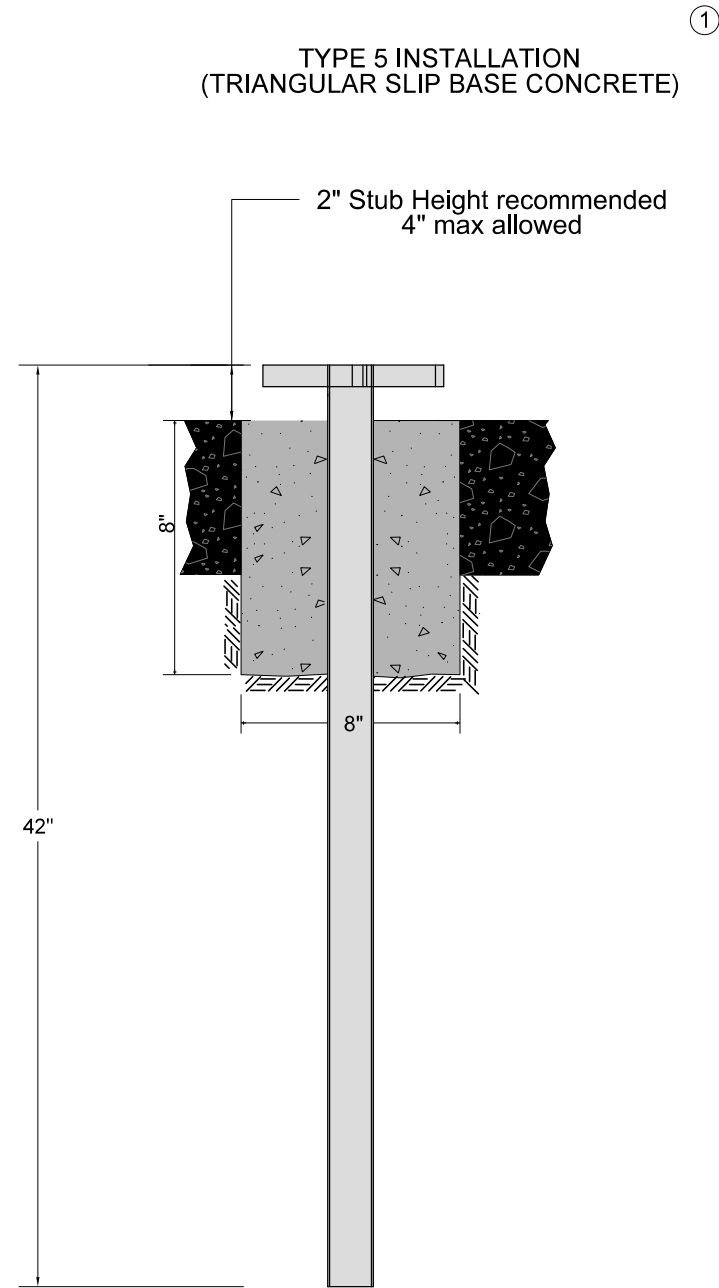
TYPE 3 INSTALLATION
(TRIANGULAR SLIP BASE SOIL)





TYPE 4 INSTALLATION
(TRIANGULAR SLIP BASE CONCRETE)

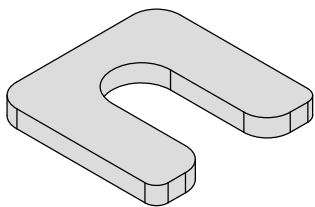


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	TAS STANDARD	
REVISION: __		
Support Structures - Perforated Square Steel Tube Anchor and Post		

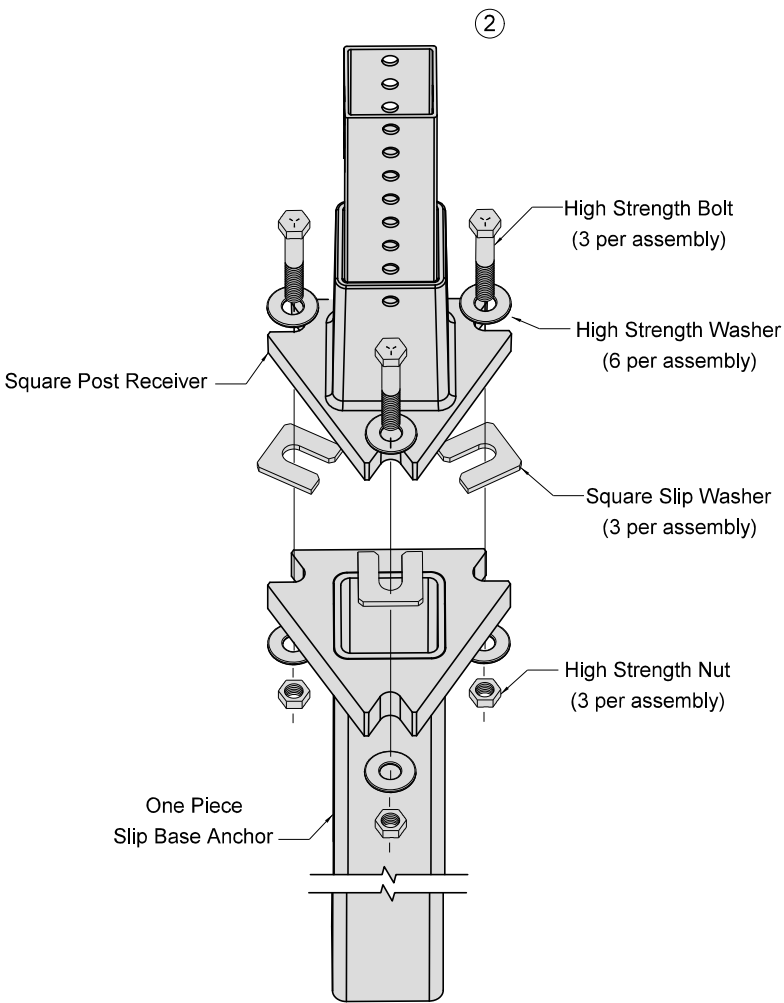


① Used in concrete islands.

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Support Structures - Perforated Square Steel Tube Anchor and Post				

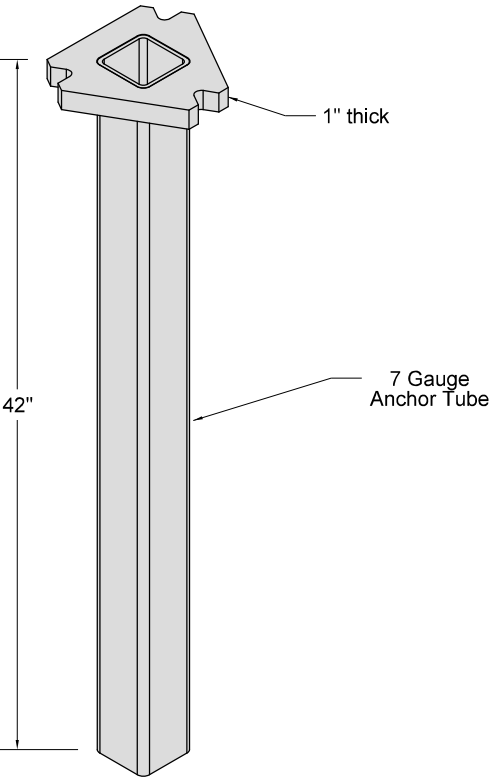


1 $\frac{3}{4}$ " SQUARE X $\frac{3}{16}$ "
SQUARE SLIP WASHER



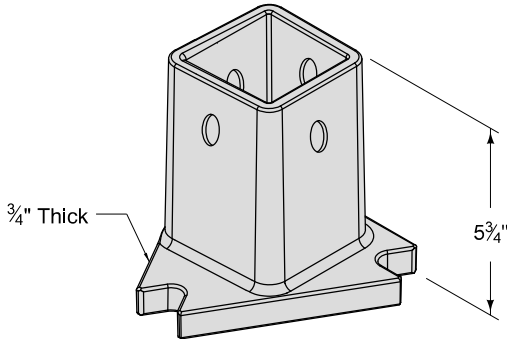
EXPLODED VIEW
SLIP BASE, RECEIVER AND
CONNECTION HARDWARE

ONE PIECE
SLIP BASE ANCHOR



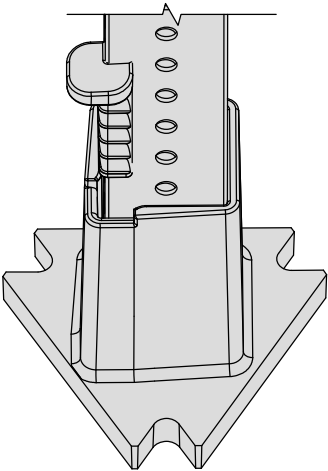
- ① Type III/IV installation
② Fastener size and installation procedure shall be according to manufacturer's recommendation.


OPTION 1



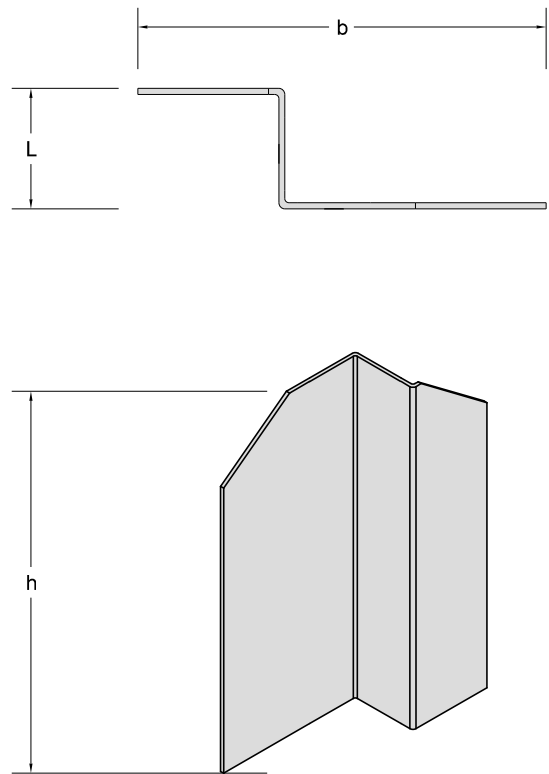
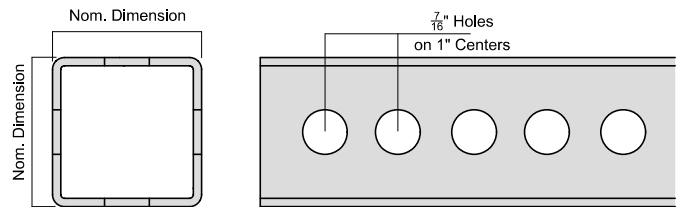
2 $\frac{1}{2}$ " SQUARE POST RECEIVER

OPTION 2



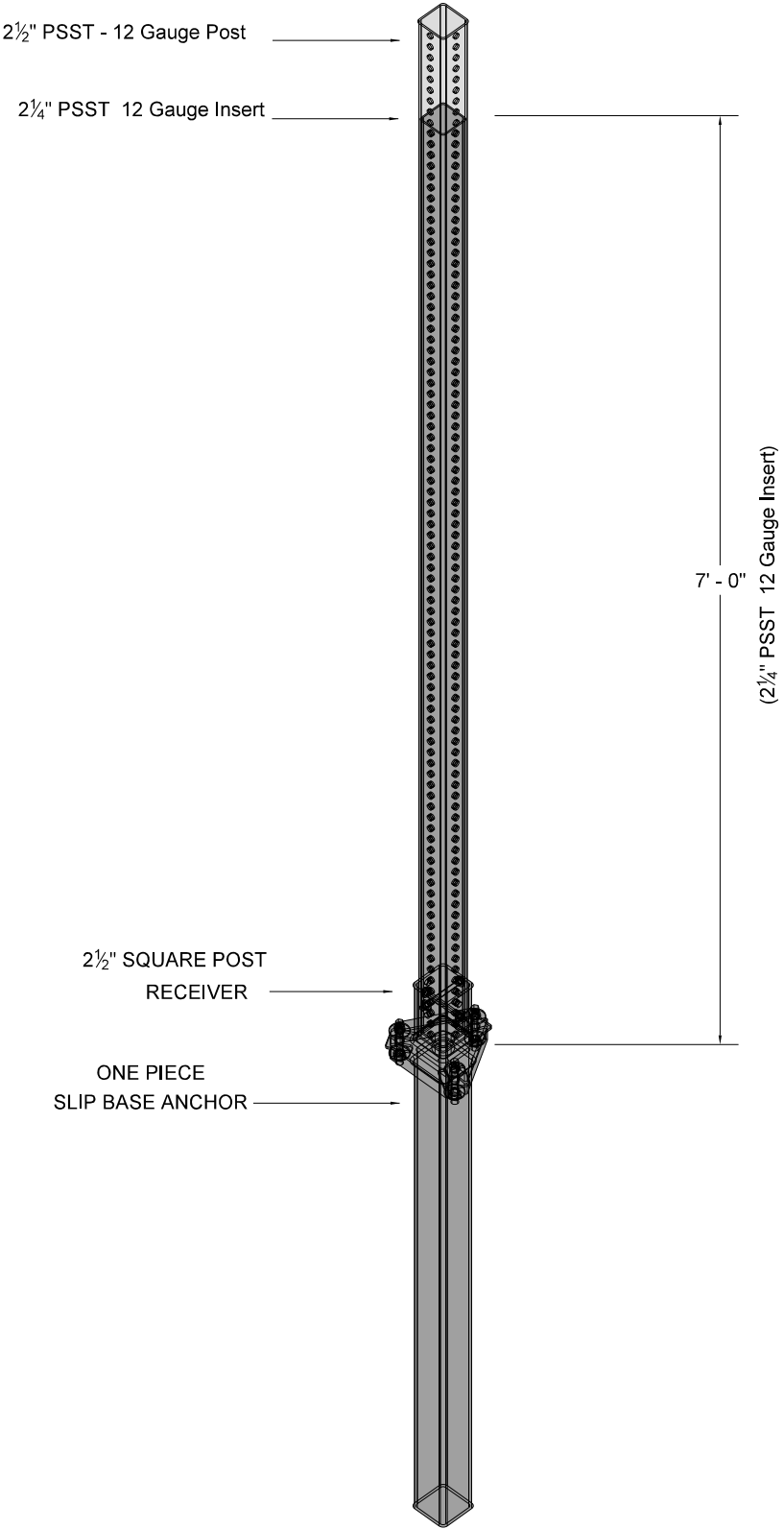
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<div>Support Structures - Perforated Square Steel Tube Anchor and Post</div>			

PERFORATED STEEL SQUARE TUBE POST DETAILS

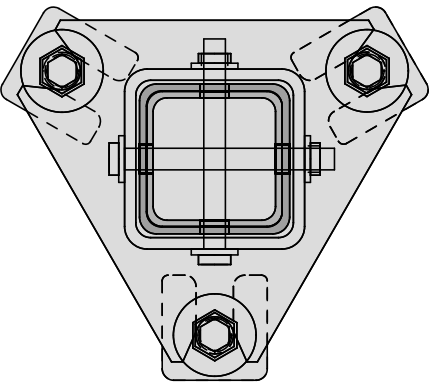
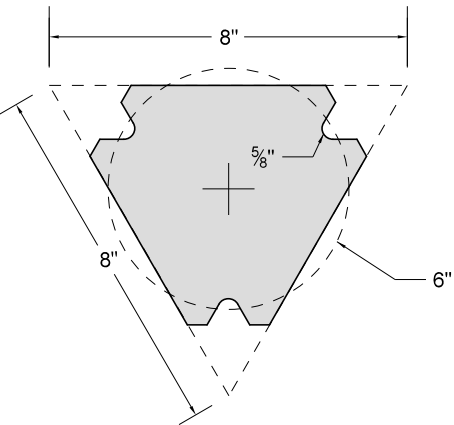


SOIL BEARING WING


SLIP BASE WITH NESTED PERFORATED SQUARE STEEL TUBE POST^①



SLIP PLATE DIMENSIONS^①

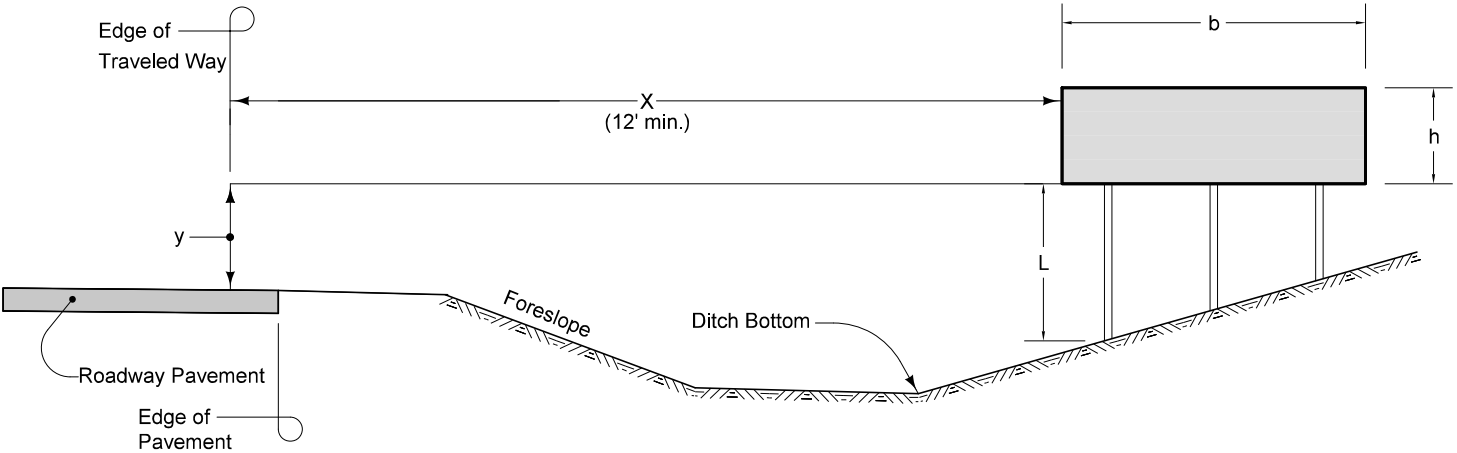


^① Type III/IV installation only


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Support Structures - Perforated Square Steel Tube Anchor and Post				

Note: The sign centroid is equivalent to $L + h/2$, (length of the longest post from the ground to the bottom of the sign plus the half the height of the sign.) and the Sign Area Yielding Design is the maximum area that the corresponding sign can have without failure. Sign Area is equivalent to $b \times h$.

POST LOADING FOR PERFORATED SQUARE STEEL TUBE POSTS						
SIGN CENTROID (FT)	SIGN AREA (SQ-FT) YIELDING DESIGN					
	TYPE 1 TYPE 2	TYPE 3/TYPE 4 (SLIP BASE REQUIRED)				
		2 1/2" x 12ga		2 1/4" x 12ga inserted into a 2 1/2" x 12 ga		
		1 Post	2 Post	3 Post	1 Post	2 Post
16.5	10.44	20.88	31.32	18.78	37.56	56.34
16	10.76	21.52	32.28	19.36	38.72	58.08
15.5	11.11	22.22	33.33	19.99	39.98	59.97
15	11.48	22.96	34.44	20.65	41.3	61.95
14.5	11.87	23.74	35.61	21.36	42.72	64.08
14	12.3	24.6	36.9	22.13	44.26	66.39
13.5	12.75	25.5	38.25	22.95	45.9	68.85
13	13.24	26.48	39.72	23.83	47.66	71.49
12.5	13.77	27.54	41.71	24.78	49.56	74.34
12	14.35	28.7	43.05	25.82	51.64	77.46
11.5	14.97	29.94	44.91	26.94	53.88	80.82
11	15.65	31.3	46.95	28.16	56.32	84.48
10.5	16.4	32.8	49.2	29.5	59	88.5
10	17.22	34.44	51.66	30.98	61.96	92.94
9.5	18.12	36.24	54.36	32.61	65.22	97.83
9	19.13	38.26	57.39	34.42	68.84	103.26
8.5	20.26	40.52	60.78	36.45	72.9	109.35
8	21.52	43.04	64.56	38.72	77.44	116.16



- ① Adapted from AASHTO Standard Specifications for - Highway Signs, Luminaires, and Traffic Signals. 6th Edition 2013. <Rev B 4/7/14>
- ② 90 MPH Wind Load

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Support Structures - Perforated Square Steel Tube Anchor and Post		

ESTIMATED PROJECT QUANTITIES AND REFERENCE NOTES

Road Items : Roadway Items

Item no.	Item Code	Item	Unit	Quantities	Estimate Reference Notes
				Estimated	
				Road Items	
1	2101-0850001	CLEARING AND GRUBBING	ACRE	0.27	Refer to Tab. 110-17.
2	2101-0850002	CLEARING AND GRUBBING	UNIT	139.8	
3	2102-0425070	SPECIAL BACKFILL	TON	144.43	Refer to Tab. 112-09 and Typicals in 'B' sheets.
4	2102-2625000	EMBANKMENT-IN-PLACE	CY	7,939	Refer to T sheets. Material shall be provided by the Contractor
5	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY	2,760	Refer to 'T' Sheets. Overhaul will not be measured or paid for but shall be considered incidental to excavation on this project.
6	2104-2710020	EXCAVATION, CLASS 10, CHANNEL	CY	294	For required excavation for placement of Revetment. Refer to 'V' sheets for locations and additional information. Dispose of excess material according to Article 1106.07 of the current specifications.
7	2105-8425015	TOPSOIL, STRIP, SALVAGE AND SPREAD	CY	5,791	Refer to Tab. 103-10 and the T Sheets.
8	2107-0425020	COMPACTING BACKFILL ADJACENT TO BRIDGES, CULVERTS OR STRUCTURES	CY	90.2	Refer to Tab.104-4.
9	2107-0875100	COMPACTION WITH MOISTURE CONTROL	CY	10,056	Refer to T Sheets. Cubic yards shown on the contract documents as determined by the template fill volume. Shrinkage will not be included in the moisture control quantity.
10	2121-7425020	GRANULAR SHOULDERS, TYPE B	TON	197.54	Refer to Detail TBR-1 in 'B' Sheets and Tab. 112-9.
11	2122-5190008	PAVED SHOULDER, P.C. CONCRETE, 8 IN.	SY	348.4	Refer to Typicals in the 'B' sheets and to Tab. 112-09.

Item no.	Item Code	Item	Unit	Quantities	Estimate Reference Notes
				Estimated	
				Road Items	
12	2123-7450000	SHOULDER CONSTRUCTION, EARTH	STA	9.49	Refer to Typical in the 'B' sheets and to Tab. 112-09. Requires 148.5 cu. yds. of Class 10 for Earth Shoulder Fill. No payment for overhaul will be allowed for this material. There is an excess of 617 cy of topsoil to be used on Earth Shoulder Construction. Requires a minimum of 4 inches of topsoil. Place according to Article 2105.03,B of the Standard Specifications.
13	2213-2713300	EXCAVATION, CLASS 13, FOR WIDENING	CY	114.5	Refer to Tab. 112-9.
14	2312-8260051	GRANULAR SURFACING ON ROAD, CLASS A CRUSHED STONE	TON	147.33	Refer to Typical in the 'B' sheets. Estimated at 3" thick.
15	2315-8275025	SURFACING, DRIVEWAY, CLASS A CRUSHED STONE	TON	24.3	Refer to Tab. 102-3.
16	2401-6745650	REMOVAL OF EXISTING STRUCTURES	LS	1	Refer to Tab. 110-02.
17	2402-2720100	EXCAVATION, CLASS 20, FOR ROADWAY PIPE CULVERT	CY	93	Refer to Tab. 104-3 in CD Sheets.
18	2416-0100024	APRONS, CONCRETE, 24 IN. DIA.	EACH	6	Refer to Tab. 104-3 in CD Sheets.
19	2416-0100030	APRONS, CONCRETE, 30 IN. DIA.	EACH	3	Refer to Tab. 104-3 in CD Sheets.
20	2416-0100036	APRONS, CONCRETE, 36 IN. DIA.	EACH	13	
21	2416-0100042	APRONS, CONCRETE, 42 IN. DIA.	EACH	3	
22	2416-0100048	APRONS, CONCRETE, 48 IN. DIA.	EACH	5	
23	2416-0100054	APRONS, CONCRETE, 54 IN. DIA.	EACH	4	
24	2416-0100060	APRONS, CONCRETE, 60 IN. DIA.	EACH	2	
25	2416-1165024	CULVERT, 2000D CONCRETE ENTRANCE PIPE, 24 IN. DIA.	LF	56	
26	2416-1180024	CULVERT, CONCRETE ROADWAY PIPE, 24 IN. DIA.	LF	42	
27	2416-1180030	CULVERT, CONCRETE ROADWAY PIPE, 30 IN. DIA.	LF	18	
28	2416-1180036	CULVERT, CONCRETE ROADWAY PIPE, 36 IN. DIA.	LF	47	
29	2416-1180042	CULVERT, CONCRETE ROADWAY PIPE, 42 IN. DIA.	LF	18	

Item no.	Item Code	Item	Unit	Quantities	Estimate Reference Notes
				Estimated	
				Road Items	
30	2416-1180048	CULVERT, CONCRETE ROADWAY PIPE, 48 IN. DIA.	LF	38	
31	2416-1180054	CULVERT, CONCRETE ROADWAY PIPE, 54 IN. DIA.	LF	18	
32	2416-1180060	CULVERT, CONCRETE ROADWAY PIPE, 60 IN. DIA.	LF	8	
33	2416-1262054	CULVERT, CONCRETE PIPE, 2000D, TRENCHLESS, 54 IN. DIA.	LF	92	
34	2416-8000204	STOCKPASS APRON, 4' X 6' PRECAST CONCRETE	EACH	2	
35	2416-8000254	STOCKPASS, 4' X 6' PRECAST CONCRETE	LF	20	Refer to 'V' sheets and Detail 510-04 in the 'U' sheets for locations and additional information.
36	2417-0225024	APRONS, METAL, 24 IN. DIA.	EACH	1	Refer to Tab. 104-3 in CD Sheets.
37	2417-1040024	CULVERT, CORRUGATED METAL ENTRANCE PIPE, 24 IN. DIA.	LF	60	
38	2418-0000010	TEMPORARY STREAM DIVERSION	EACH	4	
39	2505-4008120	REMOVAL OF STEEL BEAM GUARDRAIL	LF	228	Refer to Tab. 110-07A.
40	2505-4008300	STEEL BEAM GUARDRAIL	LF	487.5	Refer to Tab. 108-08B.
41	2505-4021720	STEEL BEAM GUARDRAIL TANGENT END TERMINAL, BA-205	EACH	4	
42	2506-4984000	FLOWABLE MORTAR	CY	47.3	Refer to Typical on 'B' sheets and Tab. 110-09.
43	2510-6745850	REMOVAL OF PAVEMENT	SY	20.4	Refer to Tab 110-01.
44	2524-6765010	REMOVE AND REINSTALL SIGN AS PER PLAN	EACH	3	<p>Refer to Tab. 190-62.</p> <p>The Contractor shall remove each sign and the hardware used to secure the sign to another sign, posts, or sign support structure. For signs mounted directly to posts, removal of the sign shall include removal of the posts. Posts may be either wood posts or steel breakaway sign posts. The removal of concrete footings for steel breakaway sign posts will be measured and paid for separately.</p> <p>Holes remaining from the removal of wood posts shall be backfilled with suitable earth to the original level or to the natural ground surface in accordance with Article 2402.09 of the Standard Specifications. All steel posts removed shall become the property of the Contractor. Unless otherwise noted, wood posts removed shall remain the property of DOT</p> <p>The Contractor shall furnish all necessary hardware to install the signs. When the new installation is similar to the original installation, unless otherwise noted, the existing hardware may be used to reinstall the sign.</p> <p>Signs damaged by the Contractor's activities shall be replaced at the Contractor's expense. Replacement materials shall be new. The DOT will furnish all details necessary for fabrication of the replacement materials.</p> <p>METHOD OF MEASUREMENT: The Engineer will count each sign removed and reinstalled.</p> <p>BASIS OF PAYMENT: For each sign removed and reinstalled, the Contractor shall be paid the contract unit price.</p>
45	2524-9276010	PERFORATED SQUARE STEEL TUBE POSTS	LF	42	Refer to Details in 'B' sheets and to Tab. 190-61 for location and additional information.

Item no.	Item Code	Item	Unit	Quantities	Estimate Reference Notes
				Estimated	
				Road Items	
46	2524-9276027	PERFORATED SQUARE STEEL TUBE POST ANCHOR, TRIANGULAR SLIP BASE ASSEMBLY	EACH	3	
47	2526-8285040	CONSTRUCTION SURVEY, LOCATION SURVEY	LS	1	
48	2527-9263181	PAVEMENT MARKINGS REMOVED	STA	0.62	Refer to Tab. 108-22.
49	2527-9263209	PAINTED PAVEMENT MARKINGS, WATERBORNE OR SOLVENT-BASED	STA	0.81	
50	2528-2518000	SAFETY CLOSURE	EACH	2	Refer to Tab. 108-13A.
51	2528-8400048	TEMPORARY BARRIER RAIL, CONCRETE	LF	1,725	Refer to Tab. 108-33 and TBR-1 detail in B Sheets. All temporary barrier rail shall be nominal 12'-6 long concrete units.
52	2528-8445110	TRAFFIC CONTROL	LS	1	Refer to Traffic Control Plan on 'J' sheets.
53	2528-8445113	FLAGGERS	EACH	0	See Proposal.
54	2533-4980005	MOBILIZATION	LS	1	--
55	2548-0000200	MILLED SHOULDER RUMBLE STRIPS, PCC SURFACE	STA	0.81	Refer to Tab. 112-10.
56	2551-0000110	TEMP CRASH CUSHION	EACH	16	Winterize sand filled or water filled crash cushions according to the manufacturer's recommendations if they are to remain in place during winter months. Refer to Tab. 108-30.
57	2602-0000020	SILT FENCE	LF	1,667	This item is for use in construction of Temporary Stream Diversions. Refer to Standard Road Plan EW-402.
58	2602-0000071	REMOVAL OF SILT FENCE OR SILT FENCE FOR DITCH CHECKS	LF	1,667	

<div>105_04 4/21/26</div> <div>STANDARDS</div> <div>The following Standards apply to construction work on this project.</div>		
Number	Date	Title
BA-200	04-21-26	Steel Beam Guardrail Components
BA-205	10-17-23	Steel Beam Guardrail Tangent End Terminal (MASH TL-3)
BA-210	10-19-21	Guardrail Post Adaptor Unit
BA-251	10-21-25	Steel Beam Guardrail Installation at Side Object (Two-Way Protection)
BA-401	04-20-21	Temporary Barrier Rail (Precast Concrete)
BA-500	04-20-21	Temporary Crash Cushions Sand Barrel
DR-101	04-18-17	Pipe Culvert (Bedding and Backfill)
DR-102	04-21-15	Pipe Culvert (Cover and Camber)
DR-103	04-21-15	Pipe Culvert (Installation Details)
DR-104	04-19-16	Depth of Cover Tables for Concrete and Corrugated Pipe
DR-111	04-17-18	Box Culvert (Backfill)
DR-121	04-18-23	Connected Pipe Joints
DR-122	10-18-16	Construction of Type 'C' Concrete Adaptors for Pipe Culvert Connections
DR-141	04-18-17	Pipe Bends and Half Pipe
DR-201	10-17-23	Concrete Aprons
DR-203	04-21-20	Metal Pipe Aprons and Beveled Ends
DR-205	10-17-23	Concrete Apron with End Wall
DR-601	04-18-17	Reinforced Concrete Pipe Culvert
DR-611	04-18-17	Reinforced Concrete Pipe Culvert Letdown Structure
DR-621	04-18-17	Pipe Extension
DR-625	04-18-17	Pipe Extension Letdown Structure with Metal Apron
DR-641	04-21-20	Concrete/Corrugated Pipe Culvert Letdown Structure with Metal Apron
EW-110	10-20-15	Ditch Blocks and Dikes
EW-301	04-16-24	Guardrail Grading
EW-402	04-18-17	Temporary Stream Diversion
EW-501	10-17-23	Rural Entrance
EW-503	10-20-15	Side Road Grading
PM-110	10-15-24	Line Types
PV-12	04-16-24	Milled Shoulder Rumble Strips
PV-101	10-21-25	Joints
PV-301	04-15-25	Superelevation Details Two Lane Roadway
SI-172	04-19-16	Delineators
SI-173	04-19-16	Object Markers
SI-211	10-18-22	Object Marker and Delineator Placement with Guardrail
TC-1	10-15-19	Work Not Affecting Traffic (Two-Lane or Multi-Lane)
TC-202	04-18-23	Work Within 15 ft of Traveled Way
TC-212	04-18-23	Spot Location Lane Closure with Flaggers
TC-213	04-18-23	Lane Closure with Flaggers

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190_61	EXISTING SIGNS TO BE REINSTALLED	C.24	
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ACCESS POINTS AND SAFETY RAMPS

Refer to Cross-Sections

102_03
10/15/24

Length of Unclassified Pipe calculated is based on using Corrugated Metal Pipe.

- (1) Refer to MI-210.
- (2) Refer to EW-501.
- (3) Refer to EW-501 or EW-502.

*Predetermined for access point not constructed with this project.

Station	Side	Access Type	Descriptor	Case	Curb Type	Curb Length (1) (LF)	Width (FT)	PR (1) (2) (FT)	SR (2) (FT)	Pipe Culvert (H) (3) (FT)	Pipe Culvert Size (3) (IN)	Culvert Length (3) (LF)	Pipe Culvert Lt. (3) (LF)	Pipe Culvert Rt. (3) (LF)	Culvert Aprons (3) (No.)	Driveway Surface Type	Driveway Surface Area (SY)	Driveway Surfacing Material (TON)	Remarks
10315+76.19	Left	C					20.0		20.0							Granular		24.300	Entrance on E 4th Ave

Total: 24.3

102_05
9/29/23

EXISTING PAVEMENT																				
County	Route	Direction of Travel	Begin Ref. Location Sign	End Ref. Location Sign	Year	Type	Project Number	Surface Type	Surface Depth (IN)	Base Type	Base Depth (IN)	Subbase Type	Subbase Depth (IN)	Removal Type	Removal Depth (IN)	Coarse Aggregate Source	Coarse Aggregate Type	Course Aggregate Durability Class	Reinforcement Type	Remarks
Cherokee	IA 31	Both	027.71	039.19	2022	S	STP-031-3(11)--2C-18	PCC	6.0					MIL	3.0					PCC Overlay
Cherokee	IA 31	Both	027.71	039.19	2020	S	STP-031-1(43)--2C-18	PCC	6.0					MIL	3.0					PCC Overlay
Cherokee	IA 31	Both	027.71	039.19	1997		STP-31-1(22)--2C-31	AAC	1.5	BAC	3.5					Correctionvil	Gravel			
Cherokee	IA 31	Both	027.71	039.19	1986		MP-31-3(1)20--76-9	BSC												
Cherokee	IA 31	Both	027.71		1967		FN-31-3(1)--21-18	BSC	1.0	SAS	8.0									
Cherokee	IA 31	Both	027.71	039.19	1951		F-774	BAC	1.0	TBB	4.0					Cherokee Co.	Gravel			

TOPSOIL STRIPPING AND PLACEMENT						
Road Identification	Dir. of Traffic	Station From	Station To	Topsoil Stripping Thickness (IN)	Topsoil Placement Thickness (IN)	Remarks
IA 31	2-Lane	54+37.58	56+18.06	12.0	8.0	
IA 31	2-Lane	164+00.98	166+00.00	12.0	8.0	
IA 31	2-Lane	172+53.25	174+53.22	12.0	8.0	
IA 31	2-Lane	237+31.14	239+60.00	12.0	8.0	
IA 31	2-Lane	250+26.19	252+05.71	12.0	8.0	
IA 31	2-Lane	1045+70.00	1052+56.36	12.0	8.0	
IA 31	2-Lane	1125+95.93	1127+52.08	12.0	8.0	
IA 31	2-Lane	1208+20.12	1209+62.88	12.0	8.0	
E 4th Ave	2-Lane	10314+89.00	10318+08.39	12.0	8.0	

103_10
4/30/25

104_04

8/15/22

ROADWAY ITEMS FOR DRAINAGE STRUCTURES INSTALLED BY CULVERT CONTRACTOR

* Not a Bid Item

(1) Backfill according to DR-111

Location	Design No.	Size	Kind	Dike Lt.	Dike Rt.	Dike Station	Dike Top Elevation	Dike Type	Compacting Backfill Adjacent (CY)	Compaction w/ Moisture Control (CY)	Compaction w/ Moisture and Density (CY)	Floodable Backfill* (A) (CY)	Porous Backfill* (B) (CY)	Flooded Backfill (1) (A+B) (CY)	Excavation Type	Excavation Quantity (CY)	Revetment Type	Revetment Quantity (TONS)	Engineering Fabric (SY)	Remarks				
165+00.47	127	10'x5'	RCB						23.0						Class 10 Channel	37.0				(1)				
173+58.22	227	8'x5'	RCB						22.2						Class 10 Channel	122.0				(1)				
238+31.81	327	8'x6'	RCB						22.2						Class 10 Channel	49.0				(1)				
251+16.75	427	5'x7'	RCB						22.8						Class 10 Channel	86.0				(1)				
Total:									90.2												294			

(1) Refer to Tab. 100-23 in RC sheets for Revetment and Engineering Fabric quantities.

107_23

8/15/22

GRADING FOR GUARDRAIL INSTALLATIONS

Refer to EW-301.

(1) Lane(s) to which the installation is adjacent.

Direction of Traffic (1)	Station	Side	Foreslope at Guardrail	X1 (FT)	Y1 (FT)	X2 (FT)	Y2 (FT)	X3 (FT)	Y3 (FT)	X4 (FT)	Y4 (FT)	Z (FT)	Excavation Class 10 (CY)	Embankment-in-Place (CY)	Remarks
NB	1050+35.63	Right		109.4	4.4	132.3	6.8			172.8	7.4	45.1			Ahead, (1)
NB	1050+35.63	Right		128.1	4.4	151.0	6.8			191.5	7.4	48.9			Trailing, (1)
SB	1050+09.93	Left		3.2	7.5	18.2	9.0	137.7	9.0	197.5	12.2	62.2			Ahead, (1)
SB	1050+09.93	Left		44.8	7.5	59.8	9.0	69.0	9.0	128.6	12.2	69.5			Trailing, (1)

(1) Earthwork quantities included in the T sheets.

108_08B
1/30/24

STEEL BEAM GUARDRAIL FOR SIDE OBSTACLE (TWO-WAY PROTECTION)																									
Possible Standards: BA-200, BA-205, BA-206, BA-210, BA-211, BA-251, LS-625, LS-626, LS-631, SI-172, SI-173, and SI-211.																									
1. Lane(s) to which the obstacle is adjacent.																									
Item No.	Lane (1)	Side	Station	OL (FT)	DO (FT)	ET (LF)	VT2A (LF)	VFA (LF)	VT1A (LF)	VT1T (LF)	VFT (LF)	VT2T (LF)	ET (LF)	BA-211 Station	BA-211 (Type)	SI-211 (Type)	SI-172 Type 1 White (EA)	SI-173 Type 2 OM2-2 (EA)	SI-173 Type 3 OM3-L (EA)	SI-173 Type 3 OM3-R (EA)	Steel Beam Guardrail BA-200 (LF)	Standard End Terminal (Type)	Standard End Terminal Count (EA)	Post Adapter BA-210 (EA)	Remarks
1	NB	Right	1050+35.60	50.1	2.4	47.67			125.000	143.75			47.67							1	262.5	BA-205	2		
2	SB	Left	1050+09.93	30.9	6.0	47.67			150.000	81.25			47.67						1		225.0	BA-205	2		(1)
Total:																		1	1	487.5		4			

(1) Use 9' posts or BA-210 between STA 1049+50 and STA 1050+28

SAFETY CLOSURES			
Station	Road Closure Qty.	Hazard Closure Qty.	Remarks
10317+97.00	1		Closure of E 4th Ave
10318+11.00	1		Closure of E 4th Ave

108_13A
3/27/25

108_22

11/25/25

PAVEMENT MARKING LINE TYPES

Line factors based on 6-inch wide continuous line.

*BCY4 - Place on the same side of the roadway to match existing markings near the project.

**NPY4 - Estimating purposes only. No Passing Zone Lines will be located in the field.

***MNY6 - Factor of 1.00 includes number of 6-inch passes to cover median nose area.

BCY4: Broken Centerline (Yellow) @ 0.17

CBW6: Crosswalk Bar (White) @ 10.00

CLW6: Crosswalk Line (White) @ 2.00

DLW4: Dotted Line (White) @ 0.22

ELW6: Edge Line Right (White) @ 1.00

MNY6: Median Nose (Yellow) @ 1.00

RLY4: Ramp Edge Line Left (Yellow) @ 0.67

SPW4: Sloped Curb 4" (White) @ 2.16

STY6: Standard Curb 6" (Yellow) @ 2.03

BCY6: Broken Centerline (Yellow) @ 0.25

CHW8: Channelizing Line (White) @ 1.33

DCY4: Double Centerline (Yellow) @ 1.34

DLW6: Dotted Line (White) @ 0.33

ELY4: Edge Line Left (Yellow) @ 0.67

NPY4: No Passing Zone Line (Yellow) @ 0.84

RLY6: Ramp Edge Line Left (Yellow) @ 1.00

SPW6: Sloped Curb 6" (White) @ 2.28

YLW2: Yield Line (White) @ 1.15

BLC6: Broken Line Contrast (White/Black) @ 0.50

CHW10: Channelizing Line (White) @ 1.67

DCY6: Double Centerline (Yellow) @ 2.00

DLY4: Dotted Line (Yellow) @ 0.22

ELY6: Edge Line Left (Yellow) @ 1.00

NPY6: No Passing Zone Line (Yellow) @ 1.25

SLW2: Stop Line (White) @ 4.00

SPY4: Sloped Curb 4" (Yellow) @ 2.16

BLW4: Broken Lane Line (White) @ 0.17

CHY8: Channelizing Line (Yellow) @ 1.33

DDY4: Double Dotted Line (Yellow) @ 0.44

DLY6: Dotted Line (Yellow) @ 0.33

LDW8: Lane Drop (White) @ 0.33

RLW4: Ramp Edge Line Right (White) @ 0.67

SLW4: Solid Lane Line (White) @ 0.67

SPY6: Sloped Curb 6" (Yellow) @ 2.28

BLW6: Broken Lane Line (White) @ 0.25

CHY10: Channelizing Line (Yellow) @ 1.67

DDY6: Double Dotted Line (Yellow) @ 0.67

ELW4: Edge Line Right (White) @ 0.67

LDW10: Lane Drop (White) @ 0.42

RLW6: Ramp Edge Line Right (White) @ 1.00

SLW6: Solid Lane Line (White) @ 1.00

STW6: Standard Curb 6" (Yellow) @ 2.03

Road ID	Station From	Station To	Lane	Marking Type	Left	Center	Right	Groove Marking Needed?	Groove Qty. (STA)	BCY6 Factored (STA)	ELW4 Factored (STA)	ELW6 Factored (STA)	ELY4 Factored (STA)	Remarks
IA 31	1046+24.00	1047+16.00	Both	Removal of Paint	X			No			0.62			
IA 31	1048+85.00	1049+66.00	Both	Waterborne/Solvent Paint	X			No				0.81		

CRASH CUSHIONS

108_30
4/16/24

- * Bid Item
1. Lane(s) to which the installation is adjacent.
2. Complete this section when using the Temporary Crash Cushion bid item and Earthwork is needed for Sand Barrel placement. Refer to BA-500.

Lane	Station	Side	Obstacle Width (FT)	Crash Cushion Type	Crash Cushion Quantity	V (FT) (2)	W (FT) (2)	X (FT) (2)	Y (FT) (2)	Z (FT) (2)	Excavation Class 10* (CY)	Embankment in Place* (CY)	Obstacle Description	Remarks
NB	163+94.00	Right	2.0	Temporary	1								TBR	
NB	166+06.50	Right	2.0	Temporary	1								TBR	
SB	163+94.00	Left	2.0	Temporary	1								TBR	
SB	166+06.50	Left	2.0	Temporary	1								TBR	
NB	172+45.50	Right	2.0	Temporary	1								TBR	
NB	174+70.50	Right	2.0	Temporary	1								TBR	
SB	172+45.50	Left	2.0	Temporary	1								TBR	
SB	174+70.50	Left	2.0	Temporary	1								TBR	
NB	237+25.50	Right	2.0	Temporary	1								TBR	
NB	239+38.00	Right	2.0	Temporary	1								TBR	
SB	237+25.50	Left	2.0	Temporary	1								TBR	
SB	239+38.00	Left	2.0	Temporary	1								TBR	
NB	250+10.50	Right	2.0	Temporary	1								TBR	
NB	252+23.00	Right	2.0	Temporary	1								TBR	
SB	250+10.50	Left	2.0	Temporary	1								TBR	
SB	252+23.00	Left	2.0	Temporary	1								TBR	

Total: 16

108_33
8/15/22

TEMPORARY BARRIER RAIL								
Possible Standard: BA-401 Possible Detail: 560-7								
* Not a bid item. Anchorage requirements are based on TBR locations shown in the plans. TBR alignments that vary from what is shown in the plans may result in additional TBR sections requiring anchorage.								
Line No.	No.	Station From	Station To	Length (FT)	Barrier Rail Type	Anchored*	Modular Glare Screen System	Remarks
1.0	US 59	163+94.00	166+06.50	212.5	Concrete BA-401	Yes	No	Right side of road
2.0	US 59	163+94.00	166+06.50	212.5	Concrete BA-401	Yes	No	Left side of road
3.0	US 59	172+45.50	174+70.50	225.0	Concrete BA-401	Yes	No	Right side of road
4.0	US 59	172+45.50	174+70.50	225.0	Concrete BA-401	Yes	No	Left side of road
5.0	US 59	237+25.50	239+38.00	212.5	Concrete BA-401	Yes	No	Right side of road
6.0	US 59	237+25.50	239+38.00	212.5	Concrete BA-401	Yes	No	Left side of road
7.0	US 59	250+10.50	252+23.00	212.5	Concrete BA-401	Yes	No	Right side of road
8.0	US 59	250+10.50	252+23.00	212.5	Concrete BA-401	Yes	No	Left side of road
Total:				1725				

<div>REMOVAL OF PAVEMENT</div> <div>Refer to Tabulation 102-5.</div>						110_01 4/5/24
* Not a bid item.						
Station From	Station To	Side	Pavement Type	Area (SY)	Saw Cut* (LF)	Remarks
1046+24.15	1047+16.01	Left	PCC	20.4	95.9	
Total:				20.4		

REMOVAL OF EXISTING STRUCTURES			110_02 8/15/22
Location	Description	Remarks	
46+72.00	4'x4' RCB	Remove both headwalls	
78+63.30	4'x2.5' RCB	Remove right headwall	
126+64.00	5'x4' RCB	Remove both headwalls	

<div>REMOVAL OF STEEL BEAM GUARDRAIL</div> <div>(1) Lane(s) to which the installation is adjacent. (2) Includes length of End Terminals and End Anchors.</div>					110_07A 8/15/22
No.	Direction of Traffic (1)	Station From	Station To	Side	Removal of Guardrail (2) (LF)
1	SB	1049+12.00	1051+11.00	Left	228.0
Total:					228

<div><div>CULVERT ABANDONMENT</div><div>Refer to Details 4315 and 4316</div></div>					
* Not a bid item					
Station	Description	Flowable Mortar (CY)	Granular Backfill* (TON)	4" Perforated Subdrain* (LF)	Remarks
55+67.80	4' x 5' x 63.9' RCB	47.3	0.281	25.0	
Total:		47.3			

110_09
8/15/22

CLEARING AND GRUBBING																						110.17 1/27/25		
Station From	Station To	Direction of Traffic	Work and Material Type	>3"-6"	>6"-9"	>9"-12"	>12"-15"	>15"-18"	>18"-24"	>24"-30"	>30"-36"	>36"-42"	>42"-48"	>48"-60"	>60"-72"	>72"	Other Materials Length (FT)	Other Materials Width (FT)	Estimated Units	Estimated Area (Acres)	Estimated Herbicide Application (EA)	Remarks		
54+75.68	55+42.87	SB	Trees - Clearing and Grubbing																	0.013				
173+41.00	173+92.00	SB	Trees - Clearing and Grubbing	1				10											136.6					
237+56.95	239+57.00	SB	Trees - Clearing and Grubbing																	0.136				
250+65.09	251+45.45	SB	Trees - Clearing and Grubbing																	0.057				
1045+87.96	1049+46.38	SB	Trees - Clearing and Grubbing																	0.055				
1208+96.00	1209+25.00	EB	Trees - Clearing and Grubbing	2															3.2					
Total:																			139.8	0.261				

112.09
4/21/26

SHOULDERS

(1) Lane(s) to which the shoulder is adjacent.
(2) See Typ. 7156, 7157, or 7158.
(3) Bid Item.
(4) Applies only for Paved Shoulders constructed on project with existing granular shoulders.
(5) Bid Item. Typ. 7156, 7157, or 7158.
(6) Does not include shrink.
(7) Paved shoulder thickness specified in Remarks.
(8) Subbase type specified in Remarks.

Roadway Identification	Direction of Travel (1)	Station From	Station To	Side	P Width (FT)	P_SG Start Width (FT)	P_SG End Width (FT)	G Width (FT)	L Length (FT)	Class 13 Excavation (CY) (3)(4)	Paved Shoulder (3) (SY)	Shoulder at Grd rail (5)(7)	Special Backfill PCC Alt. (3) (TON)	Polymer Grid (SY)	Subbase (3) (8) (CY)	Granular Shoulder (3) (TON)	Granular Shoulder (TON/STA)	Shoulder Const. Alt (3) (STA)	Shoulder Const. Alt HMA (6) (CY)	Shoulder Const. Alt PCC (6) (CY)	Remarks
IA 31	NB	163+69.50	166+31.00	Right				4.0	261.50	13.0						24.401	9.331				Refer to Detail TBR-1
IA 31	SB	163+69.50	166+31.00	Left				4.0	261.50	13.0						24.401	9.331				Refer to Detail TBR-1
IA 31	NB	172+21.00	174+95.00	Right				4.0	274.00	13.0						25.567	9.331				Refer to Detail TBR-1
IA 31	SB	172+21.00	174+95.00	Left				4.0	274.00	13.0						25.567	9.331				Refer to Detail TBR-1
IA 31	NB	237+01.00	239+62.50	Right				4.0	261.50	13.0						24.401	9.331				Refer to Detail TBR-1
IA 31	SB	237+01.00	239+62.50	Left				4.0	261.50	13.0						24.401	9.331				Refer to Detail TBR-1
IA 31	NB	249+86.00	252+47.50	Right				4.0	261.50	13.0						24.401	9.331				Refer to Detail TBR-1
IA 31	SB	249+86.00	252+47.50	Left				4.0	261.50	13.0						24.401	9.331				Refer to Detail TBR-1
IA 31	NB	1048+31.90	1048+41.05	Right					9.15									0.09			ESC
IA 31	NB	1048+41.05	1048+61.05	Right		2.4	2.4		20.00			5.3	2.324					0.20		5.00	8" PCC
IA 31	NB	1048+61.05	1049+15.43	Right		2.4	1.7		54.38			12.4	5.900					0.54		13.51	8" PCC
IA 31	NB	1049+15.43	1051+68.43	Right		1.7	1.7		253.00			47.8	23.554					2.53		47.04	8" PCC
IA 31	NB	1051+68.43	1052+29.09	Right		1.7	2.4		60.66			13.8	6.199					0.61		15.55	8" PCC
IA 31	NB	1052+29.09	1052+49.09	Right		2.4	2.4		20.00			5.3	2.338					0.20		5.51	8" PCC
IA 31	NB	1052+49.09	1052+56.36	Right					7.27									0.07			ESC
IA 31	SB	1046+24.15	1047+16.01	Left	2				91.86	10.5	20.4		16.076					0.92			8" PCC
IA 31	SB	1048+23.90	1048+62.73	Left					38.83									0.39			ESC
IA 31	SB	1048+62.73	1048+82.73	Left		8.4	8.4		20.00			18.7	6.566					0.20		3.96	8" PCC
IA 31	SB	1048+82.73	1049+29.90	Left		8.4	5.3		47.17			35.9	13.043					0.47		9.29	8" PCC
IA 31	SB	1049+29.90	1051+57.84	Left		5.3	5.3		227.94			134.2	49.463					2.28		38.24	8" PCC
IA 31	SB	1051+57.84	1052+05.01	Left		5.3	8.4		47.17			35.9	12.415					0.47		7.23	8" PCC
IA 31	SB	1052+05.01	1052+25.01	Left		8.4	8.4		20.00			18.7	6.552					0.20		3.19	8" PCC
IA 31	SB	1052+25.01	1052+56.58	Left					31.57									0.32			ESC
Total:										114.5	20.4	328	144.43			197.54		9.49		148.52	

MILLED RUMBLE STRIPS															112_10 4/15/25
* Calculated at 18" width for Shoulder. ** For use with penetrating Engineered Fog Seal. Calculated at 2" wider than rumble strips.															
Road Identification	Station From	Station To	Shoulder Pavement Type	Rumble Strip Lane	Rumble Strip Type	Fog Seal Type	L (IN)	PCC Length (STA)	HMA Length (STA)	Fog Seal* Shoulder (GAL)	Fog Seal (SY)**	Effective Shoulder Width PCC (FT)	Effective Shoulder Width HMA (FT)	Effective Shoulder Width Granular\Earth (FT)	Remarks
IA 31	1048+85.00	1049+66.00	PCC	Left Shoulder	Milled		12"	0.81				2.0			

EXISTING SIGNS TO BE REINSTALLED									
Sign Description	Direction of Travel	Location Station	Number of Posts	Square Tube Steel Posts	PSST (LF)	Wood Posts 4"x4" (L F)	Installation Type	Installation Dim 'X'	See Signing Notes
Two Direction Arrow	NB	1046+70.00	1		14.0		1	12.0	PP,RR
Street Name Assembly	NB	1046+70.00	1		14.0		1	12.0	PP,RR
Stop Sign	EB	10315+12.00	1		14.0		1	12.0	PP,RR

190.61
2/10/23

EXISTING SIGNS TO BE REMOVED										190.62 2/13/23
Sign Number or Description	Location Station	Direction of Travel	Type 'A' Sign Assembly (RA) (EA)	Type 'B' Sign Assembly (RB) (EA)	Type 'A' Remove and Reinstall (RR) (EA)	Type 'B' Remove and Reinstall (RR) (EA)	Concrete Foundation (RF) (EA)	Support Structure & Foundation (RS) (EA)	Applicable Signing Notes	Remarks
Stop Sign	1048+87.00	SB			1				RR	
Two Direction Arrow	1049+20.00	NB			1				RR	
Street Name Assembly	1049+20.00	NB			1				RR	

<div>259_01 10/15/25</div> <div>SIGNING NOTES</div> <div><p>The following tolerances will be allowed on all signs:</p><p>Accumulation error of not greater than +/-0.50" per line of copy, not greater than +/-0.50" for spacing between lines of copy, and the margin between lines of copy and the inside edge of the sign border.</p><p>The following tolerances will be allowed on each letter or numeral:</p><table><tr><td>nominal height</td><td>variation in height</td><td>variation in width</td></tr><tr><td>4" thru 12"</td><td>-1/8" to +3/8"</td><td>-1/4" to +1/4"</td></tr><tr><td>over 12"</td><td>-1/8" to +3/8"</td><td>-3/8" to +3/8"</td></tr></table><p>-----</p><p>Type B signs can be separated into two categories:</p><ul style="list-style-type: none">- Major Guide Signs.- Minor Guide Signs.<p>Major Guide Signs include the advance and exit direction guide signs for an interchange or intersection.</p><p>Minor Guide Signs include all other guide signs such as NEXT EXIT signs, supplemental guide signs, logo signs, exit gore signs, post-interchange mileage signs, ramp destination signs, and ramp logo signs for an interchange, as well as destination signs along sideroads.</p><p>Type A signs are not separated into categories, but special consideration should be given to regulatory signs.</p><p>Do not remove Type B signs until replacement signs have been installed. If construction activities require the removal of a sign, the existing sign may be relocated to temporary posts, or a temporary plywood sign may be installed to replace the existing sign.</p><p>Existing non-regulatory Type A signs are NOT required to remain in place until installation of replacement signs. Existing regulatory Type A signs, particularly Stop signs, should not be removed until replacement signs are installed. Where a staged traffic control plan is contrary to this guidance, follow the direction of the traffic control plan.</p><p>Apply the following during the replacement or modification of signs:</p><ul style="list-style-type: none">- No more than one of the major guide signs for each direction of travel at an interchange out of service at any one time.- No major guide sign out of service for more than 8 hours.- No minor guide out of service for more than 24 hours.<p>Remove existing signs and posts within 24 hours following the installation of a new replacement sign.</p><p>In any case where the plans call for a new sign and posts to be installed at the same station location and offset as an existing sign, install the new posts at a minimum of either 5 ft ahead or behind the existing sign installation. Signs shall not be installed more than 25 ft ahead or behind the existing sign installation. Whenever posts for a replacement sign are erected directly in front of an existing sign, install the new replacement sign and remove the existing sign installation within 24 hours of the time that the new posts are erected.</p><p>Where signs are located behind guardrail, locate the near edge of the sign a minimum of 3 ft behind the guardrail posts.</p></div>	nominal height	variation in height	variation in width	4" thru 12"	-1/8" to +3/8"	-1/4" to +1/4"	over 12"	-1/8" to +3/8"	-3/8" to +3/8"	<div>259_01 10/15/25</div> <div>SIGNING NOTES</div> <div><p>Unless noted otherwise, leave auxiliary panels, such as exit number panels, in place or reattach to the sign using the existing mounting hardware. Also, when replacing an existing logo sign with a new logo sign, remove the business logo panel(s) from the existing sign and attach to the new sign as directed by the Engineer. Do not damage the auxiliary or logo panels when removing and reattaching them. This work is incidental to other work and no separate payment will be made.</p><p>The following notes apply to the corresponding sign installations shown on the plan sheets and listed in the tabulations.</p><p>IB INSTALL NEW TYPE B SIGN IA INSTALL NEW TYPE A SIGN</p><p>Install new signs at the location identified in the plans.</p><p>For installation of new signs on an existing sign support structure, refer to note (L).</p><p>For installation of new signs on existing posts:</p><ul style="list-style-type: none">- if the new sign is taller than the existing sign, furnish the necessary hardware to extend the sign above the posts. Refer to Standard Road Plan SI-132.- if the new sign is shorter than the existing sign:- for wood posts and perforated square tube posts, install the sign at the proper height and cut off the excess post length.- for MASSH-400 and steel breakaway posts, install the sign at the top of the posts.<p>For plywood signs, no vertical splices are allowed in signs less than or equal to 10 ft wide. No horizontal splices are allowed in signs less than or equal to 4 ft tall.</p><p>Each new sign installed shall have a sticker applied to the back of the sign that shows the date the sign was installed. The Contractor shall supply the sticker for all contractor supplied signs. The DOT will supply date stickers on any signs supplied by the department.</p><p>Payment for installing Type A signs or Type B signs includes furnishing hardware for mounting, extending signs above existing posts, and cutting posts to length.</p><p>MS MODIFICATION OF EXISTING SIGNS</p><p>For removal and/or installation of logo panels, and other sign modifications. Refer to the project plans and typical details for additional information.</p><p>SC SIGN COVER</p><p>For the installation or removal of temporary sign covers for the purposes of temporary traffic control. Sign covers shall completely cover the existing Sign. Care should be taken so that covers, fasteners, and installation practices do not damage the existing sign. Tape of any type shall not be applied to the sheeted face of the existing sign under any circumstances. Repair of damage to the existing sign caused by sign covers will be the responsibility of the Contractor.</p><p>SO OVERLAY TYPE B GUIDE SIGNS MB INSTALL SPECIAL MOUNTING BRACKET</p><p>Install special mounting brackets at the locations identified in the plans. Refer to Tabulations 190-51 and/or 190-65.</p></div>	<div>259_01 10/15/25</div> <div>SIGNING NOTES</div> <div><p>PB INSTALL NEW BREAKAWAY STEEL POSTS AND FOOTING PP INSTALL NEW PERFORATED SQUARE TUBE POSTS AND ANCHORS PM INSTALL NEW MASSH-400 POSTS AND ANCHORS</p><p>Install new breakaway steel posts and footings, perforated square tube posts and anchors, or MASSH-400 posts and anchors at the locations identified in the plans. Refer to the Standard Road Plans, Typicals, and Tabulations 190-51 and 190-50 for post size and footing information.</p><p>New posts shall be installed in undisturbed soil. The new posts shall not be placed in the hole of removed posts.</p><p>Remove excess soil from footing hole. Do not spread soil on adjacent seeded or vegetated areas.</p><p>If note (RR) accompanies (PB), (PP), or (PM), install an existing sign on the new posts.</p><p>RR REMOVE AND REINSTALL SIGN AS PER PLAN</p><p>Do not remove existing major Type B guide signs on posts until the new posts are installed. Promptly remove sign and install at the new location.</p><p>Existing major Type B guide signs on overhead support structures, minor Type B guide signs, plywood signs, and Type A signs may be removed and stored. Transport the signs to a DOT storage area as designated by the Engineer. Transport the signs back to the job site when ready for installation at the new location.</p><p>Signs to be reinstalled shall not be stored for any length of time with the sheeted face in contact with the ground.</p><p>Replace signs damaged by the Contractor's activities at no additional cost to the Contracting Authority.</p><p>Payment for Remove and Reinstall Sign includes sign removal, delivery to and from the DOT storage area (if applicable), and reinstallation, including any hardware required for reinstallation. When noted in the plans, payment for delivery and stockpile of existing signs will be separate from the payment for Remove and Reinstall Sign.</p><p>RA REMOVAL OF TYPE A SIGN ASSEMBLY RB REMOVAL OF TYPE B SIGN ASSEMBLY</p><p>Type A Sign Assembly consists of one or more signs installed on one or more posts, either directly mounted to the post or mounted to the post with special sign mounting brackets.</p><p>Type B Sign Assembly consists of the main sign, all auxiliary signs and brackets, and posts.</p><p>Unless stated otherwise in the plans, remove all posts with the signs and brackets.</p><p>Remove each sign assembly identified in the plans. Sign posts removed become the property of the Contractor. All other materials removed remain the property of the DOT.</p><p>For each sign assembly removed, disassemble each assembly before delivering to the DOT.</p><p>* For Type A sign assemblies, unbolt all signs,</p></div>	<div>259_01 10/15/25</div> <div>SIGNING NOTES</div> <div><p>special mounting brackets, and posts from each other.</p><p>* For Type B assemblies, unbolt all extruded aluminum panels, brackets, and posts from each other. Do not damage the disassembled materials.</p><p>When the plans call for the removal of posts, the entire existing post shall be removed. The post shall not be broken off or cut off at the ground line. Place backfill in holes remaining from the removal of posts and restore to the surrounding conditions.</p><p>Deliver the removed signs, special sign mounting brackets, and extruded aluminum panels to a DOT storage area, as designated by the Engineer.</p><p>The concrete footings for steel posts are not considered part of the sign assembly. Refer to note RF for concrete footing removal.</p><p>Payment for Removal of Type A Sign Assembly or Removal of Type B Sign Assembly includes sign assembly removal and disassembly, post removal (if applicable), delivery to the DOT storage area, placing backfill in holes, and restoration of the surrounding conditions.</p><p>RF REMOVE EXISTING CONCRETE FOOTING FOR STEEL POST</p><p>Remove existing concrete footings to a depth of at least 1 ft below the natural groundline. Place backfill in holes remaining from removal and restore to the normal surrounding conditions. This work is incidental to other work and no separate payment will be made.</p><p>RS REMOVE EXISTING TYPE B SIGN SUPPORT STRUCTURE</p><p>The following are considered Type B Sign Support Structures:</p><ul style="list-style-type: none">- Overhead sign trusses and foundations- Cantilever sign trusses and foundations- Bridge-mounted brackets<p>Unless stated otherwise in the plans, existing overhead trusses, cantilever trusses, and bridge brackets which are removed become the property of the Contractor. If stated in the plans, deliver overhead trusses, cantilever trusses, and bridge brackets to a DOT storage area, as designated by the Engineer.</p><p>Payment for Removal of Sign Support Structure and Foundation includes sign support structure removal, delivery to the DOT storage area (if applicable), and restoration of the surrounding conditions. Removal of the foundation includes removal of the stem to a minimum of 1 ft below the natural groundline.</p><p>L MODIFY SIGN SUPPORT ANGLES NEEDED TO INSTALL SIGNS ON EXISTING SIGN SUPPORT STRUCTURES</p><p>Refer to the sign support structure details for information on the required angle brackets.</p><p>Provided all specifications are met, the existing sign support angles may be reused. Install existing sign support angles to be reused only on the sign support structure from which they were removed.</p><p>Sign support angles removed and not reused become the property of the Contractor.</p></div>
nominal height	variation in height	variation in width										
4" thru 12"	-1/8" to +3/8"	-1/4" to +1/4"										
over 12"	-1/8" to +3/8"	-3/8" to +3/8"										
FILE NO. 32354	ENGLISH	DESIGN TEAM Miller\DeWolf\Hobson	CHEROKEE COUNTY PROJECT NUMBER STPN-031-3(15)--2J-18	SHEET NUMBER C.26								

<div>259_01 10/15/25</div> <div>SIGNING NOTES</div> <div><p>When reusing the existing sign support angles with a shorter replacement sign, the sign support angles may need to be trimmed. Refer to the sign support details to determine if and where to trim the sign support angles.</p><p>Do not use existing fasteners. Use new U-Bolts, stainless steel bolts and nuts to install the existing or new sign support angles to the sign support structure.</p><p>Removal of existing sign support angles is incidental to removal of the sign.</p><p>Reinstalling and/or modifying existing sign support angles; furnishing and installing new sign support angles (if required); and furnishing and installing new fasteners is incidental to work associated with Type B signs.</p><p>SIGN INSTALLATION QUALITY CONTROL NOTES</p><p>Post lengths have been derived from the proposed grading cross sections. Verify post lengths in the field prior to ordering or fabrication.</p><p>Slight differences between the design template and the actual conditions should be expected. These variations should be resolved by doing some localized shaping and grading. Obtain material needed to meet the site requirements of SI-112 from the excavation and/or the area immediately adjacent to the work. Ensure reshaping work does not substantially change foreslopes or the drainage in the vicinity of the sign.</p><p>Significant differences between the plan design and the actual field conditions shall be resolved in this manner:</p><p>Survey the location and draw the actual template on the cross section. Recalculate each post length and compare to the maximum allowable leg length. If all of the maximum leg lengths are less than or equal to the maximum allowable leg length, then the proposed post design will be sufficient. If any leg is greater than the maximum allowable leg length, then submit the cross section with the actual template drawn (including offsets and elevation from the survey shown) to the Engineer. The Engineer may forward this information to the Engineer of Record in order to complete a new post design.</p><p>Install the footings, stub posts, and posts according to the tolerances shown on the applicable SI Series Standard Road Plans.</p><p>Footing construction is the controlling activity that substantially affects the quality of the site installation. Verify the elevation difference between the stubs is exactly the same as the elevation difference between the post lengths. If the Engineer requests, submit documentation detailing the site cross section in order to verify site installation.</p></div>

<div>262_06 9/28/22</div> <div>UTILITIES (NOT A POINT 25 PROJECT)</div>
<div>This is NOT a POINT 25 project and is not subject to the provisions of IAC 761-115.25.</div>

* Not a bid item

① Diameter or equivalent diameter

② UNCL = Unclassified Pipe CMP = Corrugated Metal Pipe

RCP = Reinforced Concrete Pipe

LCP = Arch or Elliptical Low Clearance Pipe

SARC = Steel Arch Pipe

(2)	Remove 2 sections of existing 48" pipe and inlet apron. Install 12' of 48" RCP with DR-205 inlet apron. Match existing grades and grade for positive drainage. Slope to match existing structure.
(3)	F=17.12, Entrance at E. 4th Avenue.
(3)	Remove 1 section of existing 48" pipe and outlet apron. Install 6' of 48" RCP with DR-201 outlet apron. Match existing grades and grade for positive drainage. Slope to match existing structure.
(4)	Remove 1 section of existing 36" pipe and both aprons. Install 6' of 36" RCP with DR-201 inlet and outlet aprons. Match existing grades and grade for positive drainage. Slope to match existing structure.
(5)	Remove 2 sections of existing 36" pipe and both aprons. Install 12' of 36" RCP with DR-201 inlet and outlet aprons. Match existing grades and grade for positive drainage. Slope to match existing structure.
(6)	Remove headwall of existing 4'x4' RCB. Install 12' of 54" RCP with DR-201 apron. Match existing grades and grade for positive drainage. Slope to match existing structure.
(7)	Remove headwall of existing 4'x4' RCB. Install 6' of 54" RCP with DR-201 apron. Match existing grades and grade for positive drainage. Slope to match existing structure.
(8)	Remove 2 sections of existing 48" pipe and both aprons. Install 12' of 48" RCP with DR-201 inlet and outlet aprons. Match existing grades and grade for positive drainage. Slope to match existing structure.
(9)	Remove headwall of existing 4'x2.5' RCB. Install 8' of 48" RCP with DR-201 apron. Match existing grades and grade for positive drainage. Slope to match existing structure.
(10)	Remove apron of existing 36" pipe. Install 6' of 36" RCP with DR-201 apron. Match existing grades and grade for positive drainage. Slope to match existing structure.
(11)	A=0 B=29.71 C=8.08 E=24.02 L=5.94 Angle1=9.5 Angle2=17 Standard Drop=
(12)	Remove apron of existing 36" pipe. Install DR-201 apron. Match existing grades and grade for positive drainage. Slope to match existing structure.
(13)	Remove 1 sections of existing 36" pipe and both aprons. Install 6' of 36" RCP with DR-201 inlet and outlet aprons. Match existing grades and grade for positive drainage. Slope to match existing structure.
(14)	Remove both headwalls of existing 5'x4' RCB. Install 8' of 60" RCP with DR-201 inlet and outlet aprons. Match existing grades and grade for positive drainage. Slope to match existing structure.
(15)	Remove 2 sections of existing 42" pipe and both aprons. Install 12' of 42" RCP with DR-201 inlet and outlet aprons. Match existing grades and grade for positive drainage. Slope to match existing structure.
(16)	Remove both existing aprons. Install DR-201 inlet and outlet aprons. Match existing grades and grade for positive drainage. Slope to match existing structure.
(17)	Remove 1 section of existing 30" pipe and both aprons. Install 6' of 30" RCP with DR-201 inlet and outlet aprons. Match existing grades and grade for positive drainage. Slope to match existing structure.
(18)	Remove 2 sections of existing 36" pipe and both aprons. Install 12' of 36" RCP with DR-201 inlet and outlet aprons. Match existing grades and grade for positive drainage. Slope to match existing structure.
(19)	Remove 3 sections of existing 24" pipe and apron. Install 18' of 24" RCP with DR-201 apron. Match existing grades and grade for positive drainage. Slope to match existing structure.
(20)	Remove 1 sections of existing 24" pipe and apron. Install 12' of 24" RCP with DR-201 apron. Match existing grades and grade for positive drainage. Slope to match existing structure.
(21)	Remove 1 sections of existing 24" pipe and apron. Install 6' of 24" RCP with DR-201 apron. Match existing grades and grade for positive drainage. Slope to match existing structure.
(22)	Remove 1 sections of existing 42" pipe and apron. Install 6' of 42" RCP with DR-201 apron. Match existing grades and grade for positive drainage. Slope to match existing structure.
(23)	Remove 2 sections of existing 30" pipe and apron. Install 12' of 30" RCP with DR-201 apron. Match existing grades and grade for positive drainage. Slope to match existing structure.
(24)	Remove 1 section of existing 24" pipe and apron. Install 6' of 24" RCP with DR-201 apron. Match existing grades and grade for positive drainage. Slope to match existing structure.



DRAINAGE STRUCTURE BY ROAD CONTRACTOR

Length of unclassified pipe calculated is based on using Reinforced Concrete Pipe.

* Not a bid item

① Diameter or equivalent diameter

2) UNCL = Unclassified Pipe CMP = Corrugated Metal Pipe RCP = Reinforced Concrete Pipe LCP = Arch or Elliptical Low Clearance Pipe SARC = Steel Arch Pipe

(3) Backfill according to DR-101

[illegible]

FILE NO.	ENGLISH	DESIGN TEAM	Miller\Dewolf\Hobson	CHEROKEE	COUNTY	PROJECT NUMBER	STPN-031-3(15)--2J-18	SHEET NUMBER	CD.2	
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103_06
8/15/22

EMBANKMENT WITH MOISTURE CONTROL

Moisture Control is required for all Class 10 fill placed in all locations and depths. Stability berms placed outside the normal foreslope template and topsoil will not require Moisture Control.

SHRINKAGE DATA		
Material	%	Remarks
Class 10	30.0	
Topsoil	40.0	

LICENSED PROFESSIONAL ENGINEER

Mark A. Dell

21208

IOWA

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

Signature

Mark A. Dell

Date

4/20/26

Printed or Typed Name

Mark A. Dell







My license renewal date is December 31, 20

27

Pages or sheets covered by this seal:

CS.1

SURVEY SYMBOLS

	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
	Sink Hole		Traffic Signal Control Box
	Board Fence		Rail Road Signal Control Box
	Chain Link or Security Fence		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)		


















UTILITY LEGEND

— FO — FO1D Fiber Optic West Iowa Telephone - Quality D







● PPA Power Pole MidAmerican

— W — WL1D Water Line City of Washta - Quality D

PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK		Design Color No.		
Green	(2)		Existing Topographic Features and Labels	
Blue	(1)		Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation	
Magenta	(5)		Existing Utilities	
SHADING		Design Color No.		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%

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

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

Legend

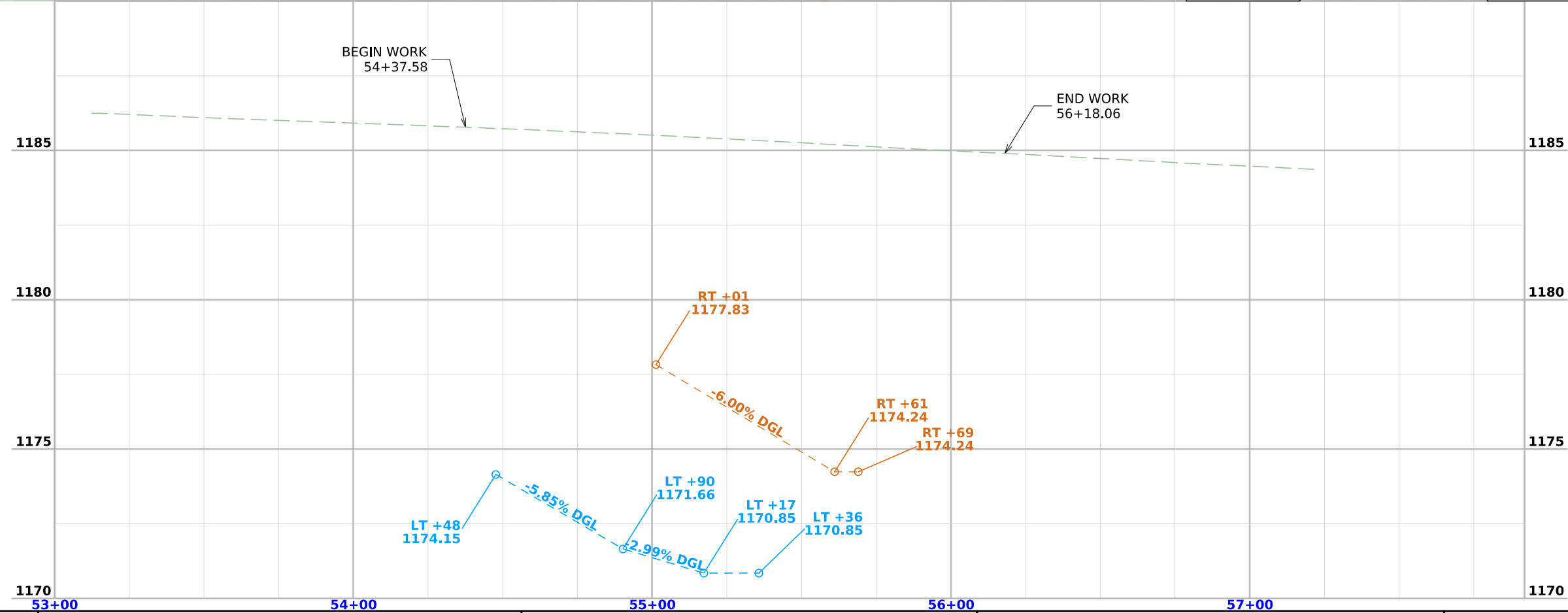
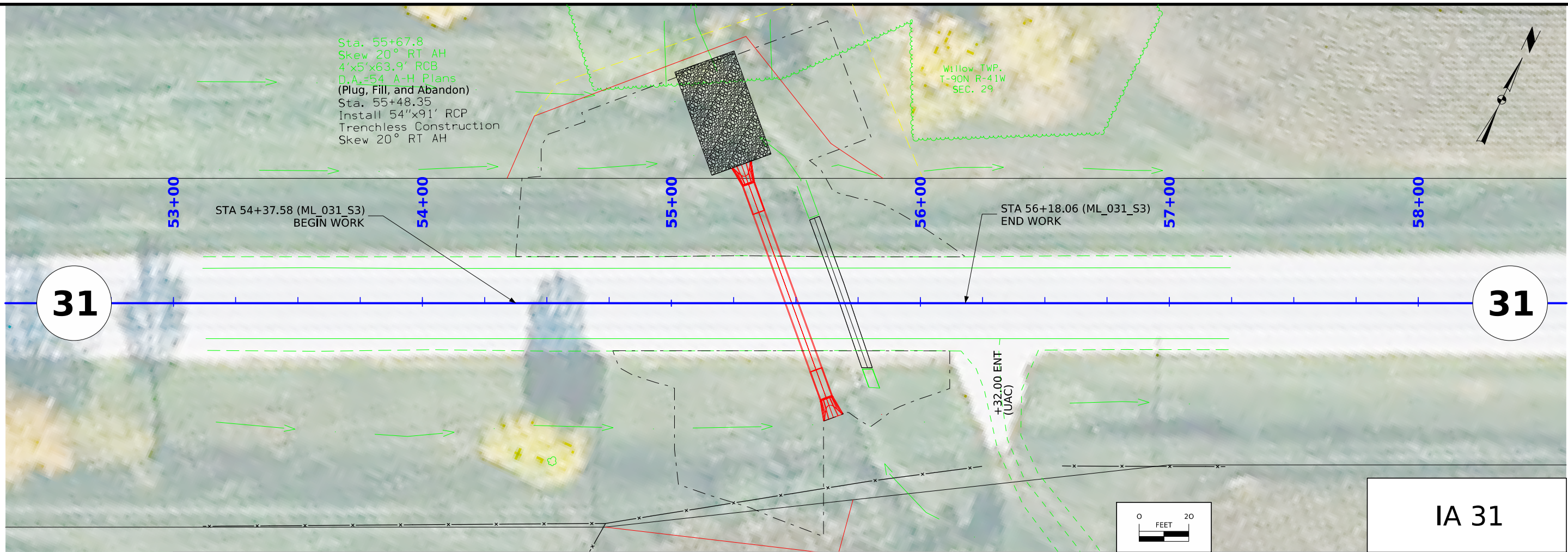
	Reference Point
	Station
	Section Corner
	Ground Line Intercept
	Saw Cut
	Guardrail
	Trench Drain
	HighTension Cable Guardrail
	Sheet Pile
	Roadway Obliteration
	Clearing & Grubbing Area

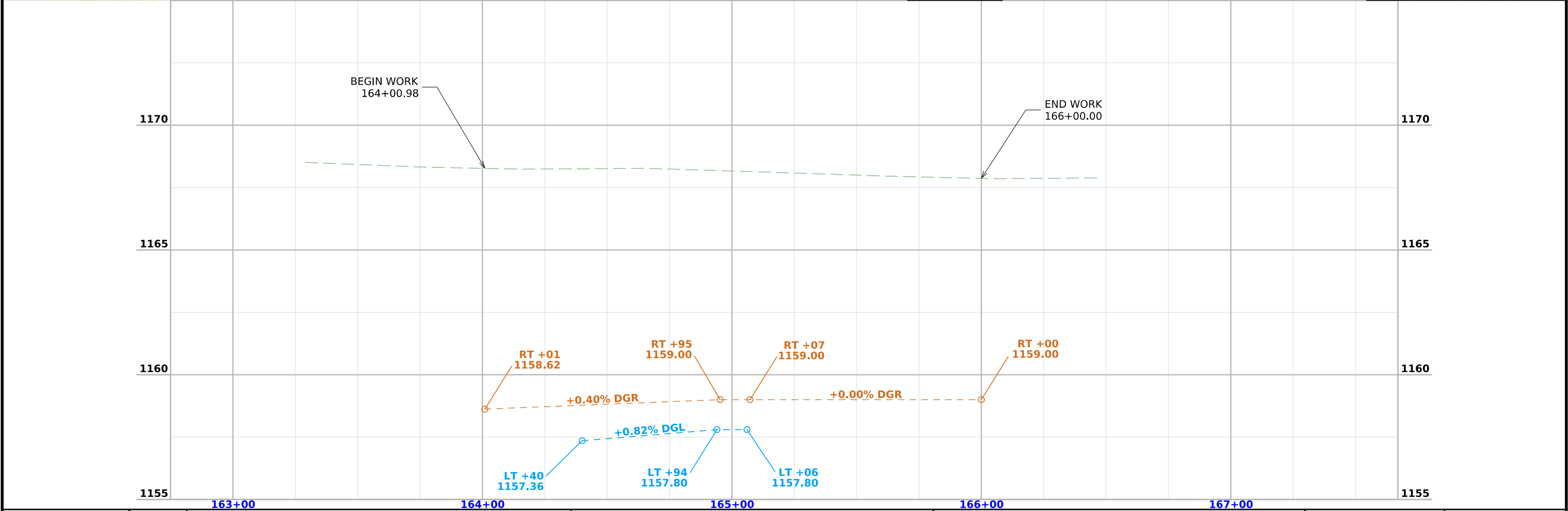
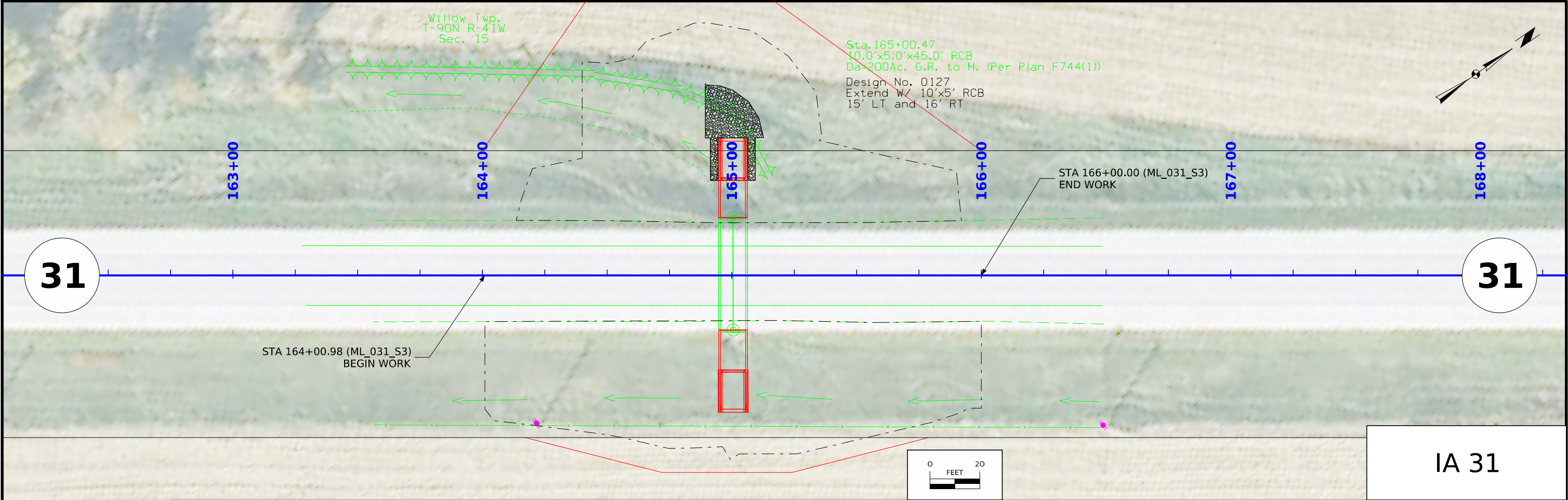
RIGHT-OF-WAY LEGEND

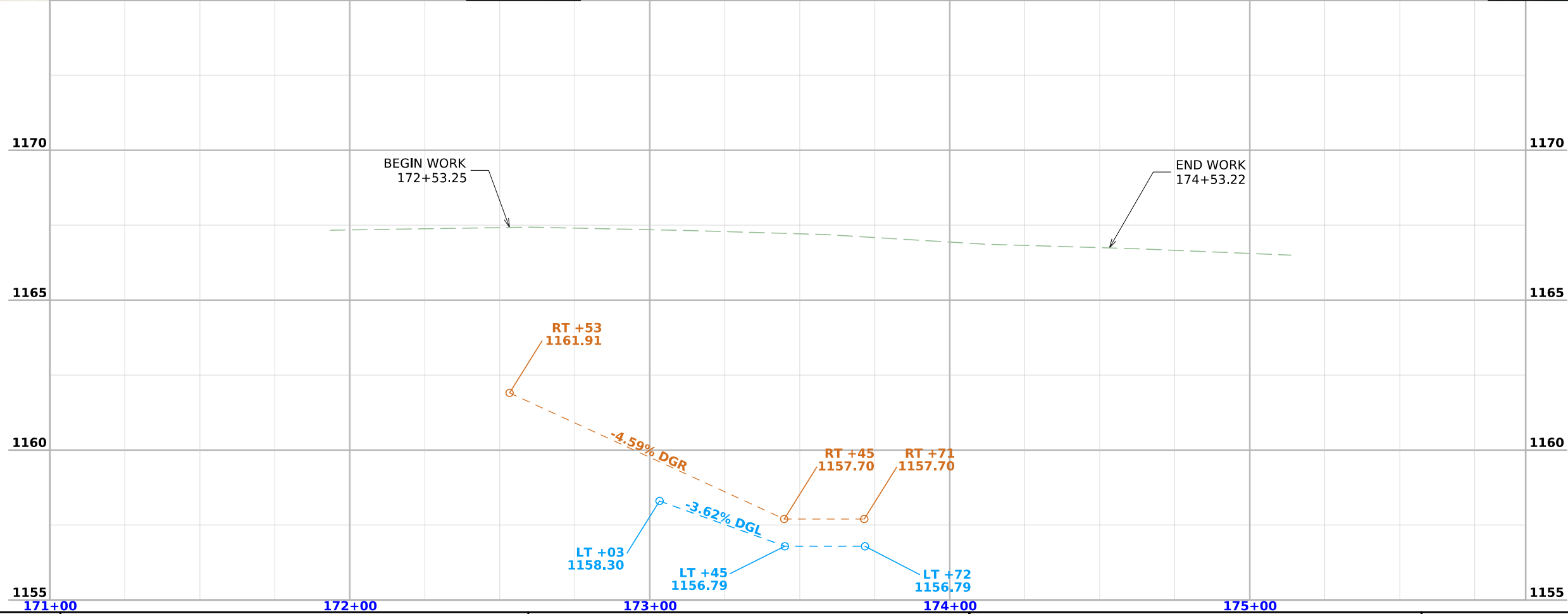
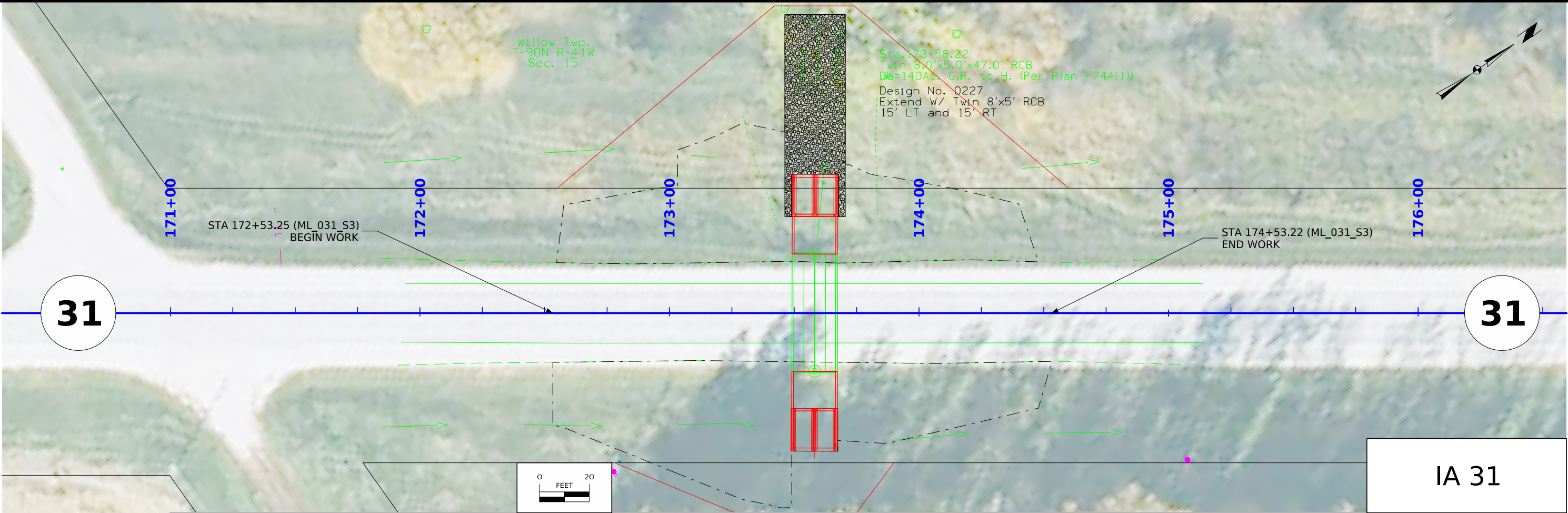
	Proposed Right-of-Way Symbol
	Proposed Right-of-Way Line
	Existing Right of Way
	Existing and Proposed Right-of-Way
	Easement and Existing Right-of-Way
	Easement (Temporary) Symbol
	Easement (Temporary) Line
	Easement
C/A	Access Control
	Property Line Symbol
	Property Line

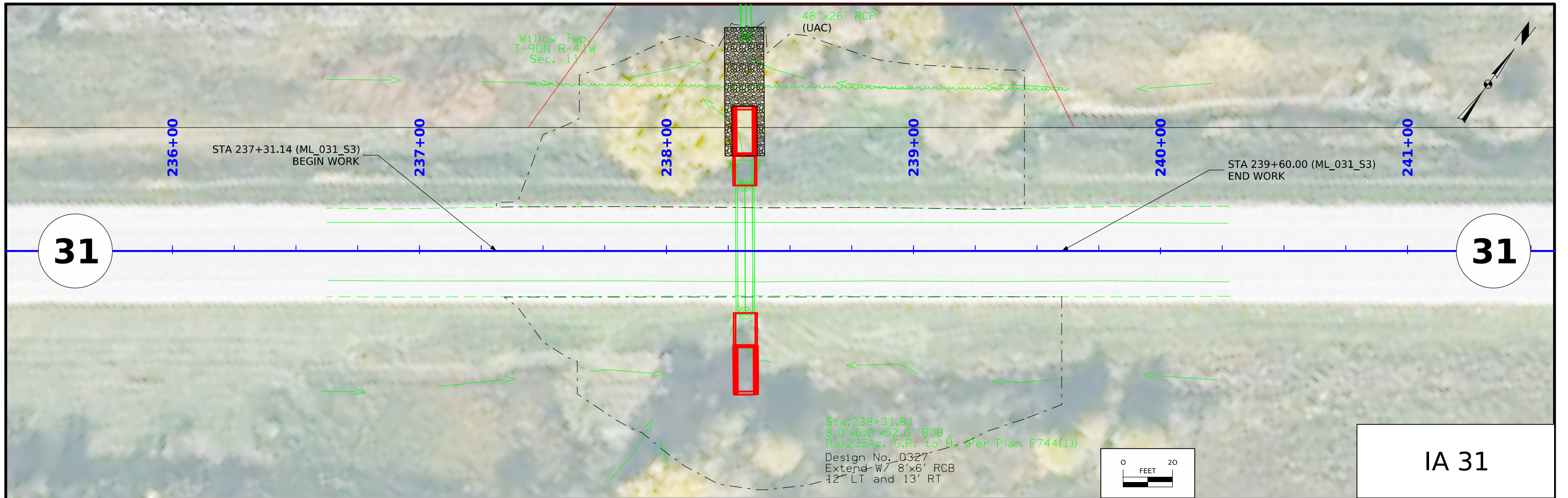
PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

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

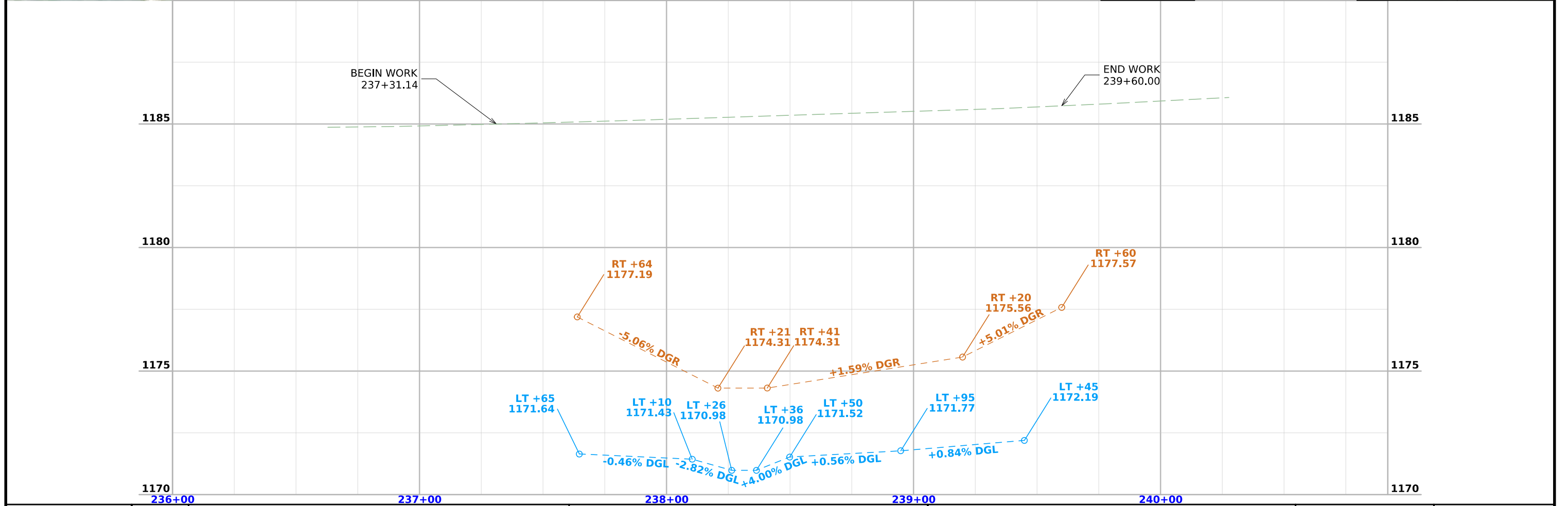


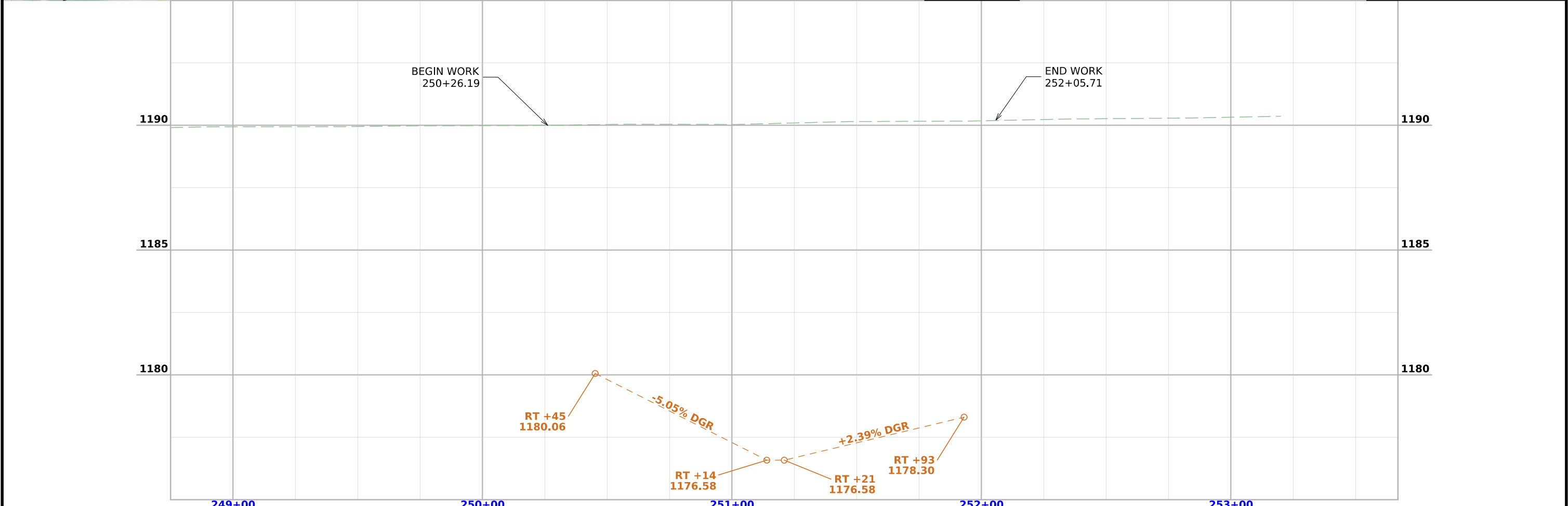
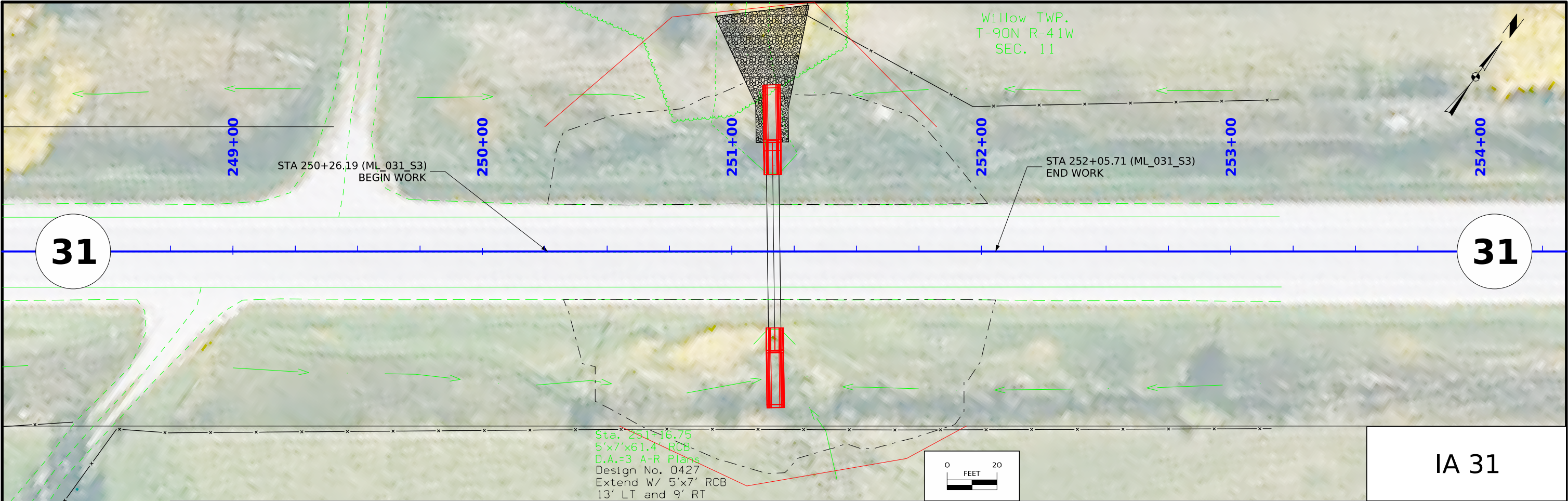


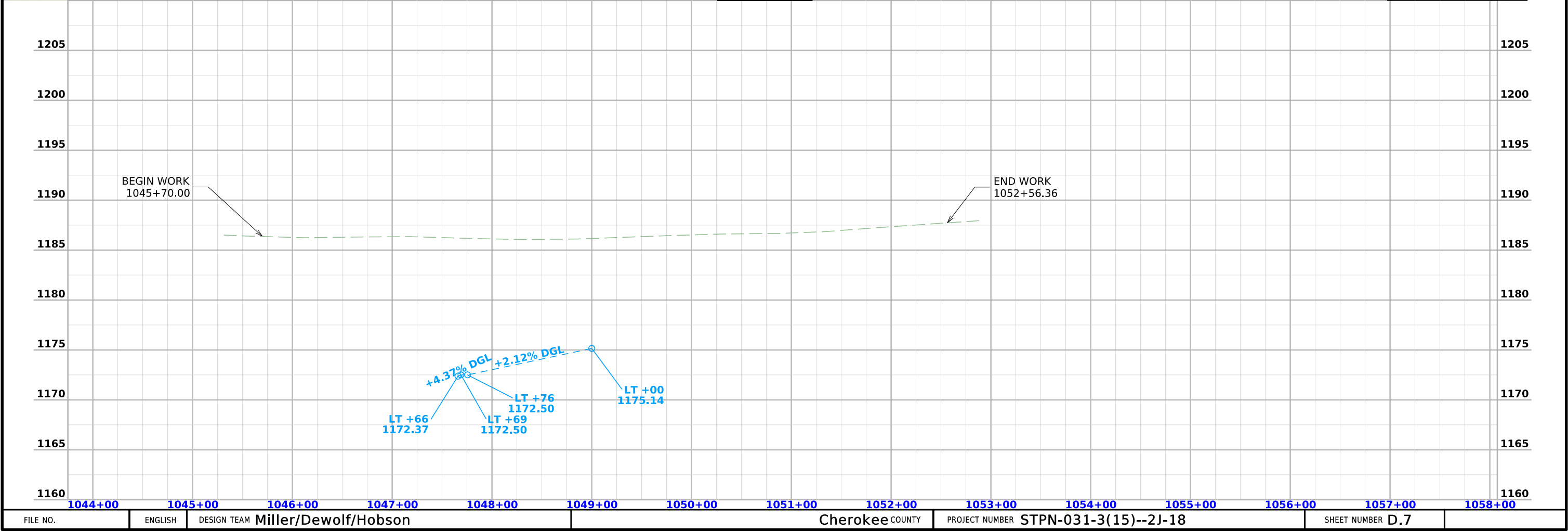
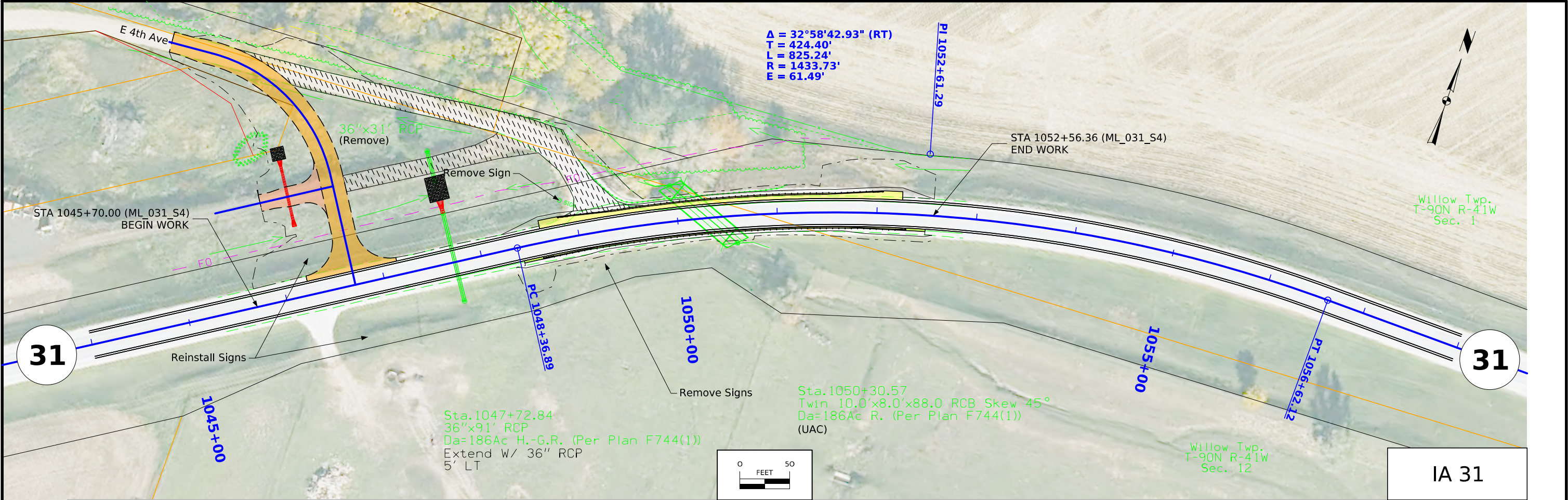


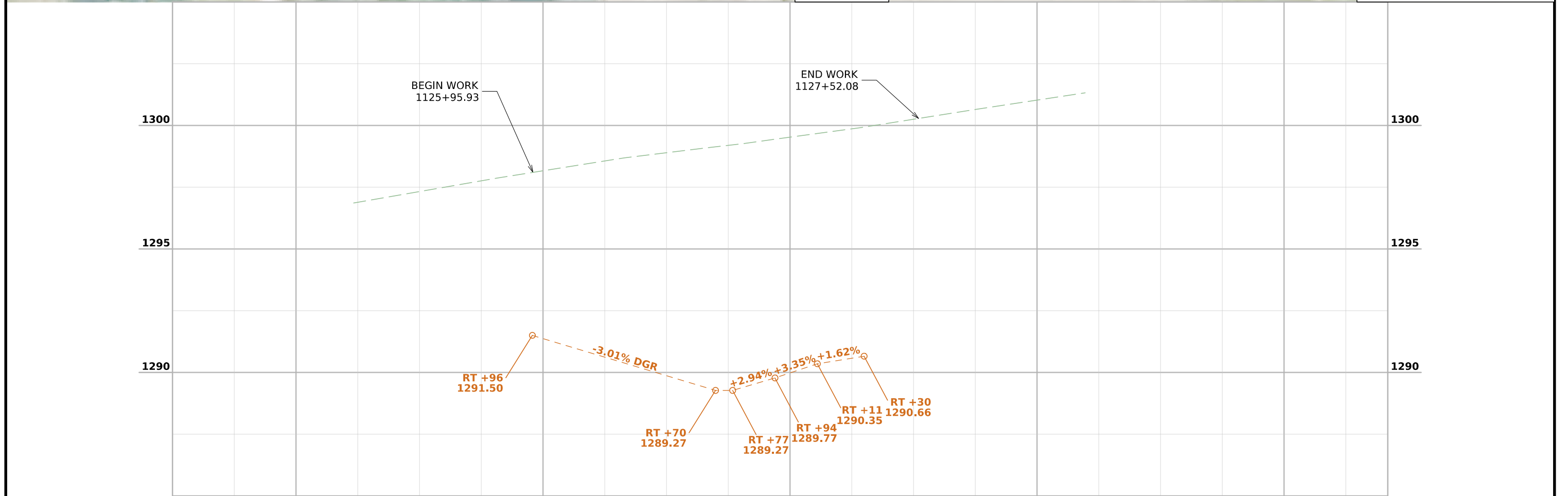
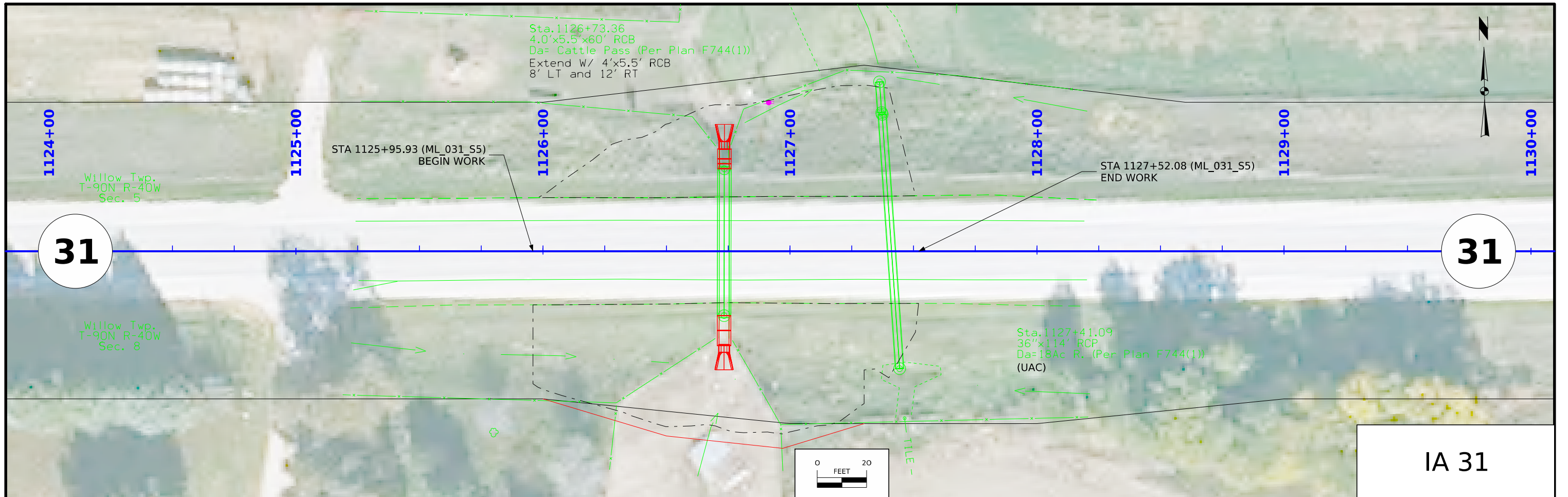


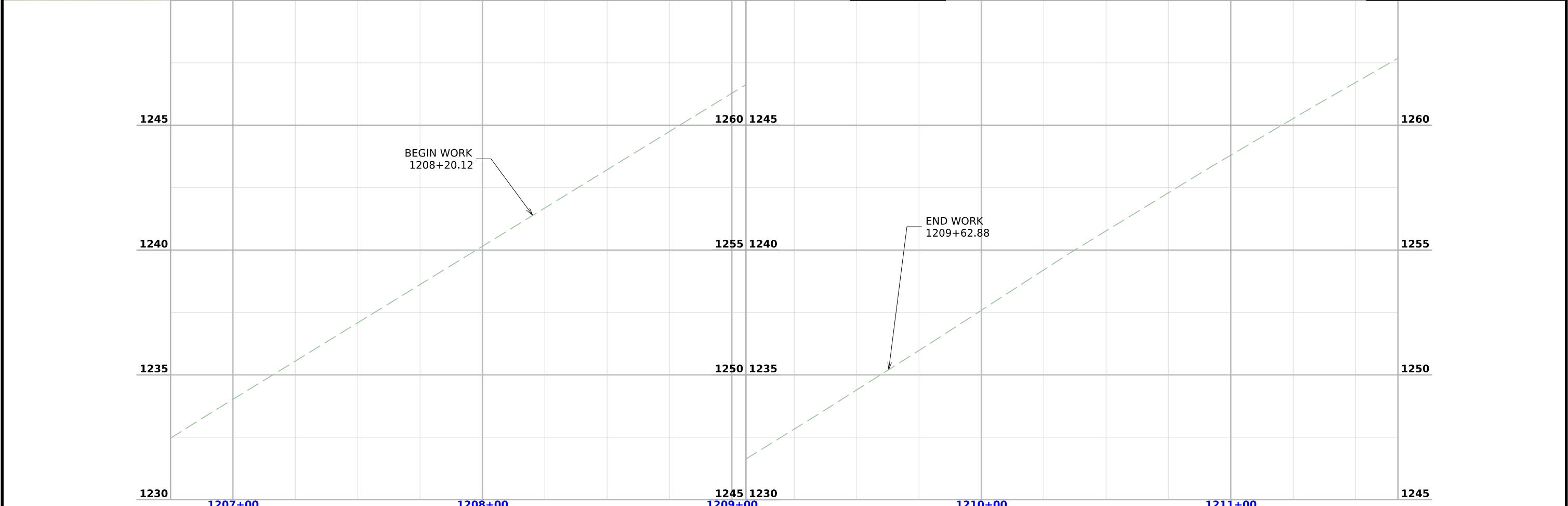
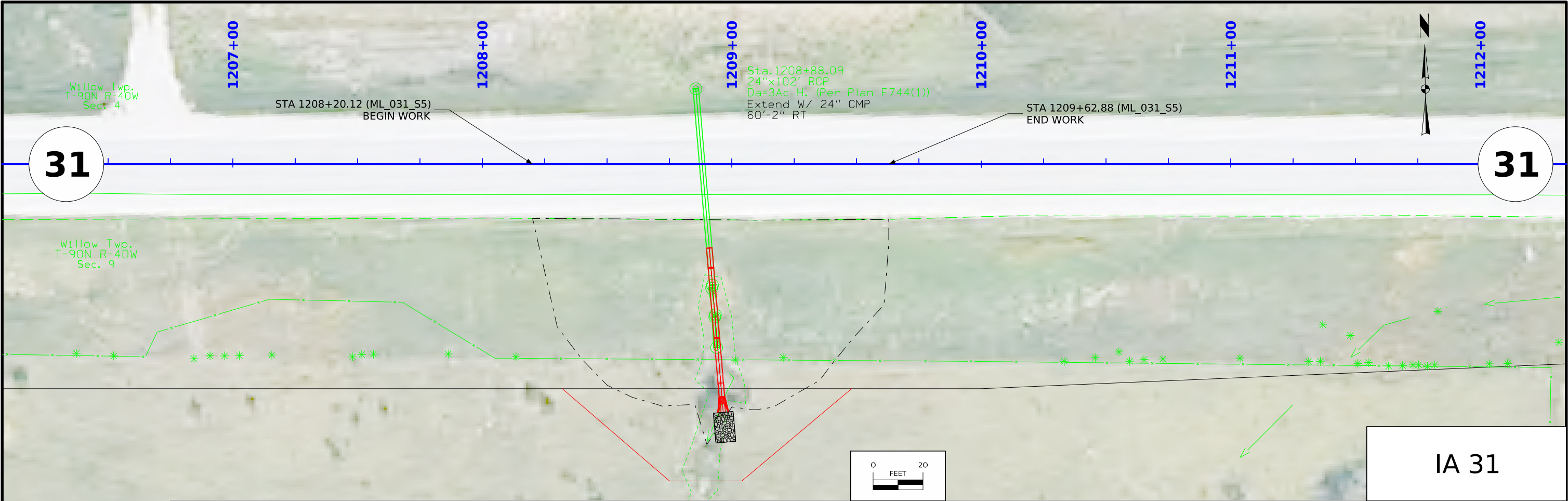
IA 31

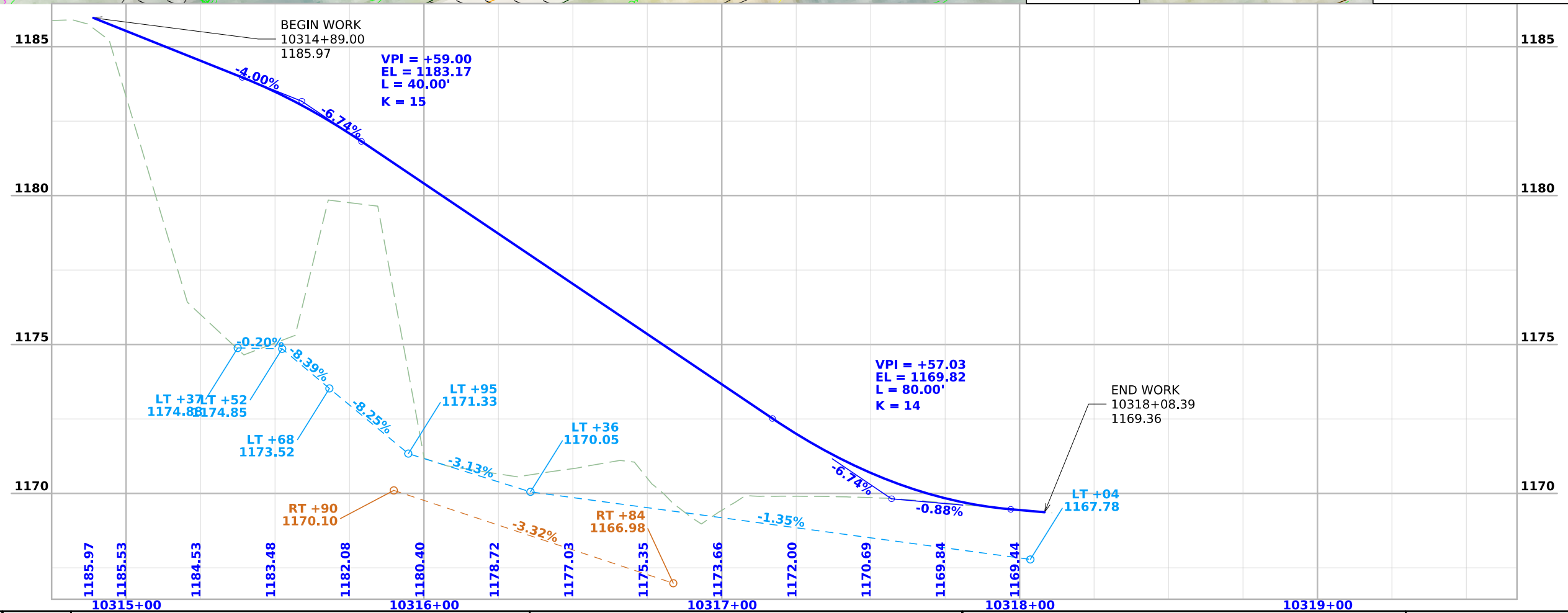
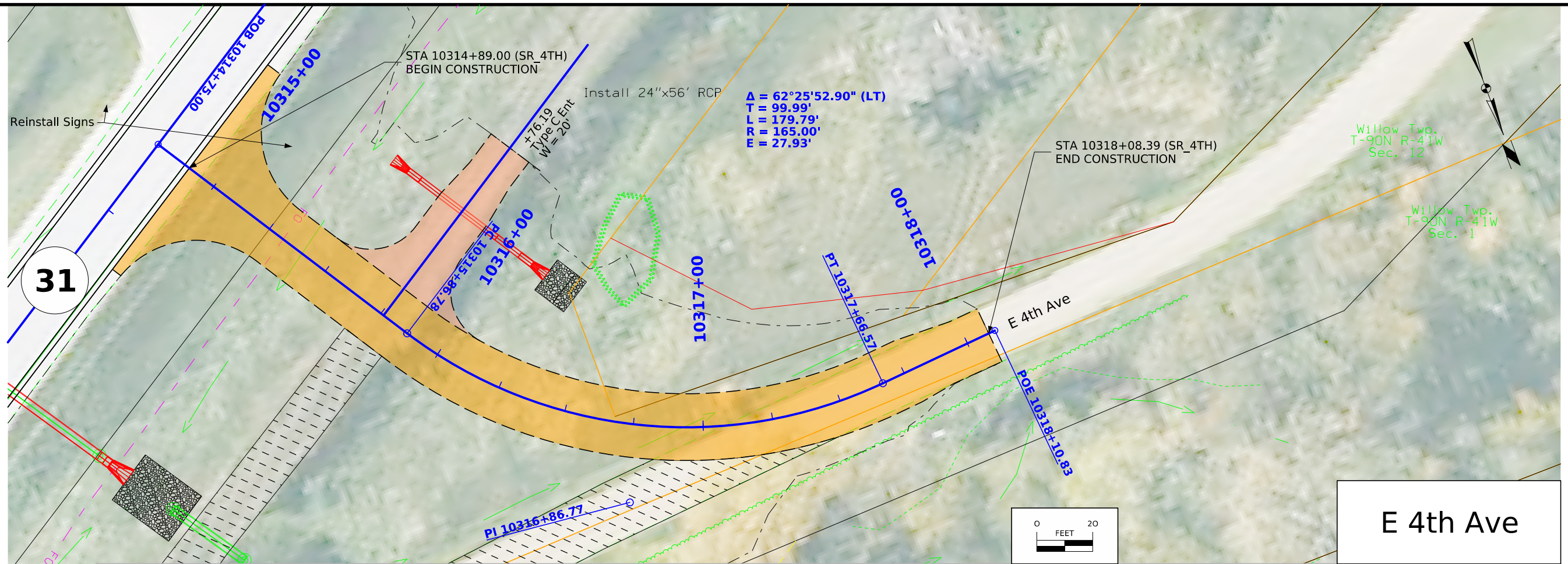












Survey Information

Cherokee, Woodbury, Ida County
STPN-031-3(11)--2J-18
Co Rd C66 in Washta to US 59
PIN 17-97-031-010
Sap-7781

General Information

Measurement units for this survey are US survey feet. This survey is for proposed drainage structures reconstruction along Iowa Highway 31. Project datum and control information is provided by Design Survey Office. This project is a Full DTM without Photo control.

Vertical Control

Vertical datum for this survey is NAVD88 (Computed using Geoid12b). GRS80 Ellipsoidal Height was computed at project Pts. REF384, REF422, REF432, REF453, REF473, REF483, REF513, REF522, REF572, 600, 2000-019, 2000-077 by doing concurrent 6 hour static observations. The project control is relative to nearby Iowa RTN Base Stations.

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

Cherokee County GPS Network mark designated 2000-019 has a published Elev. Of 1164.35
Survey Elev. = 1164.145

Cherokee County GPS Network mark designated 2000-077 has a published Elev. Of 1155.51
Survey Elev. = 1155.433

Horizontal Control

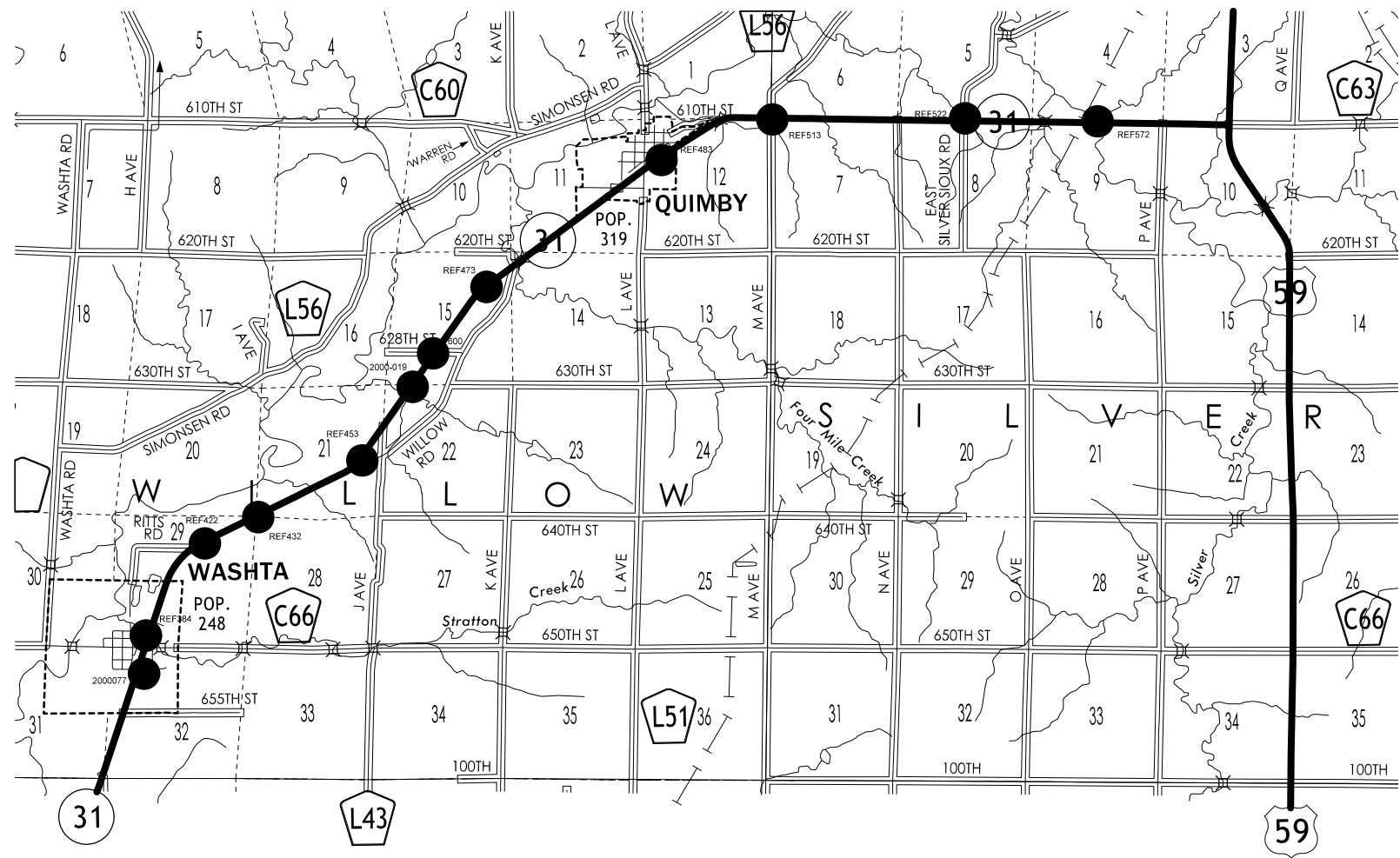
The project coordinate system for this survey is Iowa RCS Zone 4 (U.S. Survey Feet). This survey control is relative to laRTN reference stations. laRTN Reference Station coordinates are relative to the National Reference Station network datum: NAD83 (2011) for Epoch 2010.00. Coordinates were determined by conducting concurrent 6 hour static observations on Project Pts. REF384, REF422, REF432, REF453, REF473, REF483, REF513, REF522, REF572, 600, 2000-019, 2000-077.

Alignment Information

Horizontal alignment was provided by District 3.

CONTROL POINT VICINITY MAP

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



HORIZ. DATUM: NAD83(2011) EPOCH 2010.00

VERT. DATUM: NAVD88

1a. Regional Coordinate System Zone 4

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

HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING

HORIZ. DATUM: NAD83(2011) EPOCH 2010.00

VERT. DATUM: NAVD88

Ia. Regional Coordinate System Zone 4

Name: REF384
Description: CM 75FT CL ENT 50FT CL HWY 35FT STOP SIGN
Feature Definition: CP
Northing: 8616900.781 Easting: 14262464.700 Elevation: 1151.80

Name: REF422
Description: CM 88FT CL HWY 85FT CL ENT 2.5FT FENCE LINE
Feature Definition: CP
Northing: 8620776.584 Easting: 14264812.280 Elevation: 1191.99

Name: REF432
Description: CM 140FT CL ENT 77FT CL HWY 20FT PP
Feature Definition: CP
Northing: 8621830.155 Easting: 14266942.520 Elevation: 1192.08

Name: REF453
Description: CM 105FT PP 100FT CL HWY 75FT ROW RAIL
Feature Definition: CP
Northing: 8624091.523 Easting: 14271099.120 Elevation: 1202.32

Name: REF473
Description: CM 120FT END OF 36IN RCP 80FT CM 34FT CL HWY
Feature Definition: CP
Northing: 8631023.050 Easting: 14276058.310 Elevation: 1159.76

Name: REF483
Description: CM 110FT CL HWY 32FT ROW RAIL 2FT FENCE LINE
Feature Definition: CP
Northing: 8636091.413 Easting: 14283045.040 Elevation: 1186.49

Name: REF513
Description: CM 58FT CL HWY 55 CL M AVE 2FT FENCE LINE
Feature Definition: CP
Northing: 8637711.595 Easting: 14287474.090 Elevation: 1207.95

Name: REF522
Description: CM 100FT CL HWY 43FT CL E SILVER SIOUX RD 2.5FT FENCE LINE
Feature Definition: CP
Northing: 8637754.621 Easting: 14295165.480 Elevation: 1274.31

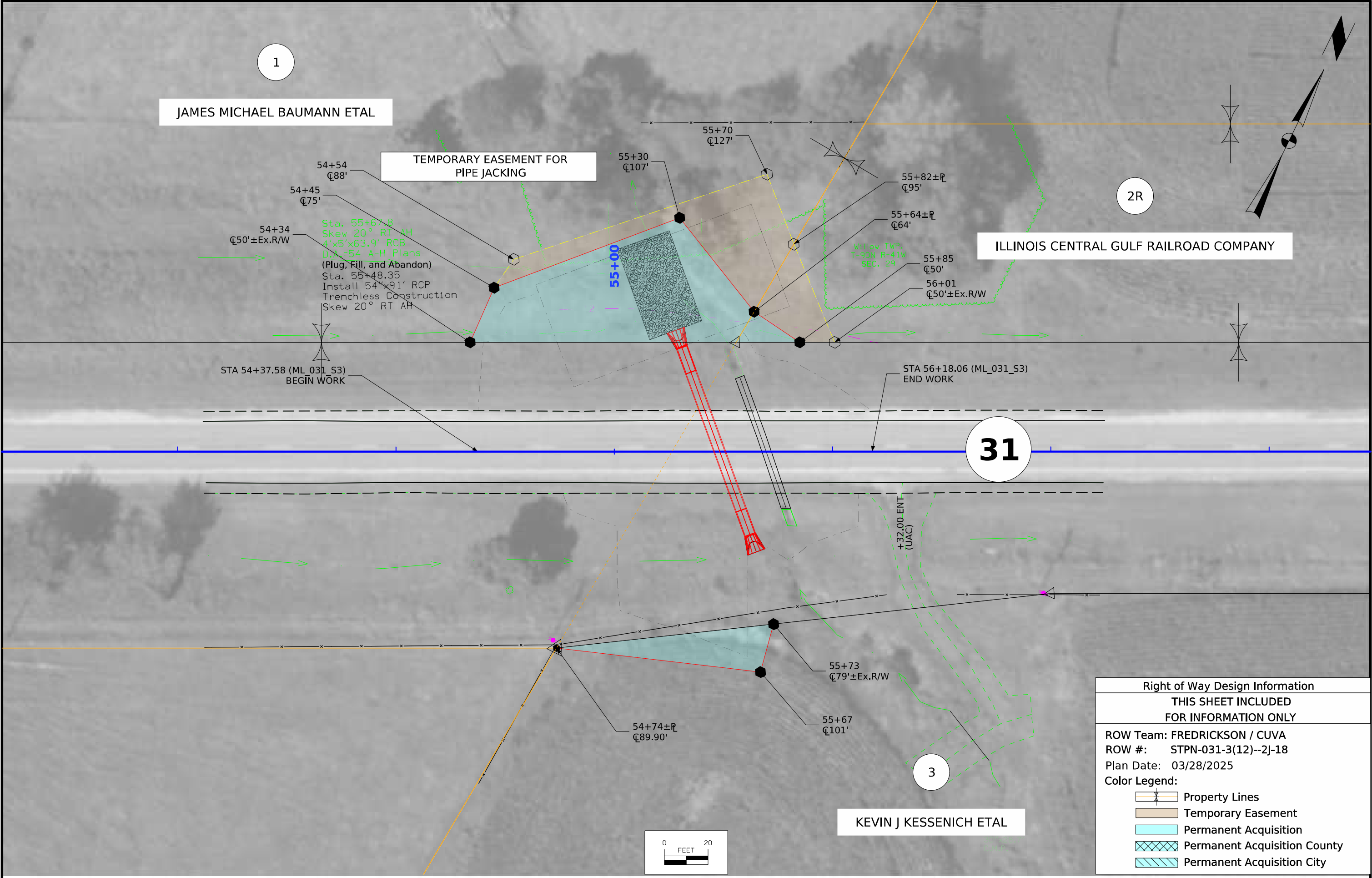
Name: REF572
Description: CM 102FT NW COR BR WING 60FT CL HWY 42FT CL ENT
Feature Definition: CP
Northing: 8637636.918 Easting: 14300462.280 Elevation: 1193.66

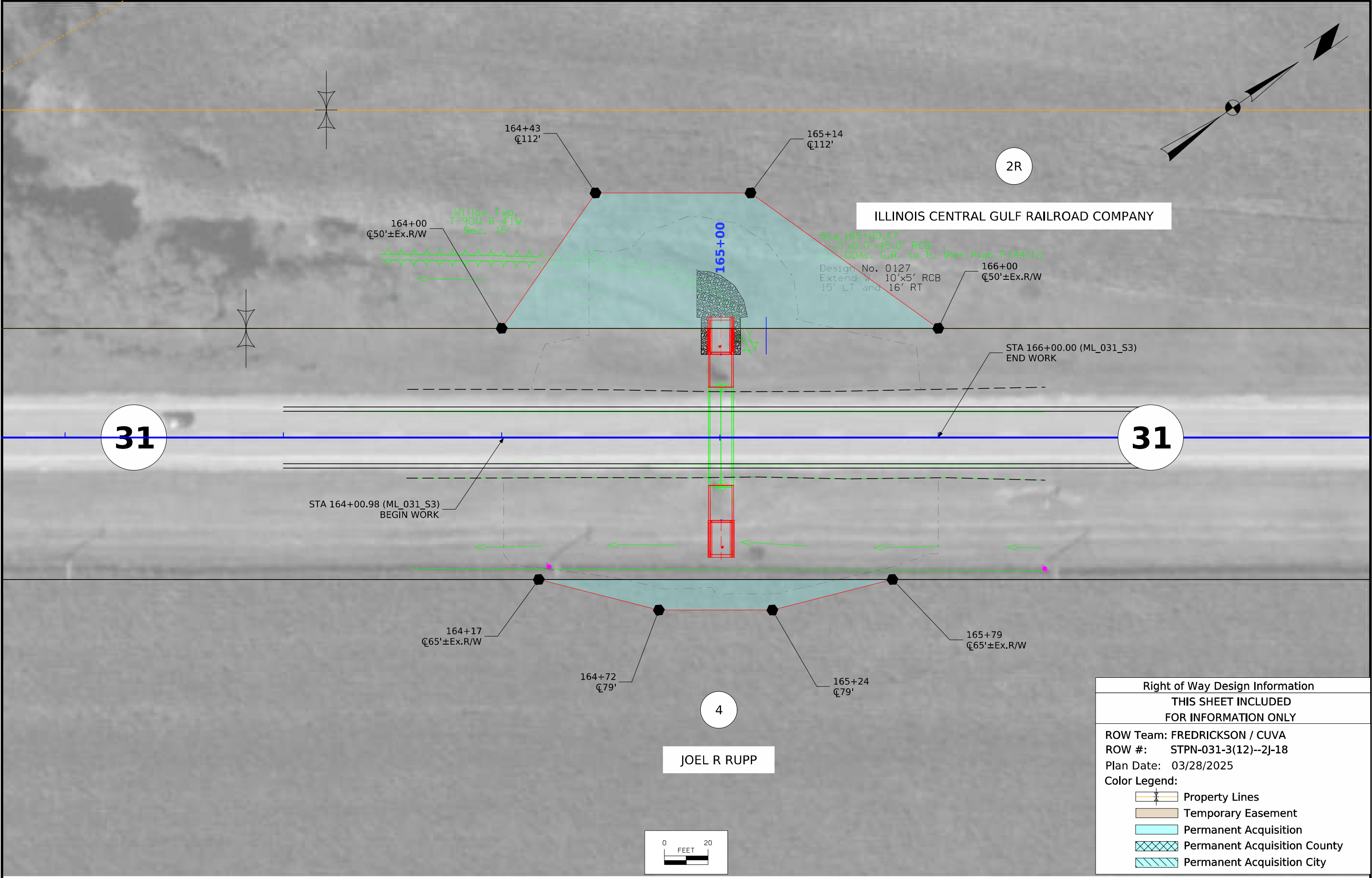
Name: 600
Description: CM 63FT ELECTRIC BOX 55FT CL 620TH ST 50FT CL HWY
Feature Definition: CP
Northing: 8628367.884 Easting: 14273926.030 Elevation: 1161.10

Name: 2000-019
Description: COUNTY GPS MON
Feature Definition: CP
Northing: 8627034.311 Easting: 14273111.480 Elevation: 1164.15

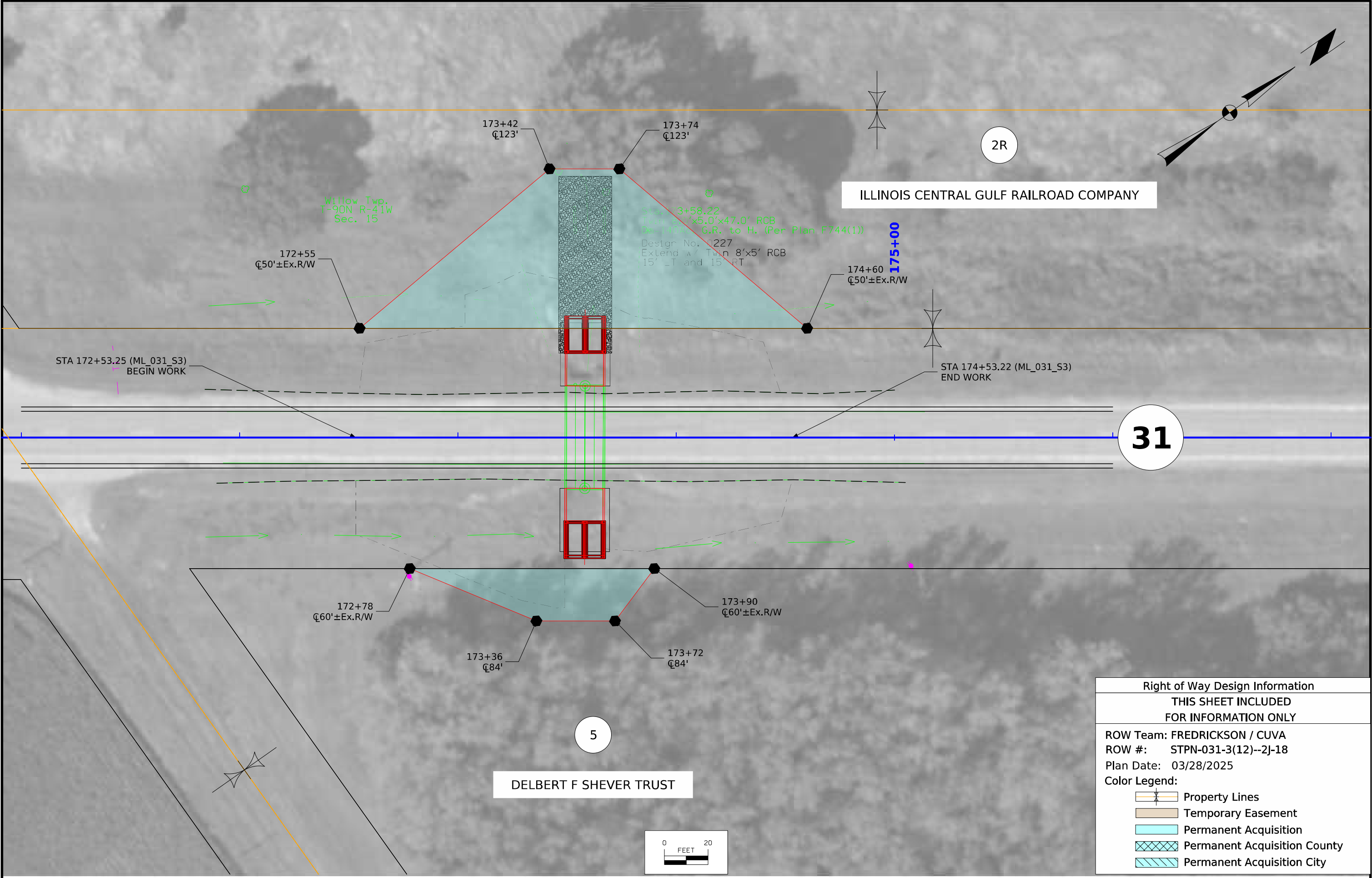
Name: 2000-077
Description: COUNTY GPS MON
Feature Definition: CP
Northing: 8616040.810 Easting: 14262306.190 Elevation: 1155.43

ALIGNMENT COORDINATES																			101_16 10/25/24
Name	Location	Point on Tangent Station	Point on Tangent Y Northing	Point on Tangent X Easting	Begin Spiral Station	Begin Spiral Y Northing	Begin Spiral X Easting	Begin Curve Station	Begin Curve Y Northing	Begin Curve X Easting	Simple Curve PI or Master PI Station	Simple Curve PI or Master PI Y Northing	Simple Curve PI or Master PI X Easting	End Curve Station	End Curve Y Northing	End Curve X Easting	End Spiral Station	End Spiral Y Northing	End Spiral X Easting
E 4th Ave		10314+75.00	8637483.601	14285023.469															
E 4th Ave								10315+86.78	8637578.248	14284964.007	10316+86.77	8637662.915	14284910.815	10317+66.57	8637654.947	14284811.144			
E 4th Ave		10318+10.83	8637651.420	14284767.020															

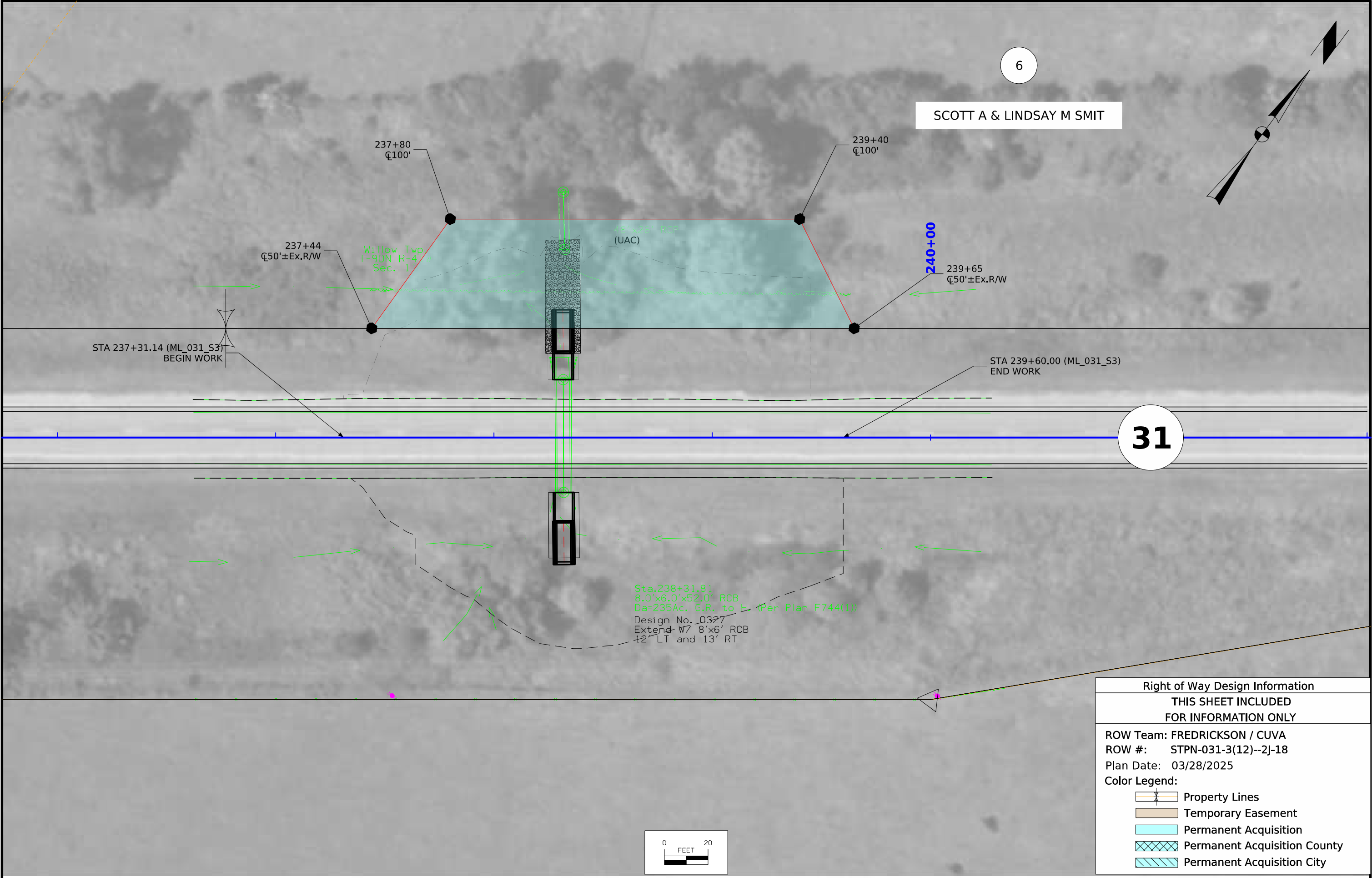


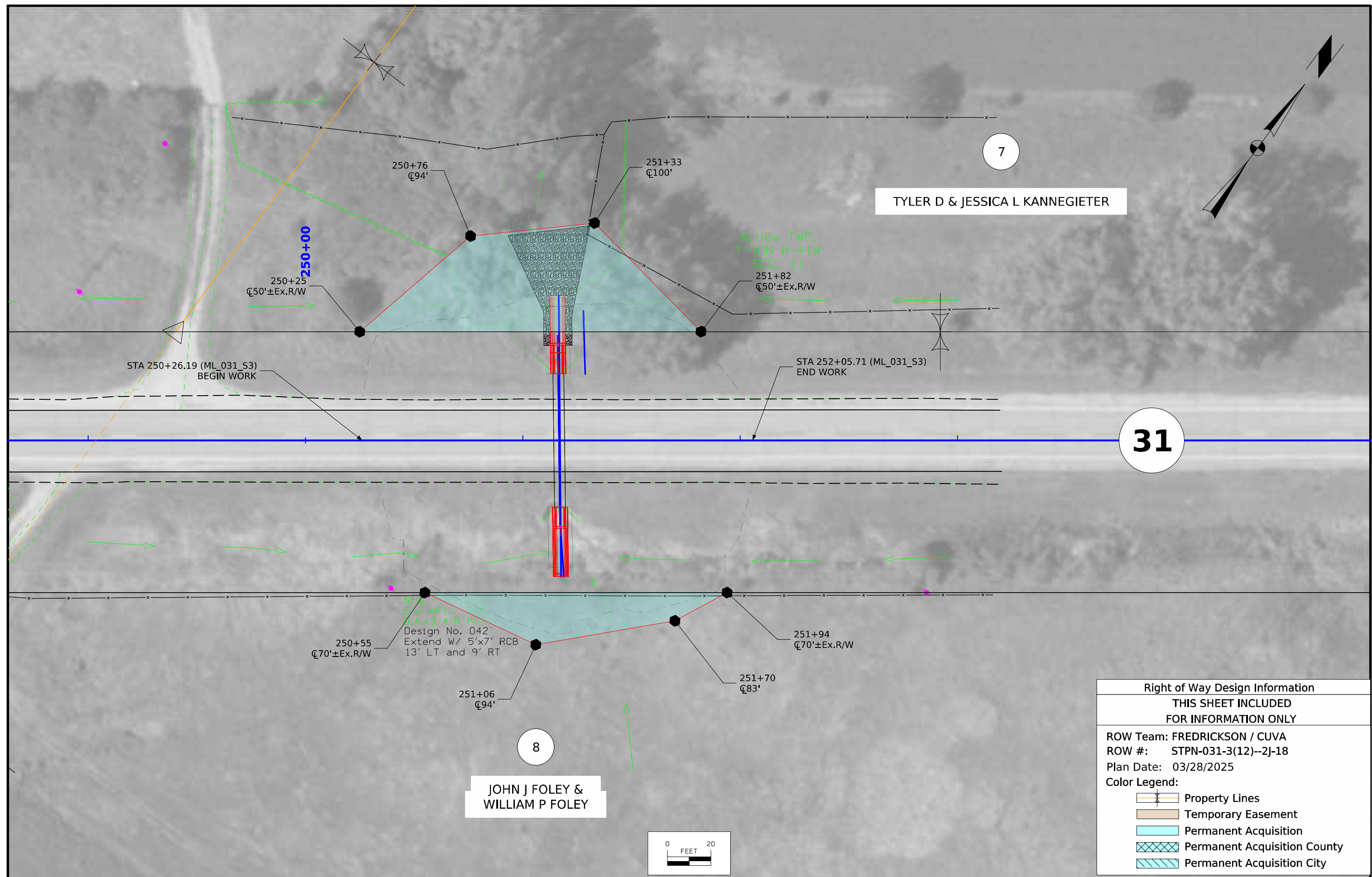


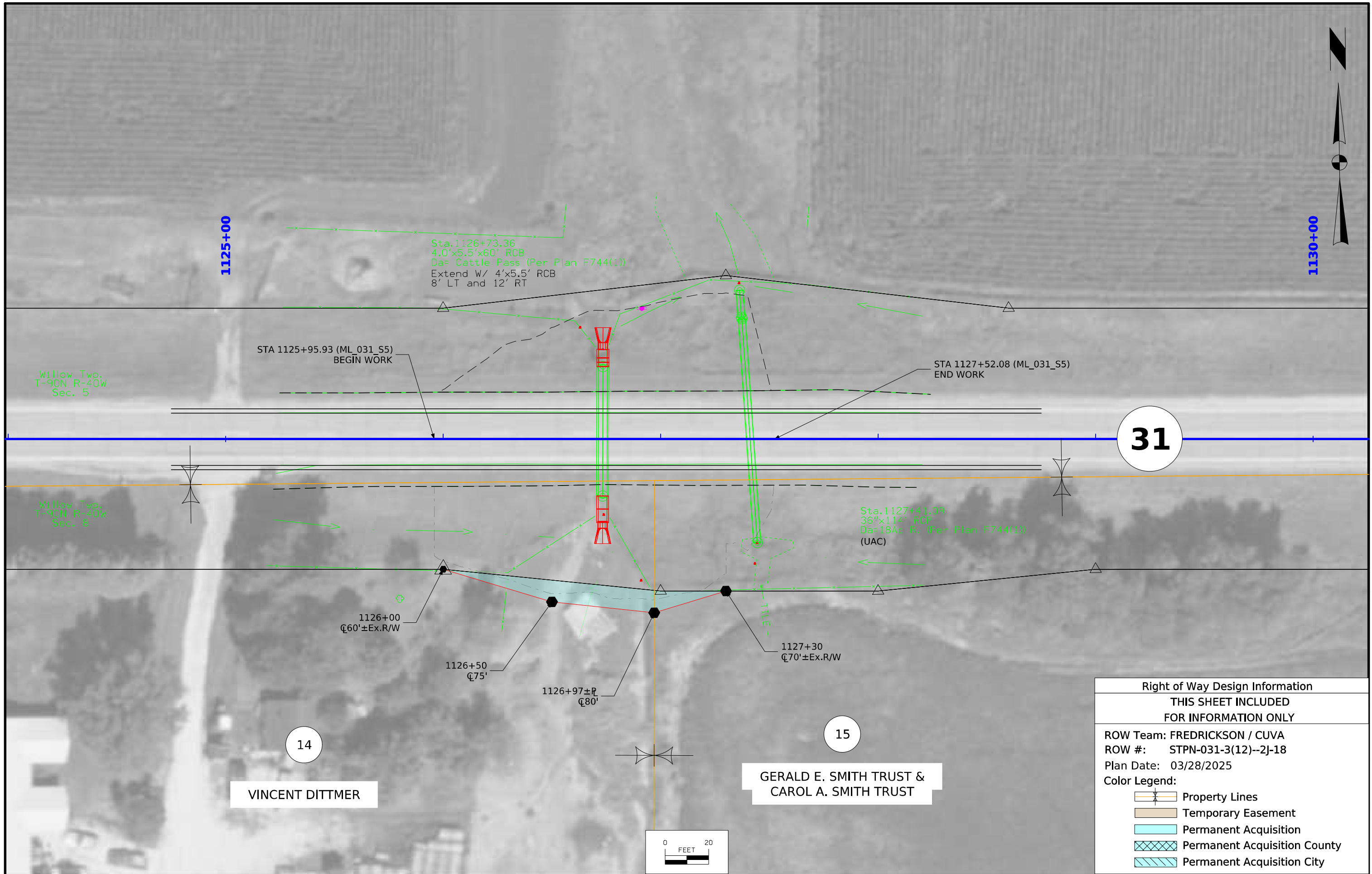
Right of Way Design Information	
THIS SHEET INCLUDED FOR INFORMATION ONLY	
ROW Team: FREDRICKSON / CUVA	
ROW #: STPN-031-3(12)--2J-18	
Plan Date: 03/28/2025	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition
	Permanent Acquisition County
	Permanent Acquisition City



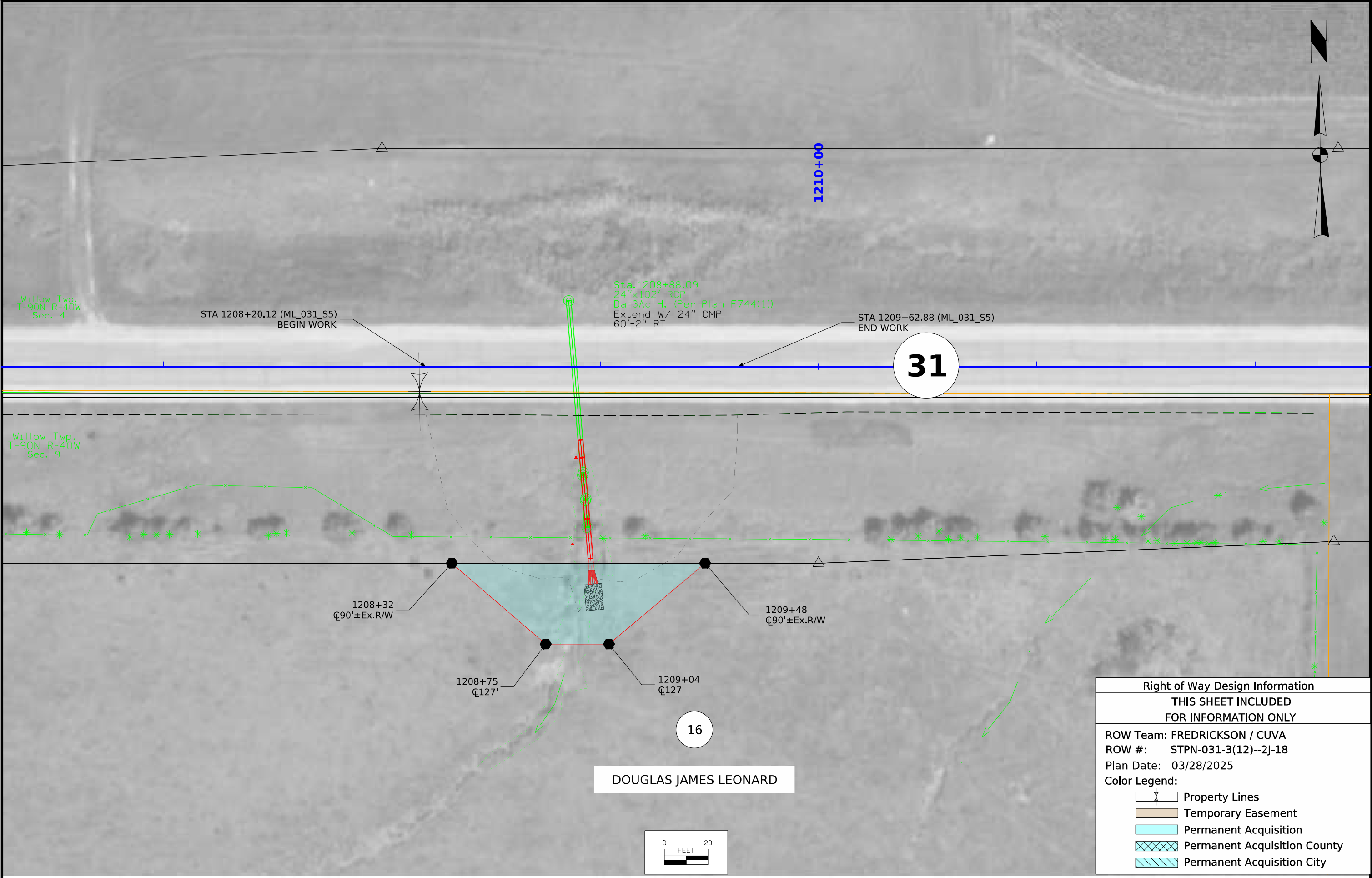
Right of Way Design Information	
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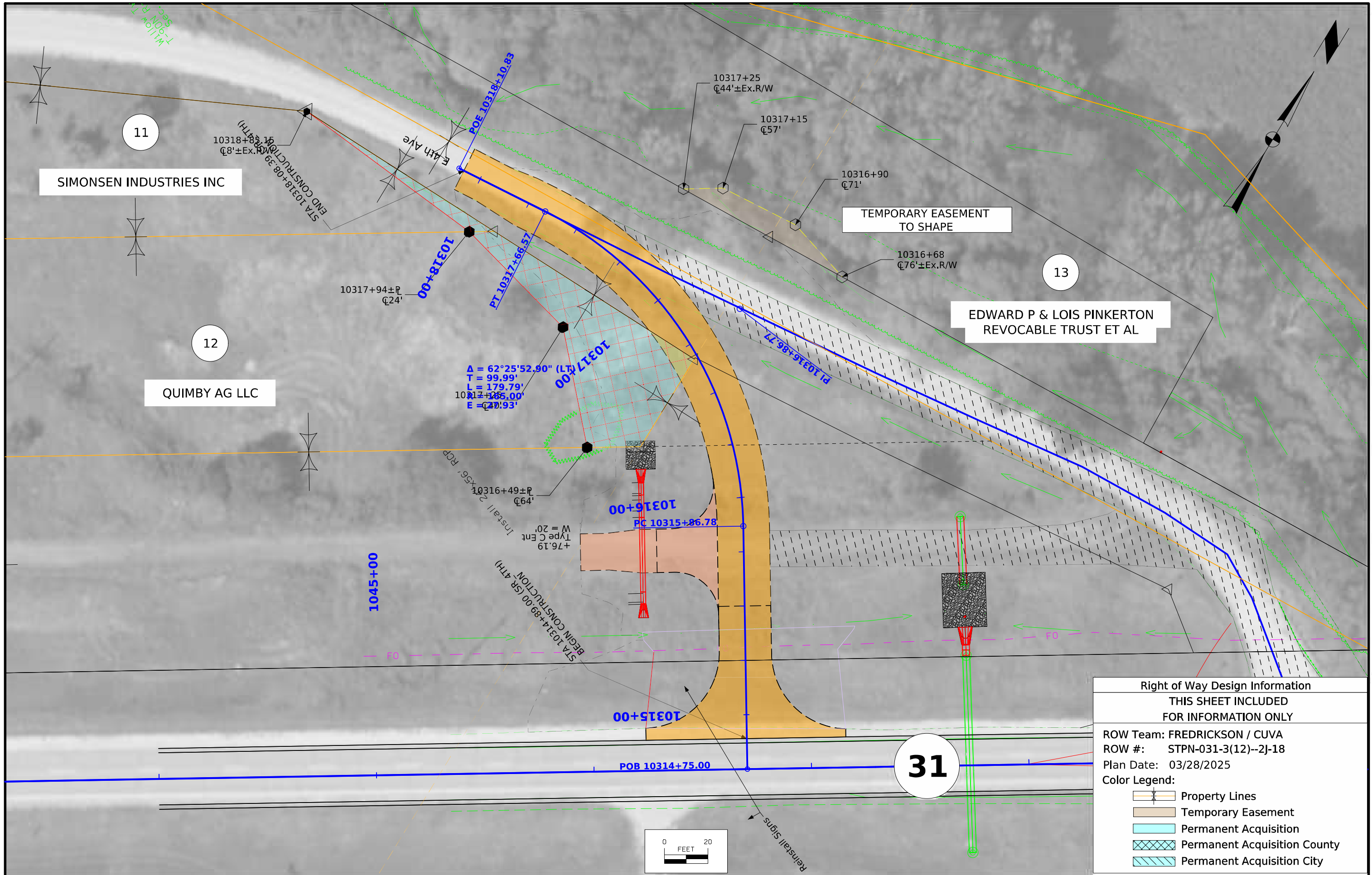






Right of Way Design Information	
THIS SHEET INCLUDED FOR INFORMATION ONLY	
ROW Team: FREDRICKSON / CUVA	
ROW #: STPN-031-3(12)--2J-18	
Plan Date: 03/28/2025	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition
	Permanent Acquisition County
	Permanent Acquisition City





Right of Way Design Information	
THIS SHEET INCLUDED FOR INFORMATION ONLY	
ROW Team: FREDRICKSON / CUVA	
ROW #: STPN-031-3(12)--2J-18	
Plan Date: 03/28/2025	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition
	Permanent Acquisition County
	Permanent Acquisition City

108_23A
8/15/22

TRAFFIC CONTROL PLAN

Traffic on IA 31 will be maintained at all times. During the construction of RCB extensions, TBR will be placed on the shoulder. During the construction of pipe extensions and pipe jacking, a shoulder closure will be utilized. One shoulder shall be closed at a time to allow traffic operations to continue and farm equipment to pass. During guardrail construction, one lane will be closed and flaggers will be used.

E. 4th Street will be closed to traffic during construction.

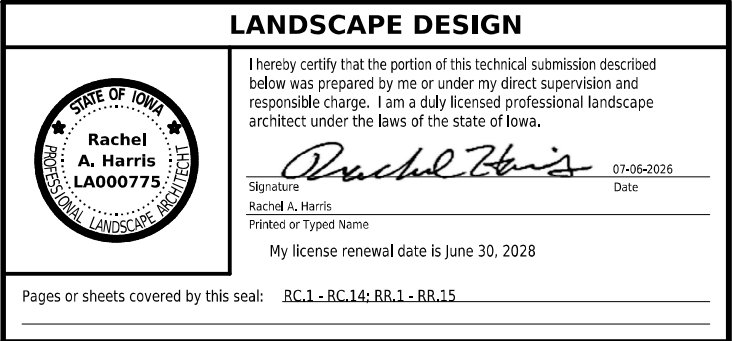
FILE NO.	32354	ENGLISH	DESIGN TEAM	Miller\DeWolf\Hobson	CHEROKEE COUNTY	PROJECT NUMBER	STPN-031-3(15)--2J-18	SHEET NUMBER	J.2
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111_01
10/14/22

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
BRF-031-3(13)--38-18	Bridge Replacement



Signature Rachel Harris Date 07-06-2026

My license renewal date is June 30, 2028

Pages or sheets covered by this seal: BC.1 - BC.14; BB.1 - BB.15

ESTIMATED PROJECT QUANTITIES AND REFERENCE NOTES

Roadside : Roadside Items

Item no.	Item Code	Item	Unit	Quantities	Estimate Reference Notes
				Estimated	
				Roadside	
1	2507-3250005	ENGINEERING FABRIC	SY	1,242.7	<p>Refer to Tab. 100-23 for locations.</p> <p>Refer to Standard Road Plan EC-301.</p> <p>Use material specified for embankment erosion control according to Article 4196.01, B, 3. of the Standard Specifications. Material will be measured in sq. yds. of actual area covered. Refer to details.</p> <p>The tabulation includes estimated locations for placement of "Engineering Fabric" to address erosion at culvert outlets. The bid quantity includes an additional 30% for other locations as needed. Verify additional locations with the Engineer prior to placement.</p>
2	2507-6800061	REVETMENT, CLASS E	TON	946.9	<p>Refer to Tab. 100-23 for locations.</p> <p>Refer to Standard Road Plan EC-301.</p> <p>The tabulation includes estimated locations for placement of "Revetment, Class E" to address erosion to be encountered during construction. The bid quantity includes an additional 30% for other locations as needed. Verify additional locations with the Engineer prior to placement.</p> <p>Estimated at 1.5 ton/cu yd. Class E revetment shall meet requirements of Article 4130 of the Standard Specifications.</p>
3	2601-2634100	MULCHING	ACRE	4.9	<p>Perform mulching according to Article 2601.03, E, 2, of the Standard Specifications. Anchor mulch into the soil using mulch anchoring equipment with a minimum of two passes.</p> <p>Item is included for areas requiring reshaping and seedbed preparation except where slope protection has been applied. Use mulch that is Certified Noxious Weed Seed Free Mulch as certified by the Iowa Crop Improvement Association or adjacent states Crop Improvement Associations.</p> <p>Mulch Rate: 1 1/2 tons of dry cereal straw or native grass straw per acre.</p>
4	2601-2636043	SEEDING AND FERTILIZING (RURAL)	ACRE	4.9	<p>Seed and fertilize all areas 8 foot adjacent to the shoulder mainline, medians, and side according to Article 2601.03, C, 3, of the Standard Specifications.</p>
5	2601-2642100	STABILIZING CROP - SEEDING AND FERTILIZING	ACRE	4.9	<p>Item is included for disturbed areas.</p> <p>Seed and fertilize all disturbed areas according to Article 2601.03, C, 1, of the Standard Specifications. If permanent seeding cannot be placed due to the restrictive planting dates, stabilizing crop will need to be placed on all disturbed areas as temporary erosion control.</p> <p>When stabilizing crop must be used, place immediately following completions of finished grading. Reseeding of these areas will be required at contractors expense if damage occurs due to contractors negligence during the contract period.</p> <p>It is not necessary to place stabilizing crop in locations that have be covered by slope or special ditch protection.</p>

Item no.	Item Code	Item	Unit	Quantities	Estimate Reference Notes
				Estimated	
				Roadside	
6	2601-2643110	WATERING FOR SOD, SPECIAL DITCH CONTROL, OR SLOPE PROTECTION	MGAL	11.8	<p>Estimate for watering Special Ditch Control, Slope Protection Areas, Turf Reinforcement Mat, or Transition Mat is based on a total of four waterings at a rate of 50 gallons maximum per square, per watering.</p> <p>The first watering should be done no later than the day following placement of the materials with 3 additional watering at intervals of 5 to 8 calendar days.</p> <p>The amount of water used should be sufficient to saturate the seedbed to a depth of approximately 2 inches.</p>
7	2601-2643300	MOBILIZATION FOR WATERING	EACH	3	
8	2601-2643412	TURF REINFORCEMENT MAT, TYPE 2	SQ	59	<p>Refer to Tab 100-22 for locations.</p> <p>Refer to Standard Road Plan EC-104.</p>
9	2602-0000030	SILT FENCE FOR DITCH CHECKS	LF	957	<p>Refer to Tab 100-18 for locations.</p> <p>Refer to Standard Road Plan EC-201.</p> <p>The tabulation includes estimated locations for placement of "Silt Fence for Ditch Checks" to address erosion to be encountered during construction. Verify the specific locations with the Engineer prior to beginning placement.</p> <p>Bid item includes 50% additional quantity for field adjustments and replacements.</p>
10	2602-0000071	REMOVAL OF SILT FENCE OR SILT FENCE FOR DITCH CHECKS	LF	957	<p>This item is included for silt fence and silt fence for ditch check removal required for staging reasons, removal to allow for replacement (replacement to be paid separately), or for areas that have achieved 70% permanent growth. This item is included for silt fence and silt fence for ditch check removal.</p> <p>Remove silt fence and posts after mulching or vegetation is established and approved by the engineer.</p>
11	2602-0000101	MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECK	LF	95.7	<p>This item is included for clean-out and repair of the silt fence and silt fence for ditch checks during the project.</p>
12	2602-0000150	STABILIZED CONSTRUCTION ENTRANCE, EC-303	LF	1,000	<p>Refer to Standard Road Plan EC-303.</p>
13	2602-0000312	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 12 IN. DIA.	LF	4,330	<p>Refer to Tab. 100-19 for locations.</p> <p>Refer to Standard Road Plan EC-204.</p> <p>The tabulation includes estimated locations for placement of "Perimeter and Slope Sediment Control Device, 12 in. dia." to address erosion to be encountered during construction.</p> <p>Verify the specific locations with the Engineer prior to beginning placement. Bid item includes 25% additional quantity for field adjustments and replacements.</p>

Item no.	Item Code	Item	Unit	Quantities	Estimate Reference Notes
				Estimated	
				Roadside	
14	2602-0000320	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 20 IN. DIA.	LF	4,330	Refer to Standard Road Plan EC-204. Item is included for temporary perimeter sediment control, inlet protection, and water velocity reduction on slopes or ditches at locations to be determined during construction. Verify specific locations with the Engineer prior to beginning placement. Item may be used in addition to, or as a direct replacement for "Perimeter and Slope Sediment Control Device, 12 in. dia." upon Engineer approval.
15	2602-0000351	REMOVAL OF PERIMETER AND SLOPE OR DITCH CHECK SEDIMENT CONTROL DEVICE	LF	8,660	
16	2602-0010010	MOBILIZATIONS, EROSION CONTROL	EACH	1	
17	2602-0010020	MOBILIZATIONS, EMERGENCY EROSION CONTROL	EACH	1	

281_01
9/28/22

SECTION 404 PERMIT AND CONDITIONS

Construct this project according to the requirements of U.S. Army Corps of Engineers Nationwide, Permit No. 3 and 14. A copy of this permit is available from the Iowa DOT website (<http://www.envpermits.iowadot.gov/>). The U.S. Army Corps of Engineers reserves the right to visit the site without prior notice.

281_03
11/9/23

STORM WATER BEST MANAGEMENT PRACTICES

When the following best management practices are used, they are intended to account for disturbed areas where storage volume cannot be provided: Silt Fence For Ditch Checks, Perimeter and Slope Sediment Control Devices, Turf Reinforcement Mat - Type 2, Rock Ditches, Rock Splash Basins and Seeding.

282_03
9/28/22

TEMPORARY STREAM CROSSING, CAUSEWAY, OR EQUIPMENT PAD

Standard Road Plan EW-401 is listed in Tabulation 105-4; however, it is included for information purposes only since it is an option. No quantities associated with constructing EW-401 are included in any bid items.

111_25 4/21/26			
INDEX OF TABULATIONS			
Line No.	Tabulation	Tabulation Title	Sheet No.
1.0	111_25	INDEX OF TABULATIONS	RC.6
2.0	105_04	STANDARD ROAD PLANS	RC.7
3.0	100_18	SILT FENCES FOR DITCH CHECKS	RC.8
4.0	100_19	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE	RC.9
5.0	100_22	ROLLED EROSION CONTROL	RC.10
6.0	100_23	ROCK EROSION CONTROL	RC.11
7.0	100_34	STORMWATER DRAINAGE BASIN	RC.12
8.0	110_12	POLLUTION PREVENTION PLAN	RC.13 - RC.14

105_04
4/21/26

STANDARDS

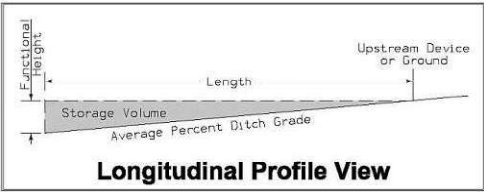
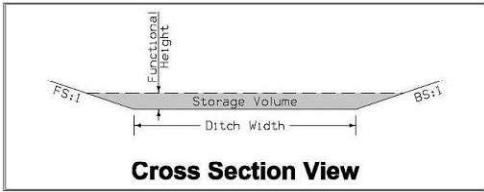
The following Standards apply to construction work on this project.

Number	Date	Title
EC-104	04-17-18	Turf Reinforced Mat (TRM)
EC-201	04-20-21	Silt Fence
EC-204	10-19-21	Perimeter, Slope and Ditch Check Sediment Control Devices
EC-301	10-18-22	Rock Erosion Control (REC)
EC-303	10-19-21	Stabilized Construction Entrance
EC-502	04-21-15	Seeding in Rural Areas
EW-401	10-20-15	Temporary Stream Crossing, Causeway, or Equipment Pad

SILT FENCES FOR DITCH CHECKS

Possible Standard: EC-201

100_18
8/15/22



* The functional height used in the volume equation is 85% of effective height. Effective height is 1.58 feet as shown on EC-201.
* Volume equation: $[0.5 \times \text{Spacing} \times (0.5 \times H^2 \times FS + DW \times H + 0.5 \times H^2 \times BS)]$

Basin No.	Type	Station	Side	Installation (LF)	Maintenance (LF)	Removal (LF)	Foreslope (FS:1)	Backslope (BS:1)	Ditch Width (FT)	Avg. % Slope Ditch Grade	Volume (CF)	Remarks
1	Type 1	55+25.00	Right	22.0	2.2	22.0	3.0	3.0	10.0	3.0	471.00	
3	Type 1	172+62.00	Right	22.0	2.2	22.0	3.0	3.0	10.0	4.6	329.70	
3	Type 1	172+97.00	Right	22.0	2.2	22.0	3.0	3.0	10.0	4.6	329.70	
3	Type 1	173+32.00	Right	22.0	2.2	22.0	3.0	3.0	10.0	4.6	329.70	
3	Type 1	173+08.00	Left	22.0	2.2	22.0	3.0	3.0	10.0	3.6	376.80	
4	Type 1	237+67.00	Right	22.0	2.2	22.0	3.0	3.0	10.0	5.0	329.70	
4	Type 1	238+02.00	Right	22.0	2.2	22.0	3.0	3.0	10.0	5.0	329.70	
4	Type 1	238+58.00	Right	22.0	2.2	22.0	3.0	3.0	10.0	1.6	706.50	
4	Type 1	239+33.00	Right	22.0	2.2	22.0	3.0	3.0	10.0	5.0	329.70	
4	Type 1	237+63.00	Left	22.0	2.2	22.0	3.0	3.0	10.0	0.5	2967.30	
4	Type 1	238+59.00	Left	22.0	2.2	22.0	3.0	3.0	10.0	0.8	1460.10	
4	Type 1	239+44.00	Left	22.0	2.2	22.0	3.0	3.0	10.0	0.8	1460.10	
5	Type 1	250+50.00	Right	22.0	2.2	22.0	3.0	3.0	10.0	5.1	282.60	
5	Type 1	250+80.00	Right	22.0	2.2	22.0	3.0	3.0	10.0	5.1	282.60	
5	Type 1	251+10.00	Right	22.0	2.2	22.0	3.0	3.0	10.0	5.1	282.60	
5	Type 1	251+33.00	Right	22.0	2.2	22.0	3.0	3.0	10.0	2.4	565.20	
5	Type 1	251+93.00	Right	22.0	2.2	22.0	3.0	3.0	10.0	2.4	565.20	
6	Type 1	10317+25.00	Left	22.0	2.2	22.0	3.0	3.0	10.0	1.4	942.00	E 4th Ave.
7	Type 1	10316+00.00	Right	22.0	2.2	22.0	3.0	3.0	10.0	3.3	423.90	E 4th Ave.
7	Type 1	10316+45.00	Right	22.0	2.2	22.0	3.0	3.0	10.0	3.3	423.90	E 4th Ave.
7	Type 1	10316+90.00	Right	22.0	2.2	22.0	3.0	3.0	10.0	3.3	423.90	E 4th Ave.
7	Type 1	1048+00.00	Left	22.0	2.2	22.0	3.0	3.0	10.0	2.1	565.20	
7	Type 1	1048+60.00	Left	22.0	2.2	22.0	3.0	3.0	10.0	2.1	565.20	
8	Type 1	1126+00.00	Right	22.0	2.2	22.0	3.0	3.0	10.0	3.0	471.00	
8	Type 1	1126+50.00	Right	22.0	2.2	22.0	3.0	3.0	10.0	3.0	471.00	
8	Type 1	1126+86.00	Right	22.0	2.2	22.0	3.0	3.0	10.0	3.0	471.00	
8	Type 1	1127+29.00	Right	22.0	2.2	22.0	3.0	3.0	10.0	3.0	471.00	
9	Type 1	1208+45.00	Right	22.0	2.2	22.0	3.0	3.0	10.0	2.0	706.50	
9	Type 1	1209+39.00	Right	22.0	2.2	22.0	3.0	3.0	10.0	2.0	706.50	
Total:				638	63.8	638						

100_19
10/15/24

PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE

Possible Standards: EC-204

Station From	Station To	Side	Sediment Control Device Type	Diameter Size	Length (LF)	Remarks
54+38.00	55+89.00	Left	Perimeter and Slope	12 inch	160.00	
54+80.00	56+15.00	Right			140.00	
55+64.00		Right			50.00	Inlet Protection
164+00.00	166+00.00	Right			210.00	
164+15.00	165+91.00	Left			180.00	
165+00.00		Right			50.00	Inlet Protection
172+55.00	174+47.00	Left			200.00	
172+55.00	174+53.00	Right			210.00	
173+58.00		Right			80.00	Inlet Protection
237+41.00	239+45.00	Left			210.00	
237+41.00	239+59.00	Right			220.00	
238+30.00		Right			60.00	Inlet Protection
250+28.00	251+85.00	Left			160.00	
250+37.00	252+03.00	Right			170.00	
251+16.00		Right			60.00	Inlet Protection
10315+00.00	10315+55.00	Left			130.00	E 4th Ave.
10315+41.00		Left			40.00	E 4th Ave. Inlet Protection
10315+88.00	10316+50.00	Left			60.00	E 4th Ave.
10316+70.00	10317+03.00	Left			60.00	E 4th Ave.
10315+10.00	10315+94.00	Right			90.00	E 4th Ave.
10315+92.00	10316+39.00	Right			60.00	E 4th Ave.
10316+32.00	10316+85.00	Right			60.00	E 4th Ave.
1046+85.00	1049+63.00	Left			300.00	
1125+96.00	1127+50.00	Right			160.00	
1126+73.00		Right			50.00	Inlet Protection
1126+14.00	1127+50.00	Left			140.00	
1208+21.00	1209+61.00	Right			150.00	

Total:3460

<div>ROLLED EROSION CONTROL</div> <div>Refer to EC-101, EC-103 and EC-104.</div>										100_22 8/15/22
Road Identification	Station From	Station To	Side	Length (FT)	Width (FT)	TRM Type (EC-104)	TRM Quantity (Squares)	Slope Protection (EC-103) (Squares)	Special Ditch Control (EC-101) (Squares)	Remarks
IA 31	1208+20.00	1209+62.00	Right	140.0	42.0	Type 2	59.0			

Total:

59

<div>100_23 8/15/22</div> <div>ROCK EROSION CONTROL</div> <div>Refer to EC-301 and Detail 570-8</div>										
Road Identification	Station From	Station To	Side	Length (FT)	Width (FT)	Rock Erosion Control Type	Engineering Fabric (SY)	Class E Revetment (TON)	Erosion Stone (TON)	Remarks
IA 31	54+63.00	55+10.00	Left	45.00	12.0	Type 2 - Rock Ditch	87.2	60.000		
IA 31	55+28.00		Left	44.00	25.0	Type 4 - Rock Splash Basin	154.7	122.300		
IA 31	165+00.00		Left	25.00	20.0	Type 4 - Rock Splash Basin	78.0	52.000		
IA 31	173+60.00		Left	65.00	25.0	Type 4 - Rock Splash Basin	234.0	196.000		
IA 31	238+32.00		Left	42.00	16.0	Type 4 - Rock Splash Basin	73.0	70.000		
IA 31	251+17.00		Left	45.00	25.0	Type 4 - Rock Splash Basin	163.0	122.000		
IA 31	10316+32.00		Left	13.50	13.0	Type 4 - Rock Splash Basin	33.1	19.500		
IA 31	1047+73.00		Left	25.00	20.0	Type 4 - Rock Splash Basin	77.4	55.600		
IA 31	1126+75.00		Left	13.50	13.5	Type 4 - Rock Splash Basin	34.1	20.300		
IA 31	1208+95.00		Right	12.00	8.0	Type 4 - Rock Splash Basin	21.4	10.700		
Total:							955.9	728.4		

100_34
11/30/25

STORMWATER DRAINAGE BASIN
Refer to EC Standards and 570s Details.

Basin No.	Station From	Station To	Side	Discharge Station	Discharge Direction	Total Disturbed Area (ACRES)	Disturbed Area with Storage Provided (ACRES)	Disturbed Area without Storage Provided (ACRES)	Best Management Practice	Total Storage Volume Provided (CF)	Total Storage Volume Required (CF)	Storage Volume Met	Remarks
1	54+27.00	56+18.00	L/R	55+28.00	NW	0.2	0.2		Silt Fence for Ditch Check (EC-201)	471.00	720.0	No	
2	164+01.00	166+00.00	L/R	165+00.00	SW	0.4	0.4				1440.0	No	
3	172+53.00	174+54.00	L/R	173+59.00	NW	0.4	0.4		Silt Fence for Ditch Check (EC-201)	1366.00	1440.0	No	
4	237+31.00	239+58.00	L/R	238+32.00	NW	0.6	0.6		Silt Fence for Ditch Check (EC-201)	7583.00	2160.0	Yes	
5	250+25.00	252+05.00	L/R	251+17.00	NW	0.4	0.4		Silt Fence for Ditch Check (EC-201)	1978.00	1440.0	Yes	
6	1045+40.00	1046+70.00	Left	1045+40.00	W	0.3	0.3		Silt Fence for Shallow Ditch or No Ditch (EC-201)	942.00	1080.0	No	
7	1045+40.00	1052+55.00	L/R	1045+40.00	W	1.3	1.3		Silt Fence for Ditch Check (EC-201)	2402.00	4680.0	No	
8	1125+96.00	1127+52.00	L/R	1126+73.00	N	0.3	0.3		Silt Fence for Ditch Check (EC-201)	1884.00	1080.0	Yes	
9	1208+20.00	1209+63.00	Right	1208+95.00	SW	0.2	0.2		Silt Fence for Ditch Check (EC-201)	1413.00	720.0	Yes	

<div>110_12 1/13/23</div> <div>POLLUTION PREVENTION PLAN</div> <div><p>This project is regulated by the requirements of the Iowa Department of Natural Resources (DNR) National Pollutant Discharge Elimination System (NPDES) General Permit No. 2 OR an Iowa Department of Natural Resources (DNR) National Pollutant Discharge Elimination System (NPDES) individual storm water permit. The Contractor shall carry out the terms and conditions of this permit and the Pollution Prevention Plan (PPP).</p><p>This Base PPP includes information on Roles and Responsibilities, Project Site Description, Controls, Maintenance Procedures, Inspection Requirements, Non-Storm Water Controls, Potential Sources of Off Right-of-Way Pollution, and Definitions. This plan references other documents rather than repeating the information contained in the documents. A copy of this Base Pollution Prevention Plan, amended as needed during construction, will be readily available for review.</p><p>All contractors shall conduct their operations in a manner that controls pollutants, minimizes erosion, and prevents sediments from entering waters of the state and leaving the highway right-of-way. The Contractor shall be responsible for compliance and implementation of the PPP for their entire contract. This responsibility shall be further shared with subcontractors whose work is a source of potential pollution as defined in this PPP.</p><p>I. ROLES AND RESPONSIBILITES</p><p>A. Designer:</p><ol style="list-style-type: none">Prepares Base PPP included in the project plan.Prepares Notice of Intent (NOI) submitted to Iowa DNR.Is signature authority on the Base PPP. If consultant designed, signature from Contracting Authority is also required.<p>B. Contractor:</p><ol style="list-style-type: none">Signs a co-permittee certification statement adhering to the requirements of the NPDES permit and this PPP. All co-permittees are legally required under the Clean Water Act and the Iowa Administrative Code to ensure compliance with the terms and conditions of this PPP.Designates a Water Pollution Control Manager (WPCM), who has the duties and responsibilities as defined in Section 2602 of the Standard Specifications.Submits an Erosion Control Implementation Plan (ECIP) and ECIP updates according to Section 2602 of the Standard Specifications.Installs and maintains appropriate controls. This work may be subcontracted as documented through Subcontractor Request Forms (Form 830231).Supervises and implements good housekeeping practices according to Paragraph III, C, 2.Conducts joint required inspections of the site with inspection staff. When Contractor is not mobilized on site, Contractor may delegate this responsibility to a trained or certified subcontractor. Contracting Authority also may waive joint inspection requirement during winter shutdown. In both circumstances, WPCM (or trained or certified delegate from the Contractor) is still responsible to review and sign inspection reports.Complies with training and certification requirements of Section 2602 of the Standard Specifications.Submits amended PPP site map according to Section 2602 of the Standard Specifications.<p>C. Subcontractors:</p><ol style="list-style-type: none">Sign a co-permittee certification statement adhering to the requirements of the NPDES permit and this PPP if: responsible for sediment or erosion controls; involved in land disturbing activities; or perorming work that is a source of potential pollution as defined in this PPP. Subcontracted work items are identified in Subcontractor Request Forms (Form 830231). All co-permittees are legally required under the Clean Water Act and the Iowa Administrative Code to ensure compliance with the terms and conditions of this PPP.Implement good housekeeping practices according to Paragraph III, C, 2.<p>D. RCE/Project Engineer:</p><ol style="list-style-type: none">Is Project Storm Water Manager.On projects where DOT is the Contracting Authority, is current with erosion control training or certification.Takes actions necessary to ensure compliance with storm water requirements including, where appropriate, issuing stop work orders, and directing additional inspections at construction project sites that are experiencing problems with achieving permit compliance.Orders the taking of measures to cease, correct, prevent, or minimize the consequences of non-compliance with the storm water requirements of the Applicable Permit.Supervises all work necessary to meet storm water requirements at the Project, including work performed by contractors and subcontractors.Requires employees, contractors, and subcontractors to take appropriate responsive action to comply with storm water requirements, including requiring any such person to cease or correct a violation of storm water requirements, and to order or recommend such other actions as necessary to meet storm water requirements.Is familiar with the Project PPP and storm water site map.On projects where DOT is Contracting Authority, is responsible for periodically monitoring inspection reports to determine whether deficiencies identified in inspection reports were adequately and timely addressed, and if not, has the authority and responsibility to direct immediate actions to correct the deficiencies.Is the point of contact for the Project for regulatory officials, Inspector, contractors, and subcontractors regarding storm water requirements.Is signature authority on Notice of Discontinuation.Maintains an up-to-date record of contractors, subcontractors, and subcontracted work items through Subcontractor Request Forms (Form 830231).Makes information to determine permit compliance available to the DNR upon their request.</div>				<div>110_12 1/13/23</div> <div>POLLUTION PREVENTION PLAN</div> <div><p>E. Inspector:</p><ol style="list-style-type: none">Updates PPP through fieldbook entries and storm water site inspection reports if there is a change in design, construction, operation, or maintenance which has a significant effect on the discharge of pollutants from the project.Makes information to determine permit compliance available to the DNR upon their request.Conducts joint required inspections of the site with the contractor/subcontractor.Completes an inspection report after each inspection.Is signature authority on storm water inspection reports.<p>F. PROJECT SITE DESCRIPTION</p><p>A. This Pollution Prevention Plan (PPP) is for Culvert Work in Cherokee County.</p><p>B. This PPP covers approximately 13.7 acres with an estimated 4.2 acres being disturbed. The portion of the PPP covered by this contract has 4.2 acres disturbed.</p><p>C. The PPP is located in an area of Galva - Primghar soil association.</p><p>The estimated weighted average runoff coefficient number for this PPP after completion will be 0.46.</p><p>D. Storm Water Site Map is located in the R sheets. Proposed slopes are shown in cross sections, details, or standard road plans. Supplemental information is located in the Tabulations in the C or CE sheets.</p><p>E. The base storm water site map is amended by contract modifications and progress payments (fieldbook entries) of completed erosion control work. Also, due to project phasing, erosion and sediment controls shown on project plans may not be installed until needed, based on site conditions. For example, silt fence ditch checks will typically not be installed until the ditch has been installed. Installed locations may also be modified from tabulation locations by field staff. Installed locations will be documented by fieldbook entries and amended PPP site map.</p><p>F. Runoff from this work will flow into Silver Creek and Four Mile creek to the Little Sioux River.</p><p>III. CONTROLS</p><p>A. The Contractor’s ECIP specified in Article 2602.03 of the Standard Specifications for accomplishment of storm water controls should clearly describe the intended sequence of major activities, and for each activity define the control measure and the timing during the construction process that the measure will be implemented.</p><p>B. Preserve vegetation in areas not needed for construction.</p><p>C. Sections 2601 and 2602 of the Standard Specifications define requirements to implement erosion and sediment control measures. Actual quantities used and installed locations may vary from the Base PPP and amendment of the plan will be documented via fieldbook entries, amended PPP site map, or by contract modification. Additional erosion and sediment control items may be required as determined by the inspector and/or contractor during storm water site inspections. If the work involved is not applicable to any contract items, the work will be paid for according to Article 1109.03 paragraph B of the Standard Specifications.</p><p>1. EROSION AND SEDIMENT CONTROLS</p><p>a. Stabilization Practices</p><ol style="list-style-type: none">Site plans will ensure that existing vegetation or natural buffers are preserved where attainable and disturbed portions of the site will be stabilized.Initialize stabilization of disturbed areas immediately after clearing, grading, excavating, or other earth disturbing activities have:<ol style="list-style-type: none">Permanently ceased on any portion of the site, orTemporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days.Staged permanent and/or temporary stabilizing seeding and mulching shall be completed as the disturbed areas are completed. Incomplete areas shall be stabilized according to paragraph III, C, 1, a, 2, b above.Permanent and Temporary Stabilization practices to be used for this project are located in the storm water site map, Estimated Project Quantities (100-0A, 100-1A, or 100-1C), and Estimate Reference Information (100-4A) located in the C or R sheets. Typical drawings detailing construction of the practices to be used on this project are referenced in the Standard Road Plans Tabulation (105-4) in the C or R sheets.Preservation of existing vegetation within right-of-way or easements will act as vegetative buffer strips.Preservation of topsoil: Bid items to be used for this project are located in the Estimated Project Quantities (100-0A, 100-1A, or 100-1C) and Estimate Reference Information (100-4A) located in the C or R sheets. Additional information may be found in the Tabulations in the C or T Tabulation sheets, or is referenced in Section 2105 of the Standard Specifications.<p>b. Structural Practices</p><ol style="list-style-type: none">Structural practices will be implemented to divert flows from exposed soils and detain or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Additionally, structural practices may include: silt basins that provide 3600 cubic feet of storage per acre drained or equivalent sediment controls, outlet structures that withdraw water from surface when discharging basins, and controls to direct storm water to vegetated areas.Structural practices to be used for this project are located in the storm water site map, Estimated Project Quantities (100-0A, 100-1A, or 100-1C), and Estimate Reference Information (100-4A) located in the C or R sheets, as well as all other item specific Tabulations. Typical drawings detailing construction of the devices to be used on this project can be found on the B or R sheets or are referenced in the Standard Road Plans Tabulation (105-4) located in the C or R sheets.</div>					
FILE NO.	32354	ENGLISH	DESIGN TEAM	Harris/Pohlen/McDonald	CHEROKEE COUNTY	PROJECT NUMBER	STPN-031-3(15)--2J-18	SHEET NUMBER	RC.13

4/1/2026 9:22:34 AM

baebanamcdonald@iowadot.us

Measures shall be installed during the construction process to control pollutants in storm water discharges that will occur after construction operations have been completed. This may include velocity dissipation devices at discharge locations and along length of outfall channel as necessary to provide a non-erosion velocity flow from structure to water course. If included with this project, these items are located in the storm water site map and Estimated Project Quantities (100-0A, 100-1A, or 100-1C) and Estimate Reference Information (100-4A) located in the C or R sheets, as well as all other item specific Tabulations. Typical drawings detailing construction of the practices to be used on this project are referenced in the Standard Road Plans Tabulation. The installation of these devices may be subject to Section 404 of the Clean Water Act.

Contractor disposal of unused construction materials and construction material wastes shall comply with applicable state and local waste disposal, sanitary sewer, or septic system regulations. In the event of a conflict with other governmental laws, rules and regulations, the more restrictive laws, rules or regulations shall apply.

- During the course of this construction, it is possible that situations will arise where unknown materials will be encountered. When such situations are encountered, they will be handled according to all federal, state, and local regulations in effect at the time.

The Contractor is required to maintain all temporary erosion and sediment control measures in proper working order, including cleaning, repairing, or replacing them throughout the contract period. This shall begin when the features have lost 50% of their capacity.

A. Inspections shall be made jointly by the Contractor and the Contracting Authority's inspector at least once every seven calendar days. Storm water site inspections will include:

1. Date of the inspection.
2. Summary of the scope of the inspection.
3. Name and qualifications of the personnel making the inspection.
5. Review of erosion and sediment control measures within disturbed areas for the effectiveness in preventing impacts to receiving waters.
6. Major observations related to the implementation of the PPP.
7. Identification of corrective actions required to maintain or modify erosion and sediment control measures.

B. Include storm water site inspection reports in the Amended PPP. Incorporate any additional erosion and sediment control measures determined as a result of the inspection. Immediately begin corrective actions on all deficiencies found within 3 calendar days of the inspection and complete within 7 calendar days following the inspection. If it is determined that making the corrections less than 72 hours after the inspection is impracticable, it should be documented why it is impracticable and indicate an estimated date by which the corrections will be made.

FILE NO.	32354	ENGLISH	DESIGN TEAM	Harris/Pohlen/McDonald
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silts, sediment, and other forms of pollution may be transported onto highway right-of-way (ROW) as a result of a storm event. Potential sources of pollution located outside highway ROW are beyond the control of this PPP. Pollution within highway ROW will be conveyed and controlled per this PPP.






- A. Base PPP - Initial Pollution Prevention Plan.
- B. Amended PPP - Base PPP amended during construction. May include Plan Revisions or Contract Modifications for new items, storm water site inspection reports, fieldbook entries made by the inspector, amended PPP site map by the Contractor, ECIP, NOI, co-permittee certifications, and Subcontractor Request Forms. Items amending the PPP are stored electronically and are readily available upon request.
- C. Fieldbook Entries - This contains the inspector's daily diary and bid item postings.
- D. Controls - Methods, practices, or measures to minimize or prevent erosion, control sedimentation, control storm water, or minimize contaminants from other types of waste or materials. Also called Best Management Practices (BMPs).
- E. Signature Authority - Representative authorized to sign various storm water documents.




I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.








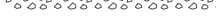
Nathan Paller
Signature








Nathan J. Pohlen
Print Name

LINE STYLE LEGEND OF LANDSCAPE SHEETS	
LINESTYLE	Design Element
-----	Living Snow Fence Single Row
-----	Living Snow Fence Double Row
-----	Mechanical Edge

CELL LEGEND OF LANDSCAPE SHEETS		
CELL	Design Element	Plant Diameter
	Clearing	
	Proposed Shrub	6 FT
	Proposed Understory Tree	12 FT
	Proposed Conifer Tree	18 FT
	Proposed Overstory Tree	30 FT

















PATTERN LEGEND OF LANDSCAPE SHEETS	
	Brush Clearing
	Clearing & Grubbing
	Spray Area

LINE STYLE LEGEND OF EROSION CONTROL SHEETS	
LINESTYLE	Design Element
	Silt Fence
	Perimeter and Slope Sediment Control Device (9")
	Perimeter and Slope Sediment Control Device (12")
	Perimeter and Slope Sediment Control Device (20")
	Open-Throat Curb Intake Sediment Filter
	Concentrated Flow
	Rock Check and Rock Check Dam
	Sheet Flow

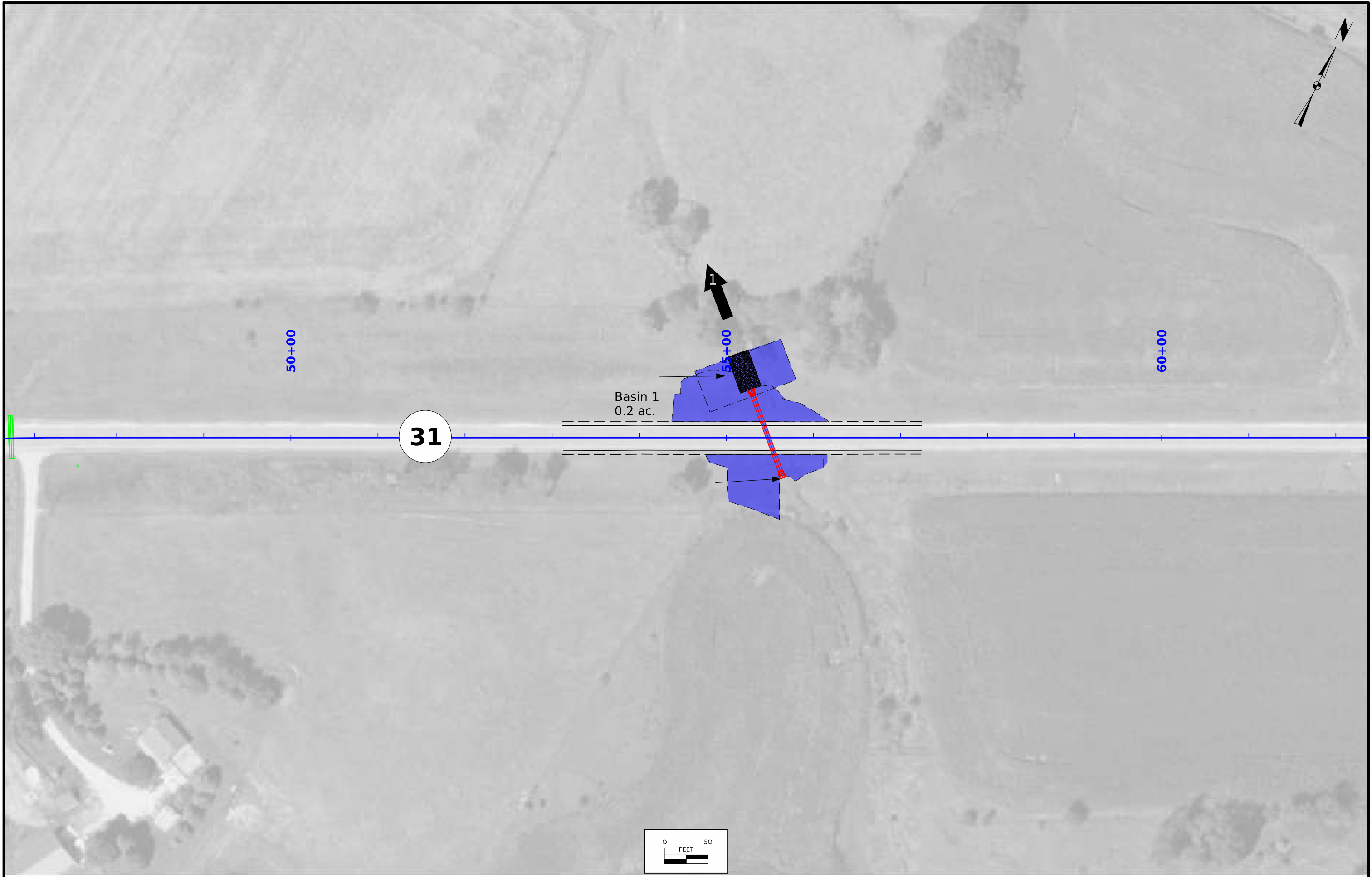
CELL LEGEND OF EROSION CONTROL SHEETS	
CELL	Design Element
	Temporary Sediment Control basin
	Erosion Control for Circular Intake or Manhole Well
	Erosion Control for Rectangular Intake or Manhole Well
	Grate Intake Sediment Filter Bag
	Silt Basin
	Silt Fence Tail
	Stormwater Drainage Basin Discharge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

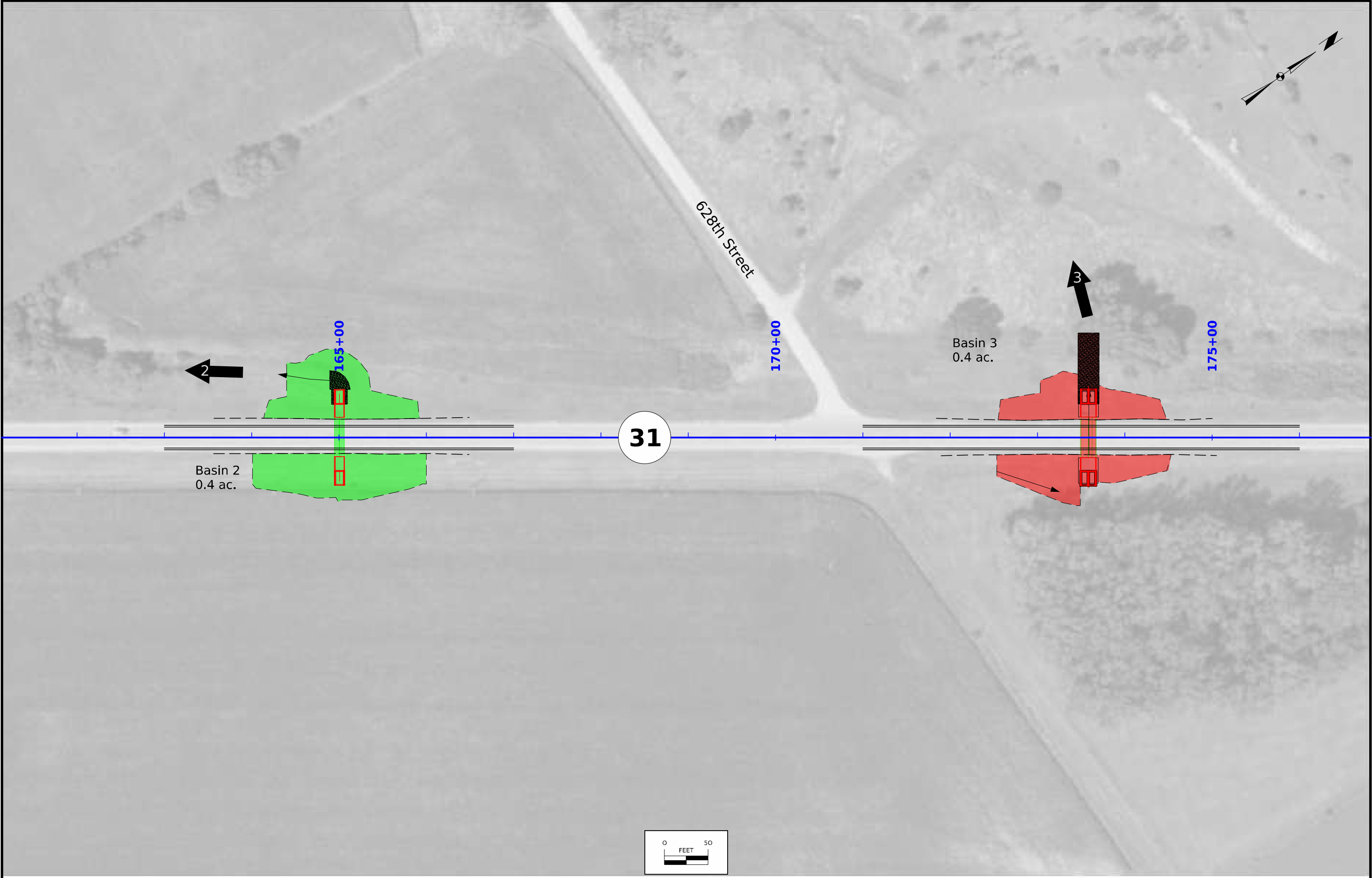
PLAN VIEW COLOR LEGEND OF EROSION CONTROL SHEETS		
LINEWORK	Design Color No.	
Green	(2)	Existing Topographic Features and Labels
Blue	(1)	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Magenta	(5)	Existing Utilities
Black	(0)	Permanent Erosion Control Features
Blaze Orange	(222)	Temporary Erosion Control Features

SHADING	Design Color No.	Transparency
Citron	(234)	Mulching, All Types 50%
Light Brown	(238)	Special Ditch Control, Wood Excelsior Mat 0%
Grass Green	(233)	8FT Mow Strip 50%
Red	(3)	Delineates Restricted Areas 0%

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

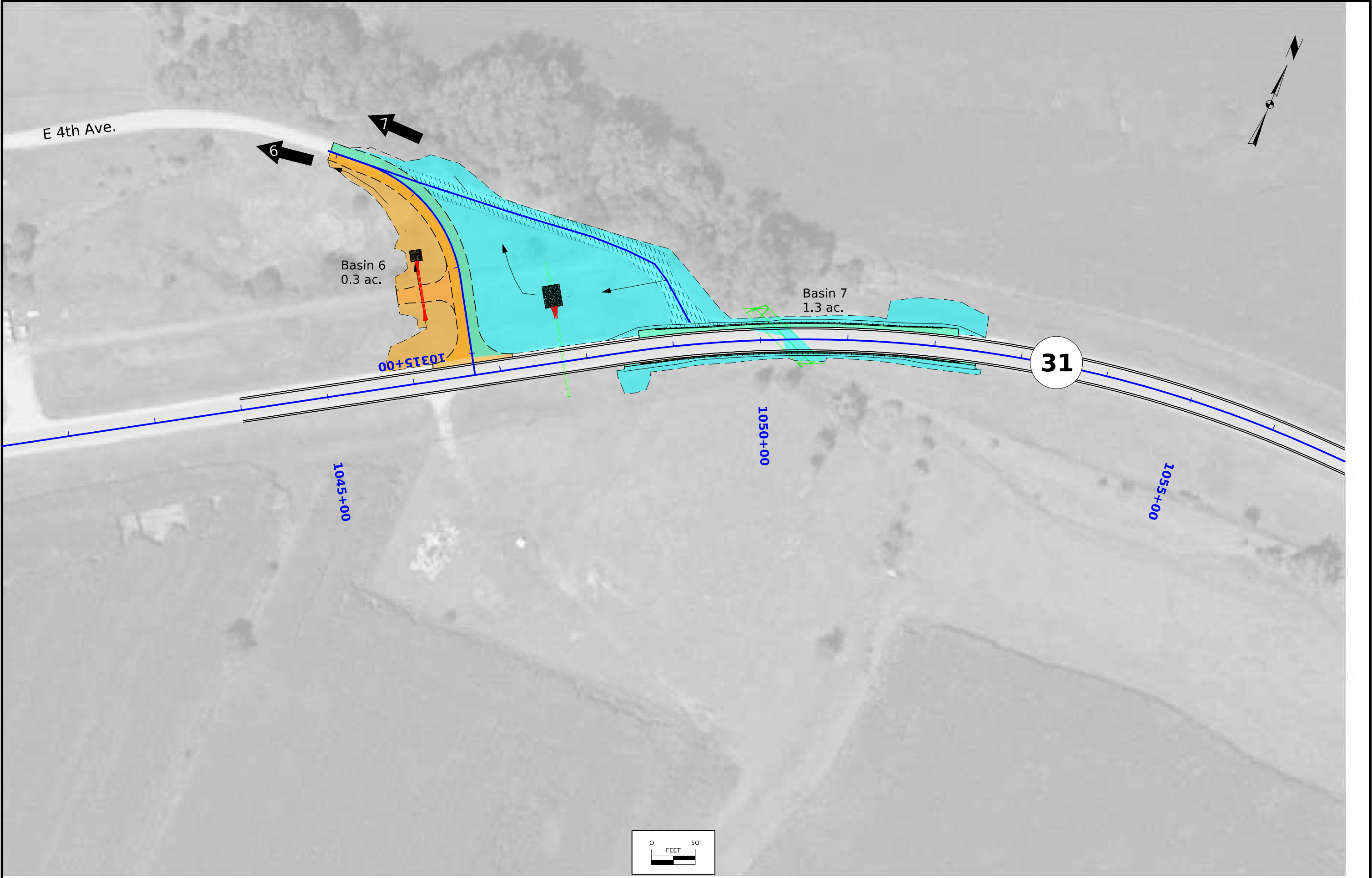
LEGEND AND SYMBOL
INFORMATION SHEET
(COVERS SHEET SERIES D & R)



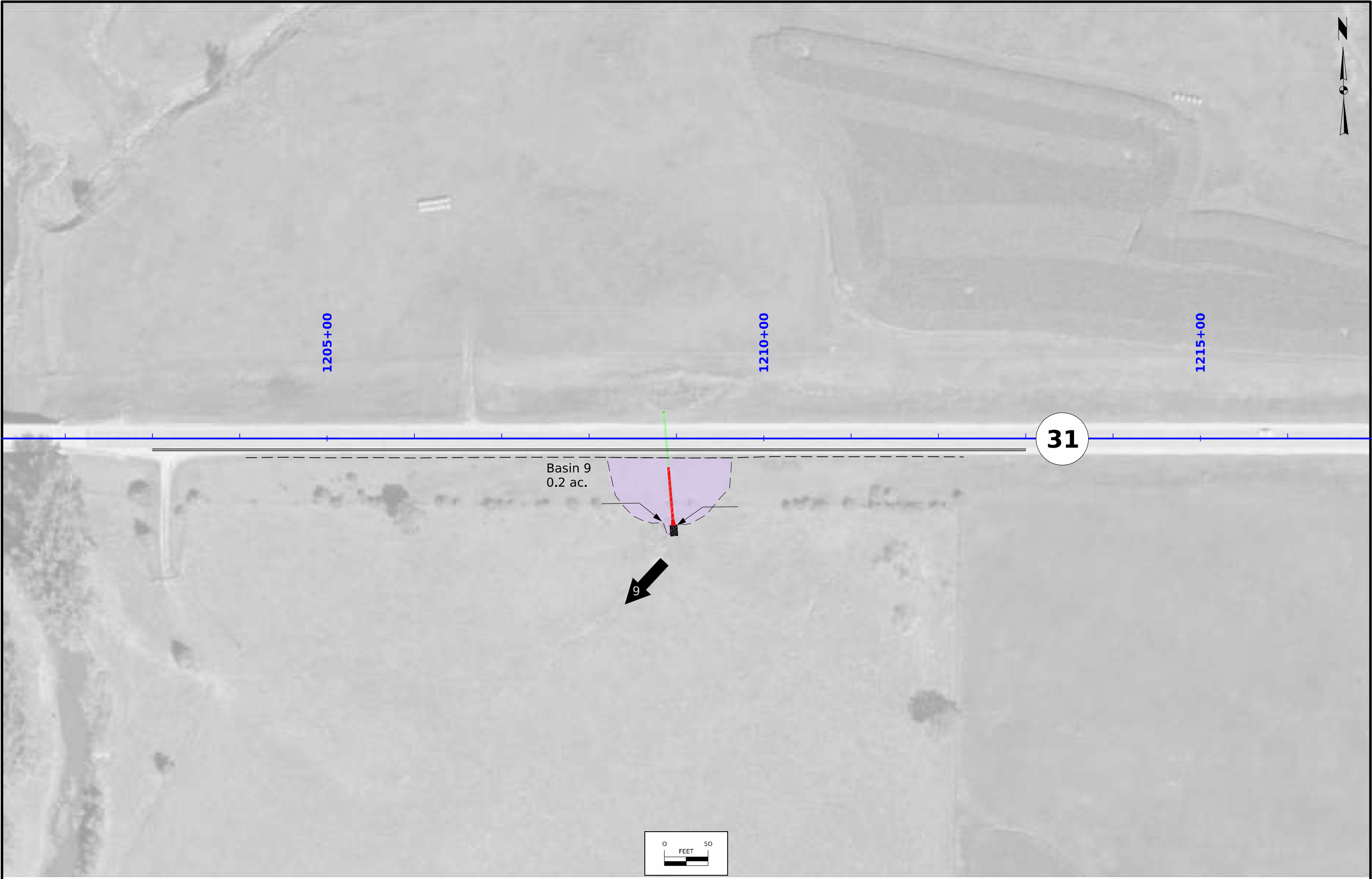










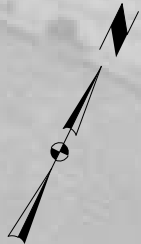
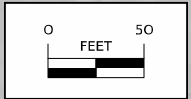


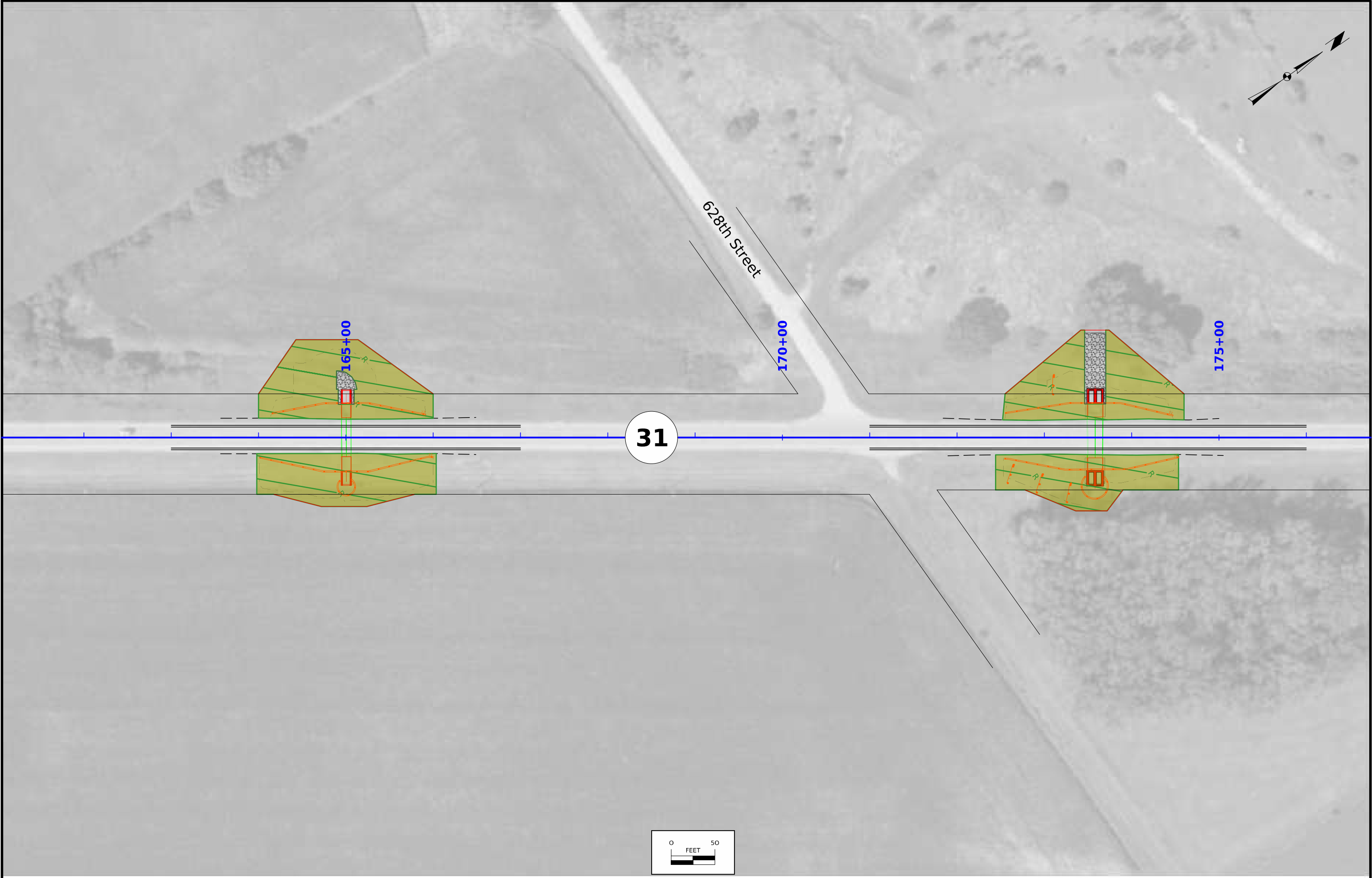
31

50+00

55+00

60+00



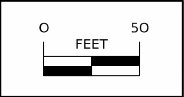






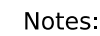






FILE NO. 32354	ENGLISH	DESIGN TEAM Harris/Pohlen/McDonald	Cherokee COUNTY	PROJECT NUMBER STPN-031-3(15)--2J-18	SHEET NUMBER RR.15
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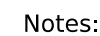
RURAL



- | CUT | SIDE | Total | Cut | Adjusted |
|-----|--------|-------|-----|----------|
| D | Top | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| D | Bottom | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| E | Top | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| E | Bottom | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| F | Top | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| F | Bottom | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| G | Top | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| G | Bottom | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| H | Top | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| H | Bottom | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| I | Top | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| I | Bottom | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| J | Top | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| J | Bottom | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| K | Top | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| K | Bottom | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| L | Top | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| L | Bottom | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| M | Top | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| M | Bottom | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| N | Top | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| N | Bottom | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| O | Top | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| O | Bottom | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| P | Top | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| P | Bottom | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| Q | Top | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| Q | Bottom | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| R | Top | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| R | Bottom | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | 3 | 3 | 3 |
| | | 4 | 4 | 4 |
| S | Top | 1 | 1 | 1 |
| | | 2 | 2 | 2 |
| | | | | |



- RURAL



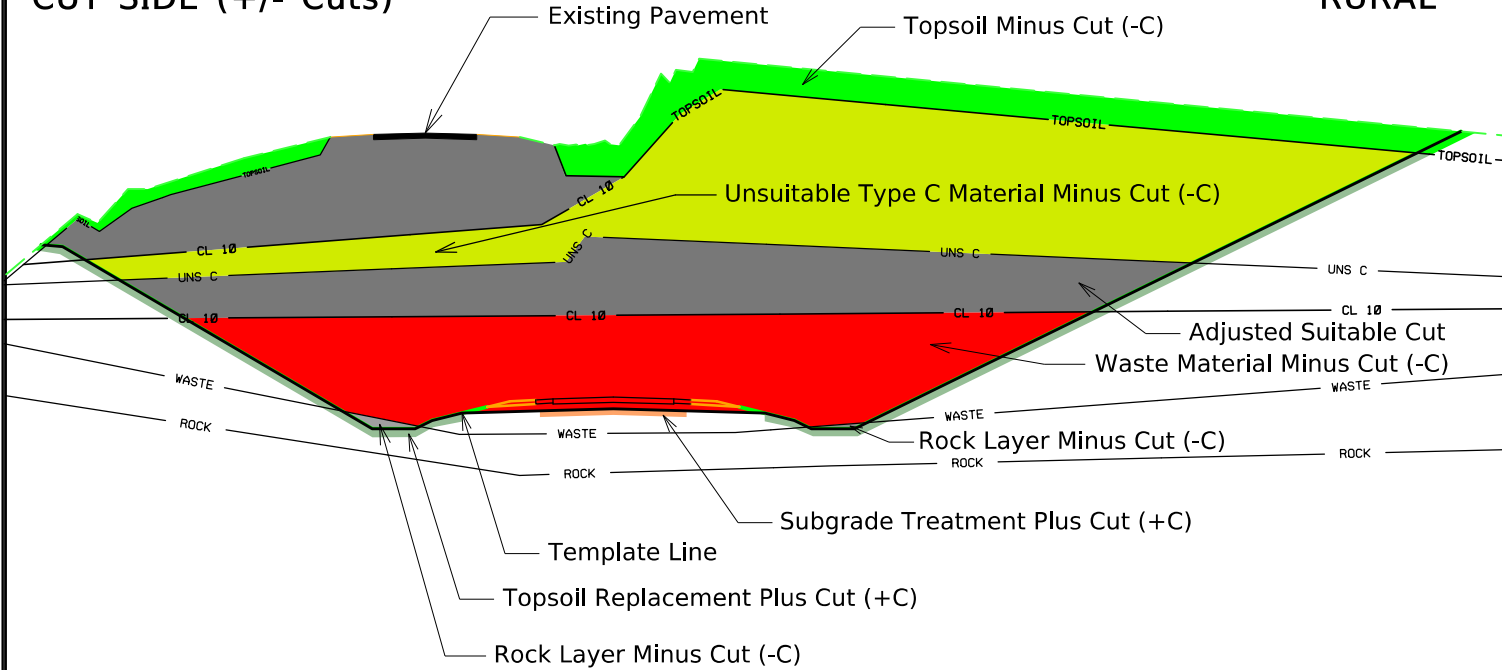
- | | FILL | SIDE | Total | Fill | Adjusted |
|----|------|------|-------|------|----------|
| 1 | 1 | 1 | 2 | 1 | 1 |
| 2 | 1 | 1 | 2 | 1 | 1 |
| 3 | 1 | 1 | 2 | 1 | 1 |
| 4 | 1 | 1 | 2 | 1 | 1 |
| 5 | 1 | 1 | 2 | 1 | 1 |
| 6 | 1 | 1 | 2 | 1 | 1 |
| 7 | 1 | 1 | 2 | 1 | 1 |
| 8 | 1 | 1 | 2 | 1 | 1 |
| 9 | 1 | 1 | 2 | 1 | 1 |
| 10 | 1 | 1 | 2 | 1 | 1 |
| 11 | 1 | 1 | 2 | 1 | 1 |
| 12 | 1 | 1 | 2 | 1 | 1 |
| 13 | 1 | 1 | 2 | 1 | 1 |
| 14 | 1 | 1 | 2 | 1 | 1 |
| 15 | 1 | 1 | 2 | 1 | 1 |
| 16 | 1 | 1 | 2 | 1 | 1 |
| 17 | 1 | 1 | 2 | 1 | 1 |
| 18 | 1 | 1 | 2 | 1 | 1 |
| 19 | 1 | 1 | 2 | 1 | 1 |
| 20 | 1 | 1 | 2 | 1 | 1 |
| 21 | 1 | 1 | 2 | 1 | 1 |
| 22 | 1 | 1 | 2 | 1 | 1 |
| 23 | 1 | 1 | 2 | 1 | 1 |
| 24 | 1 | 1 | 2 | 1 | 1 |
| 25 | 1 | 1 | 2 | 1 | 1 |
| 26 | 1 | 1 | 2 | 1 | 1 |
| 27 | 1 | 1 | 2 | 1 | 1 |
| 28 | 1 | 1 | 2 | 1 | 1 |
| 29 | 1 | 1 | 2 | 1 | 1 |
| 30 | 1 | 1 | 2 | 1 | 1 |
| 31 | 1 | 1 | 2 | 1 | 1 |
| 32 | 1 | 1 | 2 | 1 | 1 |
| 33 | 1 | 1 | 2 | 1 | 1 |
| 34 | 1 | 1 | 2 | 1 | 1 |
| 35 | 1 | 1 | 2 | 1 | 1 |
| 36 | 1 | 1 | 2 | 1 | 1 |
| 37 | 1 | 1 | 2 | 1 | 1 |
| 38 | 1 | 1 | 2 | 1 | 1 |
| 39 | 1 | 1 | 2 | 1 | 1 |
| 40 | 1 | 1 | 2 | 1 | 1 |
| 41 | 1 | 1 | 2 | 1 | 1 |
| 42 | 1 | 1 | 2 | 1 | 1 |
| 43 | 1 | 1 | 2 | 1 | 1 |
| 44 | 1 | 1 | 2 | 1 | 1 |
| 45 | 1 | 1 | 2 | 1 | 1 |
| 46 | 1 | 1 | 2 | 1 | 1 |
| 47 | 1 | 1 | 2 | 1 | 1 |
| 48 | 1 | 1 | 2 | 1 | 1 |
| 49 | 1 | 1 | 2 | 1 | 1 |
| 50 | 1 | 1 | 2 | 1 | 1 |
| 51 | 1 | 1 | 2 | 1 | 1 |
| 52 | 1 | 1 | 2 | 1 | 1 |
| 53 | 1 | 1 | 2 | 1 | 1 |
| 54 | 1 | 1 | 2 | 1 | 1 |
| 55 | 1 | 1 | 2 | 1 | 1 |
| 56 | 1 | 1 | 2 | 1 | 1 |
| 57 | 1 | 1 | 2 | 1 | 1 |
| 58 | 1 | 1 | 2 | 1 | 1 |
| 59 | 1 | 1 | 2 | 1 | 1 |
| 60 | 1 | 1 | 2 | 1 | 1 |
| 61 | 1 | 1 | 2 | 1 | 1 |
| 62 | 1 | 1 | 2 | 1 | 1 |
| 63 | 1 | 1 | 2 | 1 | 1 |
| 64 | 1 | 1 | 2 | 1 | 1 |
| 65 | 1 | 1 | 2 | 1 | 1 |
| 66 | 1 | 1 | 2 | 1 | 1 |
| 67 | 1 | 1 | 2 | 1 | 1 |
| 68 | 1 | 1 | 2 | 1 | 1 |
| 69 | 1 | 1 | 2 | 1 | 1 |
| 70 | 1 | 1 | 2 | 1 | 1 |
| 71 | 1 | 1 | 2 | 1 | 1 |
| 72 | 1 | 1 | 2 | 1 | 1 |
| 73 | 1 | 1 | 2 | 1 | 1 |
| 74 | 1 | 1 | 2 | 1 | 1 |
| 75 | 1 | 1 | 2 | 1 | 1 |
| 76 | 1 | 1 | 2 | 1 | 1 |
| 77 | 1 | 1 | 2 | 1 | 1 |
| 78 | 1 | 1 | 2 | 1 | 1 |
| 79 | 1 | 1 | 2 | 1 | 1 |
| 80 | 1 | 1 | 2 | 1 | 1 |
| 81 | 1 | 1 | 2 | 1 | 1</ |



1. "Total Fill Adjusted" Column includes all Class 10, 12, and 13 fill and adjustments for additional fill from cuts such as existing pavement, plowing and shaping operations, entrances, dikes, and topsoil stripping.
2. The available area to place unsuitable materials in the T Sheet tabulation does not include the undercut values from the topsoil stripping, existing pavement, or plowing and shaping

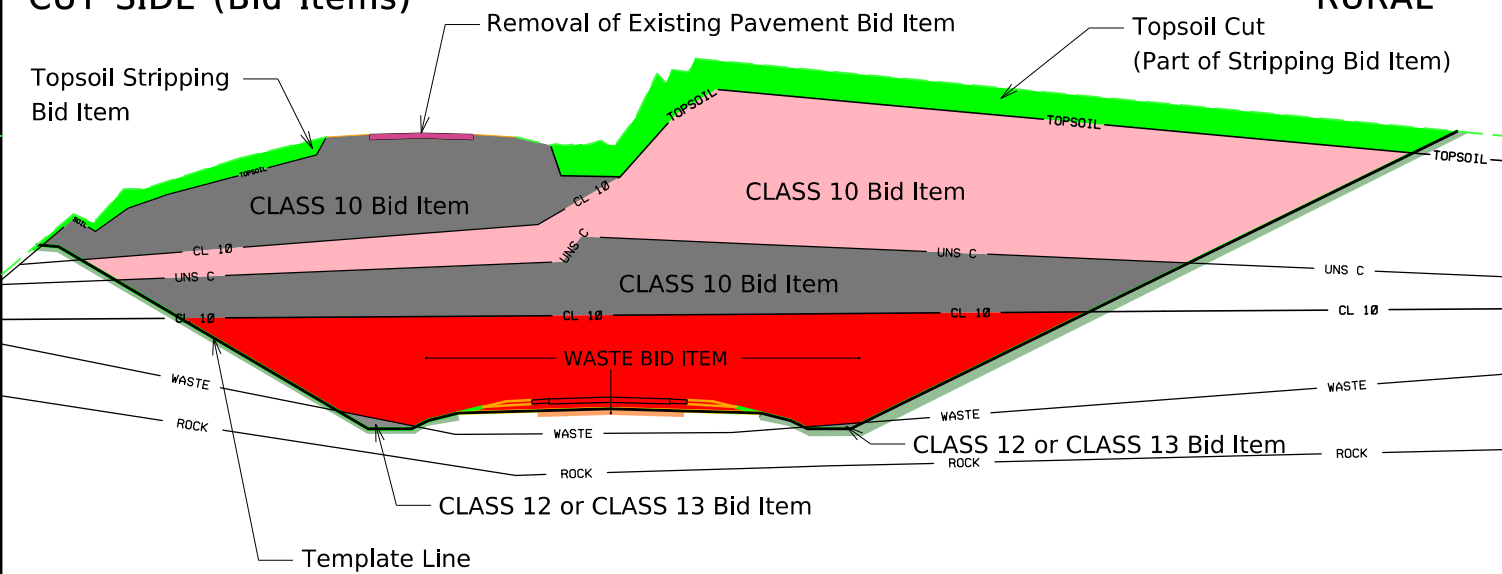
CUT SIDE (+/- Cuts)

RURAL



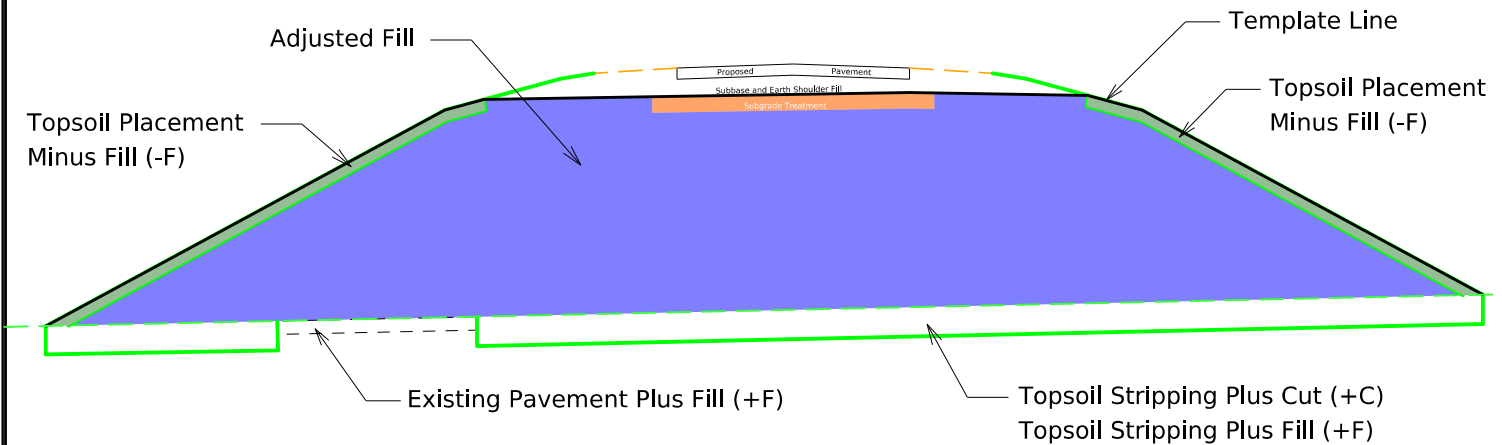
CUT SIDE (Bid Items)

RURAL



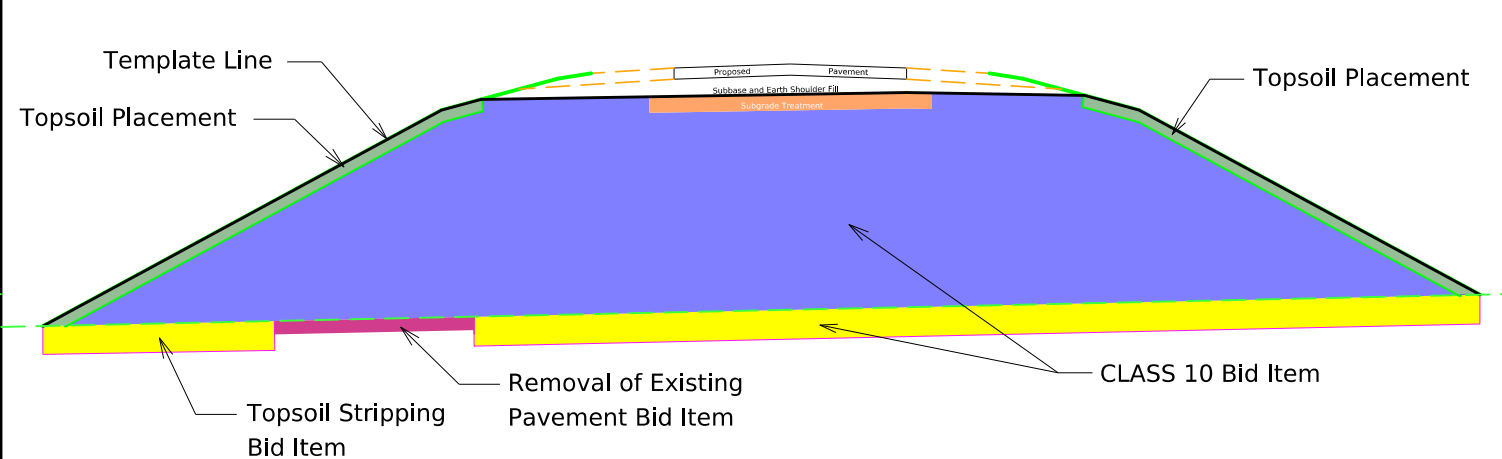
FILL SIDE (+/- Fills)

RURAL



FILL SIDE (Bid Items)

RURAL



Notes:

1. "Add Quantity +C" columns are additional cut encountered that is not Typical, Topsoil, or Subgrade Treatment Based. (Entrance, Dike, Etc.)
2. "-C" columns are either soil types or Class 10, 12, or 13 designated material that is encountered in the cut station range that is paid for by other bid items.
3. The "(SoilType) Cut" columns are soil types encountered in the cut that are paid by either Class 10, 12, or 13.
4. The "Adjusted Clas (10,12 or 13)" columns are the sum of all various soil types encountered in that station range, that are paid by Class 10, 12, or 13 bid items.
5. Refer to Standard Road Plan EW-102 for placement of unsuitable soil types.

Notes:

1. Refer to Standard Road Plan EW-102 for placement of unsuitable soil types.

TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

Station	Cut				Fill				Checks (EW-102)		Topsoil											
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]
	Total Cut Unadjusted Volume	Total Class 10 Unadjusted Volume	Topsoil Cut Volume	Total Cut Adjusted	Total Fill Unadjusted Volume	Total Fill Adjusted	Total Fill Adjusted w/ Weighted Average 1.3 Shrink Factor	Total Cut Adjusted Minus Fill w/ Shrink	Approx. Fill Vol. Below 5' & Above 20' w/ Shrink	Approx. Fill Volume Below 3' w/ Shrink	Topsoil Stripping Undercut Volume	Topsoil Placement Undercut Volume	Topsoil Placement With 1.4 Shrink Factor	Topsoil Stripping Minus Topsoil Placement w/Shrink								
ML031																						
54+37.58	11	0	11	0	5	5	7	-7	0	0	11	8	11	1								
54+50.00	64	15	49	15	29	29	38	-23	0	0	49	33	46	3								
54+75.00	93	33	60	33	44	44	57	-24	0	0	60	40	56	4								
55+00.00	123	43	80	43	46	46	60	-17	0	0	80	53	75	5								
55+25.00	179	80	98	80	78	78	101	-21	0	0	98	66	92	7								
55+50.00	130	55	76	55	99	99	129	-74	0	0	76	50	71	5								
55+75.00	38	0	38	0	56	56	73	-73	0	0	38	26	36	3								
56+00.00	11	0	11	0	10	10	13	-13	0	0	11	7	10	1								
56+18.06	0	0	0	0	0	0	0	0	0	0	0	0	0	0								
164+00.98	44	1	43	1	34	34	44	-43	0	0	43	29	41	2								
164+25.00	86	6	80	6	96	96	125	-119	0	0	80	53	75	5								
164+50.00	135	26	109	26	190	190	247	-221	0	0	109	73	102	7								
164+75.00	170	49	121	49	312	312	405	-356	0	0	121	79	111	9								
165+00.00	147	31	116	31	336	336	437	-407	0	0	116	79	111	6								
165+25.00	94	4	90	4	223	223	290	-286	0	0	90	62	87	3								
165+50.00	68	3	66	3	109	109	142	-139	0	0	66	44	61	4								
165+75.00	47	1	46	1	38	38	50	-49	0	0	46	31	43	3								
166+00.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0								
172+53.26	36	2	34	2	25	25	33	-31	0	0	34	23	32	2								
172+75.00	73	10	62	10	73	73	95	-85	0	0	62	42	58	4								
173+00.00	114	30	84	30	117	117	152	-122	0	0	84	56	79	6								
173+25.00	102	22	80	22	202	202	263	-240	0	0	80	54	76	4								
173+50.00	62	0	62	0	234	234	304	-304	0	0	62	43	60	2								
173+75.00	60	0	60	0	172	172	223	-223	0	0	60	40	56	4								
174+00.00	51	0	51	0	108	108	141	-141	0	0	51	34	48	3								
174+25.00	28	0	28	0	41	41	54	-54	0	0	28	19	26	2								
174+50.00	2	0	2	0	1	1	2	-2	0	0	2	1	2	0								
174+59.69	0	0	0	0	0	0	0	0	0	0	0	0	0	0								
237+31.14	17	0	17	0	14	14	18	-18	0	0	17	11	16	1								
237+50.00	74	4	70	4	79	79	103	-99	0	0	70	46	65	5								
237+75.00	139	31	108	31	169	169	220	-190	0	0	108	72	101	7								
238+00.00	219	89	130	89	275	275	358	-269	0	0	130	86	121	9								
238+25.00	265	128	137	128	290	290	377	-249	0	0	137	92	128	9								
238+50.00	245	114	131	114	217	217	282	-168	0	0	131	87	122	9								
238+75.00	203	83	120	83	155	155	202	-119	0	0	120	80	112	8								
239+00.00	160	50	110	50	82	82	107	-57	0	0	110	73	103	7								
239+25.00	94	19	75	19	24	24	31	-12	0	0	75	50	70	5								
239+50.00	18	1	17	1	3	3	3	-2	0	0	17	11	16	1								
239+60.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0								
250+26.19	35	1	35	1	29	29	38	-37	0	0	35	23	32	2								
250+50.00	89	9	80	9	91	91	118	-109	0	0	80	53	74	5								
250+75.00	127	32	95	32	187	187	243	-211	0	0	95	63	89	6								
251+00.00	139	37	102	37	270	270	351	-314	0	0	102	68	96	7								
251+25.00	126	28	98	28	225	225	292	-264	0	0	98	65	91	6								
251+50.00	109	22	88	22	116	116	151	-129	0	0	88	58	82	6								
251+75.00	61	8	53	8	41	41	53	-46	0	0	53	35	49	4								
252+00.00	3	0	3	0	1	1	2	-2	0	0	3	2	3	0								
252+05.70	0	0	0	0	0	0	0	0	0	0	0	0	0	0								
1047+43.98	83	50	33	50	29	29	38	13	0	0	33	28	40	-7								
1047+50.00	267	138	129	138	145	145	189	-51	0	0	129	113	158	-29								
1047+75.00	196	78	118	78	145	145	188	-110	0	0	118	104	146	-28								
1048+00.00	166	58	107	58	101	101	131	-73	0	0	107	94	132	-25								
1048+25.00	161	53	108	53	109	109	141	-89	0	0	108	90	126	-18								
1048+50.00	168	74	95	74	129	129	168	-95	0	0	95	79	110	-15								
1048+75.00	204	155	49	155	62	62	81	74	0	0	49	62	87	-39								
1049+00.00	164	135	29	135	12	12	16	119	0	0	29	49	69	-40								
1049+25.00	57	27	30	27	17	17	22	4	0	0	30	27	37	-7								
1049+50.00	24	6	18	6	12	12	16	-10	0	0	18	8	11	7								
1049+75.00	17	6	11	6	8	8	11	-4	0	0	11	1	2	9								
1050+00.00	17	6	11	6	8	8	11	-5	0	0	11	1	1	10								
1050+25.00	18	6	13	6	8	8	11	-5	0	0	13	1	2	11								
1050+50.00	20	6	15	6	9	9	12	-6	0	0	15	3	4	11								
1050+75.00	20	6	14	6	9	9	12	-7	0	0	14	2	3	11								
1051+00.00	19	6	13	6	9	9	12	-6	0	0	13	1	2	12								
1051+25.00	29	6	23	6	15	15	20	-14	0	0	23	8	12	12								
1051+50.00	42	6	36	6	37	37	48	-42	0	0	36	17	24	12								
1051+75.00	46	6	40	6	66	66	86	-80	0	0	40	18	25	15								
1052+00.00																						
Subtotals:	5,808	1,892	3,915	1,892	5,878	5,878	7,645	-5,755	0	0	3,915	2,730	3,824	93								

Refer to Standard Road Plans EW-101 and EW-102.

TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

107-28
4-21-15

[illegible]

TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

Station	Cut				Fill				Checks (EW-102)		Topsoil											
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]
	Total Cut Unadjusted Volume	Total Class 10 Unadjusted Volume	Topsoil Cut Volume	Total Cut Adjusted	Total Fill Unadjusted Volume	Total Fill Adjusted	Total Fill Adjusted w/ Weighted Average 1.3 Shrink Factor	Total Cut Adjusted Minus Fill w/ Shrink	Approx. Fill Vol. Below 5' & Above 20' w/ Shrink	Approx. Fill Volume Below 3' w/ Shrink	Topsoil Stripping Undercut Volume	Topsoil Placement Undercut Volume	Topsoil Placement With 1.4 Shrink Factor	Topsoil Stripping Minus Topsoil Placement w/Shrink								
Summary:																						
ML031 SR 4th Ent 10315+76	6,660 1,889 0	1,964 796 0	4,697 1,094 0	1,964 796 0	7,324 2,732 585	7,324 2,732 0	9,525 3,552 0	-7,564 -2,757 0	0 0 0	0 0 0	4,697 1,094 0	3,246 532 0	4,549 745 0	151 350 0								
Project Totals:	8,549	2,760	5,791	2,760	10,641	10,056	13,077	-10,321	0	0	5,791	3,778	5,294	501								
	Totals: Embankment in Place = 7,939 [8]/1.3 Class 10, Excavation, Roadway and Borrow = 2,760 [5] Topsoil, Strip, Salvage and Spread = 5,791 [11] Compaction with Moisture Control = 10,056 [7]																					

DESIGNER INFORMATION

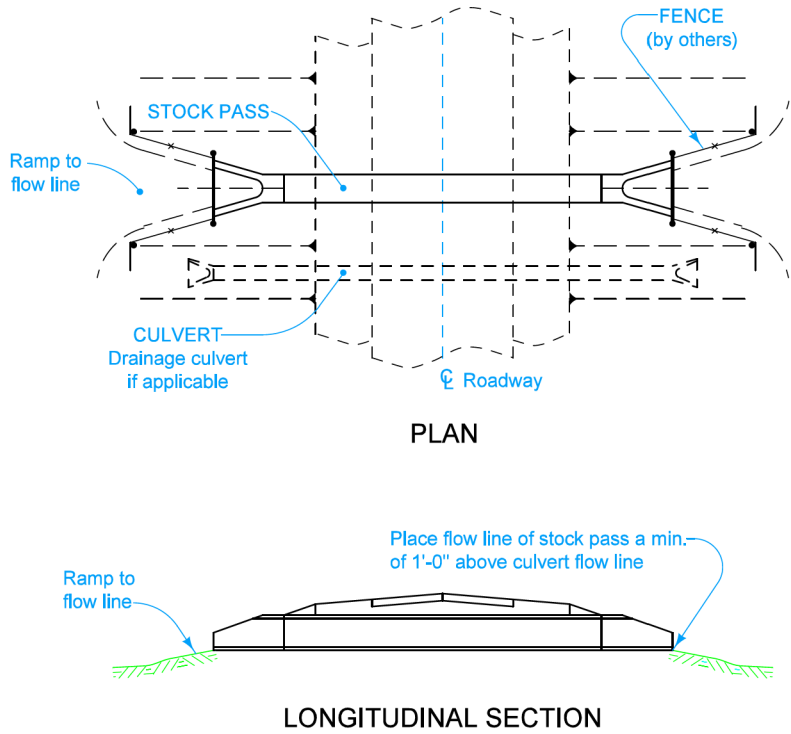
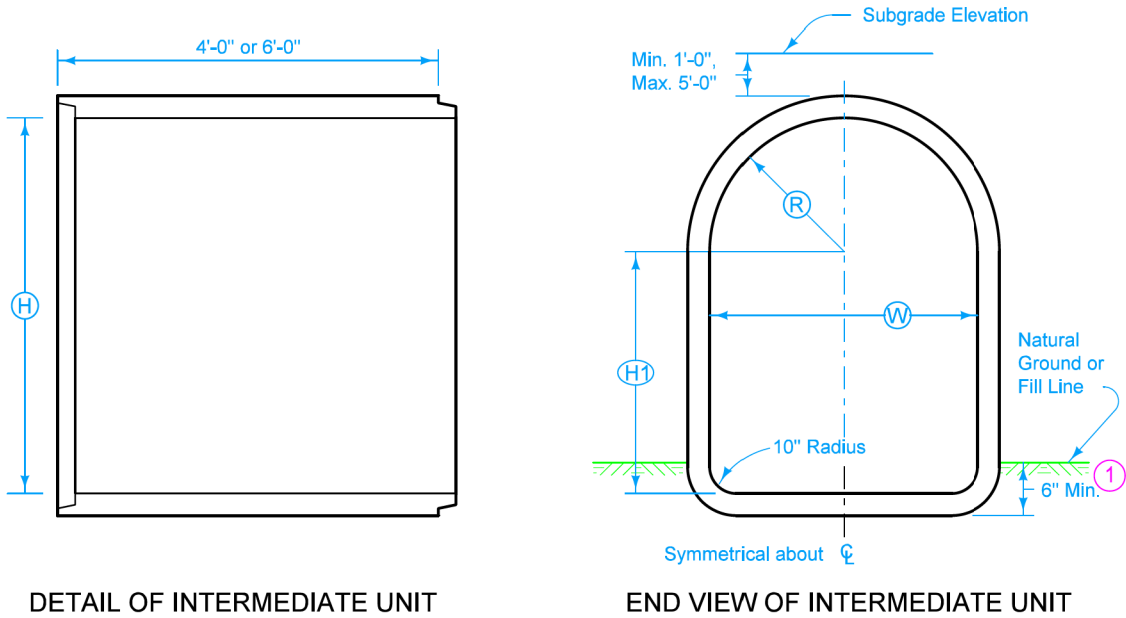
Furnish Precast Stock Pass complying with Section 2415 of the Standard Specifications. Install according to Section 2416 of the Standard Specifications.

Seal joints and install joint ties according to the manufacturer's recommendations.

Details indicated are typical. Alternate designs or methods may be submitted to the Engineer for approval.

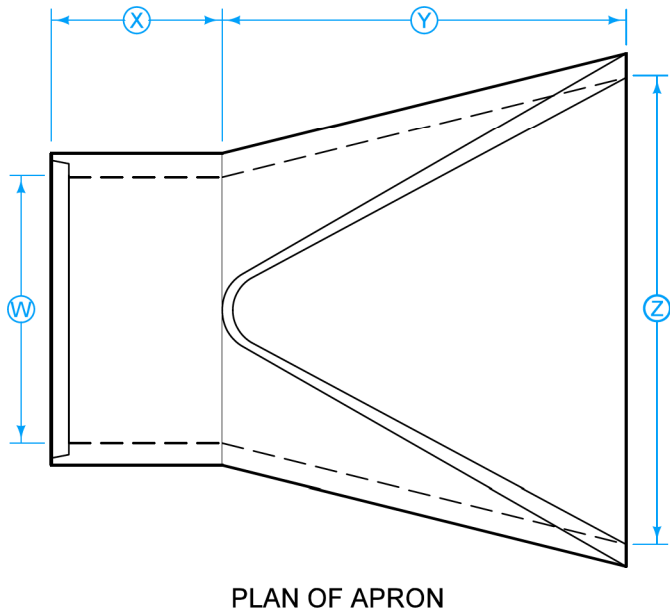
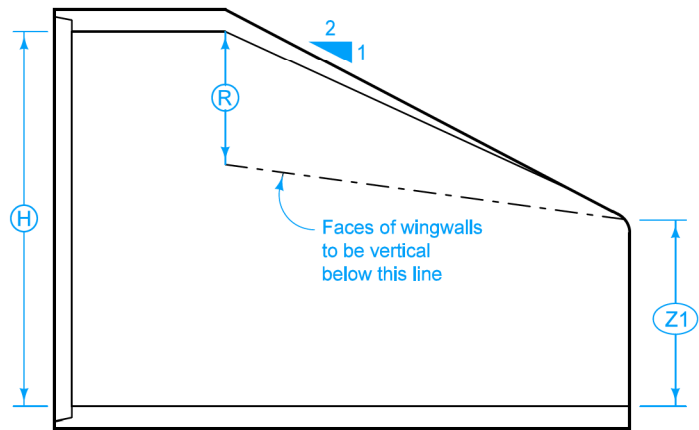
Payment is full compensation for furnishing and installing stock pass and apron.

- 1 Perform excavation below ground line using a template conforming to the shape of the stock pass.



Structure	DIMENSIONS FOR APRON						
	(W)	(H)	(R)	(X)	(Y)	(Z)	(Z1)
4' x 6'	4'	6'	2'	3'-2"	7'	7'	2'-11"
5' x 7'	5'	7'	2'-6"	1'-9"	7'-5 1/2"	7'	3'-6"

Structure	DIMENSIONS FOR INTERMEDIATE UNIT			
	(W)	(H)	(R)	(H1)
4' x 6'	4'	6'	2'	4'
5' x 7'	5'	7'	2'-6"	4'-6"



- Possible Contract Items:
- Stock Pass Apron, 4' x 6' Precast Concrete
 - Stock Pass Apron, 5' x 7' Precast Concrete
 - Stock Pass, 4' x 6' Precast Concrete
 - Stock Pass, 5' x 7' Precast Concrete

ROAD DESIGN DETAIL

REVISIONS: New. Replaces RF-8.

REVISION

NEW 04-21-15

510-04

SHEET 1 of 1

PRECAST STOCK PASS EXTENSION

Overlay Typical For Information Only

MIL-1

Notes:

- ① Includes both sides.
- ② Existing total pavement width is 24-ft.
- ③ Blading and Shaping of Shoulder Material. Area consists of the top 3" of existing shoulder. Not included in Class 13 Excavation quantity. Slope shall be adjusted as directed by the Engineer.
- Any existing HMA edgerut, fillet material and existing 3-ft HMA widening unit shall be considered Class 13 Excavation except at paved county road intersections.

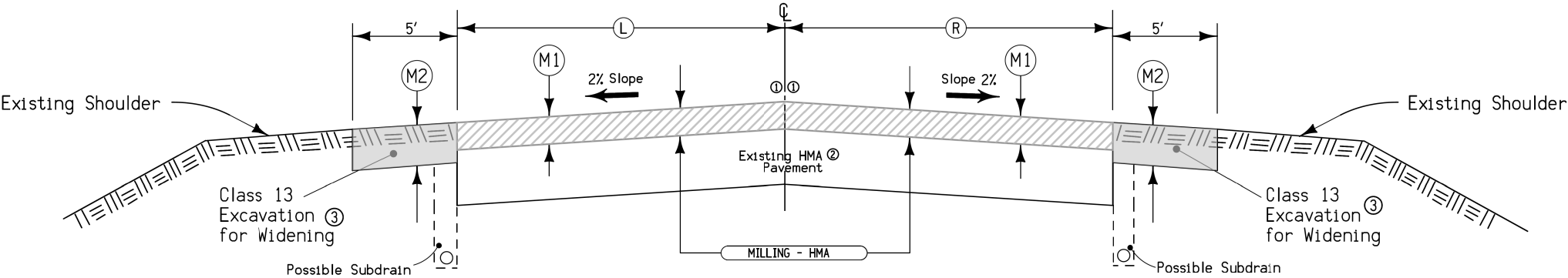


TABLE OF DESIGN QUANTITIES			Per Station						
LOCATION									MILLING Sq. Yds.
ROAD IDENTIFICATION	STATION TO STATION		(L) Feet	(R) Feet	(M1) Inches	(M2) Inches	CLASS 13 Cu. Yds.	BLADE & SHAPING Sta. ③	
IA 31 - Div 2	458+50	2+92	12	12	3	6	7.41	2	266.7
IA 31 - Div 2	4+96	25+70	12	12	3	6	7.41	2	266.7
IA 31 - Div 1	25+70	1002+16.5	12	12	3	6	7.41	2	266.7
IA 31 - Div 2	1002+16.5	1030+30	12	12	3	6	7.41	2	266.7
IA 31 - Div 1	1030+30	2251+79.5	12	12	3	6	7.41	2	266.7

TYPICAL CROSS SECTION
FULL DEPTH HMA PAVEMENT
FOR MILLING AND
CLASS 13 PRIOR TO
UNBONDED PCC OVERLAY

POL-1

Notes:

- ① Longitudinal joints shall be located at centerline and 12.0-ft. L. and Rt. of centerline. Transverse joints shall be located at 12.0-ft. spacings.
- See Sheet B.2 for a plan view of the required joint layout.
- ② Shoulder material as specified elsewhere in these plans; refer to typical 7135 on Sheet B.6 for "Type B" Granular Surfaced Shoulders."
- ③ Existing total pavement width is 24-ft.
- ④ Material resulting from blading and shaping of shoulder shown in Typical MIL-1 shall be placed and compacted in the class 13 trench outside of the safety edge prior to placing granular shoulder. This work is included in the item Blading and Shaping shoulder material.

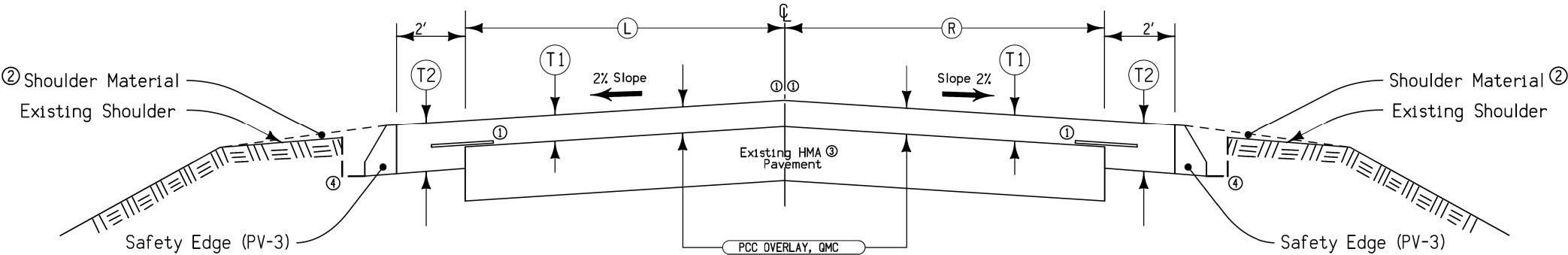


TABLE OF DESIGN QUANTITIES					Per Station				
LOCATION				(L) Feet	(R) Feet	(T1) Inches	(T2) Inches	PCC OVERLAY, QMC (PLACE) Sq. Yds.	PCC OVERLAY, QMC (FURNISH) Cu. Yds.
ROAD IDENTIFICATION	STATION TO STATION								
IA 31 - Div 2	458+50	2+92		12	12	6	9	333.3	57.64
IA 31 - Div 2	4+96	25+70		12	12	6	9	333.3	57.64
IA 31 - Div 1	25+70	1002+16.5		12	12	6	9	333.3	57.64
IA 31 - Div 2	1002+16.5	1030+30		12	12	6	9	333.3	57.64
IA 31 - Div 1	1030+30	2251+79.5		12	12	6	9	333.3	57.64

TYPICAL CROSS SECTION
UNBONDED PCC OVERLAY OVER
FULL DEPTH HMA PAVEMENT

REVISED 11-2016 - CHANGED THE SERIES DATE "IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015", (WAS SERIES 2012).
REVISED 02-2017 - CHANGED THE DESIGN STRESSES NOTE TO STATE "AASHTO LRFD" (WAS LRFD AASHTO).
REVISED 01-2021 - CHANGED DESIGN SPECIFICATIONS TO AASHTO LRFD 8TH ED.
ENGLISHSINGLECULVERTS.DGN - 1043 - THIS SHEET REDRAWN 9-8-88

ESTIMATED CAST IN PLACE CULVERT QUANTITIES

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL
1	2401-6750001	REMOVALS, AS PER PLAN	LS	1
2	2402-2720000	EXCAVATION, CLASS 20	CY	84
3	2402-3825025	GRANULAR MATERIAL FOR BLANKET	CY	28.3
4	2403-0100020	STRUCTURAL CONCRETE (RCB CULVERT)	CY	60.8
5	2404-7775000	REINFORCING STEEL	LB	9,957

ESTIMATE REFERENCE INFORMATION

ITEM NO.	ITEM CODE	ITEM DESCRIPTION
1	2401-6750001	REMOVALS, AS PER PLAN Includes all work for removal and off-site disposal of existing concrete. Work also includes clearing the existing barrel of sediments or deposits. Removal of scheduled items shall be in accordance with Section 2401, of the Standard Specifications. Any damage to material not to be removed shall be the responsibility of the Contractor and repaired at no extra cost to the State.
2	2402-2720000	EXCAVATION, CLASS 20 Includes filling and compacting low areas around proposed culvert. Includes excavation necessary to place 12" granular working blanket.
3	2402-3825025	GRANULAR MATERIAL FOR BLANKET Granular material shall be in accordance with Section 4118 of the Standard Specifications. Includes 28.3 CY for a working blanket. The working blanket may be deleted if determined to be unnecessary at the time of construction.
4	2403-0100020	STRUCTURAL CONCRETE (RCB CULVERT) Includes all resilient joint filler required.
5	2404-7775000	REINFORCING STEEL --

Specifications:

Design:
AASHTO LRFD Bridge Design Specifications, 8th Ed., Series of 2017.

Construction:
Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, current series, plus applicable General Supplemental Specifications, Developmental Specifications, Supplemental Specifications and Special Provisions

Design Stresses:

Design stresses for the following materials are in accordance with the AASHTO LRFD Bridge Design Specifications, 8th Ed., Series of 2017:
Reinforcing steel in accordance with AASHTO LRFD Section 5, Grade 60.
Concrete in accordance with AASHTO LRFD Section 5, f'c = 4.0 ksi.

Standards: For details and notes not shown refer to the following Iowa D.O.T. Highway Standards:		
Standard	Issued	Revised
RCB G2-20	07-2020	-----
**RCB G3-20	07-2020	-----
RCB 10-5-20	07-2020	-----
PWH 0-1-20	07-2020	-----
PWH 0-2-20	07-2020	-----
PWH 0-3-20	07-2020	-----
PWH 0-4-20	07-2020	-----
PWH 0-8-20 (Sheet 2 of 2)	07-2020	-----

** Note: "Top Slab Construction Joint Detail" does not apply,

Summary of Reinforcing Steel

Location	Quantity	Total
Headwalls 0° Skew (2 Req'd)	2 @ 2,117	4,234
15'-0" Barrel Extension	2,688	2,688
16'-0" Barrel Extension	2,867	2,867
Δ 5z1 x 2'-6" Dowels Bars	2 @ 84	168
Total (LB)		9,957

Δ One set of 5z1 dowel bars includes 32-#5 bars x 2'-6", Weight = 84 per set

Concrete Placement Quantities

Location	Footing	Walls	Slab	Total
Headwalls 0° Skew (2 Req'd)	2 @ 10.3 = 20.6	2 @ 3.5 = 7.0	* 2 @ 1.4 = 2.8	30.4
15'-0" Barrel Extension	6.1	3.9	4.7	14.7
16'-0" Barrel Extension	6.5	4.1	5.1	15.7
Total (CY)	33.2	15.0	12.6	60.8

* Includes parapet and top of wingwall.

Design History
at this Site

(Includes this Design)

Des. No.	Type of Work
1848	Original Design
0127	Culvert Extension

Design For 0° Skew
10'-0" x 5'-0" Reinforced
Concrete Box Culvert Extensions

Estimate Quantities

STA. 165+00.47 (IA 31) Turn-in Date: May 2026
Cherokee County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 0127 Design Sheet No. 1 of 5 Asset I.D. 900515

Roadway Quantities shown
elsewhere in these plans.

Structural Design



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

Signature Majellen C. Pitcher Date 04-17-2026
Printed or Typed Name Majellen C. Pitcher
My license renewal date is December 31, 2026

Pages or sheets covered by this seal: V.1 - V.26

REVISED 03-2019 - UPDATED NOTE REFERRING TO COPIES OF ORIGINAL DESIGN PLANS.
REVISED 01-2021 - UPDATED BAR LAP TABLE AND DESIGN SPECIFICATION TO AASHTO LRFD 8TH ED.
ENGLISHSINGLECULVERTS.DGN - 1043s2 - THIS SHEET ISSUED 10-08.

General Notes:

It is the intent of this design to extend the existing 10'-0" x 5'-0" reinforced concrete box culvert at Station 165+00.47.

Electronic copies of original design plans are available to the Contractor as part of the e-files supplied with the contract documents. Dimensions shown on these plans are based on design plans (Original Design No. 1848).

Faint lines on plans indicate existing structure.

Utility companies and municipalities whose facilities are shown on the plans or known to be within the construction limits shall be notified by the Contractor of the construction starting date.

The R.C.B. culvert extension sections are designed for HL-93 live load and earth fills of 2 feet. This design is based on Load and Resistance Factor Design, according to the 2017 AASHTO LRFD Bridge Design Specifications.

Vertical earth pressure, EV=0.120 kcf.

Horizontal earth pressure, EHmax = 0.060 kcf max, EHmin = 0.030 kcf.

The Contractor may submit alternate frost trough dimensions for approval. Any additional costs due to change in the frost trough dimensions is to be paid for by the Contractor.

Floor of barrel is to be finished smooth. Sides of footing are to be formed to ensure correct line and grade.

The permissible construction joint at the top of the walls may be lowered at the Contractor's option with Engineer's approval.

The vertical bars in the walls may be spliced above the footing at the Contractor's option as follows:

Bar Size Number	4	5	6	7	8	9
Minimum Splice Length	20"	24"	29"	34"	38"	47"

This splice, if used will be at the Contractor's expense.

Metal bar chairs spaced at not over 3'-0" C-C in either direction are to be used to support all slab and floor steel as outlined in the Standard Specifications.

The reinforcement supplied for this structure shall be Grade 60. Reinforcing bar clearances will be as follows:

Edge clearances: 2" except
Top of floor 2¼" to near transverse reinforcing bar
Bottom of floor 3½" to near transverse reinforcing bar

End clearances:
Vertical top 2"
Vertical bottom 3" or 3½" if overall height of the culvert is not to a full inch
Transverse 2"

All reinforcing bars and bars noted as dowels supplied for this structure shall be deformed reinforcement unless otherwise noted or shown.

Class 20 excavation material unsuitable for backfilling shall be disposed of in a manner that will leave the site in a neat condition.

The price bid for "Removals as Per Plan" shall include the cost for removals of portions of the existing culvert, and the setting of the dowel reinforcing bars into existing concrete.

All dimensions and details shown on these plans pertinent to new construction in relation to existing portions of the structure shall be verified in the field by the Contractor before starting construction.

The removal of the existing culvert shall be at the front face of the existing parapet. Removals shall be on a vertical plane parallel with the front face of the existing parapet, and to the width of the floor of the proposed extension. The walls shall be cut normal to the barrel walls and as shown on the "Part Removal Plan". The removal line shall be initiated with a 2½"± deep saw cut on the top and both sides of each wall, and across the top of the floor. This saw cut should cut thru any existing longitudinal reinforcing thereby facilitating a neat non-spalled break line. If existing top of parapets will be within 6" of proposed subgrade elevation, the parapets shall be removed down to an elevation 1"± above the top of the existing slab. Any existing parapet vertical bars exposed during parapet removal shall be cut off flush with the parapet removal line and painted with two coats of zinc rich paint.

All removals shall be carefully accomplished and any concrete damaged by the Contractor that is not to be removed shall be repaired by the Contractor at no extra cost to the state. Removals shall be in accordance with Section 2401 of the Standard Specifications.

The proposed culvert extension shall abut against the front face of the existing parapet. 5z1 x 2'-6" dowel reinforcing bars with a 10" minimum embedment into existing concrete shall be set around the entire periphery of the existing culvert. 5z1 dowel reinforcing bars shall be centered in the existing slab, walls and floor unless otherwise specified. 5z1 dowel reinforcing bars shall be at 1'-0" maximum spacing C-C of dowels. 5z1 dowel reinforcing bars shall be set with polymer grout in accordance with Article 2301.03, e, of the Standard Specifications, and current Supplemental Specifications of the Iowa D.O.T. Highway Division.

The roadway will be open to traffic during construction.

Since the highway will not be closed to traffic during this construction, the Contractor may feel temporary shoring (sheet pile or other) is necessary to ensure that the shoulder will not slough in while culvert is being extended. However, if for any reason such shoring is deemed necessary, the Contractor shall submit the shoring plan to the Engineer for approval. Cost of shoring, if required, will be considered incidental to construction and no direct payment will be made. Therefore, all material used for shoring shall remain the property of the Contractor. In addition to the requirements noted above, Article 1107.07, of the Standard Specifications, still applies.

Keyway dimensions shown on the plans are based on nominal dimensions unless stated otherwise. In addition, the bevel used on the keyway shall be limited to a maximum of 10 degrees from vertical.

These bridge plans label all reinforcing steel with English notation (5a1 is ⅝ inch diameter bar). English reinforcing steel received in the field may display the following "Bar Designation". The "Bar Designation" is the stamped impression on the reinforcing bars, and is equivalent to the bar diameter in millimeters.

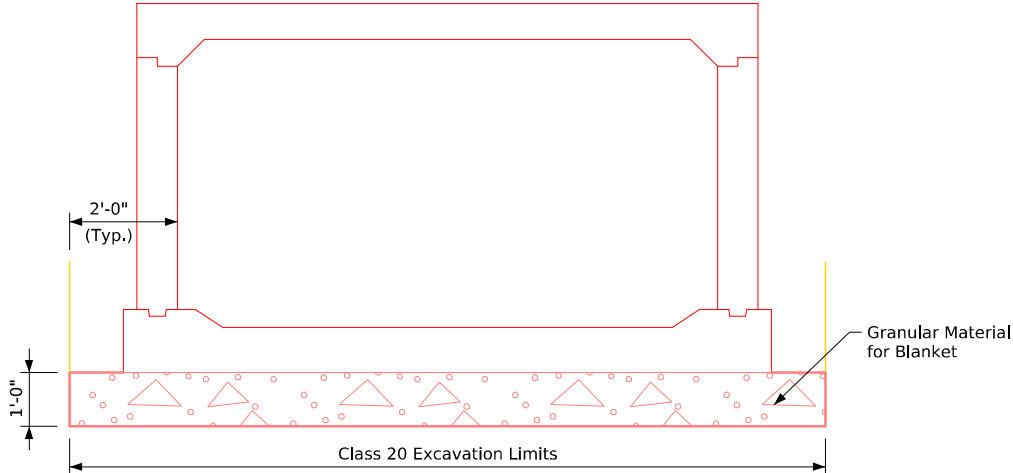
English Size	3	4	5	6	7	8	9	10	11
Bar Designation	10	13	16	19	22	25	29	32	36

Traffic will be maintained at all times in accordance with the traffic control plans shown in these plans.

Traffic control adjacent to the culvert will be the responsibility of the Contractor constructing the culvert and is to coordinate construction of the culvert with the Contractor doing the grading.

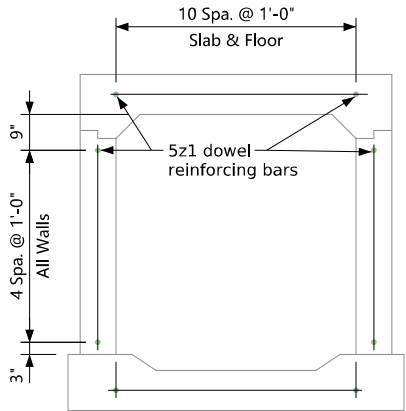
Any dimensional transition required between existing structure and the extension shall be made in the first 1'-0" of new work.

When de-watering presents a problem for placing the curtain walls as detailed, alternate methods such as steel sheet pile and precast concrete walls may be approved but at no additional cost. The Contractor is to submit to the Engineer for approval complete drawings of the proposed curtain wall alternate before beginning construction.



Excavation Details

Granular Material for Blanket shall terminate 3'-0 short of the curtain wall.



Section Near Extension

(Showing spacing of 5z1 dowel reinforcing bars)

Traffic Control Plan

Note: The roadway will be open to thru traffic. Refer to the Traffic Control Plan on the road plans in these plans.

10'-0" x 5'-0" Reinforced Concrete Box Culvert Extensions

General Notes

STA. 165+00.47 (IA 31)

Turn-in Date: May 2026

Cherokee County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0127

Design Sheet No. 2 of 5

Asset I.D. 900515

FILE NO. 32354

ENGLISH

DESIGN TEAM MCP \ JSZ \ AY

Culvert Extension Details (Sheet 2 of 2)

Standard Sheet 1043s2

Cherokee COUNTY

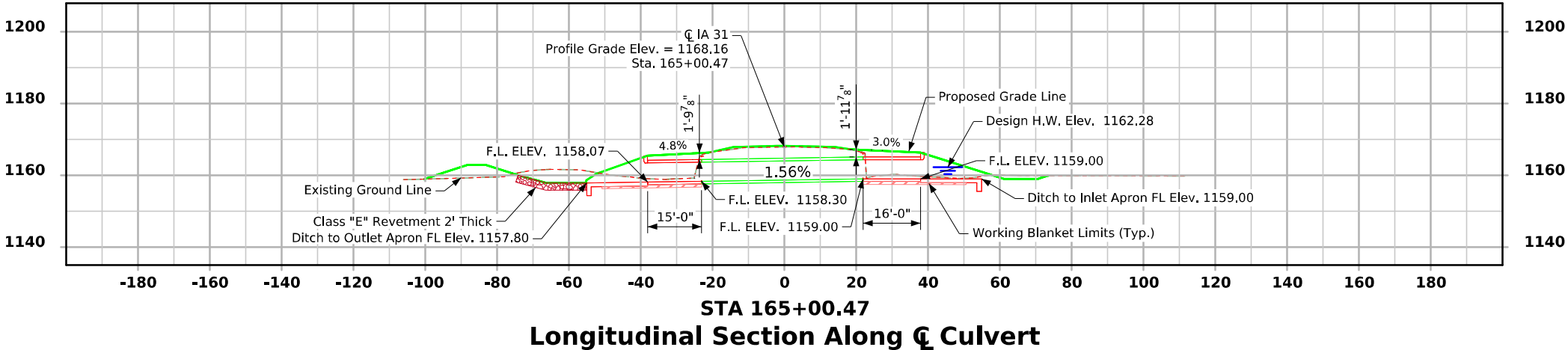
PROJECT NUMBER STPN-031-3(15)--2J-18

SHEET NUMBER

V.2

10:45:15 AM 4/16/2026 jzimmer pw:\NTPwint1.dot.int.lan:PWMain\Documents\Projects\9703101017\Bridge\15)_RCB Culvert Extension - Single Box\SHT_18031015_HNTB_DOT_0127_900515_CIP_Z04.dgn

Control Point: CP 600 CM 63 ft Electric Box 55 ft CL 620th St 50 ft CL Hwy Northing:8628367.884 Easting:14273926.030 Elevation:1161.10



General Notes:

1. This design is for the extension of an existing single 10'-0" x 5'-0" RCB culvert, Asset ID No. 900515
2. All elevation dimentions are in feet.

Design Notes:

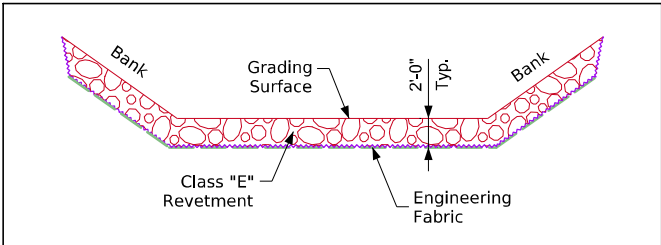
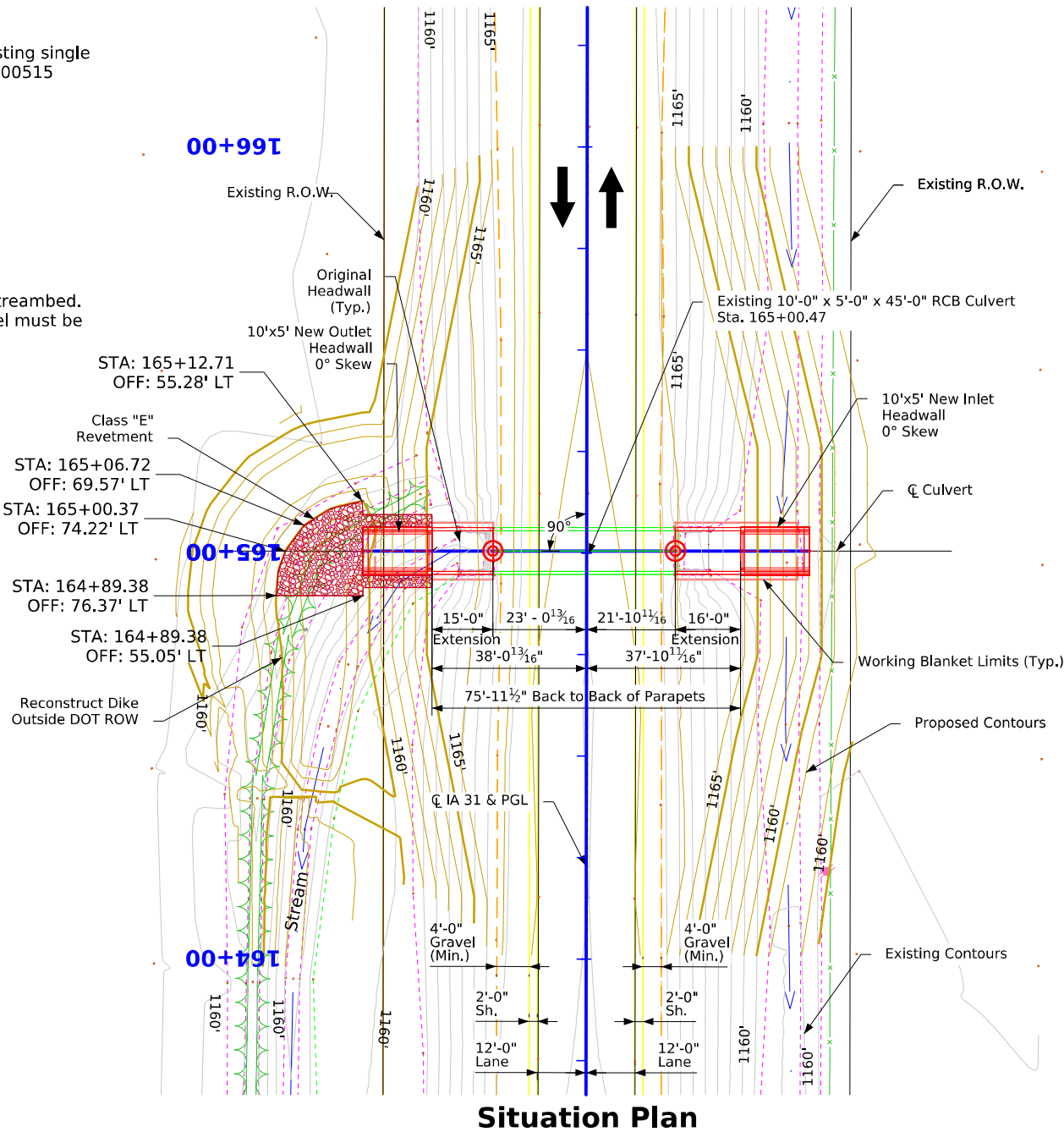
1. Design fill for this C.I.P. culvert is 2'.
2. Anticipated settlement is negligible.
3. Revetment is proposed at the culvert outlet due to erosion concerns.

Plan Notes:

1. Flow line of culvert has been set below streambed.
2. Drainage through existing culvert/channel must be maintained throughout construction.

Traffic Estimate:

Posted Speed Limit 55 mph
2019 AADT 1,400 VPD 13% Trucks
2039 AADT 1,400 VPD 14% Trucks



Typical Channel Protection

Estimated Revetment Quantities Included With Road Plans

Location	Revetment Class "E" (Ton)	Engineering Fabric (SY)	CL 10 Channel Excavation (CY)
Inlet	0	0	0
Outlet	52	78	37
Totals	52	78	37

Excavation quantity calculated from grading surface. Excavation quantity is for embedded revetment core out only, and does not include excavation to the grading surface. Excavation quantity to the grading surface is determined by Road Design and included in the Road Plans. Quantities shown for information only. See Road Sheets.

Note:

For existing road profile grade on IA 31, refer to the "D" sheets of this plan.

Hydraulic Data

RIDB: Not Applicable
Drainage Area = 75.6 Acres
Stream Slope = 306 Ft./Mi.

$Q_{50} = 161$ cfs
HW Elev. = 1162.28
Exit Velocity = 5.92 fps

$Q_{100} = 193$ cfs
HW Elev. = 1162.71
Exit Velocity = 6.56 fps

Location

IA-31 over Stream
T-90N R-41W
Section 15
Willow Township
Cherokee County
Asset ID No. 900515
Latitude 42.606886°
Longitude -95.673963°

Utilities Note:

Utilities shown on this sheet are for information only. See Road Design sheets for utility information.

General Utility Symbols:

E - Electric Line
G - Gas Line
SAN. - Sanitary Sewer
T - Telephone Line
W - Water Line
FO - Fiber Optic Line
GHP - Gas High Pressure
ST S - Storm Sewer
TV - TV
● - Power Poles

Hydraulic Design



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

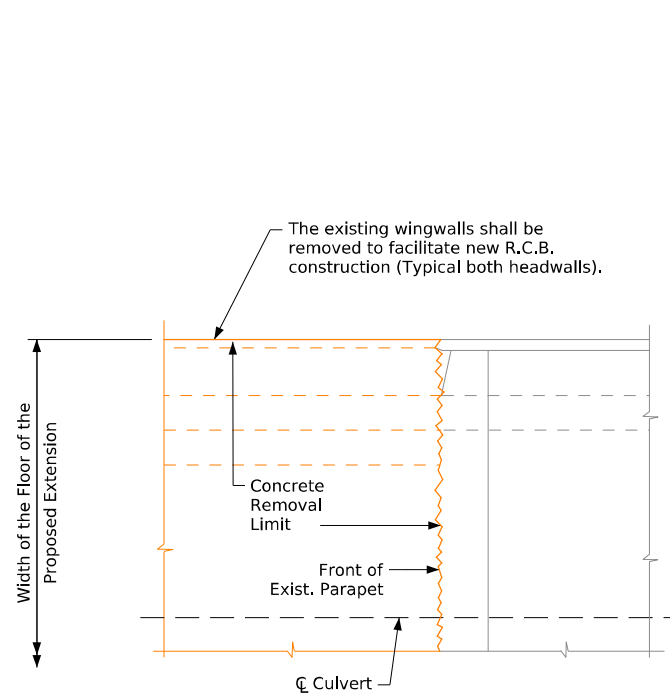
Signature: *Heidi J. Lane* Date: _____
Printed or Typed Name: Heidi J. Lane, PE
My license renewal date is December 31, 2027

Pages or sheets covered by this seal: V.3, V.8, V.13 and V.18

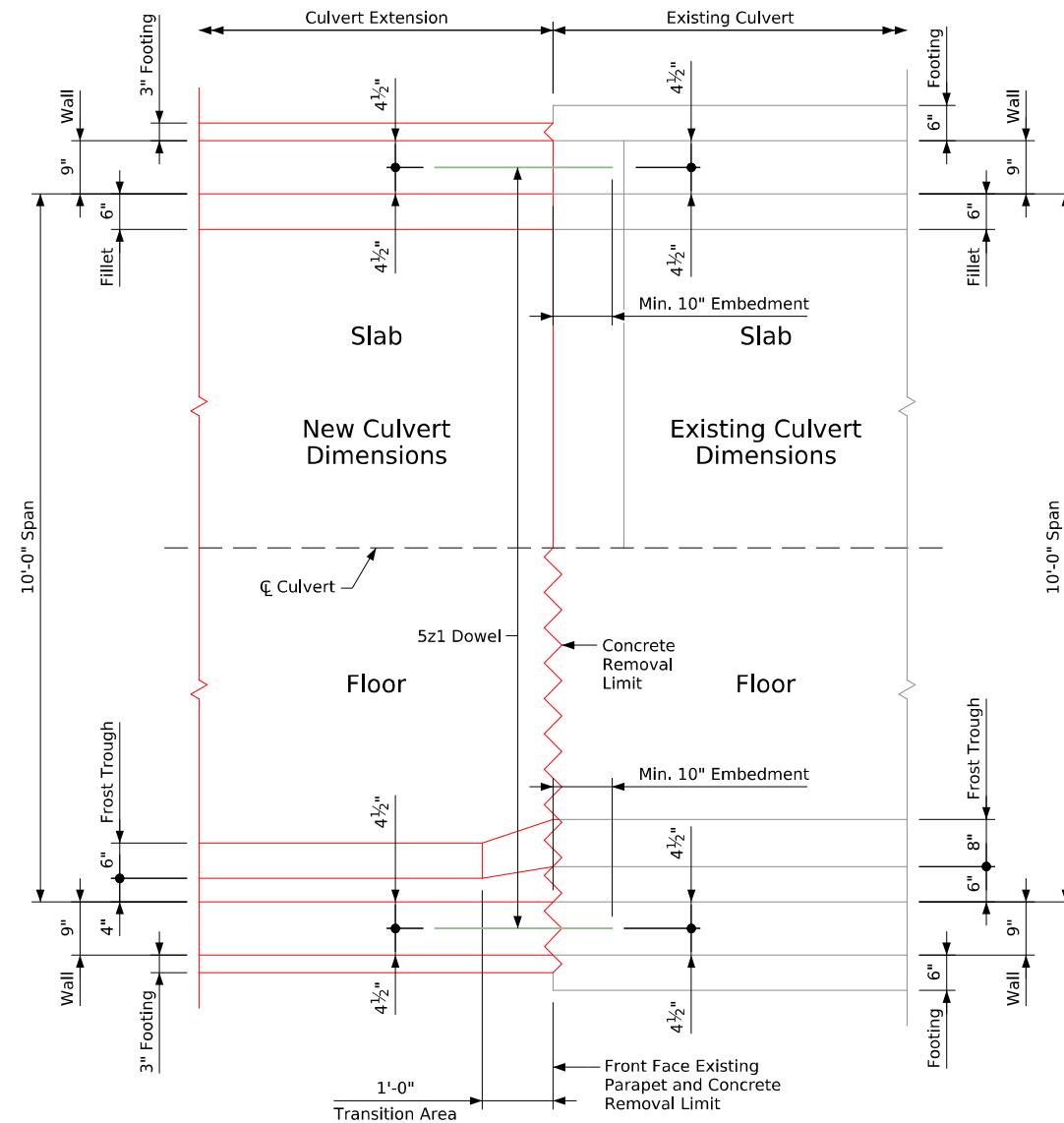
10'-0" x 5'-0" Reinforced Concrete Box Culvert Extensions

Situation Plan

STA. 165+00.47 (IA 31) Turn-in Date: May 2026
Cherokee County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 0127 Design Sheet No. 3 of 5 Asset I.D. 900515

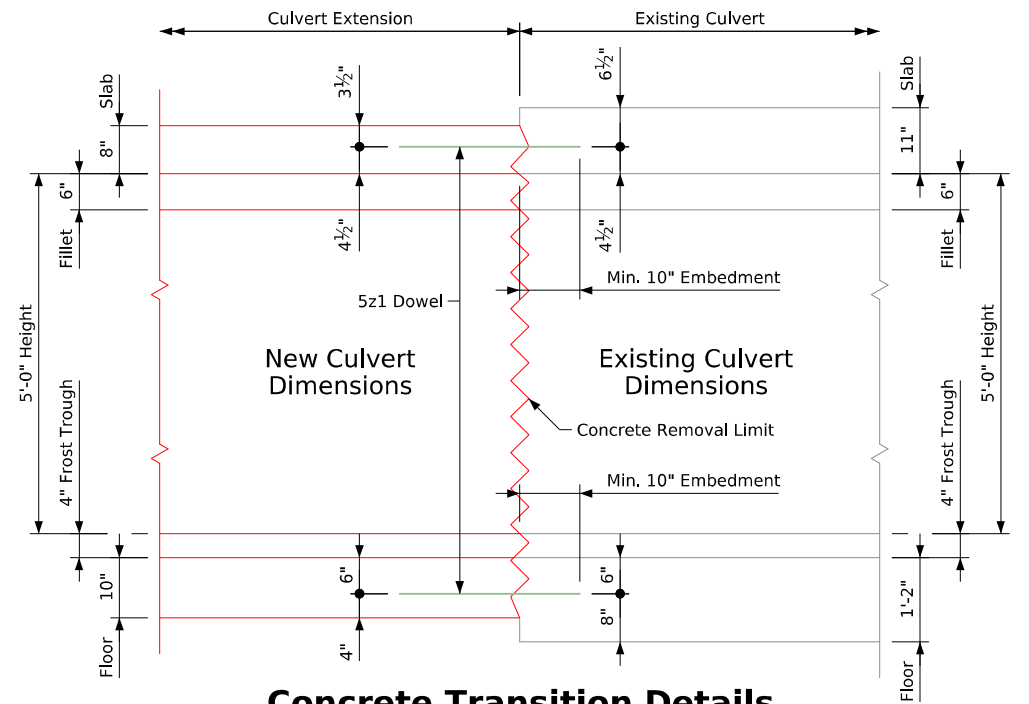


Part Removal Plan



Concrete Transition Details

(Plan View)



Concrete Transition Details

(Elevation View)

- Note:
1. 5z1 dowel shall have a minimum of 10" embedment into existing concrete.

Design For 0° Skew
**10'-0" x 5'-0" Reinforced
 Concrete Box Culvert Extensions**

Transition Details

STA. 165+00.47 (IA 31) Turn-in Date: May 2026

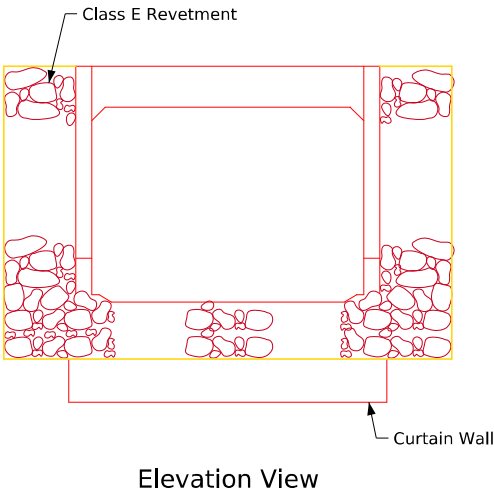
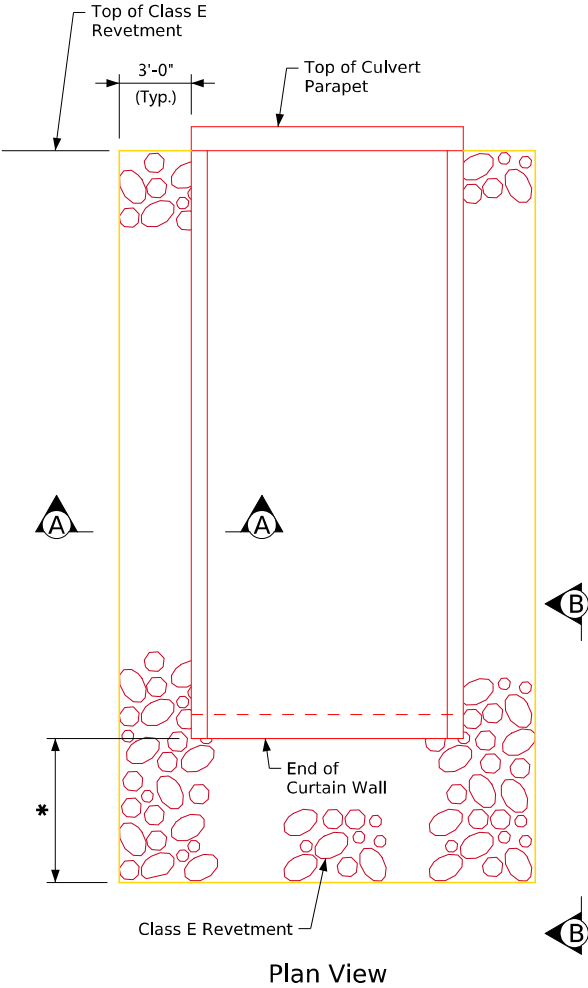
Cherokee County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0127 Design Sheet No. 4 of 5 Asset I.D. 900515

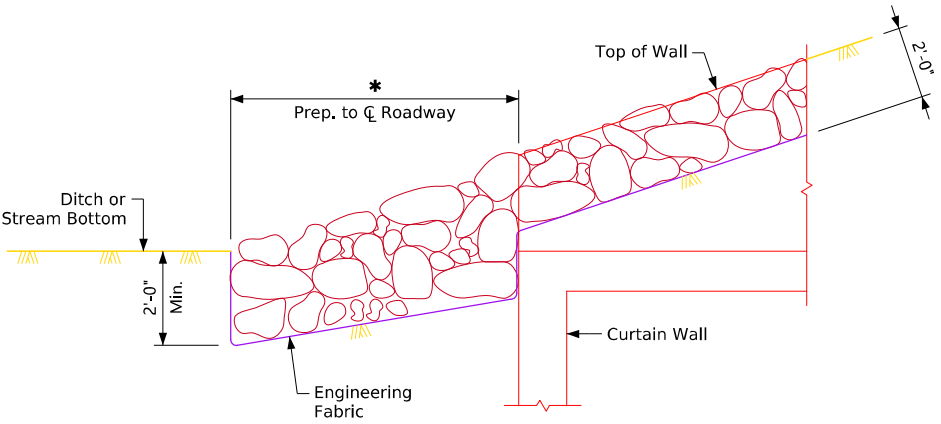
Revised 1-2016 - Added note "See culvert plans for limits of revetment and engineering fabric."
Revised 02-2017 - Added section directors "A-A" to zero skew plan view detail.
Revision 01-2021 - Changed Design Specifications to AASHTO LRFD 8th Ed.
englishsingculverts.dgn - 1092 - This sheet issued 04-12.

* = See culvert plans for limits of
revetment and engineering fabric.

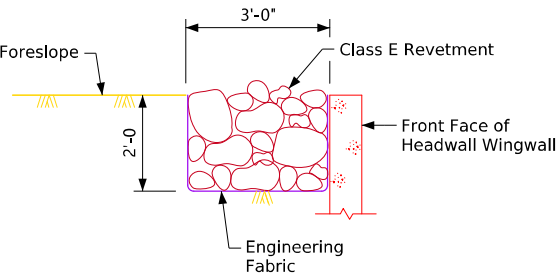


0° Skew Headwalls

* = See culvert plans for limits of
revetment and engineering fabric.



View B-B



Section A-A

Typical Details

Construction Notes:

Class E Revetment shall be used and placed according to Article 2507.03, of the Standard Specifications. The engineering fabric shall meet the material requirements in accordance with Article 4196.01,B,3, of the Standard Specifications.

Design For 0° Skew

10'-0" x 5'-0" Reinforced
Concrete Box Culvert Extensions

Revetment Protection Details

STA. 165+00.47 (IA 31)

Turn-in Date: May 2026

Cherokee County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0127

Design Sheet No. 5 of 5

Asset I.D. 900515

REVISED 11-2016 - CHANGED THE SERIES DATE "IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015", (WAS SERIES 2012).
REVISED 02-2017 - CHANGED THE DESIGN STRESSES NOTE TO STATE "AASHTO LRFD" (WAS LRFD AASHTO).
REVISED 01-2021 - CHANGED DESIGN SPECIFICATIONS TO AASHTO LRFD 8TH ED.
ENGLISHSINGLECULVERTS.DGN - 1043 - THIS SHEET REDRAWN 9-8-88

ESTIMATED CAST IN PLACE CULVERT QUANTITIES				
ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL
1	2401-6750001	REMOVALS, AS PER PLAN	LS	1
2	2402-2720000	EXCAVATION, CLASS 20	CY	133.4
3	2402-3825025	GRANULAR MATERIAL FOR BLANKET	CY	23.8
4	2403-0100020	STRUCTURAL CONCRETE (RCB CULVERT)	CY	87.6
5	2404-7775000	REINFORCING STEEL	LB	12,781

ESTIMATE REFERENCE INFORMATION		
ITEM NO.	ITEM CODE	ITEM DESCRIPTION
1	2401-6750001	REMOVALS, AS PER PLAN Includes all work for removal and off-site disposal of existing concrete. Work also includes clearing the existing barrel of sediments or deposits. Removal of scheduled items shall be in accordance with Section 2401, of the Standard Specifications. Any damage to material not to be removed shall be the responsibility of the Contractor and repaired at no extra cost to the State.
2	2402-2720000	EXCAVATION, CLASS 20 Includes filling and compacting low areas around proposed culvert. Includes excavation necessary to place 12" granular working blanket.
3	2402-3825025	GRANULAR MATERIAL FOR BLANKET Granular material shall be in accordance with Section 4118 of the Standard Specifications. Includes 23.8 CY for a working blanket. The working blanket may be deleted if determined to be unnecessary at the time of construction.
4	2403-0100020	STRUCTURAL CONCRETE (RCB CULVERT) Includes all resilient joint filler required.
5	2404-7775000	REINFORCING STEEL --

Specifications:

Design:
AASHTO LRFD Bridge Design Specifications, 8th Ed., Series of 2017.

Construction:
Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, current series, plus applicable General Supplemental Specifications, Developmental Specifications, Supplemental Specifications and Special Provisions

Design Stresses:

Design stresses for the following materials are in accordance with the AASHTO LRFD Bridge Design Specifications, 8th Ed., Series of 2017:
Reinforcing steel in accordance with AASHTO LRFD Section 5, Grade 60.
Concrete in accordance with AASHTO LRFD Section 5, f'c = 4.0 ksi.

Standards: For details and notes not shown refer to the following Iowa D.O.T. Highway Standards:		
Standard	Issued	Revised
TWRCB G2-20	07-2020	-----
**TWRCB G3-20	07-2020	-----
TWRCB 8-5-20	07-2020	-----
TWPWH 0-1-20	07-2020	-----
TWPWH 0-2-20	07-2020	08-2022
TWPWH 0-3-20	07-2020	-----
TWPWH 0-4-20	07-2020	-----
TWPWH 0-5-20	07-2020	-----
TWPWH 0-8-20	07-2020	-----

** Note: "Top Slab Construction Joint Detail" does not apply,

Summary of Reinforcing Steel

Location	Quantity	Total
Headwalls 0° Skew (2 Req'd)	2 @ 2,943	5,886
15'-0" Barrel Extension	2 @ 3,314.5	6,629
Δ 5z1 x 2'-6" Dowels Bars	2 @ 133	266
Total (LB)		12,781

Δ One set of 5z1 dowel bars includes 51-#5 bars x 2'-6", Weight = 133 per set

Concrete Placement Quantities

Location	Footing	Walls	Slab	Total
Headwalls 0° Skew (2 Req'd)	2 @ 14.3 = 28.6	2 @ 4.7 = 9.4	* 2 @ 1.9 = 3.8	41.8
15'-0" Barrel Extension (2 Req'd)	2 @ 9.6 = 19.2	2 @ 5.7 = 11.4	2 @ 7.6 = 15.2	45.8
Total (CY)	47.8	20.8	19.0	87.6

* Includes parapet and top of wingwall.

Design History at this Site

(Includes this Design)

Des. No.	Type of Work
1948	Original Design
0227	Culvert Extension

Design For 0° Skew
Twin 8'-0" x 5'-0" Reinforced
Concrete Box Culvert Extensions

Estimate Quantities

STA. 173+58.22 (IA 31)

Turn-in Date: May 2026

Cherokee County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0227

Design Sheet No. 1 of 5

Asset I.D. 900520

SHEET NUMBER

V.6

Roadway Quantities shown
elsewhere in these plans.

REVISED 03-2019 - UPDATED NOTE REFERRING TO COPIES OF ORIGINAL DESIGN PLANS.
REVISED 01-2021 - UPDATED BAR LAP TABLE AND DESIGN SPECIFICATION TO AASHTO LRFD 8TH ED.
ENGLISHINGCULVERTS.DGN - 1043s2 - THIS SHEET ISSUED 10-08.

General Notes:

It is the intent of this design to extend the existing Twin 8'-0" x 5'-0" reinforced concrete box culvert at Station 173+58.22.

Electronic copies of original design plans are available to the Contractor as part of the e-files supplied with the contract documents. Dimensions shown on these plans are based on design plans (Original Design No. 1948).

Faint lines on plans indicate existing structure.

Utility companies and municipalities whose facilities are shown on the plans or known to be within the construction limits shall be notified by the Contractor of the construction starting date.

The R.C.B. culvert extension sections are designed for HL-93 live load and earth fills of 2 feet. This design is based on Load and Resistance Factor Design, according to the 2017 AASHTO LRFD Bridge Design Specifications.

Vertical earth pressure, EV=0.120 kcf.

Horizontal earth pressure, EHmax = 0.060 kcf max, EHmin = 0.030 kcf.

The Contractor may submit alternate frost trough dimensions for approval. Any additional costs due to change in the frost trough dimensions is to be paid for by the Contractor.

Floor of barrel is to be finished smooth. Sides of footing are to be formed to ensure correct line and grade.

The permissible construction joint at the top of the walls may be lowered at the Contractor's option with Engineer's approval.

The vertical bars in the walls may be spliced above the footing at the Contractor's option as follows:

Bar Size Number	4	5	6	7	8	9
Minimum Splice Length	20"	24"	29"	34"	38"	47"

This splice, if used will be at the Contractor's expense.

Metal bar chairs spaced at not over 3'-0" C-C in either direction are to be used to support all slab and floor steel as outlined in the Standard Specifications.

The reinforcement supplied for this structure shall be Grade 60. Reinforcing bar clearances will be as follows:

Edge clearances: 2" except
Top of floor 2¼" to near transverse reinforcing bar
Bottom of floor 3½" to near transverse reinforcing bar

End clearances:
Vertical top 2"
Vertical bottom 3" or 3½" if overall height of the culvert is not to a full inch
Transverse 2"

All reinforcing bars and bars noted as dowels supplied for this structure shall be deformed reinforcement unless otherwise noted or shown.

Class 20 excavation material unsuitable for backfilling shall be disposed of in a manner that will leave the site in a neat condition.

The price bid for "Removals as Per Plan" shall include the cost for removals of portions of the existing culvert, and the setting of the dowel reinforcing bars into existing concrete.

All dimensions and details shown on these plans pertinent to new construction in relation to existing portions of the structure shall be verified in the field by the Contractor before starting construction.

The removal of the existing culvert shall be at the front face of the existing parapet. Removals shall be on a vertical plane parallel with the front face of the existing parapet, and to the width of the floor of the proposed extension. The walls shall be cut normal to the barrel walls and as shown on the "Part Removal Plan". The removal line shall be initiated with a 2½"± deep saw cut on the top and both sides of each wall, and across the top of the floor. This saw cut should cut thru any existing longitudinal reinforcing thereby facilitating a neat non-spalled break line. If existing top of parapets will be within 6" of proposed subgrade elevation, the parapets shall be removed down to an elevation 1"± above the top of the existing slab. Any existing parapet vertical bars exposed during parapet removal shall be cut off flush with the parapet removal line and painted with two coats of zinc rich paint.

All removals shall be carefully accomplished and any concrete damaged by the Contractor that is not to be removed shall be repaired by the Contractor at no extra cost to the state. Removals shall be in accordance with Section 2401 of the Standard Specifications.

The proposed culvert extension shall abut against the front face of the existing parapet. 5z1 x 2'-6" dowel reinforcing bars with a 10" minimum embedment into existing concrete shall be set around the entire periphery of the existing culvert. 5z1 dowel reinforcing bars shall be centered in the existing slab, walls and floor unless otherwise specified. 5z1 dowel reinforcing bars shall be at 1'-0" maximum spacing C-C of dowels. 5z1 dowel reinforcing bars shall be set with polymer grout in accordance with Article 2301.03, e, of the Standard Specifications, and current Supplemental Specifications of the Iowa D.O.T. Highway Division.

Engineering Seal Note

Refer to project plans of Cherokee County with Design No. 127, and Asset ID. No. 900515 for the Structural Engineering Seal applicable to this design.

The roadway will be open to traffic during construction.

Since the highway will not be closed to traffic during this construction, the Contractor may feel temporary shoring (sheet pile or other) is necessary to ensure that the shoulder will not slough in while culvert is being extended. However, if for any reason such shoring is deemed necessary, the Contractor shall submit the shoring plan to the Engineer for approval. Cost of shoring, if required, will be considered incidental to construction and no direct payment will be made. Therefore, all material used for shoring shall remain the property of the Contractor. In addition to the requirements noted above, Article 1107.07, of the Standard Specifications, still applies.

Keyway dimensions shown on the plans are based on nominal dimensions unless stated otherwise. In addition, the bevel used on the keyway shall be limited to a maximum of 10 degrees from vertical.

These bridge plans label all reinforcing steel with English notation (5a1 is ⅝ inch diameter bar). English reinforcing steel received in the field may display the following "Bar Designation". The "Bar Designation" is the stamped impression on the reinforcing bars, and is equivalent to the bar diameter in millimeters.

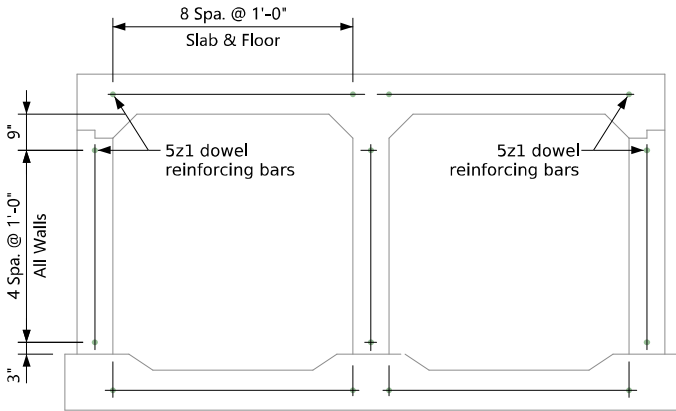
English Size	3	4	5	6	7	8	9	10	11
Bar Designation	10	13	16	19	22	25	29	32	36

Traffic will be maintained at all times in accordance with the traffic control plans shown in these plans.

Traffic control adjacent to the culvert will be the responsibility of the Contractor constructing the culvert and is to coordinate construction of the culvert with the Contractor doing the grading.

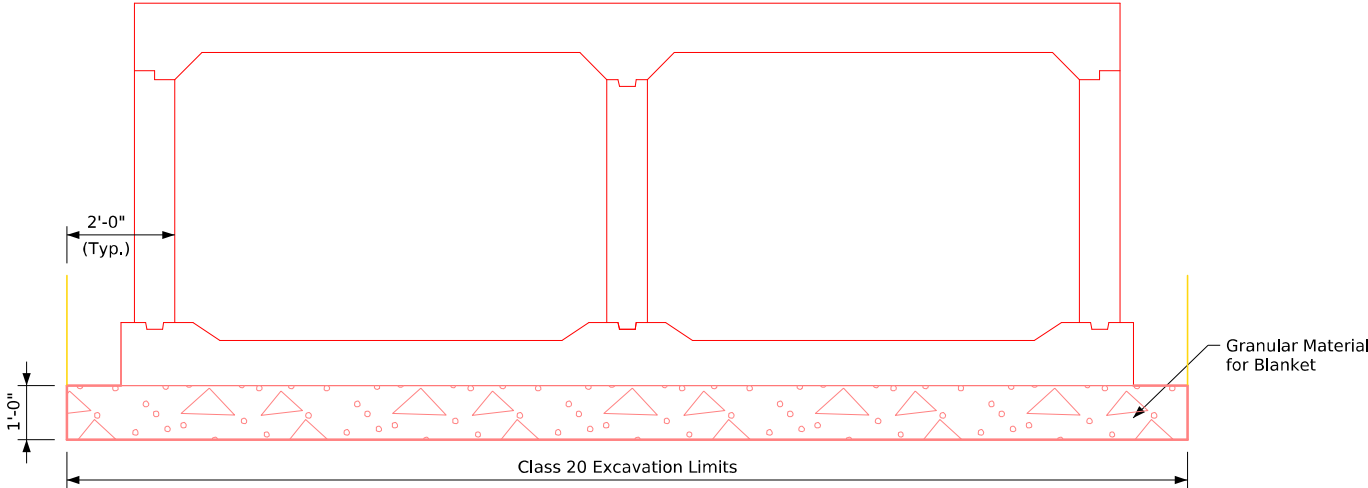
Any dimensional transition required between existing structure and the extension shall be made in the first 1'-0" of new work.

When de-watering presents a problem for placing the curtain walls as detailed, alternate methods such as steel sheet pile and precast concrete walls may be approved but at no additional cost. The Contractor is to submit to the Engineer for approval complete drawings of the proposed curtain wall alternate before beginning construction.



Section Near Twin Extension

(Showing spacing of 5z1 dowel reinforcing bars)



Excavation Details

Granular Material for Blanket shall terminate 3'-0 short of the curtain wall.

Traffic Control Plan

Note: The roadway will be open to thru traffic. Refer to the Traffic Control Plan on the road plans in these plans.

Twin 8'-0" x 5'-0" Reinforced Concrete Box Culvert Extensions

General Notes

STA. 173+58.22 (IA 31)

Turn-in Date: May 2026

Cherokee County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0227

Design Sheet No. 2 of 5

Asset I.D. 900520

SHEET NUMBER

V.7

FILE NO. 32354

ENGLISH

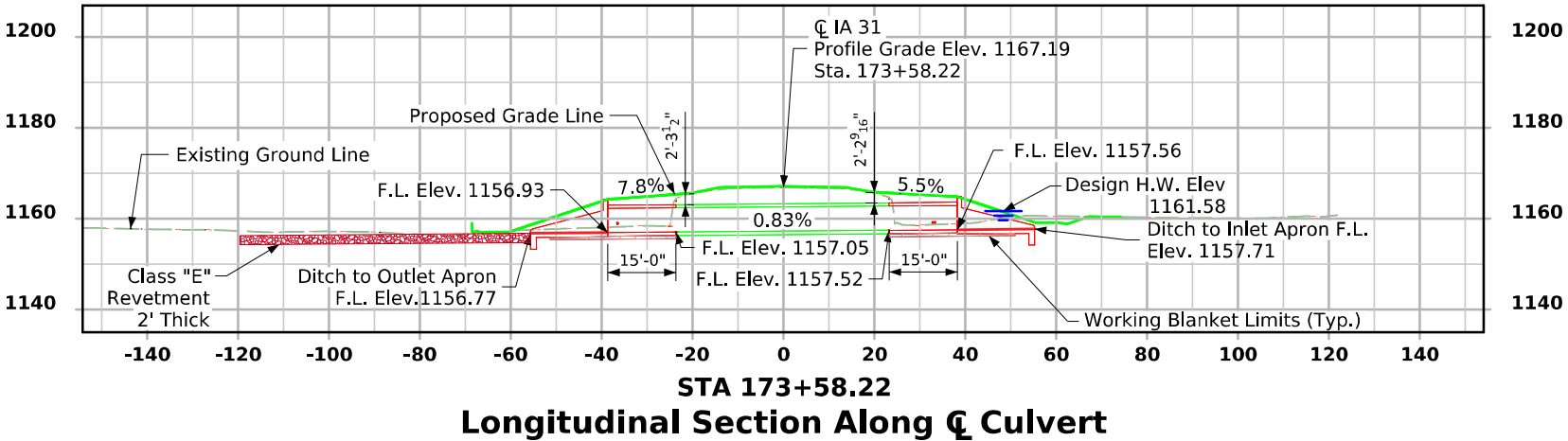
DESIGN TEAM MCP \ JSZ \ AY

Culvert Extension Details (Sheet 2 of 2)

Standard Sheet 1043s2

Cherokee COUNTY

PROJECT NUMBER STPN-031-3(15)--2J-18



General Notes:

1. This design is for the extension of an existing twin 8'-0" x 5'-0" RCB culvert, Asset ID No.900520.
2. All elevation dimensions are in feet.

Design Notes:

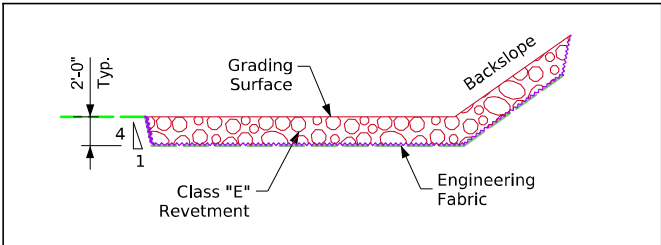
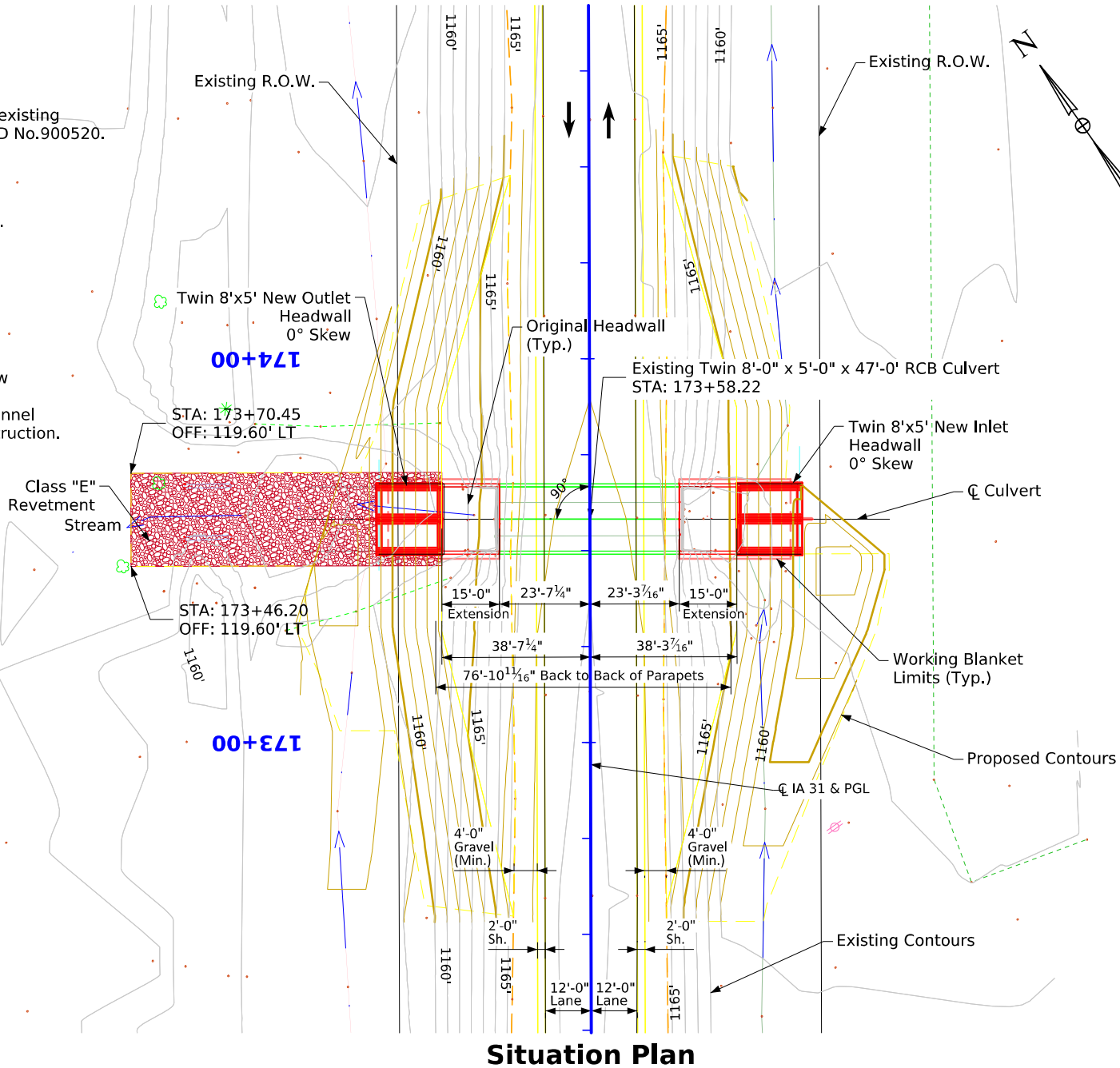
1. Design fill for this C.I.P culvert is 2'-0".
2. Anticipated settlement is negligible.
3. Revetment is proposed at the culvert outlet due to the outlet velocity exceeding policy limits.

Plan Notes:

1. Flow line of culvert has been set below Streambed.
2. Drainage through existing culvert/channel must be maintained throughout construction.

Traffic Estimate:

Posted Speed Limit 55 mph
2019 AADT 1,400 VPD, 13% Trucks
2039 AADT 1,400 VPD, 14% Trucks



Typical Channel Protection

Estimated Revetment Quantities Included With Road Plans

Location	Revetment Class "E" (Ton)	Engineering Fabric (SY)	CL 10 Channel Excavation (CY)
Inlet	0	0	0
Outlet	196	234	122
Totals	196	234	122

Excavation quantity calculated from grading surface. Excavation quantity is for embedded revetment core out only, and does not include excavation to the grading surface. Excavation quantity to the grading surface is determined by Road Design and included in the Road Plans. Quantities shown for information only. See Road Sheets.

Note:

For existing road profile grade on IA 31, refer to the "D" sheets of this plan.

Hydraulic Data

RIDB: Not Applicable
Drainage Area = 223.6 Acres
Stream Slope = 175 Ft./Mi.
 $Q_{50} = 349$ cfs
HW Elev. = 1161.58
Exit Velocity = 8.89 fps

$Q_{100} = 419$ cfs
HW Elev. = 1162.10
Exit Velocity = 9.44 fps

Location

IA-31 over Stream
T-90N R-41W
Section 15
Willow Township
Cherokee County
Asset ID No. 900520
Latitude 42.608824°
Longitude -95.672158°

Utilities Note:

Utilities shown on this sheet are for information only. See Road Design sheets for utility information.

General Utility Symbols:

E - Electric Line
G - Gas Line
SAN. - Sanitary Sewer
T - Telephone Line
W - Water Line
FO - Fiber Optic Line
GHP - Gas High Pressure
STS - Storm Sewer
TV - TV
Power Poles

Engineering Seal Note

Refer to the situation plan of Cherokee County with Design No. 127, and Asset ID. No. 900515 for the Hydraulic Engineering Seal applicable to this design.

Twin 8'-0" x 5'-0" Reinforced Concrete Box Culvert Extensions

Situation Plan

STA. 173+58.22 (IA 31)

Turn-in Date: May 2026

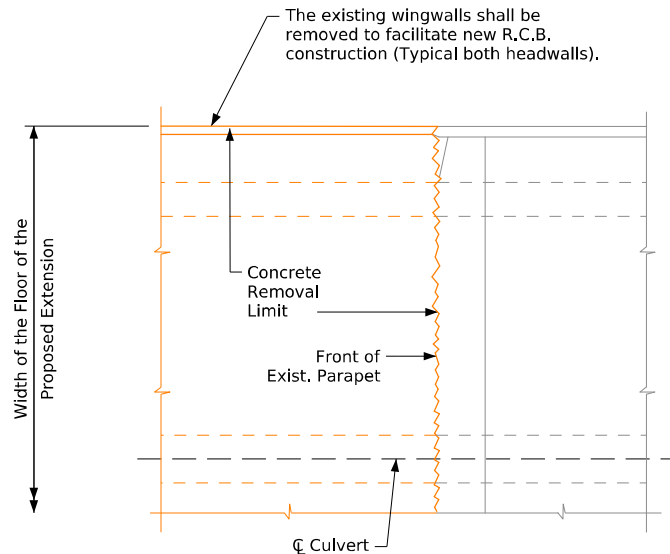
Cherokee County

IOWA DEPARTMENT OF TRANSPORTATION

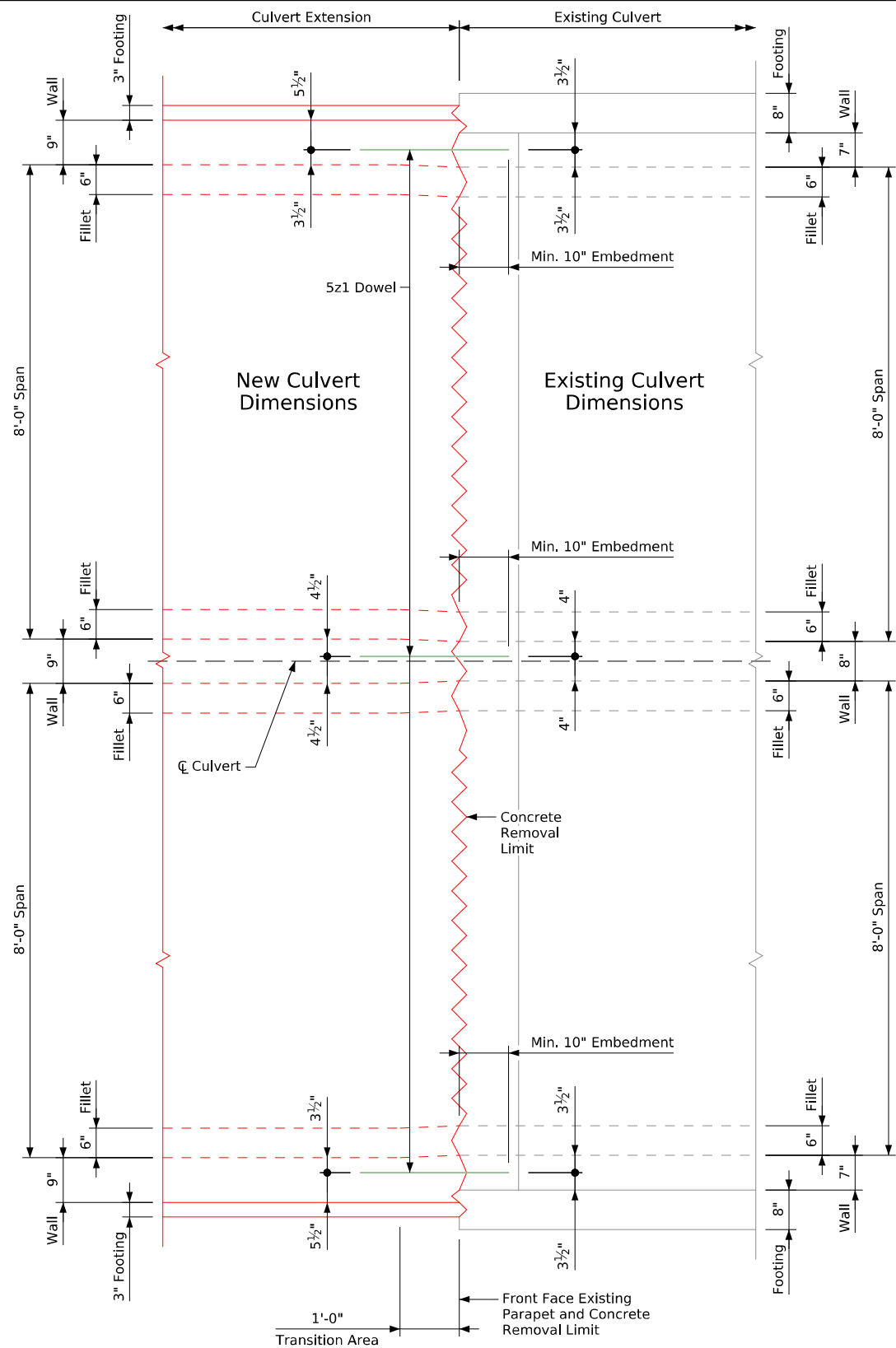
Design No. 0227

Design Sheet No. 3 of 5

Asset I.D. 900520



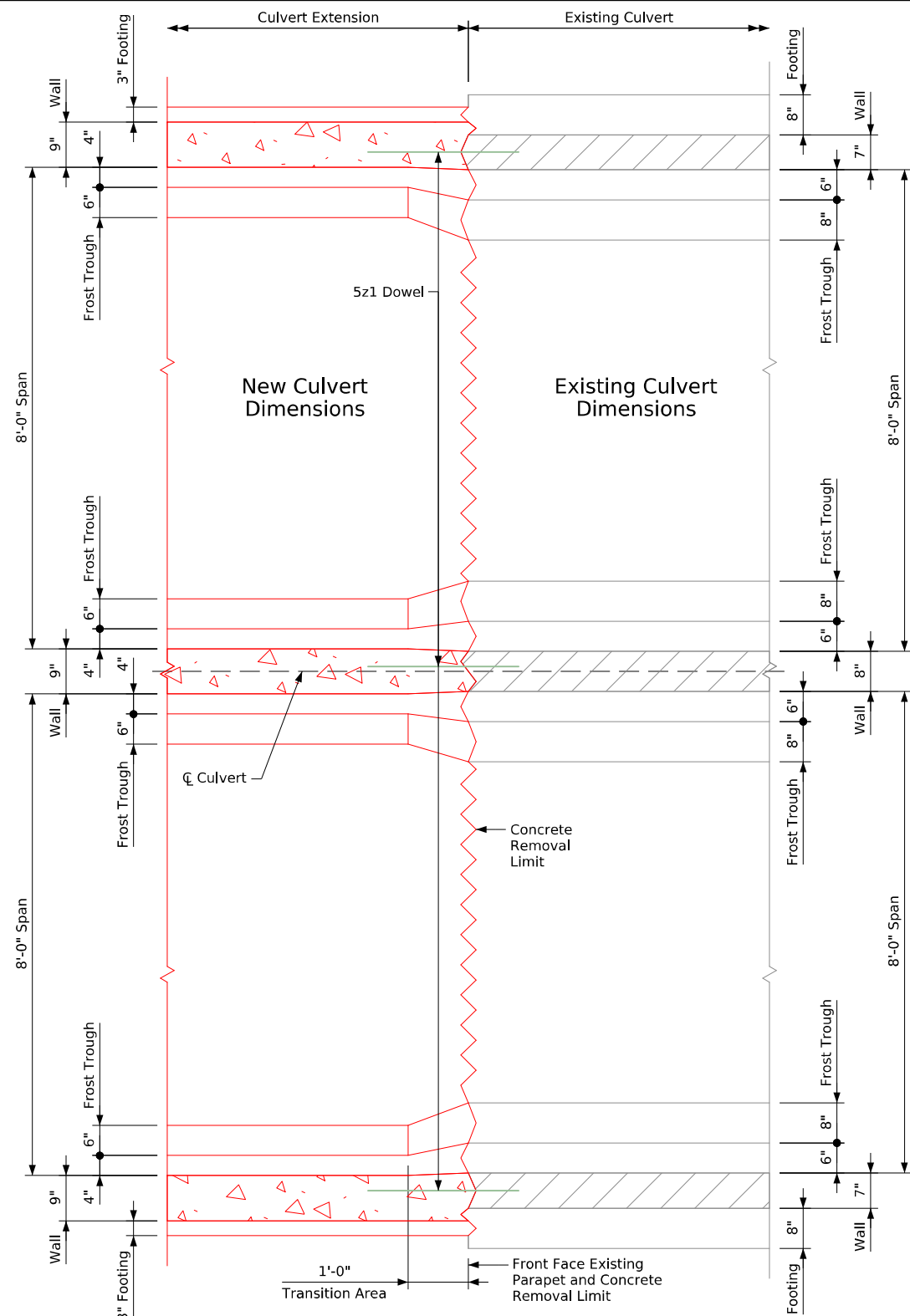
Part Removal Plan



Concrete Transition Details

(Plan View - Slab)

Note:
See Sheet V.10 for additional transition details.



Concrete Transition Details

(Plan View - Floor)

Design For 0° Skew

Twin 8'-0" x 5'-0" Reinforced Concrete Box Culvert Extensions

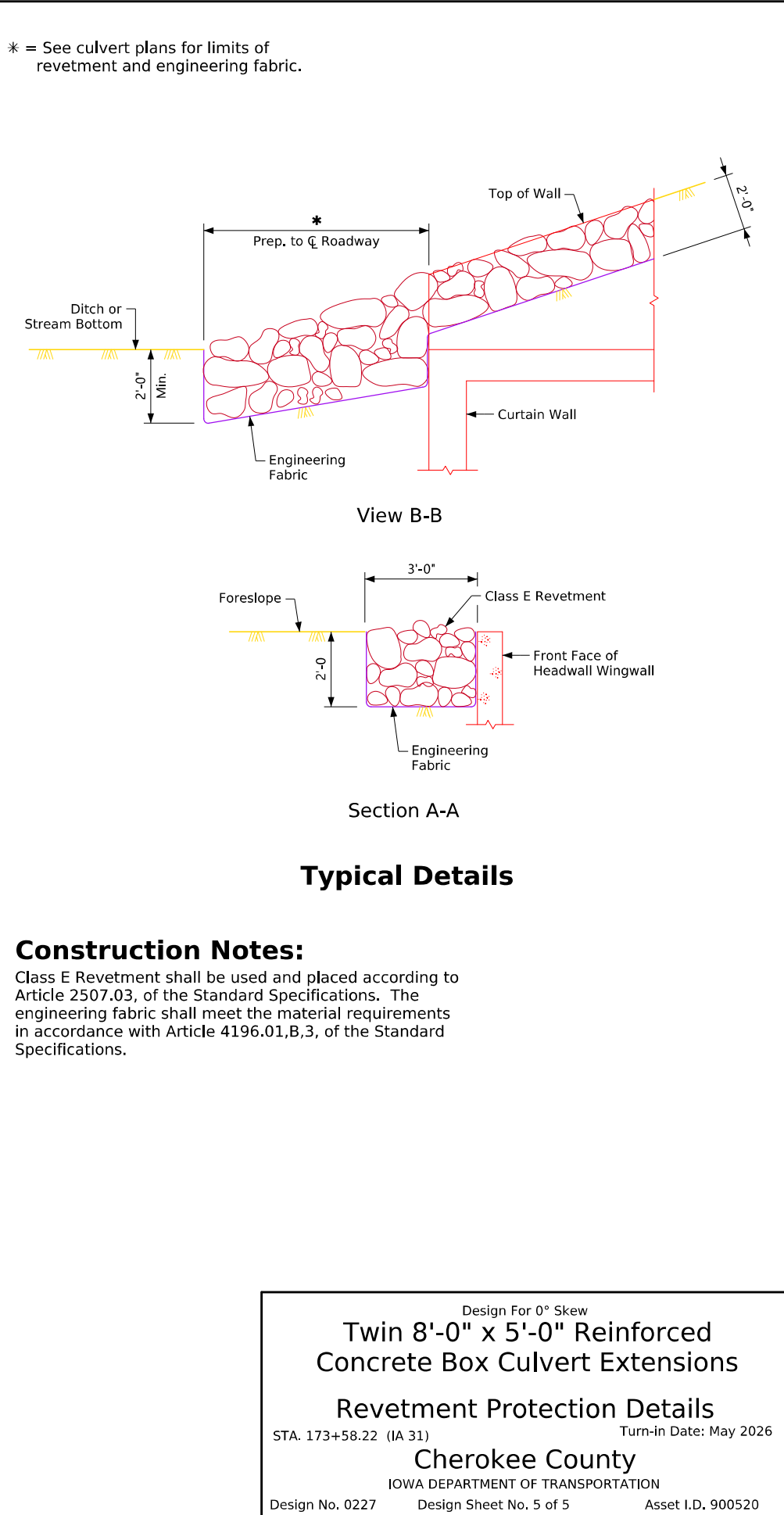
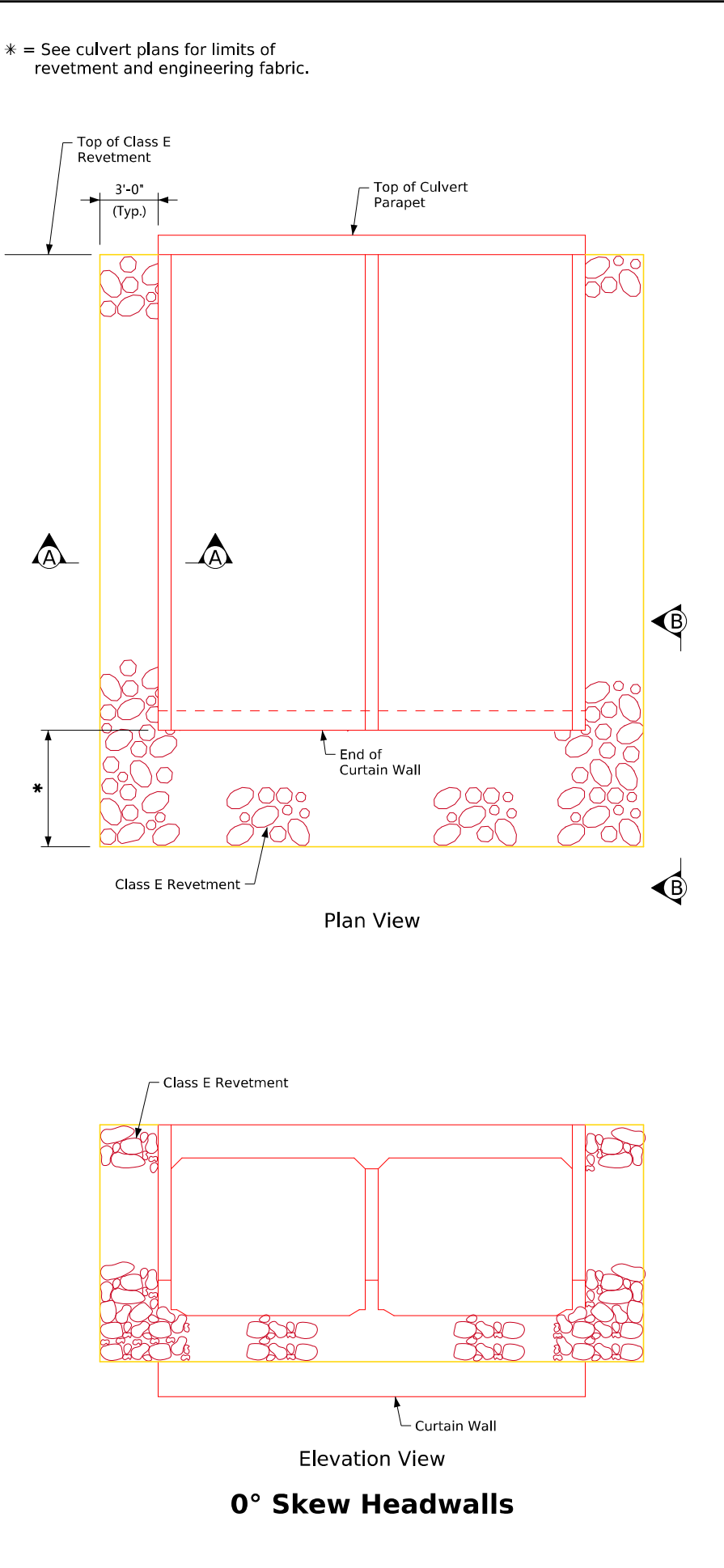
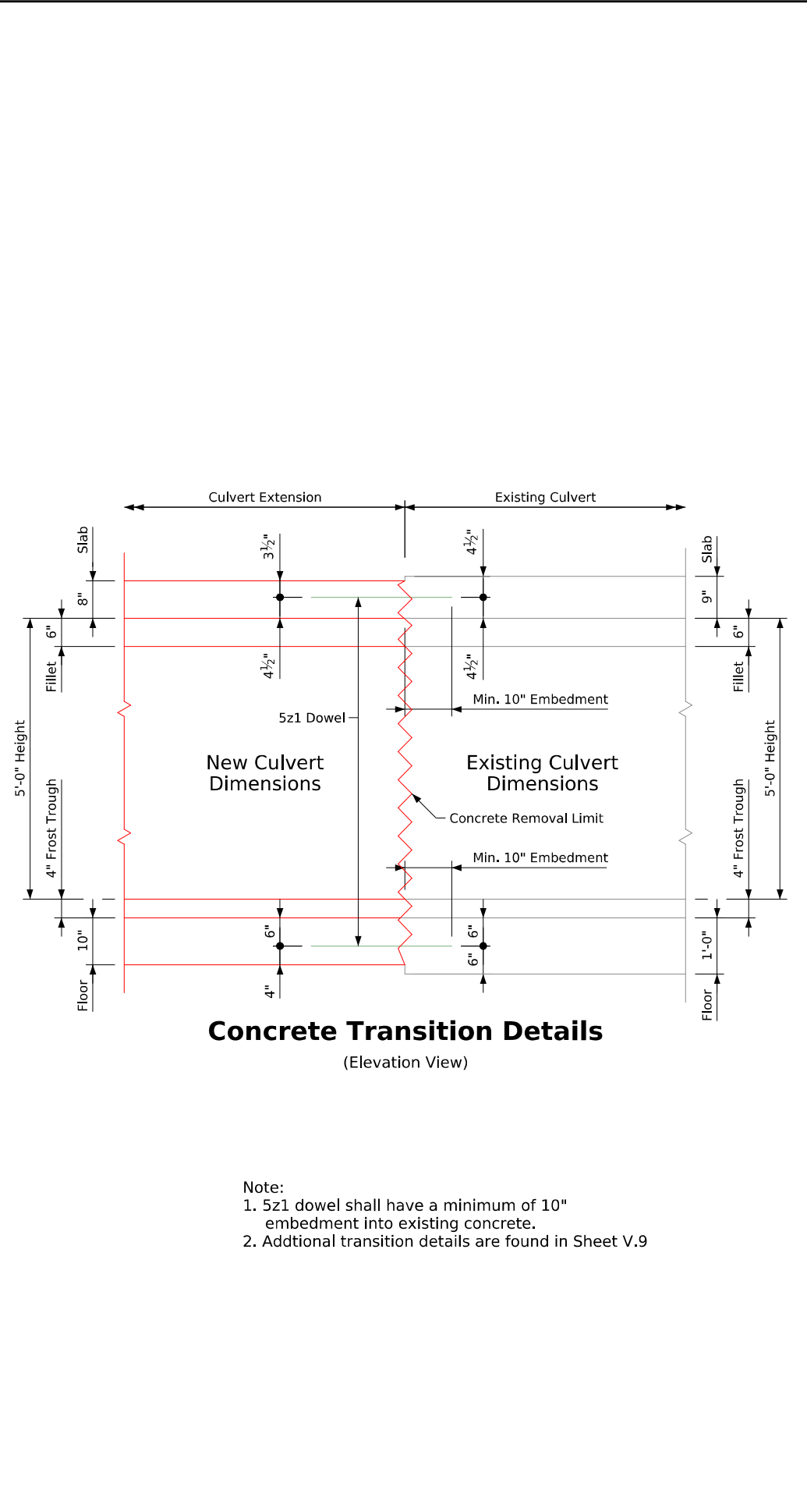
Transition Details

STA. 173+58.22 (IA 31) Turn-in Date: May 2026

Cherokee County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0227 Design Sheet No. 4 of 5 Asset I.D. 900520



Construction Notes:

Class E Revetment shall be used and placed according to Article 2507.03, of the Standard Specifications. The engineering fabric shall meet the material requirements in accordance with Article 4196.01,B,3, of the Standard Specifications.

Design For 0° Skew

Twin 8'-0" x 5'-0" Reinforced Concrete Box Culvert Extensions

Revetment Protection Details

STA. 173+58.22 (IA 31) Turn-in Date: May 2026

Cherokee County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0227 Design Sheet No. 5 of 5 Asset I.D. 900520

REVISED 11-2016 - CHANGED THE SERIES DATE "IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015", (WAS SERIES 2012).
REVISED 02-2017 - CHANGED THE DESIGN STRESSES NOTE TO STATE "AASHTO LRFD" (WAS LRFD AASHTO).
REVISED 01-2021 - CHANGED DESIGN SPECIFICATIONS TO AASHTO LRFD 8TH ED.
ENGLISHSINGLECULVERTS.DGN - 1043 - THIS SHEET REDRAWN 9-8-88

ESTIMATED CAST IN PLACE CULVERT QUANTITIES				
ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL
1	2401-6750001	REMOVALS, AS PER PLAN	LS	1
2	2402-2720000	EXCAVATION, CLASS 20	CY	40.6
3	2402-3825025	GRANULAR MATERIAL FOR BLANKET	CY	24.2
4	2403-0100020	STRUCTURAL CONCRETE (RCB CULVERT)	CY	53.0
5	2404-7775000	REINFORCING STEEL	LB	7,999

ESTIMATE REFERENCE INFORMATION		
ITEM NO.	ITEM CODE	ITEM DESCRIPTION
1	2401-6750001	REMOVALS, AS PER PLAN Includes all work for removal and off-site disposal of existing concrete. Work also includes clearing the existing barrel of sediments or deposits. Removal of scheduled items shall be in accordance with Section 2401, of the Standard Specifications. Any damage to material not to be removed shall be the responsibility of the Contractor and repaired at no extra cost to the State.
2	2402-2720000	EXCAVATION, CLASS 20 Includes filling and compacting low areas around proposed culvert. Includes excavation necessary to place 12" granular working blanket.
3	2402-3825025	GRANULAR MATERIAL FOR BLANKET Granular material shall be in accordance with Section 4118 of the Standard Specifications. Includes 24.2 CY for a working blanket. The working blanket may be deleted if determined to be unnecessary at the time of construction.
4	2403-0100020	STRUCTURAL CONCRETE (RCB CULVERT) Includes all resilient joint filler required.
5	2404-7775000	REINFORCING STEEL --

Specifications:

Design:
AASHTO LRFD Bridge Design Specifications, 8th Ed., Series of 2017.

Construction:
Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, current series, plus applicable General Supplemental Specifications, Developmental Specifications, Supplemental Specifications and Special Provisions

Design Stresses:

Design stresses for the following materials are in accordance with the AASHTO LRFD Bridge Design Specifications, 8th Ed., Series of 2017:
Reinforcing steel in accordance with AASHTO LRFD Section 5, Grade 60.
Concrete in accordance with AASHTO LRFD Section 5, f'c = 4.0 ksi.

Standards: For details and notes not shown refer to the following Iowa D.O.T. Highway Standards:		
Standard	Issued	Revised
RCB G2-20	07-2020	-----
**RCB G3-20	07-2020	-----
RCB 8-6-20	07-2020	-----
PWH 0-1-20	07-2020	-----
PWH 0-2-20	07-2020	-----
PWH 0-3-20	07-2020	-----
PWH 0-4-20	07-2020	-----
PWH 0-9-20	07-2020	-----

** Note: "Top Slab Construction Joint Detail" does not apply,

Summary of Reinforcing Steel		
Location	Quantity	Total
Headwalls 0° Skew (2 Req'd)	2 @ 2,324	4,648
12'-0" Barrel Extension	1,533	1,533
13'-0" Barrel Extension	1,660	1,660
Δ 5z1 x 2'-6" Dowels Bars	2 @ 79	158
Total (LB)		7,999

Δ One set of 5z1 dowel bars includes 30-#5 bars x 2'-6", Weight = 79 per set

Concrete Placement Quantities				
Location	Footing	Walls	Slab	Total
Headwalls 0° Skew (2 Req'd)	2 @ 8.9 = 17.8	2 @ 4.8 = 9.6	* 2 @ 1.2 = 2.4	29.8
12'-0" Barrel Extension	4.1	3.8	3.2	11.1
13'-0" Barrel Extension	4.5	4.1	3.5	12.1
Total (CY)	26.4	17.5	9.1	53.0

* Includes parapet and top of wingwall.

Design History at this Site (Includes this Design)	
Des. No.	Type of Work
2048	Original Design
0327	Culvert Extension

Design For 0° Skew 8'-0" x 6'-0" Reinforced Concrete Box Culvert Extensions Estimate Quantities STA. 238+31.81 (IA 31) Turn-in Date: May 2026 Cherokee County IOWA DEPARTMENT OF TRANSPORTATION Design No. 0327 Design Sheet No. 1 of 5 Asset I.D. 900525		
SHEET NUMBER	V.11	

Roadway Quantities shown elsewhere in these plans.

REVISED 03-2019 - UPDATED NOTE REFERRING TO COPIES OF ORIGINAL DESIGN PLANS.
REVISED 01-2021 - UPDATED BAR LAP TABLE AND DESIGN SPECIFICATION TO AASHTO LRFD 8TH ED.
ENGLISHSINGLECULVERTS.DGN - 1043s2 - THIS SHEET ISSUED 10-08.

General Notes:

It is the intent of this design to extend the existing 8'-0" x 6'-0" reinforced concrete box culvert at Station 238+31.81.

Electronic copies of original design plans are available to the Contractor as part of the e-files supplied with the contract documents. Dimensions shown on these plans are based on design plans (Original Design No. 2048).

Faint lines on plans indicate existing structure.

Utility companies and municipalities whose facilities are shown on the plans or known to be within the construction limits shall be notified by the Contractor of the construction starting date.

The R.C.B. culvert extension sections are designed for HL-93 live load and earth fills of 3 feet. This design is based on Load and Resistance Factor Design, according to the 2017 AASHTO LRFD Bridge Design Specifications.

Vertical earth pressure, EV=0.120 kcf.

Horizontal earth pressure, EHmax = 0.060 kcf max, EHmin = 0.030 kcf.

The Contractor may submit alternate frost trough dimensions for approval. Any additional costs due to change in the frost trough dimensions is to be paid for by the Contractor.

Floor of barrel is to be finished smooth. Sides of footing are to be formed to ensure correct line and grade.

The permissible construction joint at the top of the walls may be lowered at the Contractor's option with Engineer's approval.

The vertical bars in the walls may be spliced above the footing at the Contractor's option as follows:

Bar Size Number	4	5	6	7	8	9
Minimum Splice Length	20"	24"	29"	34"	38"	47"

This splice, if used will be at the Contractor's expense.

Metal bar chairs spaced at not over 3'-0" C-C in either direction are to be used to support all slab and floor steel as outlined in the Standard Specifications.

The reinforcement supplied for this structure shall be Grade 60. Reinforcing bar clearances will be as follows:

Edge clearances: 2" except

Top of floor 2¼" to near transverse reinforcing bar

Bottom of floor 3½" to near transverse reinforcing bar

End clearances:

Vertical top 2"

Vertical bottom 3" or 3½" if overall height of the culvert is not to a full inch

Transverse 2"

All reinforcing bars and bars noted as dowels supplied for this structure shall be deformed reinforcement unless otherwise noted or shown.

Class 20 excavation material unsuitable for backfilling shall be disposed of in a manner that will leave the site in a neat condition.

The price bid for "Removals as Per Plan" shall include the cost for removals of portions of the existing culvert, and the setting of the dowel reinforcing bars into existing concrete.

All dimensions and details shown on these plans pertinent to new construction in relation to existing portions of the structure shall be verified in the field by the Contractor before starting construction.

The removal of the existing culvert shall be at the front face of the existing parapet. Removals shall be on a vertical plane parallel with the front face of the existing parapet, and to the width of the floor of the proposed extension. The walls shall be cut normal to the barrel walls and as shown on the "Part Removal Plan". The removal line shall be initiated with a 2½"± deep saw cut on the top and both sides of each wall, and across the top of the floor. This saw cut should cut thru any existing longitudinal reinforcing thereby facilitating a neat non-spalled break line. If existing top of parapets will be within 6" of proposed subgrade elevation, the parapets shall be removed down to an elevation 1"± above the top of the existing slab. Any existing parapet vertical bars exposed during parapet removal shall be cut off flush with the parapet removal line and painted with two coats of zinc rich paint.

All removals shall be carefully accomplished and any concrete damaged by the Contractor that is not to be removed shall be repaired by the Contractor at no extra cost to the state. Removals shall be in accordance with Section 2401 of the Standard Specifications.

The proposed culvert extension shall abut against the front face of the existing parapet. 5z1 x 2'-6" dowel reinforcing bars with a 10" minimum embedment into existing concrete shall be set around the entire periphery of the existing culvert. 5z1 dowel reinforcing bars shall be centered in the existing slab, walls and floor unless otherwise specified. 5z1 dowel reinforcing bars shall be at 1'-0" maximum spacing C-C of dowels. 5z1 dowel reinforcing bars shall be set with polymer grout in accordance with Article 2301.03, e, of the Standard Specifications, and current Supplemental Specifications of the Iowa D.O.T. Highway Division.

Engineering Seal Note

Refer to project plans of Cherokee County with Design No. 127, and Asset ID. No. 900515 for the Structural Engineering Seal applicable to this design.

The roadway will be open to traffic during construction.

Since the highway will not be closed to traffic during this construction, the Contractor may feel temporary shoring (sheet pile or other) is necessary to ensure that the shoulder will not slough in while culvert is being extended. However, if for any reason such shoring is deemed necessary, the Contractor shall submit the shoring plan to the Engineer for approval. Cost of shoring, if required, will be considered incidental to construction and no direct payment will be made. Therefore, all material used for shoring shall remain the property of the Contractor. In addition to the requirements noted above, Article 1107.07, of the Standard Specifications, still applies.

Keyway dimensions shown on the plans are based on nominal dimensions unless stated otherwise. In addition, the bevel used on the keyway shall be limited to a maximum of 10 degrees from vertical.

These bridge plans label all reinforcing steel with English notation (5a1 is ⅝ inch diameter bar). English reinforcing steel received in the field may display the following "Bar Designation". The "Bar Designation" is the stamped impression on the reinforcing bars, and is equivalent to the bar diameter in millimeters.

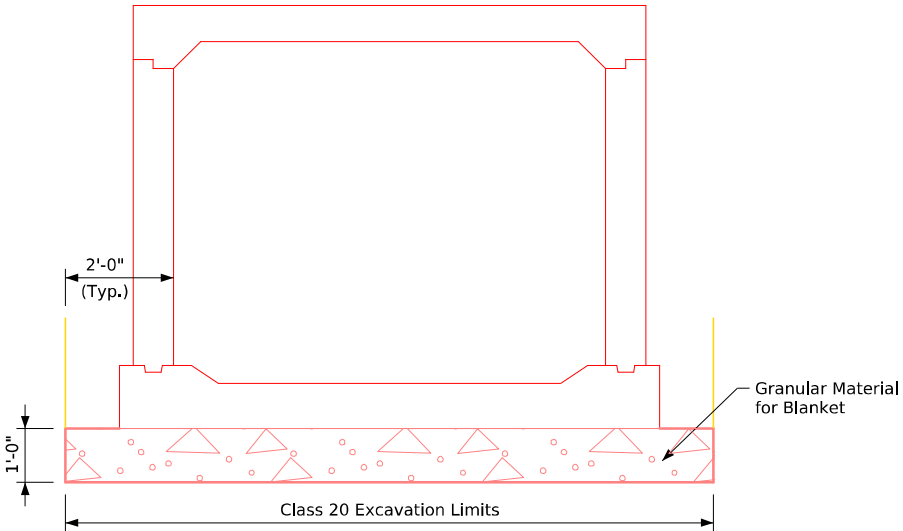
English Size	3	4	5	6	7	8	9	10	11
Bar Designation	10	13	16	19	22	25	29	32	36

Traffic will be maintained at all times in accordance with the traffic control plans shown in these plans.

Traffic control adjacent to the culvert will be the responsibility of the Contractor constructing the culvert and is to coordinate construction of the culvert with the Contractor doing the grading.

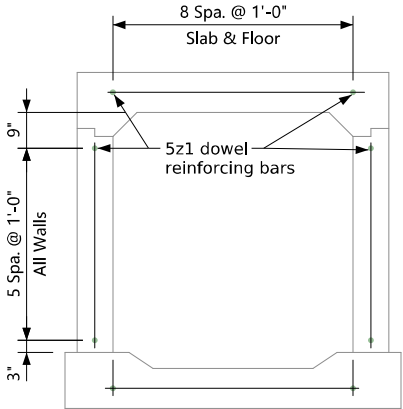
Any dimensional transition required between existing structure and the extension shall be made in the first 1'-0" of new work.

When de-watering presents a problem for placing the curtain walls as detailed, alternate methods such as steel sheet pile and precast concrete walls may be approved but at no additional cost. The Contractor is to submit to the Engineer for approval complete drawings of the proposed curtain wall alternate before beginning construction.



Excavation Details

Granular Material for Blanket shall terminate 3'-0 short of the curtain wall.



Section Near Extension

(Showing spacing of 5z1 dowel reinforcing bars)

Traffic Control Plan

Note: The roadway will be open to thru traffic. Refer to the Traffic Control Plan on the road plans in these plans.

Design For 0° Skew
8'-0" x 6'-0" Reinforced Concrete Box Culvert Extensions

General Notes

STA. 238+31.81 (IA 31)

Turn-in Date: May 2026

Cherokee County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0327

Design Sheet No. 2 of 5

Asset I.D. 900525

FILE NO. 32354

ENGLISH

DESIGN TEAM MCP \ JSZ \ AY

Culvert Extension Details (Sheet 2 of 2)

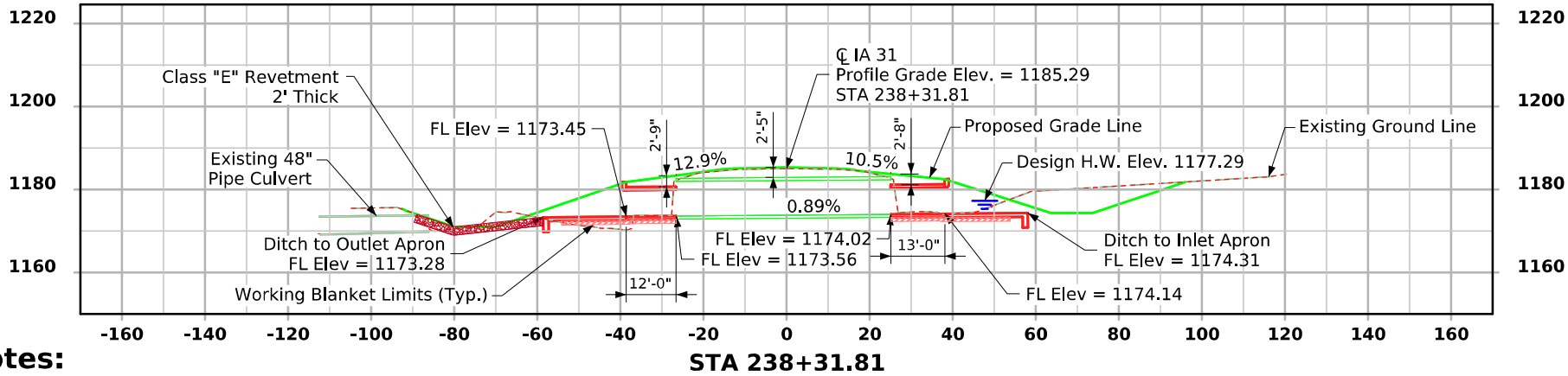
Standard Sheet 1043s2

Cherokee COUNTY

PROJECT NUMBER STPN-031-3(15)--2J-18

SHEET NUMBER V.12

Control Point: CP 473 CM 120 End of 36in RCP 80ft CM 34 ft CL Hwy Northing:8631023.050 Easting:14276058.310 Elevation:1159.76



General Notes:

- This design is for the extension of an existing single 8'-0" x 6'-0" RCB culvert, Asset ID No. 900525.
- All elevation dimensions are in feet.

Design Notes:

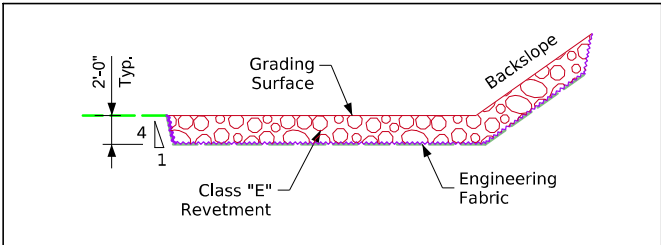
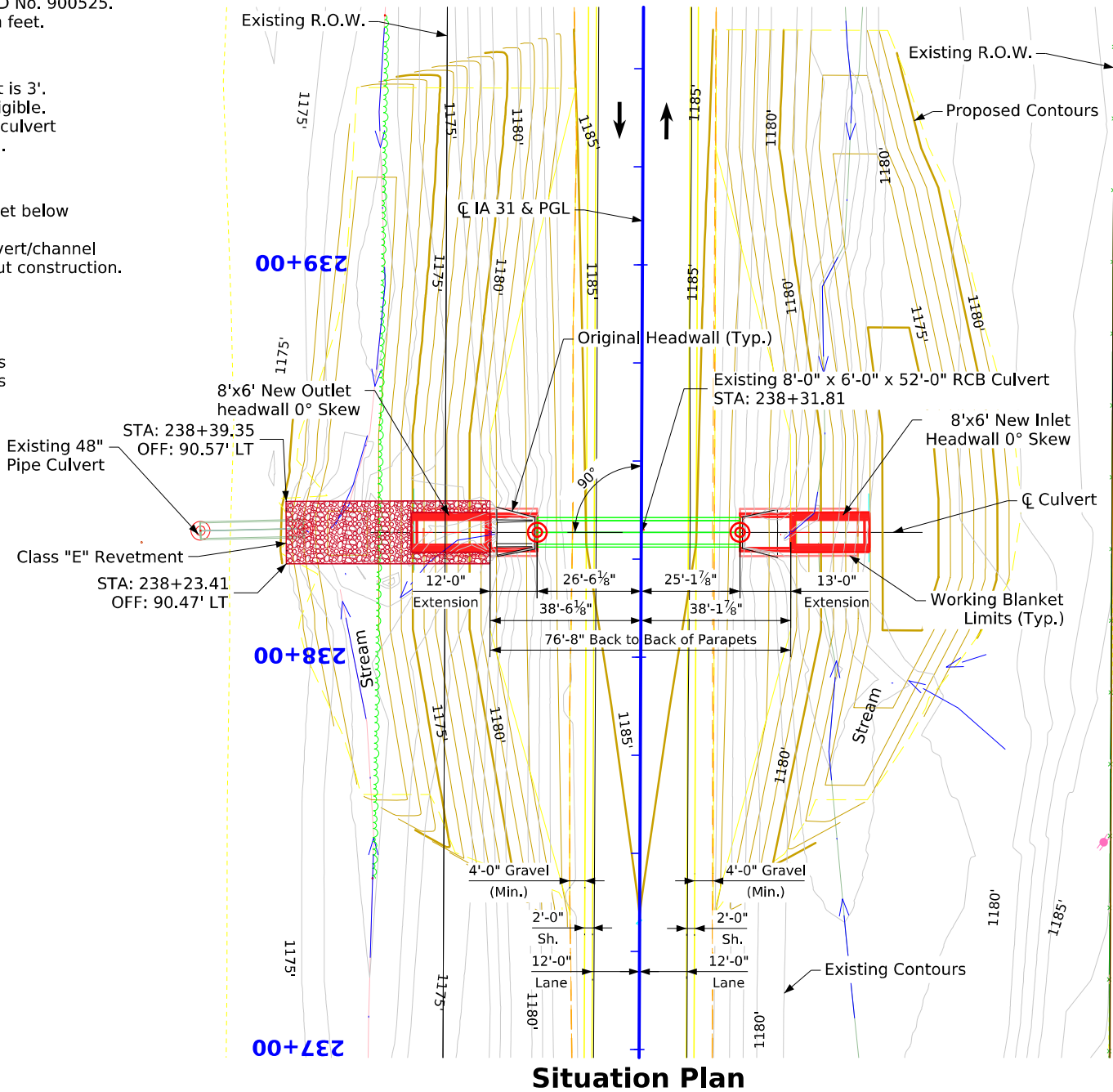
- Design fill for this C.I.P. culvert is 3'.
- Anticipated settlement is negligible.
- Revetment is proposed at the culvert outlet due to erosion concerns.

Plan Notes:

- Flow line of culvert has been set below streambed.
- Drainage through existing culvert/channel must be maintained throughout construction.

Traffic Estimate:

Posted Speed Limit 55 mph
2019 AADT 1,400 VPD 13% Trucks
2039 AADT 1,400 VPD 14% Trucks



Typical Channel Protection

Estimated Revetment Quantities Included With Road Plans

Location	Revetment Class "E" (Ton)	Engineering Fabric (SY)	CL 10 Channel Excavation (CY)
Inlet			
Outlet	70	73	49
Totals			

Excavation quantity calculated from grading surface. Excavation quantity is for embedded revetment core out only, and does not include excavation to the grading surface. Excavation quantity to the grading surface is determined by Road Design and included in the Road Plans. Quantities shown for information only. See Road Sheets.

Note:

For existing road profile grade on IA 31, refer to the "D" sheets of this plan.

Hydraulic Data

RIDB: Not Applicable
Drainage Area = 32.6 Acres
Stream Slope = 277 Ft./Mi.
Q₅₀ = 85 cfs
HW Elev. = 1177.29
Exit Velocity = 3.43 fps

Q₁₀₀ = 102 cfs
HW Elev. = 1177.43
Exit Velocity = 3.83 fps

Location

IA 31 over Stream
T-90N R-41W
Section 11
Willow Township
Cherokee County
Asset I.D. 900525
Latitude 42.621144°
Longitude -95.655203°

Utilities Note:

Utilities shown on this sheet are for information only. See Road Design sheets for utility information.

General Utility Symbols:

E - Electric Line
G - Gas Line
SAN. - Sanitary Sewer
T - Telephone Line
W - Water Line
FO - Fiber Optic Line
GHP - Gas High Pressure
ST S - Storm Sewer
TV - TV
● - Power Poles

Engineering Seal Note

Refer to the situation plan of Cherokee County with Design No. 127, and Asset ID. No. 900515 for the Hydraulic Engineering Seal applicable to this design.

Design For 0° Skew
8'-0" x 6'-0" Reinforced
Concrete Box Culvert Extensions

Situation Plan

STA. 238+31.81 (IA 31)

Turn-in Date: May 2026

Cherokee County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0327

Design Sheet No. 3 of 5

Asset I.D. 900525

FILE NO. 32354

ENGLISH

DESIGN TEAM MCP \ JSZ \ AY

Cherokee COUNTY

PROJECT NUMBER STPN-031-3(15)--2-18

SHEET NUMBER V.13



Note:
1. 5z1 dowel shall have a minimum of 10" embedment into existing concrete.

Design For 0° Skew

8'-0" x 6'-0" Reinforced Concrete Box Culvert Extensions

Transition Details

STA. 238+31.81 (IA 31) Turn-in Date: May 2026

Cherokee County

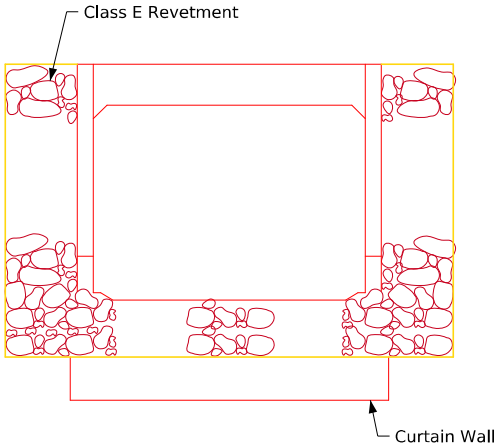
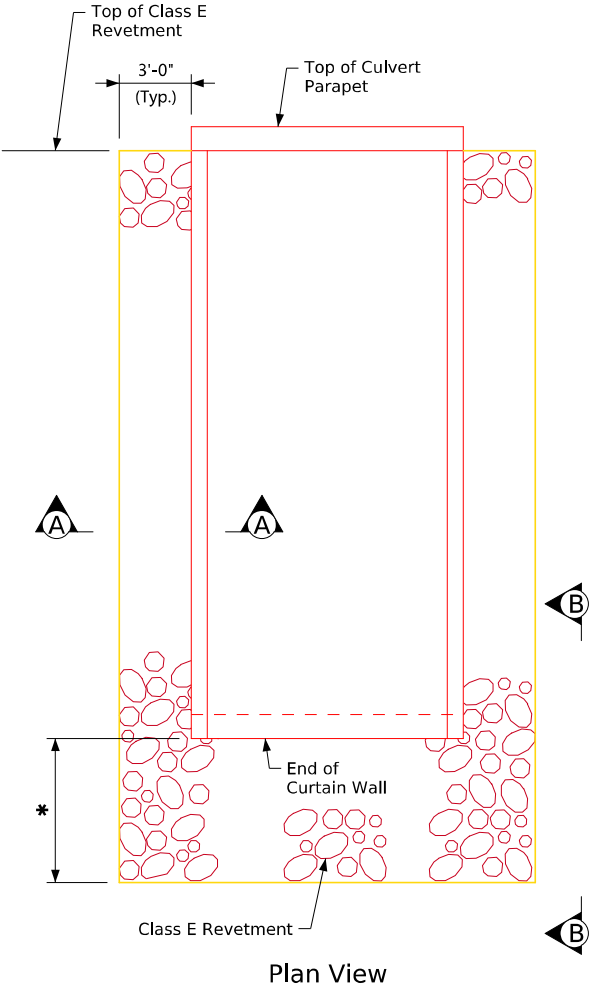
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0327 Design Sheet No. 4 of 5 Asset I.D. 900525

	SHEET NUMBER	V.14	
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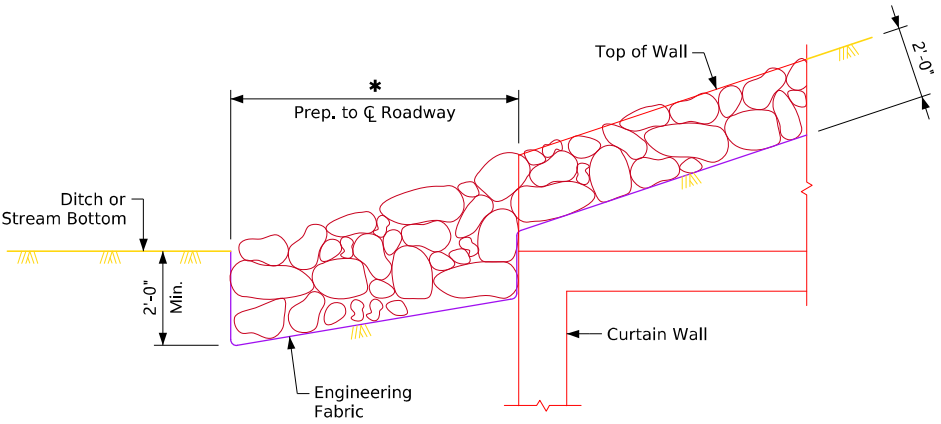
Revised 1-2016 - Added note "See culvert plans for limits of revetment and engineering fabric."
Revised 02-2017 - Added section directors "A-A" to zero skew plan view detail.
Revision 01-2021 - Changed Design Specifications to AASHTO LRFD 8th Ed.
englishsingculverts.dgn - 1092 - This sheet issued 04-12.

* = See culvert plans for limits of
revetment and engineering fabric.

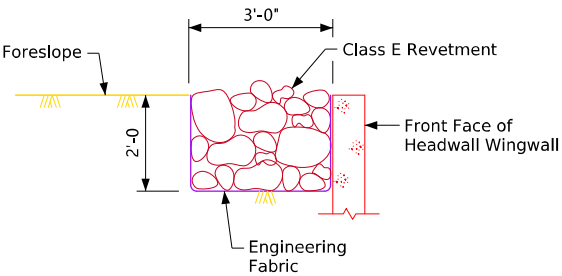


Elevation View
0° Skew Headwalls

* = See culvert plans for limits of
revetment and engineering fabric.



View B-B



Section A-A

Typical Details

Construction Notes:

Class E Revetment shall be used and placed according to Article 2507.03, of the Standard Specifications. The engineering fabric shall meet the material requirements in accordance with Article 4196.01,B,3, of the Standard Specifications.

Design For 0° Skew

8'-0" x 6'-0" Reinforced
Concrete Box Culvert Extensions

Revetment Protection Details

STA. 238+31.81 (IA 31)

Turn-in Date: May 2026

Cherokee County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0327

Design Sheet No. 5 of 5

Asset I.D. 900525

REVISED 11-2016 - CHANGED THE SERIES DATE "IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015", (WAS SERIES 2012).
REVISED 02-2017 - CHANGED THE DESIGN STRESSES NOTE TO STATE "AASHTO LRFD" (WAS LRFD AASHTO).
REVISED 01-2021 - CHANGED DESIGN SPECIFICATIONS TO AASHTO LRFD 8TH ED.
ENGLISHSINGLECULVERTS.DGN - 1043 - THIS SHEET REDRAWN 9-8-88

ESTIMATED CAST IN PLACE CULVERT QUANTITIES				
ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL
1	2401-6750001	REMOVALS, AS PER PLAN	LS	1
2	2402-2720000	EXCAVATION, CLASS 20	CY	50
3	2402-3825025	GRANULAR MATERIAL FOR BLANKET	CY	19.2
4	2403-0100020	STRUCTURAL CONCRETE (RCB CULVERT)	CY	44.1
5	2404-7775000	REINFORCING STEEL	LB	7,314

ESTIMATE REFERENCE INFORMATION		
ITEM NO.	ITEM CODE	ITEM DESCRIPTION
1	2401-6750001	REMOVALS, AS PER PLAN Includes all work for removal and off-site disposal of existing concrete. Work also includes clearing the existing barrel of sediments or deposits. Removal of scheduled items shall be in accordance with Section 2401, of the Standard Specifications. Any damage to material not to be removed shall be the responsibility of the Contractor and repaired at no extra cost to the State.
2	2402-2720000	EXCAVATION, CLASS 20 Includes filling and compacting low areas around proposed culvert. Includes excavation necessary to place 12" granular working blanket.
3	2402-3825025	GRANULAR MATERIAL FOR BLANKET Granular material shall be in accordance with Section 4118 of the Standard Specifications. Includes 19.2 CY for a working blanket. The working blanket may be deleted if determined to be unnecessary at the time of construction.
4	2403-0100020	STRUCTURAL CONCRETE (RCB CULVERT) Includes all resilient joint filler required.
5	2404-7775000	REINFORCING STEEL --

Specifications:

Design:
AASHTO LRFD Bridge Design Specifications, 8th Ed., Series of 2017.

Construction:
Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, current series, plus applicable General Supplemental Specifications, Developmental Specifications, Supplemental Specifications and Special Provisions

Design Stresses:

Design stresses for the following materials are in accordance with the AASHTO LRFD Bridge Design Specifications, 8th Ed., Series of 2017:
Reinforcing steel in accordance with AASHTO LRFD Section 5, Grade 60.
Concrete in accordance with AASHTO LRFD Section 5, f'c = 4.0 ksi.

Standards: For details and notes not shown refer to the following Iowa D.O.T. Highway Standards:		
Standard	Issued	Revised
RCB G2-20	07-2020	-----

Summary of Reinforcing Steel		
Location	Quantity	Total
Headwalls 0° Skew (2 Req'd)	2 @ 2,385	4,770
13'-0" Barrel Extension	1,413	1,413
9'-0" Barrel Extension	995	995
Δ 5z1 x 2'-6" Dowels Bars	2 @ 68	136
Total (LB)		7,314

Δ One set of 5z1 dowel bars includes 26-#5 bars x 2'-6", Weight = 68 per set

Concrete Placement Quantities				
Location	Footing	Walls	Slab	Total
Headwalls 0° Skew (2 Req'd)	2 @ 5.7 = 11.4	2 @ 6.9 = 13.8	* 2 @ 0.5 = 1.0	26.2
13'-0" Barrel Extension	3.3	4.8	2.5	10.6
9'-0" Barrel Extension	2.3	3.3	1.7	7.3
Total (CY)	17.0	21.9	5.2	44.1

* Includes parapet and top of wingwall.

Design History at this Site (Includes this Design)	
Des. No.	Type of Work
2148	Culvert Extension
0427	Culvert Extension

Design For 0° Skew 5'-0" x 7'-0" Reinforced Concrete Box Culvert Extensions	
Estimate Quantities	
STA. 251+16.75 (IA 31)	Turn-in Date: May 2026
Cherokee County	
IOWA DEPARTMENT OF TRANSPORTATION	
Design No. 0427	Design Sheet No. 1 of 11 Asset I.D. 900895

Roadway Quantities shown
elsewhere in these plans.

REVISED 03-2019 - UPDATED NOTE REFERRING TO COPIES OF ORIGINAL DESIGN PLANS.
REVISED 01-2021 - UPDATED BAR LAP TABLE AND DESIGN SPECIFICATION TO AASHTO LRFD 8TH ED.
ENGLISHSINGLECULVERTS.DGN - 1043s2 - THIS SHEET ISSUED 10-08.

General Notes:

It is the intent of this design to extend the existing non-standard 5'-0" x 7'-0" reinforced concrete box culvert at Station 251+16.75.

Electronic copies of original design plans are available to the Contractor as part of the e-files supplied with the contract documents. Dimensions shown on these plans are based on design plans (Original Design No. 2148).

Faint lines on plans indicate existing structure.

Utility companies and municipalities whose facilities are shown on the plans or known to be within the construction limits shall be notified by the Contractor of the construction starting date.

The R.C.B. culvert extension sections are designed for HL-93 live load and earth fills of 5 feet. This design is based on Load and Resistance Factor Design, according to the 2017 AASHTO LRFD Bridge Design Specifications.

Vertical earth pressure, EV=0.120 kcf.

Horizontal earth pressure, EHmax = 0.060 kcf max, EHmin = 0.030 kcf.

The Contractor may submit alternate frost trough dimensions for approval. Any additional costs due to change in the frost trough dimensions is to be paid for by the Contractor.

Floor of barrel is to be finished smooth. Sides of footing are to be formed to ensure correct line and grade.

The permissible construction joint at the top of the walls may be lowered at the Contractor's option with Engineer's approval.

The vertical bars in the walls may be spliced above the footing at the Contractor's option as follows:

Bar Size Number	4	5	6	7	8	9
Minimum Splice Length	20" 24"	29"	34"	38"	47"	

This splice, if used will be at the Contractor's expense.

Metal bar chairs spaced at not over 3'-0" C-C in either direction are to be used to support all slab and floor steel as outlined in the Standard Specifications.

The reinforcement supplied for this structure shall be Grade 60. Reinforcing bar clearances will be as follows:

Edge clearances: 2" except

Top of floor 2¼" to near transverse reinforcing bar

Bottom of floor 3½" to near transverse reinforcing bar

End clearances:

Vertical top 2"

Vertical bottom 3" or 3½" if overall height of the culvert is not to a full inch

Transverse 2"

All reinforcing bars and bars noted as dowels supplied for this structure shall be deformed reinforcement unless otherwise noted or shown.

Class 20 excavation material unsuitable for backfilling shall be disposed of in a manner that will leave the site in a neat condition.

The price bid for "Removals as Per Plan" shall include the cost for removals of portions of the existing culvert, and the setting of the dowel reinforcing bars into existing concrete.

All dimensions and details shown on these plans pertinent to new construction in relation to existing portions of the structure shall be verified in the field by the Contractor before starting construction.

The removal of the existing culvert shall be at the front face of the existing parapet. Removals shall be on a vertical plane parallel with the front face of the existing parapet, and to the width of the floor of the proposed extension. The walls shall be cut normal to the barrel walls and as shown on the "Part Removal Plan". The removal line shall be initiated with a 2½"± deep saw cut on the top and both sides of each wall, and across the top of the floor. This saw cut should cut thru any existing longitudinal reinforcing thereby facilitating a neat non-spalled break line. If existing top of parapets will be within 6" of proposed subgrade elevation, the parapets shall be removed down to an elevation 1"± above the top of the existing slab. Any existing parapet vertical bars exposed during parapet removal shall be cut off flush with the parapet removal line and painted with two coats of zinc rich paint.

All removals shall be carefully accomplished and any concrete damaged by the Contractor that is not to be removed shall be repaired by the Contractor at no extra cost to the state. Removals shall be in accordance with Section 2401 of the Standard Specifications.

The proposed culvert extension shall abut against the front face of the existing parapet. 5z1 x 2'-6" dowel reinforcing bars with a 10" minimum embedment into existing concrete shall be set around the entire periphery of the existing culvert. 5z1 dowel reinforcing bars shall be centered in the existing slab, walls and floor unless otherwise specified. 5z1 dowel reinforcing bars shall be at 1'-0" maximum spacing C-C of dowels. 5z1 dowel reinforcing bars shall be set with polymer grout in accordance with Article 2301.03, e, of the Standard Specifications, and current Supplemental Specifications of the Iowa D.O.T. Highway Division.

Engineering Seal Note

Refer to project plans of Cherokee County with Design No. 127, and Asset ID. No. 900515 for the Structural Engineering Seal applicable to this design.

The roadway will be open to traffic during construction.

Since the highway will not be closed to traffic during this construction, the Contractor may feel temporary shoring (sheet pile or other) is necessary to ensure that the shoulder will not slough in while culvert is being extended. However, if for any reason such shoring is deemed necessary, the Contractor shall submit the shoring plan to the Engineer for approval. Cost of shoring, if required, will be considered incidental to construction and no direct payment will be made. Therefore, all material used for shoring shall remain the property of the Contractor. In addition to the requirements noted above, Article 1107.07, of the Standard Specifications, still applies.

Keyway dimensions shown on the plans are based on nominal dimensions unless stated otherwise. In addition, the bevel used on the keyway shall be limited to a maximum of 10 degrees from vertical.

These bridge plans label all reinforcing steel with English notation (5a1 is ⅝ inch diameter bar). English reinforcing steel received in the field may display the following "Bar Designation". The "Bar Designation" is the stamped impression on the reinforcing bars, and is equivalent to the bar diameter in millimeters.

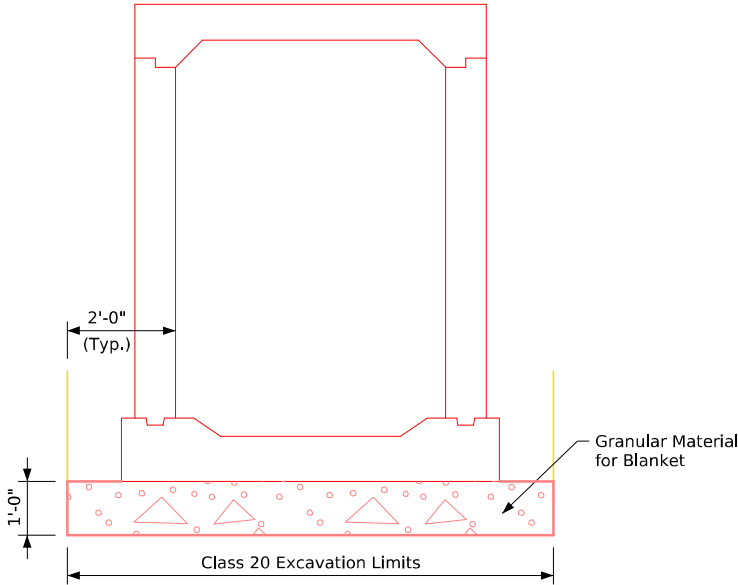
English Size	3	4	5	6	7	8	9	10	11
Bar Designation	10	13	16	19	22	25	29	32	36

Traffic will be maintained at all times in accordance with the traffic control plans shown in these plans.

Traffic control adjacent to the culvert will be the responsibility of the Contractor constructing the culvert and is to coordinate construction of the culvert with the Contractor doing the grading.

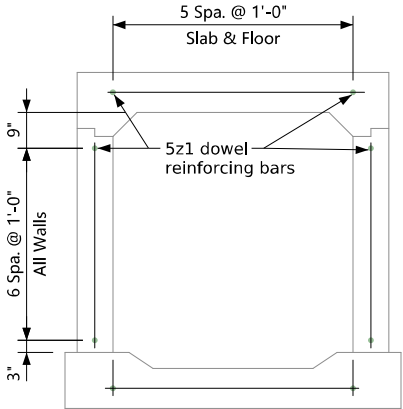
Any dimensional transition required between existing structure and the extension shall be made in the first 1'-0" of new work.

When de-watering presents a problem for placing the curtain walls as detailed, alternate methods such as steel sheet pile and precast concrete walls may be approved but at no additional cost. The Contractor is to submit to the Engineer for approval complete drawings of the proposed curtain wall alternate before beginning construction.



Excavation Details

Granular Material for Blanket shall terminate 3'-0 short of the curtain wall.



Section Near Extension

(Showing spacing of 5z1 dowel reinforcing bars)

Traffic Control Plan

Note: The roadway will be open to thru traffic. Refer to the Traffic Control Plan on the road plans in these plans.

Design For 0° Skew
5'-0" x 7'-0" Reinforced
Concrete Box Culvert Extensions

General Notes

STA. 251+16.75 (IA 31)

Turn-in Date: May 2026

Cherokee County

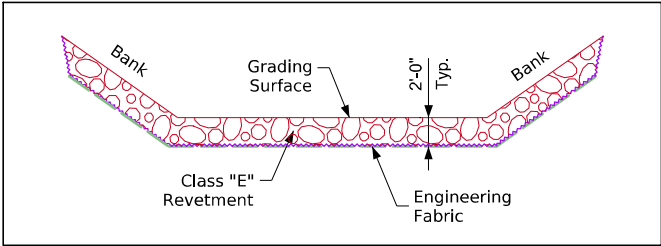
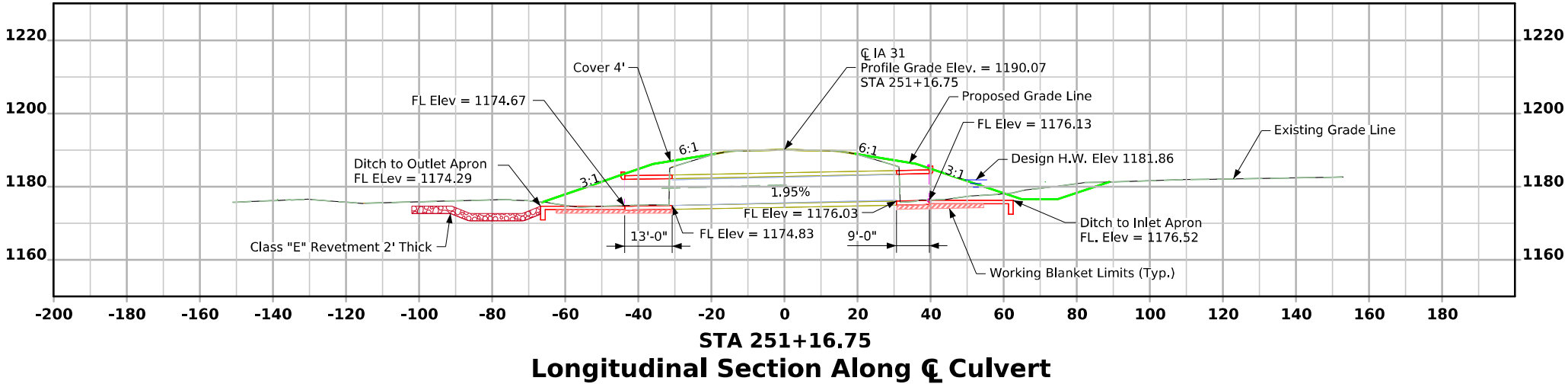
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0427

Design Sheet No. 2 of 11

Asset I.D. 900895

FILE NO. 32354	ENGLISH	DESIGN TEAM MCP \JSZ \ AY	Culvert Extension Details (Sheet 2 of 2)	Standard Sheet 1043s2	Cherokee COUNTY	PROJECT NUMBER STPN-031-3(15)--2J-18	SHEET NUMBER V.17	
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Estimated Revetment Quantities Included With Road Plans			
Location	Revetment Class "E" (Ton)	Engineering Fabric (SY)	CL 10 Channel Excavation (CY)
Inlet	0	0	0
Outlet	122	163	86
Totals	122	163	86

Excavation quantity calculated from grading surface. Excavation quantity is for embedded revetment core out only, and does not include excavation to the grading surface. Excavation quantity to the grading surface is determined by Road Design and included in the Road Plans. Quantities shown for information only. See Road Sheets.

Note:
For existing road profile grade on IA 31, refer to the "D" sheets of this plan.

General Notes:

- This design is for the extension of an existing single 5'-0" x 7'-0" RCB culvert, Asset ID No. 900895.
- All elevation dimensions are in feet.

Design Notes:

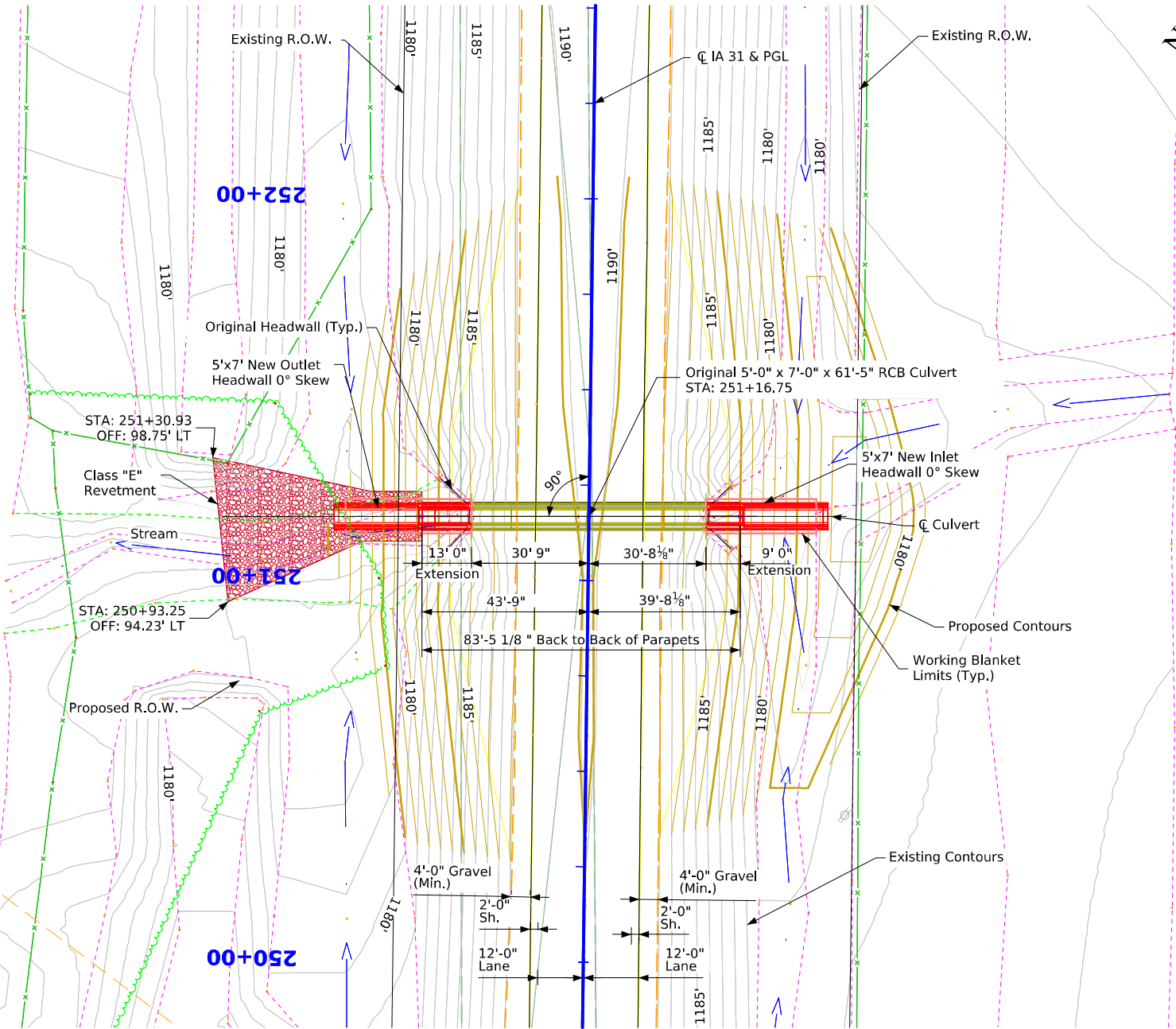
- Design fill for this C.I.P culvert is 5' from the road centerline.
- Anticipated settlement is negligible.
- Class "E" revetment stone is embedded. A riprap basin, including dissipator pool, has been provided at the culvert outlet to mitigate high stream velocities.

Plan Notes:

- Drainage through existing culvert/channel must be maintained throughout construction.

Traffic Estimate:

Post Speed Limit 55 mph
2019 AADT 1,400 VPD 13% Trucks
2039 AADT 1,400 VPD 14% Trucks



Hydraulic Data

RIDB: Not Applicable
Drainage Area = 174 Acres

$Q_{50} = 182$ cfs
HW Elev. = 1181.86
Exit Velocity = 10.54 fps

$Q_{100} = 219$ cfs
HW Elev. = 1182.60
Exit Velocity = 11.21 fps

Location

IA-31 over Stream
T-90N R-41W
Section 11
Willow Township
Cherokee County
Asset ID No. 900895
Latitude 42.623253°
Longitude -95.651389°

Utilities Note:

Utilities shown on this sheet are for information only. See Road Design sheets for utility information.

General Utility Symbols:

E - Electric Line
G - Gas Line
SAN - Sanitary Sewer
T - Telephone Line
W - Water Line
FO - Fiber Optic Line
GHP - Gas High Pressure
STS - Storm Sewer
TV - TV
Power Poles

Engineering Seal Note
Refer to the situation plan of Cherokee County with Design No. 127, and Asset ID. No. 900515 for the Hydraulic Engineering Seal applicable to this design.

Design For 0° Skew

5'-0" x 7'-0" Reinforced Concrete Box Culvert Extensions

Situation Plan

STA. 251+16.75 (IA 31) Turn-in Date: May 2026

Cherokee County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0427 Design Sheet No. 3 of 11 Asset I.D. 900895



(Plan View)



(Elevation View)

Note:
1. 5z1 dowel shall have a minimum of 10" embedment into existing concrete.

Design For 0° Skew
5'-0" x 7'-0" Reinforced
Concrete Box Culvert Extensions

Transition Details

STA. 251+16.75 (IA 31)

Turn-in Date: May 2026

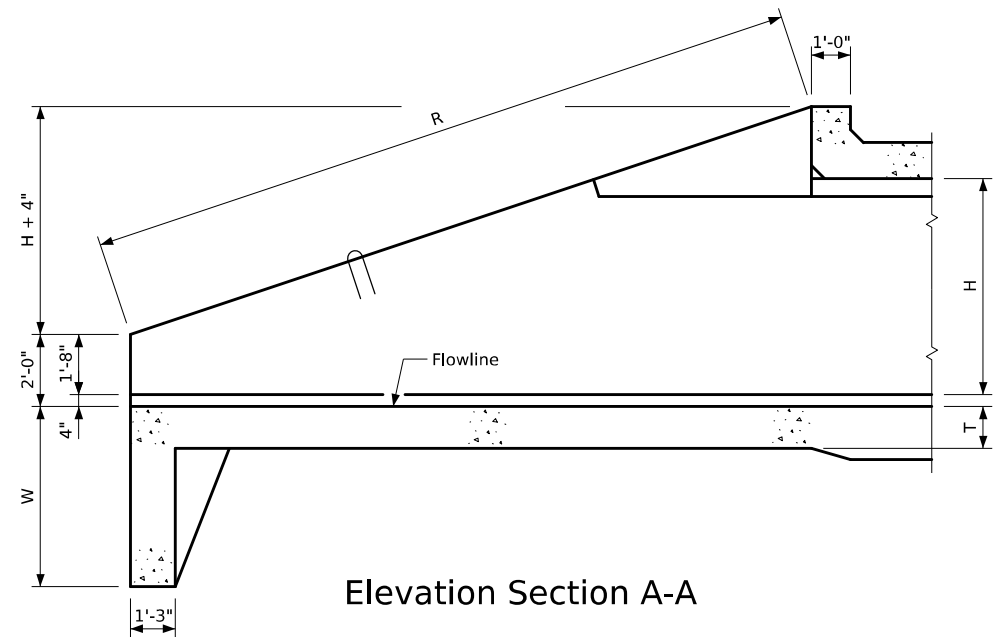
Cherokee County

IOWA DEPARTMENT OF TRANSPORTATION

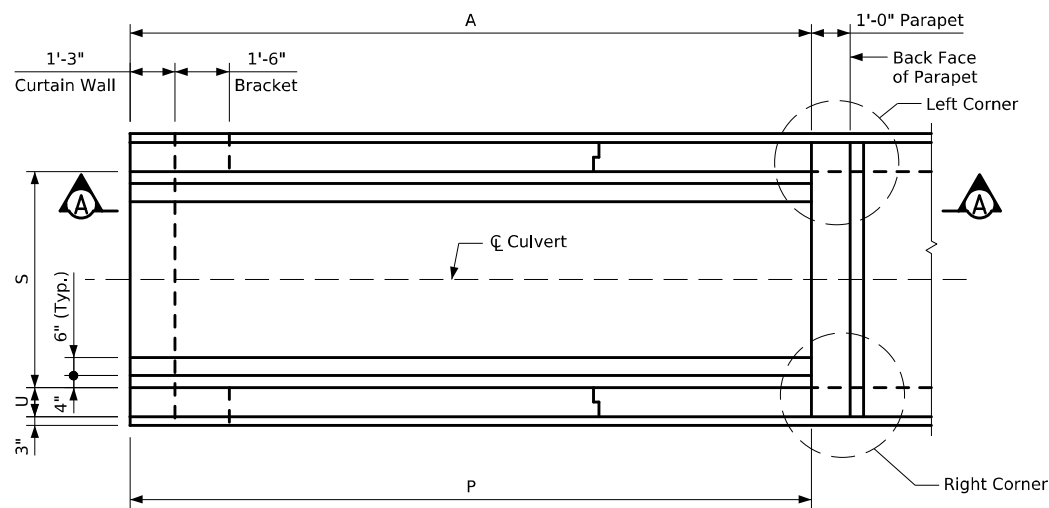
Design No. 0427

Design Sheet No. 4 of 11

Asset I.D. 900895



Elevation Section A-A



Plan View

Dimension Table				
Headwall Dimensions	S x H	5' x 7'		
	A	22'-0"		
	H	7'-0"		
	P	22'-0"		
	R	23'-2¼"		
	S	5'-0"		
	T	11"		
Bar Spacing	U	9"		
	W	3'-9"		
	B	1'-0"		
	C	9"		
	D	1'-0"		
	E	1'-0"		

Notes:

1. See Sheet RCB G2-20 for General Notes, Specifications, and Design Stresses.
2. See Sheets V.22 thru V.24 for location of certain dimensions tabulated.
3. Dimensions are in feet and inches unless otherwise noted.

Design For 0° Skew

5'-0" x 7'-0" Reinforced
Concrete Box Culvert Extensions

Parallel Wing Headwall Details

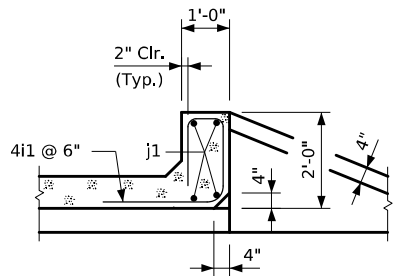
STA. 251+16.75 (IA 31) Turn-in Date: May 2026

Cherokee County

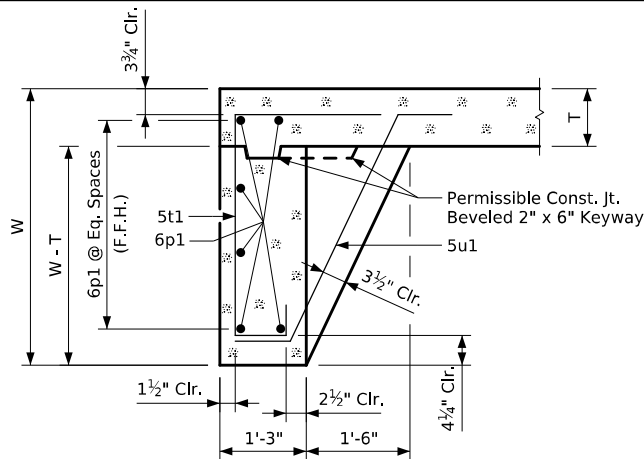
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0427 Design Sheet No. 6 of 11 Asset I.D. 900895

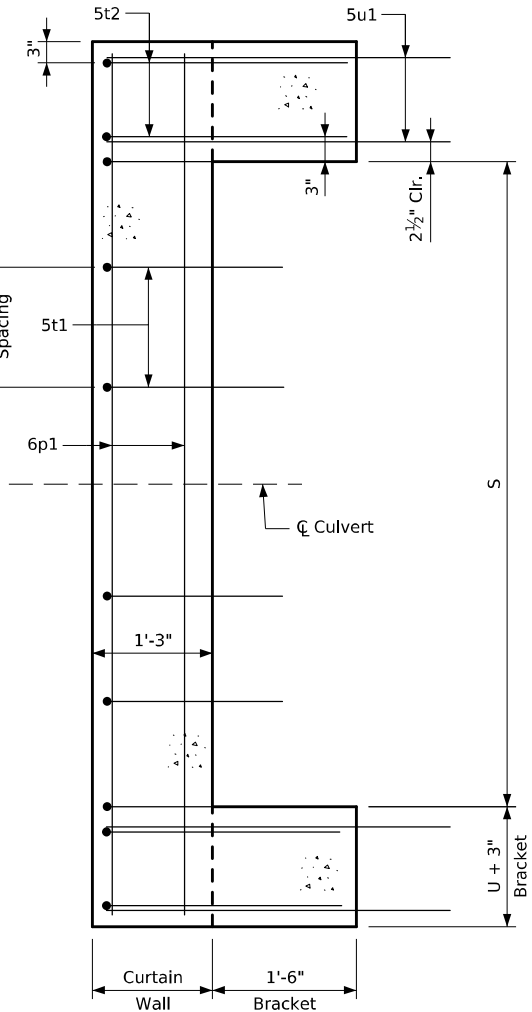
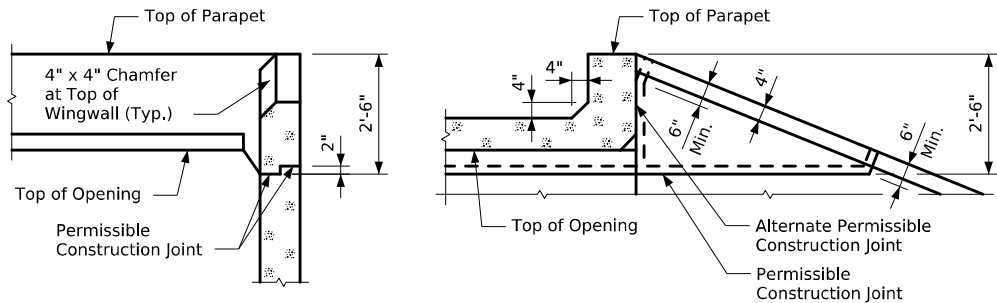
Section thru Parapet



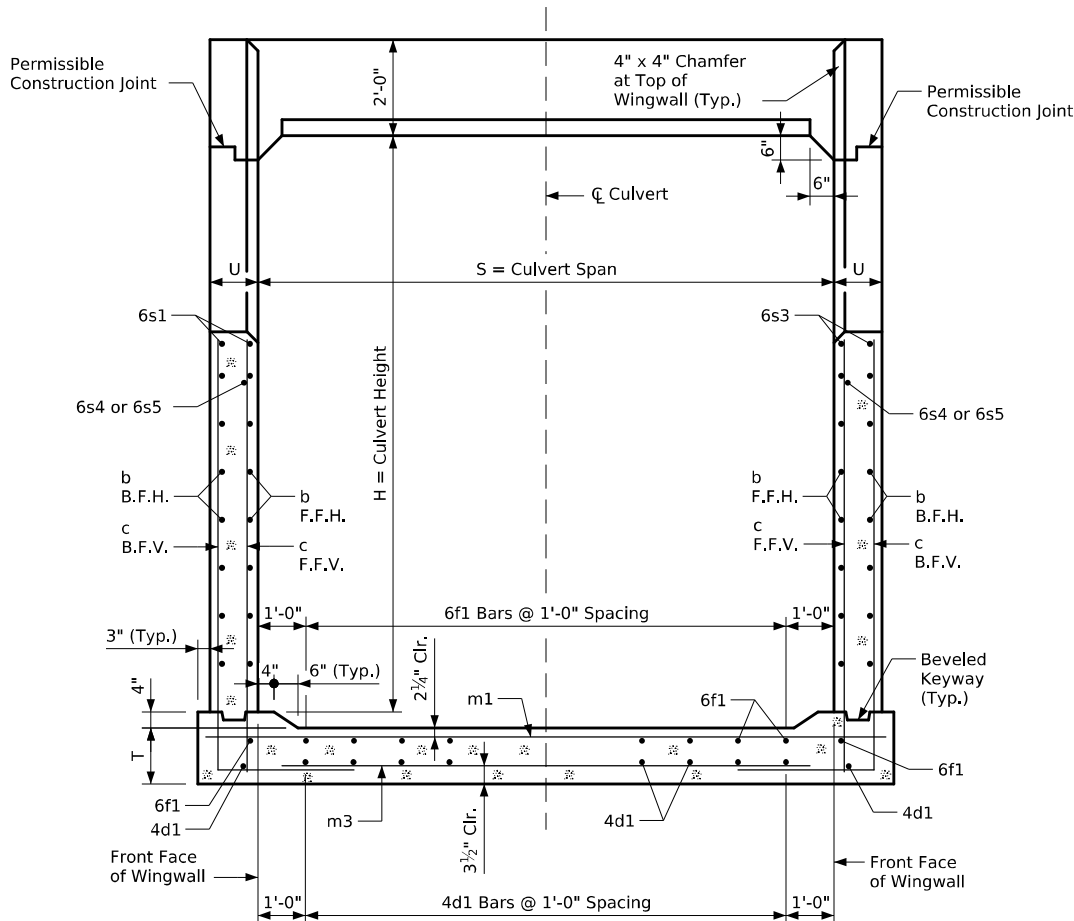
Section thru Curtain Wall



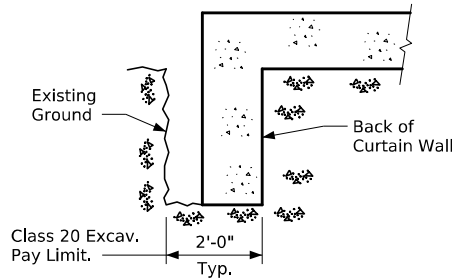
Top of Wingwall Details



Curtain Wall Detail - Plan View
(Apron is not shown)



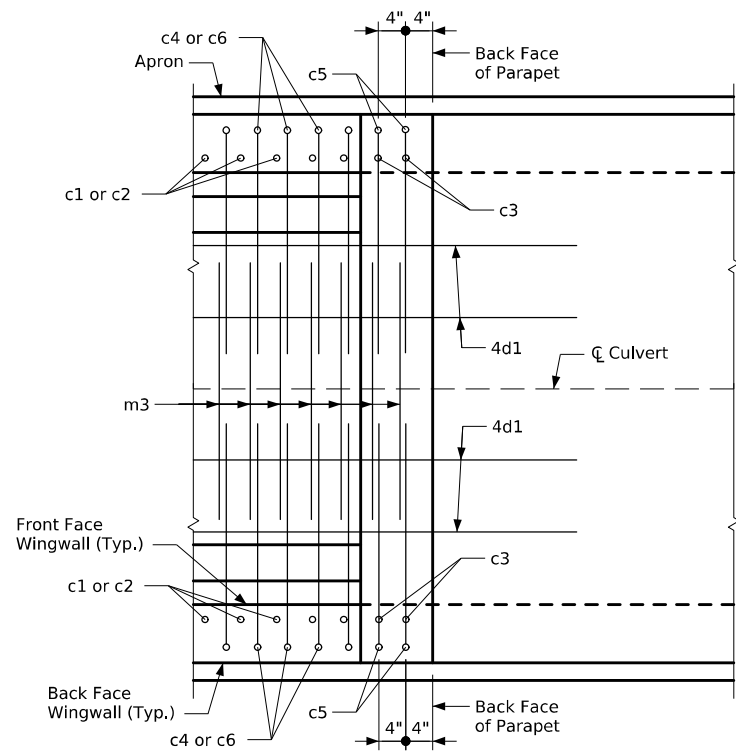
Typical Cross Section - thru Headwall



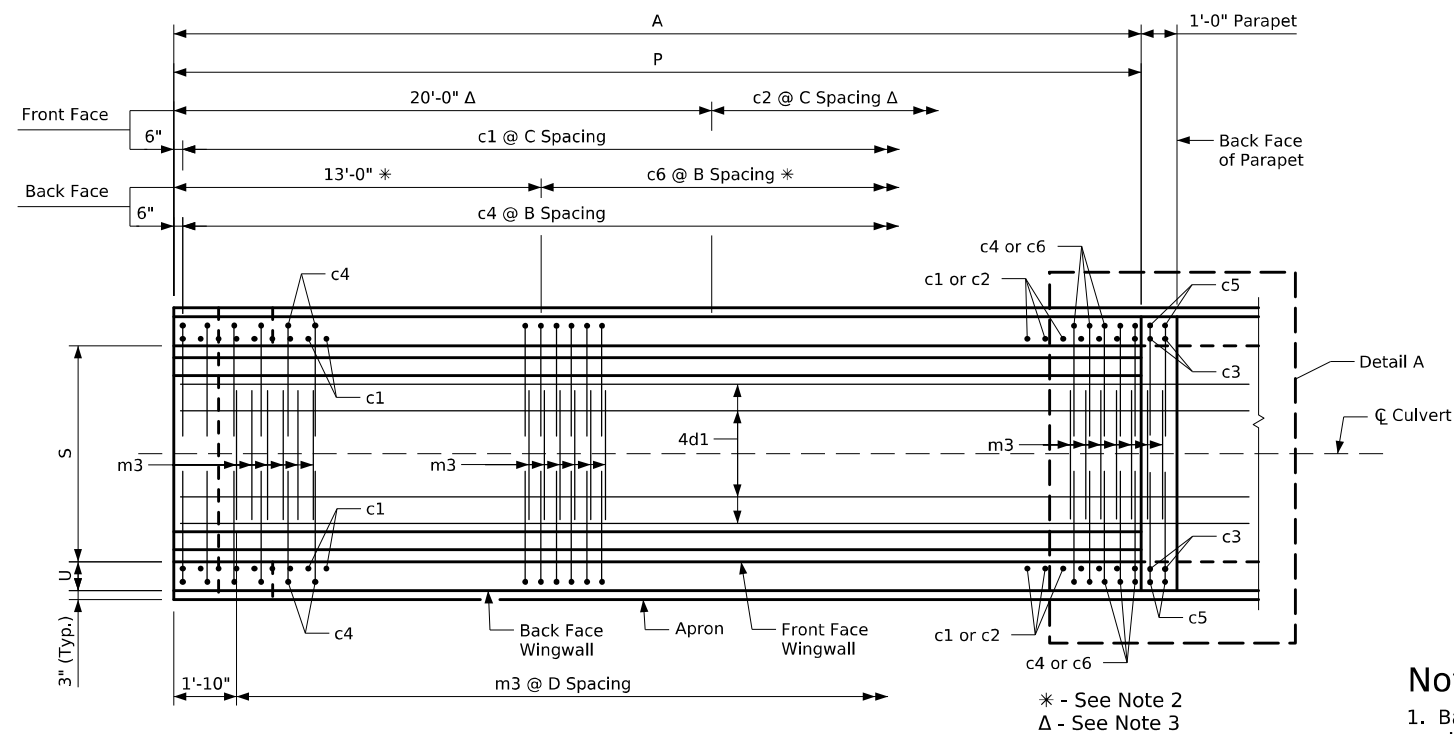
Curtain Wall
Class 20 Excavation

- Notes:
1. See Sheet RCB G2-20 for General Notes, Specifications, and Design Stresses.
 2. For dimension table see Sheet V.21.

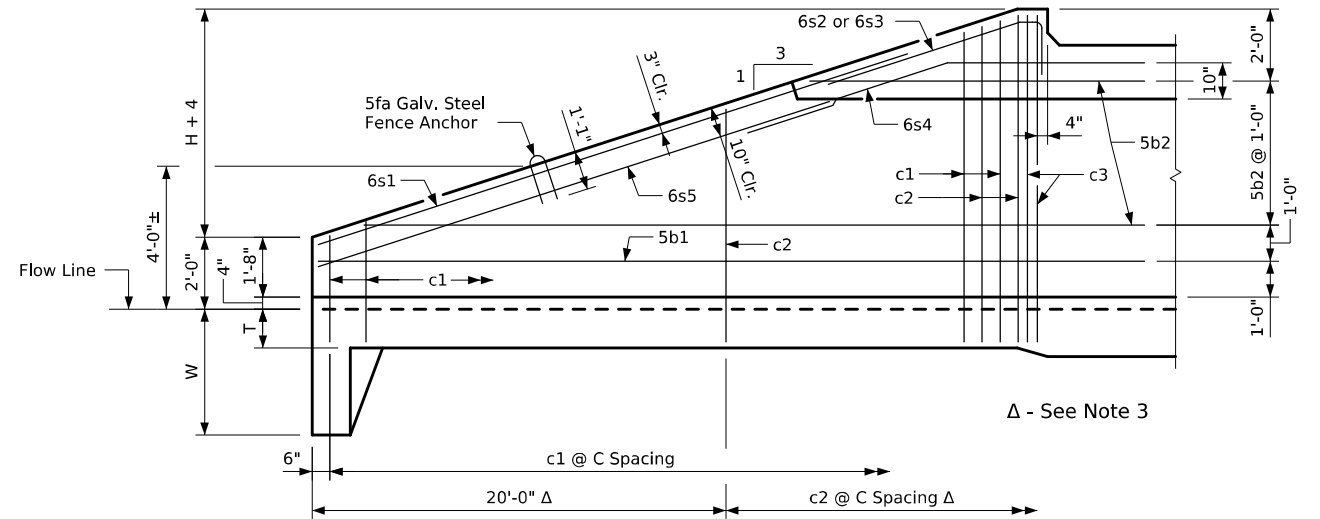
Design For 0° Skew
**5'-0" x 7'-0" Reinforced
Concrete Box Culvert Extensions**
Parallel Wing Headwall Details
STA. 251+16.75 (IA 31) Turn-in Date: May 2026
Cherokee County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 0427 Design Sheet No. 7 of 11 Asset I.D. 900895



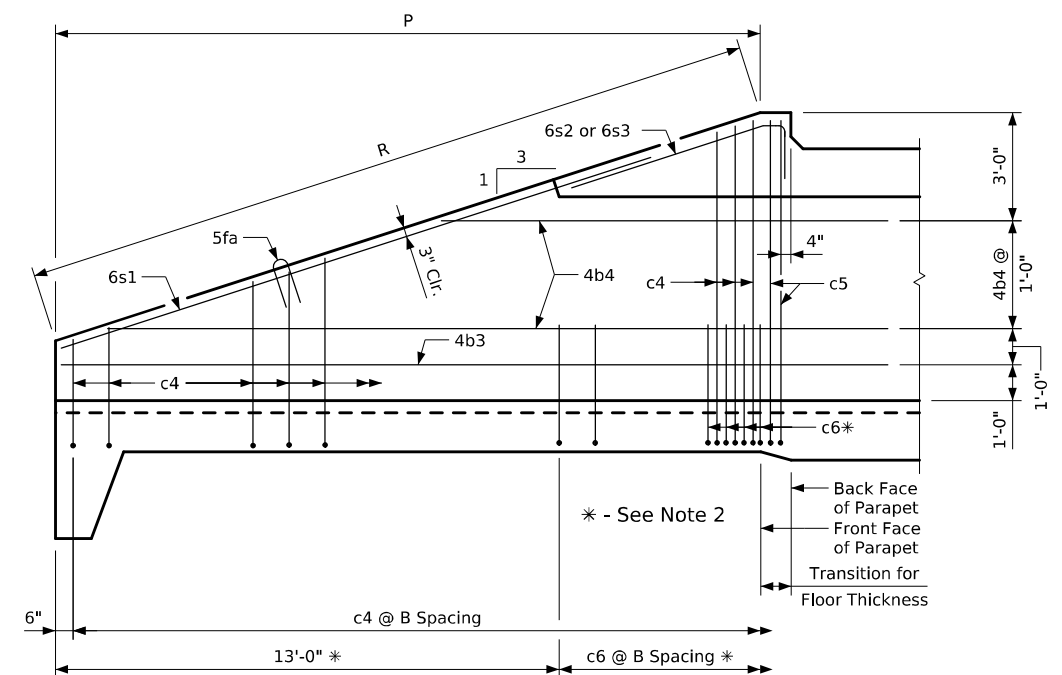
Detail A



Plan View - Bottom Apron Reinforcing
(Curtain Wall Reinforcing not shown, See Sheet Number V.22)



Typical View - Front Face Wingwall Reinforcing



Typical View - Back Face Wingwall Reinforcing

Notes:

1. Bar spacings and positions shown are similar for all sizes of headwalls in this standard.
2. Not applicable for 3' thru 5' height headwalls.
3. Not applicable for 3' thru 8' height headwalls.
4. For headwall dimensions and bar spacing see Sheet V.21.
5. Apron m3 bars are to be centered on CL culvert.
6. B.F.V. (c5) and F.F.V. (c3) bars are approximately 4" from the back of parapet for all headwalls.

Design For 0° Skew

5'-0" x 7'-0" Reinforced Concrete Box Culvert Extensions

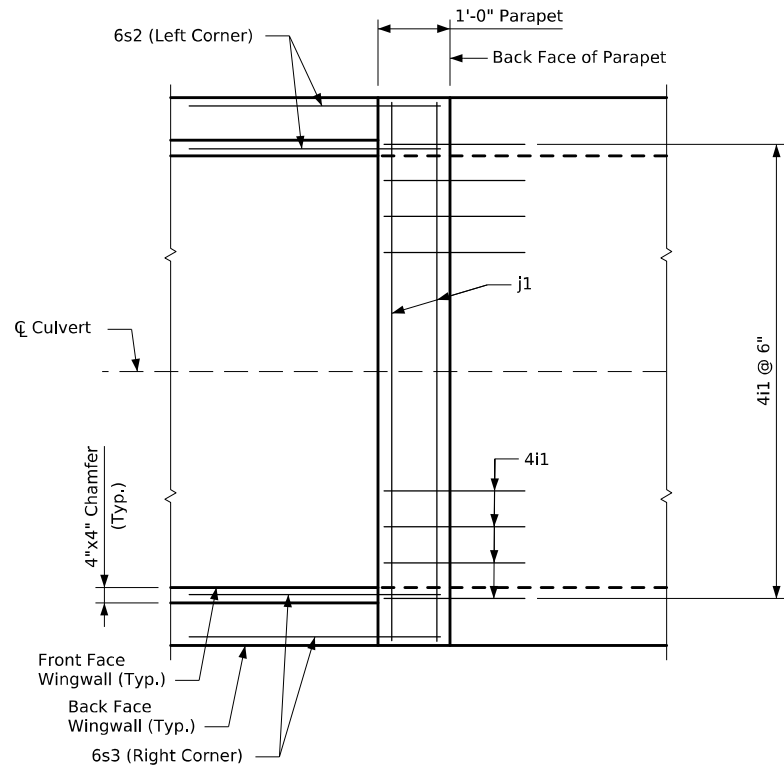
Parallel Wing Headwall Details

STA. 251+16.75 (IA 31) Turn-in Date: May 2026

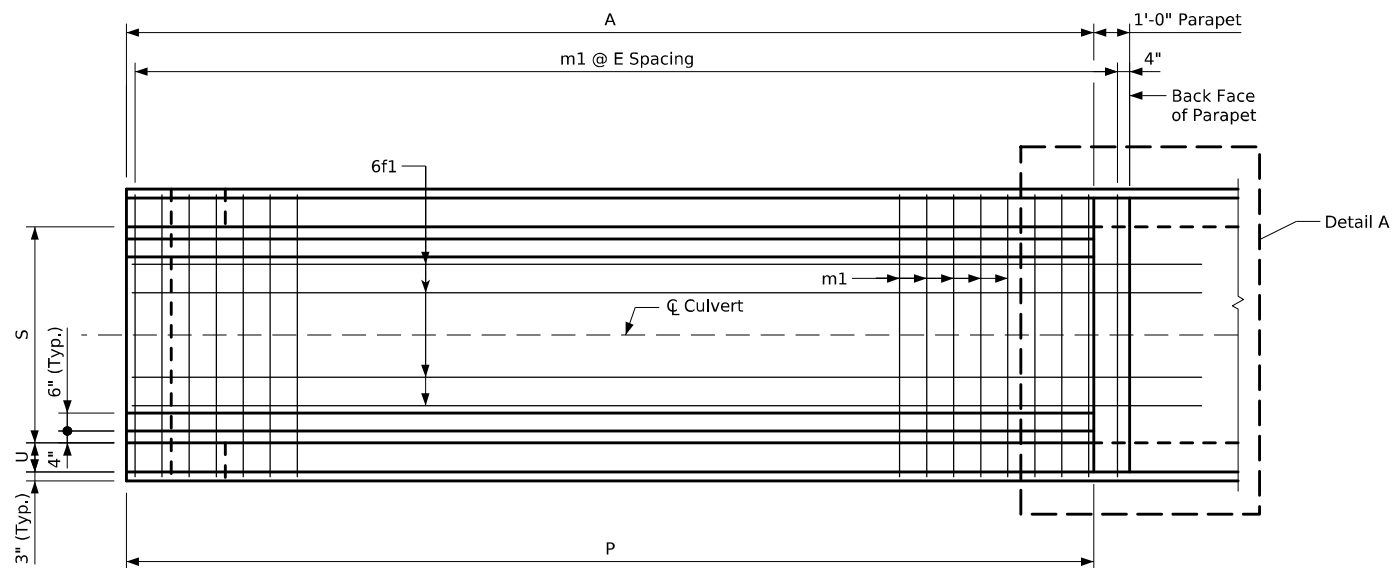
Cherokee County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0427 Design Sheet No. 8 of 11 Asset I.D. 900895



Detail A
(Showing parapet bars only)
































Plan View - Top Apron Reinforcing
(Wall Reinforcing not shown for clarity)

Notes:

1. Bar spacings and positions shown are similar for all sizes of headwalls in this standard.
2. For headwall dimensions and bar spacing see Sheet V.21.
3. Top transverse apron bars are referenced approximately 4" from the back of the parapet for all headwalls.

Design For 0° Skew
**5'-0" x 7'-0" Reinforced
Concrete Box Culvert Extensions**
Parallel Wing Headwall Details
STA. 251+16.75 (IA 31) Turn-in Date: May 2026
Cherokee County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 0427 Design Sheet No. 9 of 11 Asset I.D. 900895

Bill of Reinforcing for One Headwall 0° Skew Span x Culvert Height												
Location	Shape	5' x 7'										
		Bar	No.	Length	Wt.							
Fence Anchor (Galv.)		5fa	2	2'-10"	6							
Wingwall, F.F.H.		5b1	2	25'-3"	53							
Wingwall, F.F.H.		5b2	12 Var.	2 Each 8'-10" to 23'-10"	204							
Wingwall, B.F.H.		4b3	2	25'-3"	34							
Wingwall, B.F.H.		4b4	10 Var.	2 Each 11'-10" to 23'-10"	119							
Wingwall, F.F.V.		4c1	58 Var.	2 Each 2'-5" to 9'-5"	229							
Wingwall, F.F.V.		c2	--	--	--							
Wingwall, F.F.V. (L)		4c3	2	9'-10"	13							
Wingwall, F.F.V. (R)		4c3	2	9'-10"	13							
Wingwall, B.F.V.		5c4	44 Var.	2 Each 6'-1" to 13'-1"	440							
Wingwall, B.F.V. (L)		5c5	2	13'-4"	28							
Wingwall, B.F.V. (R)		5c5	2	13'-4"	28							
Wingwall, B.F.V.		5c6	18	8'-6"	160							
Apron, Longit., Bott.		4d1	6	25'-3"	101							
Apron, Longit., Top		6f1	6	25'-3"	228							
Parapet, Vertical		4i1	11	6'-5"	47							
Parapet, Horiz.		7j1	4	6'-2"	50							
Apron, Trans., Top		5m1	23	6'-8"	160							
Apron, Trans., Top		m2	--	--	--							
Apron, Trans., Bott.		5m3	22	3'-4"	77							
Curtain, Horiz.		6p1	5	6'-8"	50							
Wing Slope, Both F.		6s1	4	19'-11"	120							
Wing Slope, Both F. (L)		6s2	2	7'-9"	23							
Wing Slope, Both F. (R)		6s3	2	7'-9"	23							
Wing Slope, F.F.		6s4	2	11'-5"	34							
Wing Slope, F.F.		6s5	2	17'-4"	52							
Curtain, Vert.		5t1	6	6'-8"	42							
Curtain, Vert., Ends		5t2	4	6'-8"	28							
Bracket, Vert.		5u1	4	5'-5"	23							
Estimated Quantities One Headwall	Reinf. Steel		2,385 LB									
	Concrete	Parapet Δ	0.5	13.1 CY								
		Wingwalls	6.9									
		Apron *	5.7									

Δ Includes top of wingwall quantities.

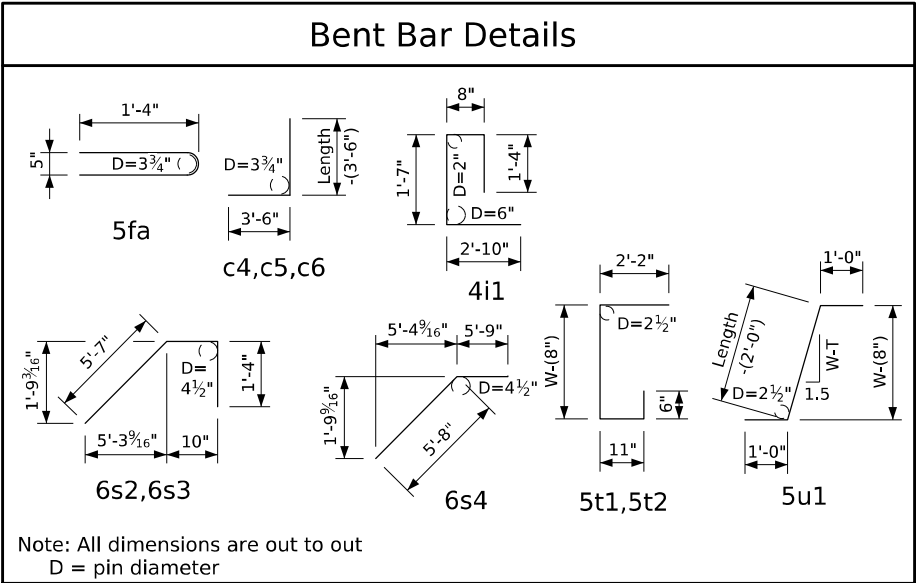
* Assumes apron and floor are equal thickness, adjust concrete quantities for transition where apron and floor thickness are not equal.

Note: Weight of bars over 40'-0" long include an allowance of 2'-5" for lap.

(L) - Indicates bar located at left corner.

(R) - Indicates bar located at right corner.

Refer to Sheet Number V.23 for left and right corner locations.



Headwall Notes:

1. This headwall is based on a 3:1 slope normal to centerline of roadway.
2. The sides of the apron are to be formed to ensure correct line and grade.
3. All apron reinforcing steel is to be supported by bar chairs at intervals of not more than 3'-0" in either direction as outlined in the Standard Specifications.
4. Clear distance from face of concrete to near reinforcing bar is to be 2" unless otherwise noted or shown. Clearance to the bottom ends of vertical bars shall be 3 inches.
5. Concrete quantities are estimated from back of parapet.
6. Horizontal tails of bars "b" & "s" estimated to extend 2'-5" beyond back of parapet (into end of barrel). Longitudinal bars "4d1" and "6f1" estimated to project into end section of barrel a minimum of 2'-5" beyond back of parapet. The "length" column reflects total number of feet necessary to meet these requirements.
7. Dimensions are in feet and inches unless otherwise noted.

Design For 0° Skew

5'-0" x 7'-0" Reinforced Concrete Box Culvert Extensions

Parallel Wing Headwall Details

STA. 251+16.75 (IA 31) Turn-in Date: May 2026

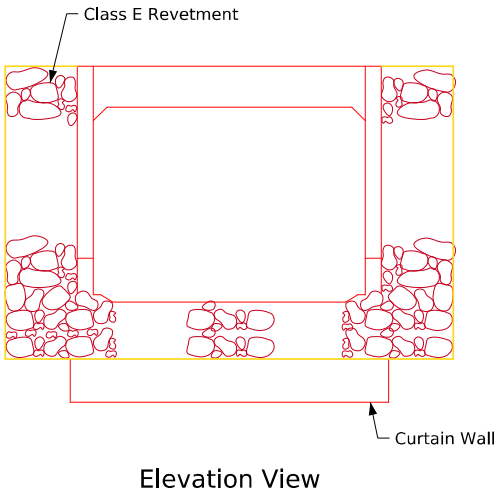
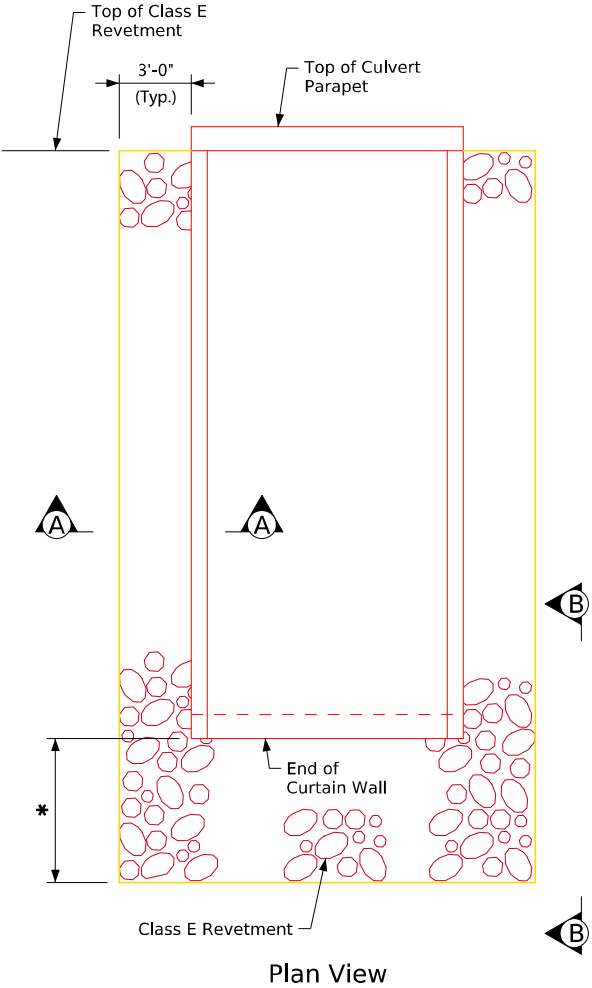
Cherokee County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0427 Design Sheet No. 10 of 11 Asset I.D. 900895

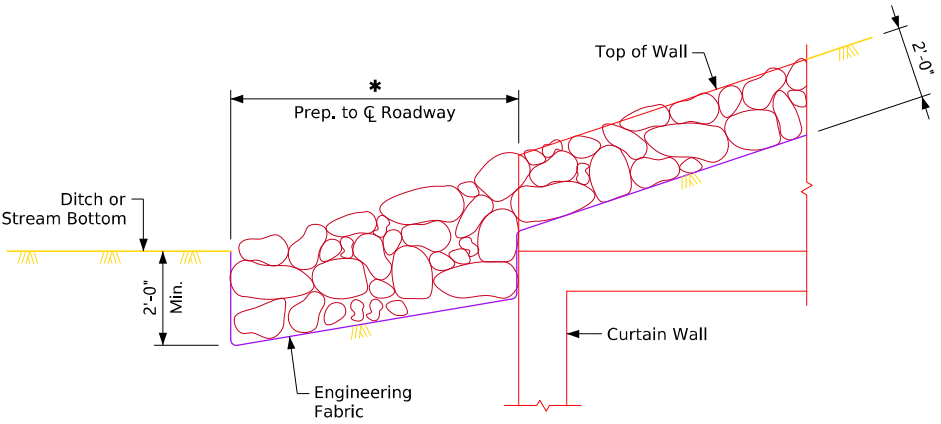
Revised 1-2016 - Added note "See culvert plans for limits of revetment and engineering fabric."
Revised 02-2017 - Added section directors "A-A" to zero skew plan view detail.
Revision 01-2021 - Changed Design Specifications to AASHTO LRFD 8th Ed.
englishsingleculverts.dgn - 1092 - This sheet issued 04-12.

* = See culvert plans for limits of
revetment and engineering fabric.

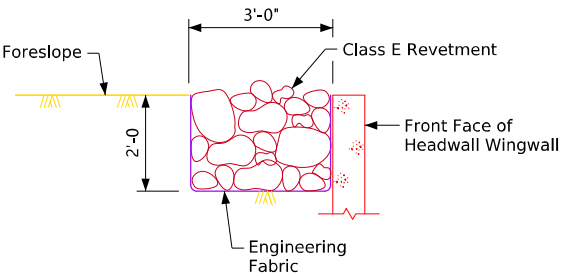


0° Skew Headwalls

* = See culvert plans for limits of
revetment and engineering fabric.



View B-B



Section A-A

Typical Details

Construction Notes:

Class E Revetment shall be used and placed according to Article 2507.03, of the Standard Specifications. The engineering fabric shall meet the material requirements in accordance with Article 4196.01,B,3, of the Standard Specifications.

Design For 0° Skew

5'-0" x 7'-0" Reinforced
Concrete Box Culvert Extensions

Revetment Protection Details

STA. 251+16.75 (IA 31) Turn-in Date: May 2026

Cherokee County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0427 Design Sheet No. 11 of 11 Asset I.D. 900895

VPI Sta. = 1125+00.00
VPI Elev. = 1299.50
LVC = 450'

VPT Sta. = 1127+25.00
VPT Elev. = 1302.14

1.173%

VPC Sta. = 1122+75.00
VPC Elev. = 1192.22

Existing Profile Grade IA 31
(For reference only)
***Vertical Datum NGVD 29**



Design Notes

- ## Traffic Estimate

Utilities Note:

General Utility Symbols:

- ## Location

Design For 0° Skew

Single 4'-0" x 6'-0" Precast Stock Pass Extensions

Situation Plan

STA. 1126+73.36 (IA 31)	Turn-in Date: February 2025	
Cherokee County		
IOWA DEPARTMENT OF TRANSPORTATION		
Design No. HNTB	Design Sheet No. 5 of 5	FHWA/Asset XXXXXX

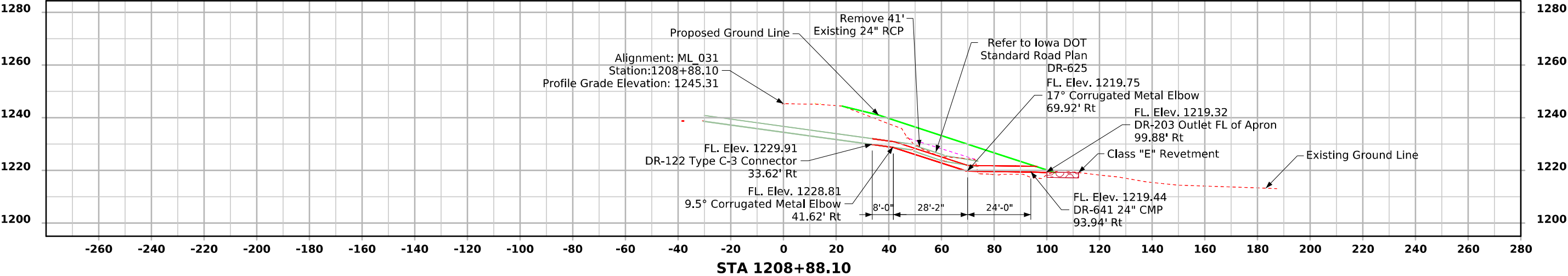


0 20
Scale In Feet

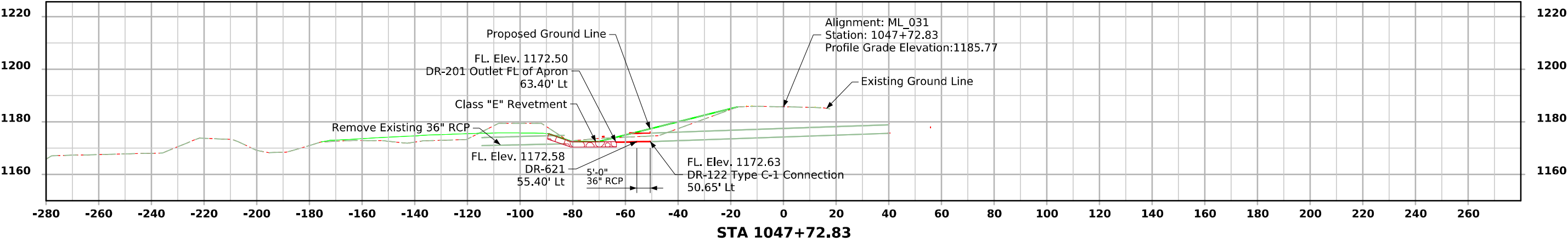
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ML - IA 31

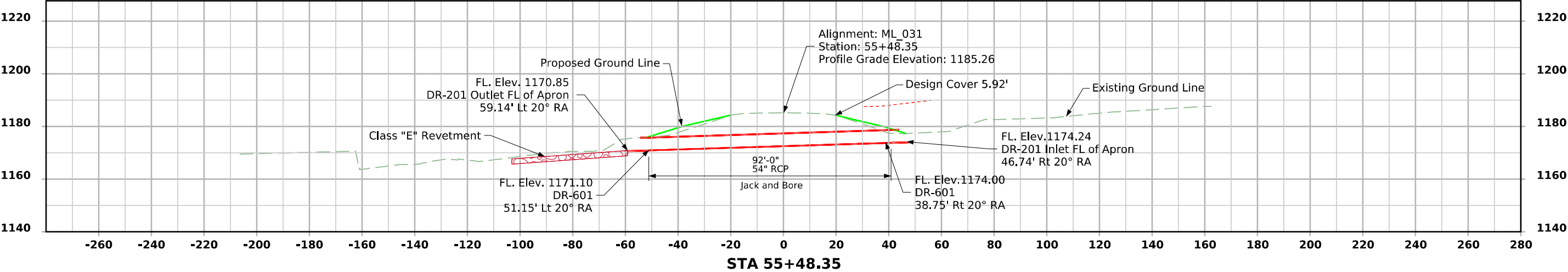
Refer to Iowa DOT Standard Road Plan DR-625



Refer to Iowa DOT Standard Road Plan DR-621

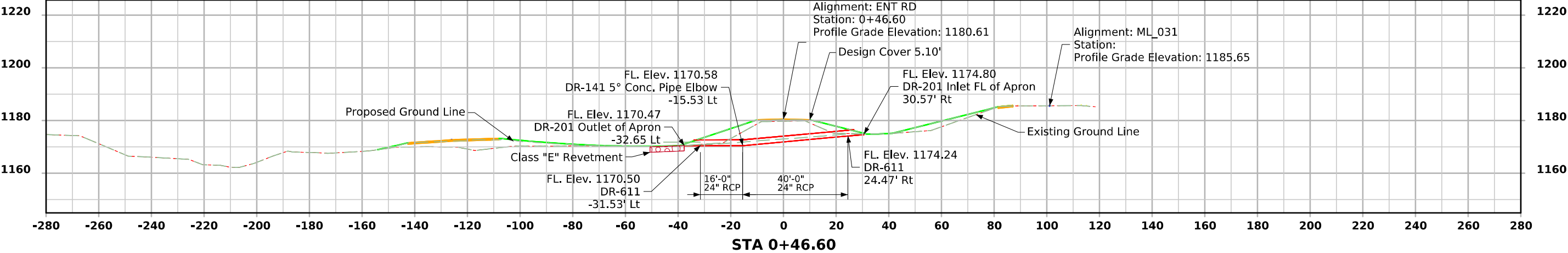


Refer to Iowa DOT Standard Road Plan DR-601



ENT RD

Refer to Iowa Dot Standard Road Plan DR-611



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

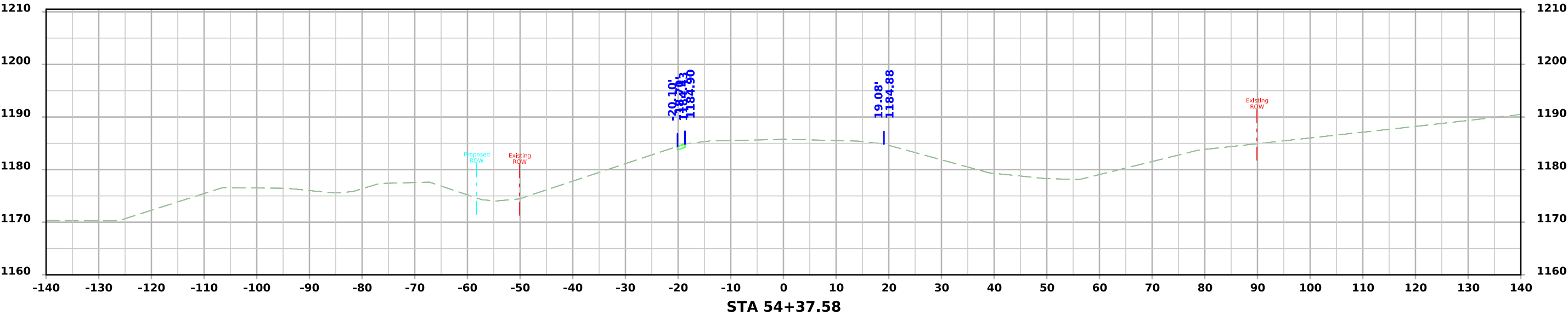
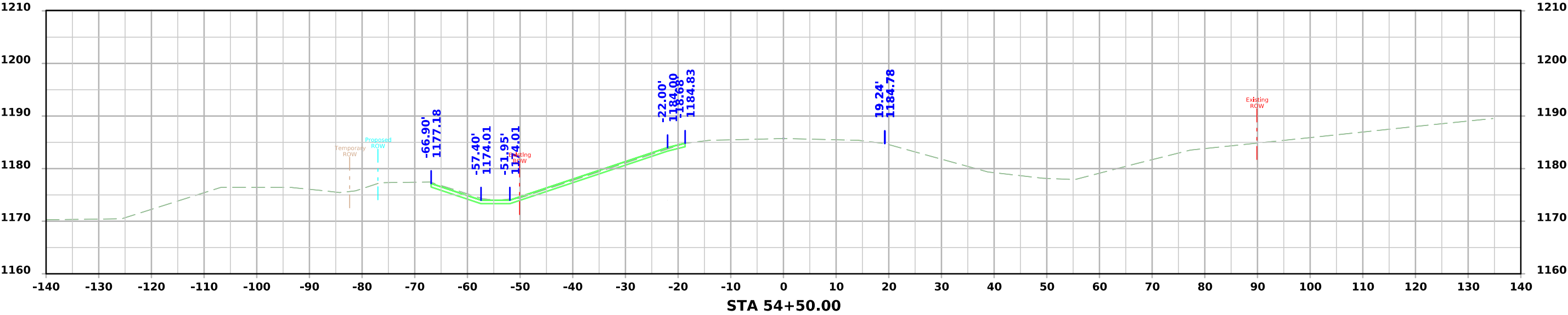
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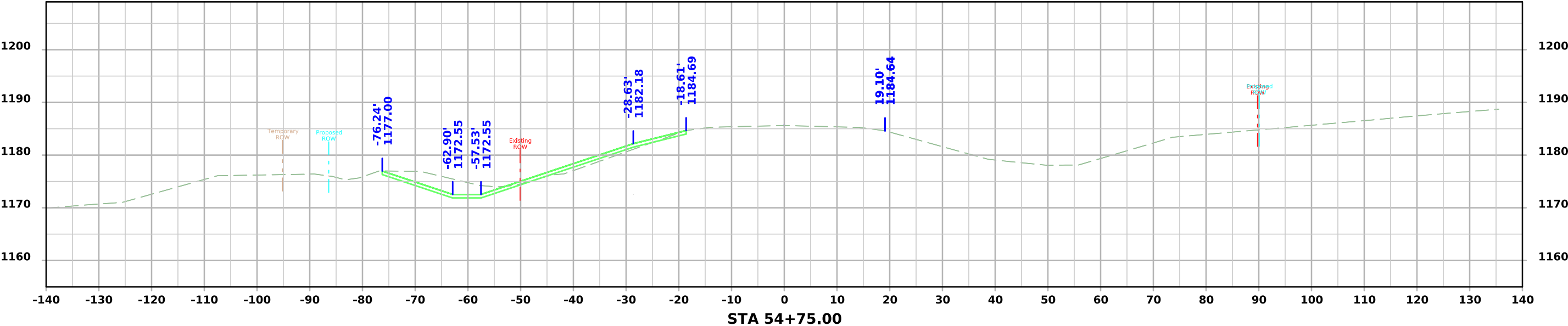
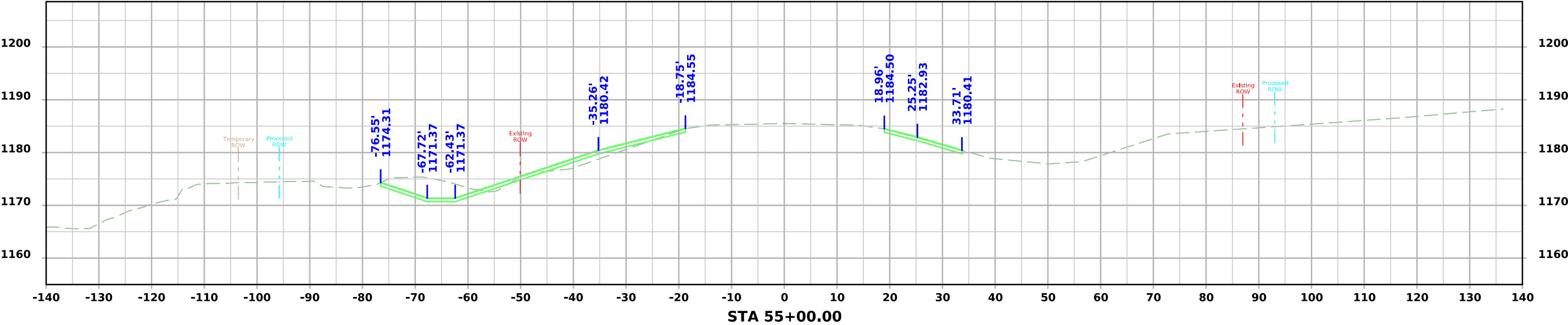
CROSS SECTIONS
LEGEND AND INFORMATION SHEET

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

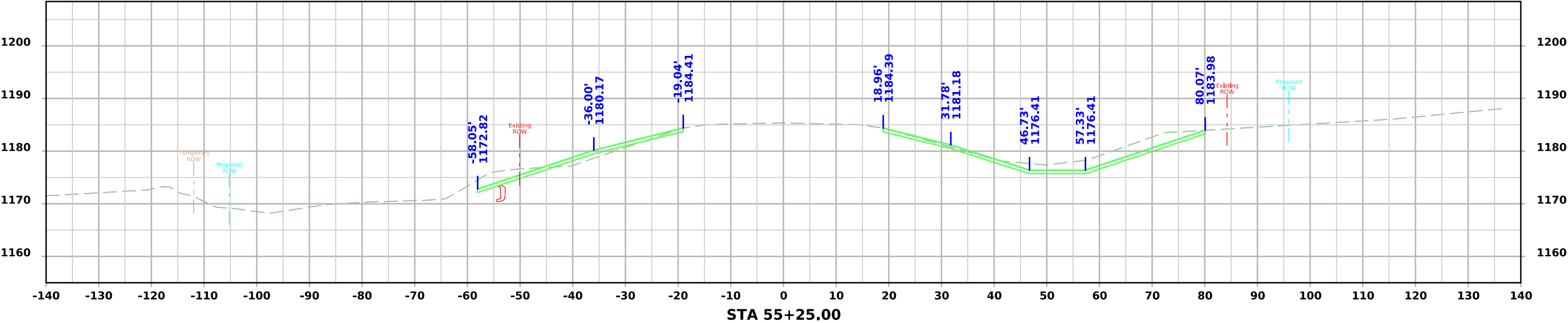
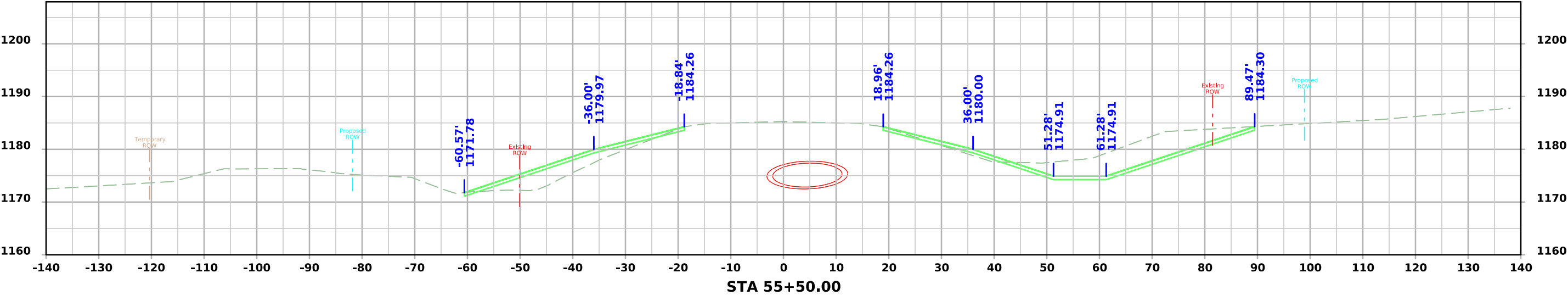
ML- IA 31



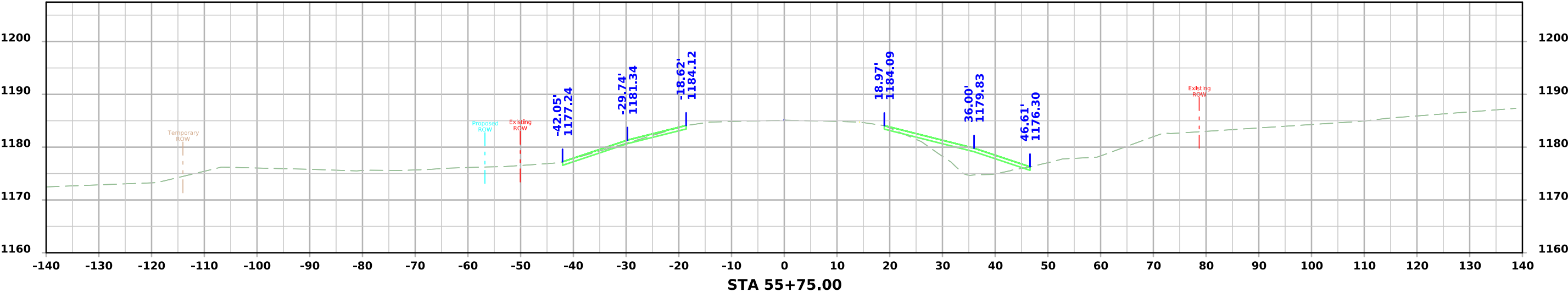
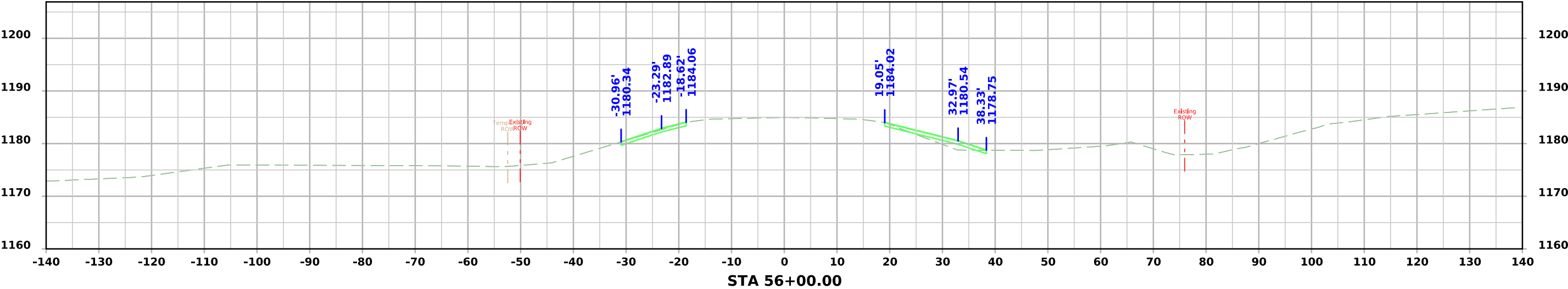
ML- IA 31



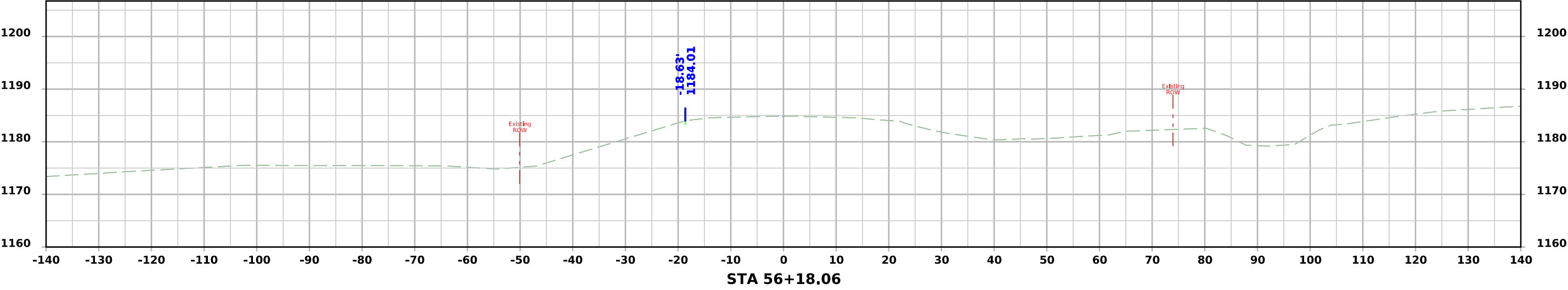
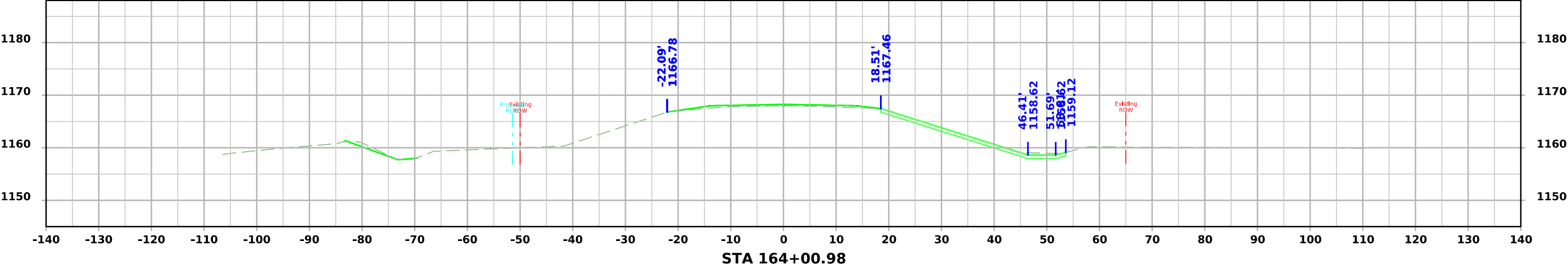
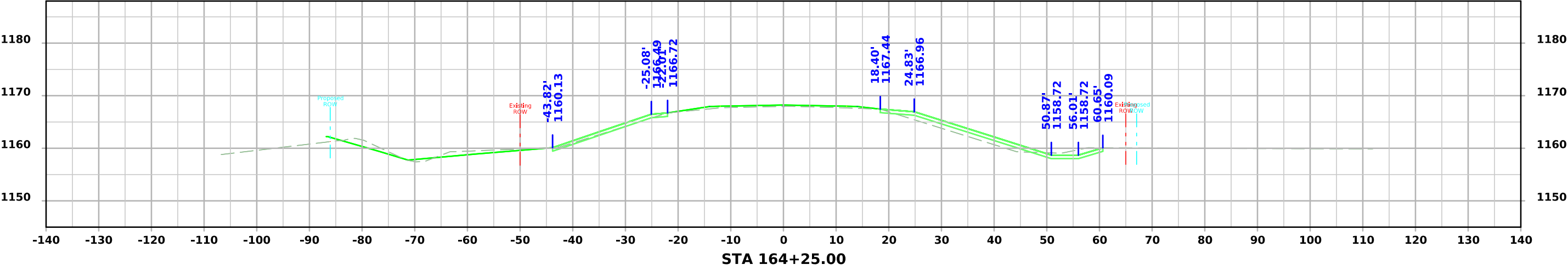
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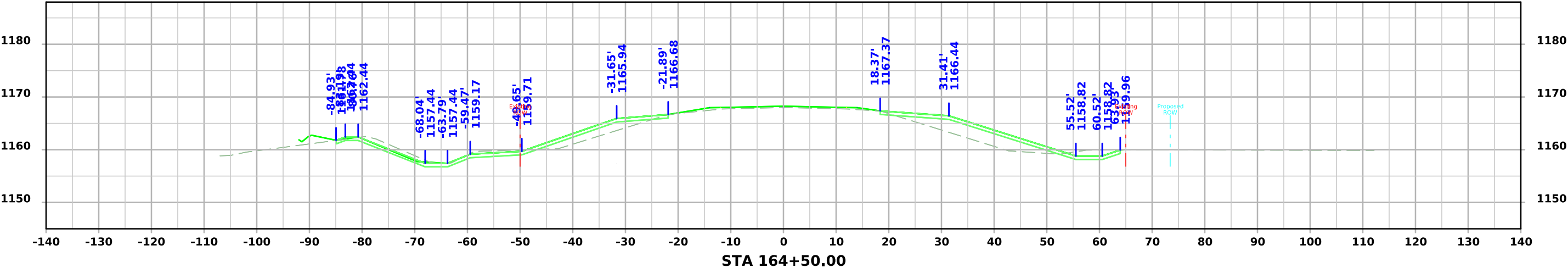
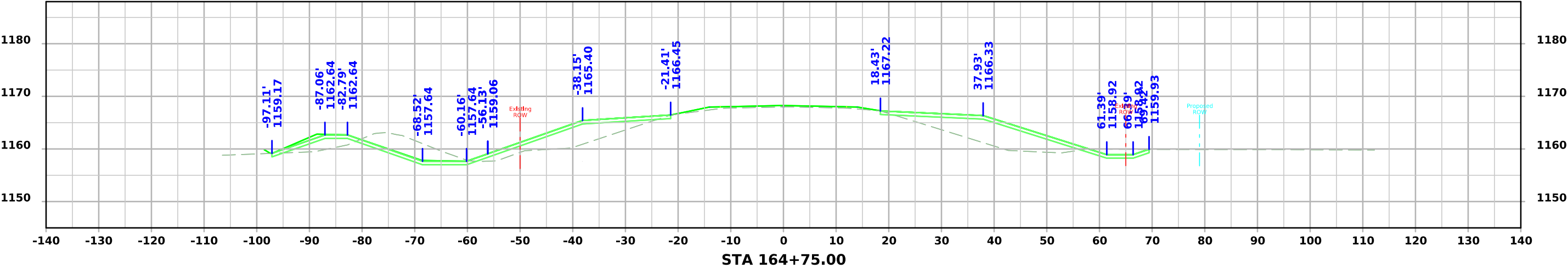
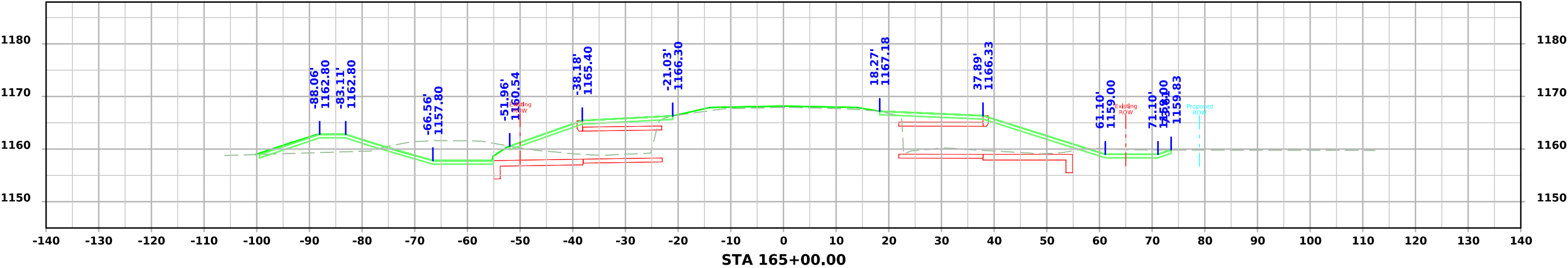
ML- IA 31



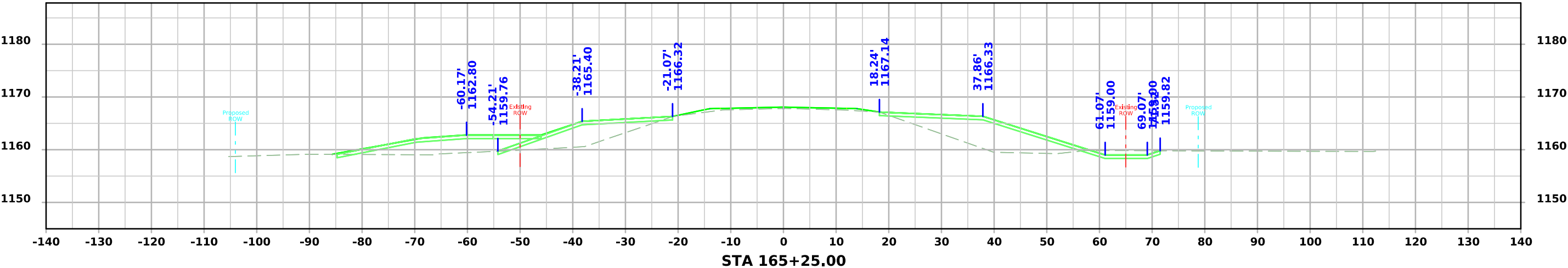
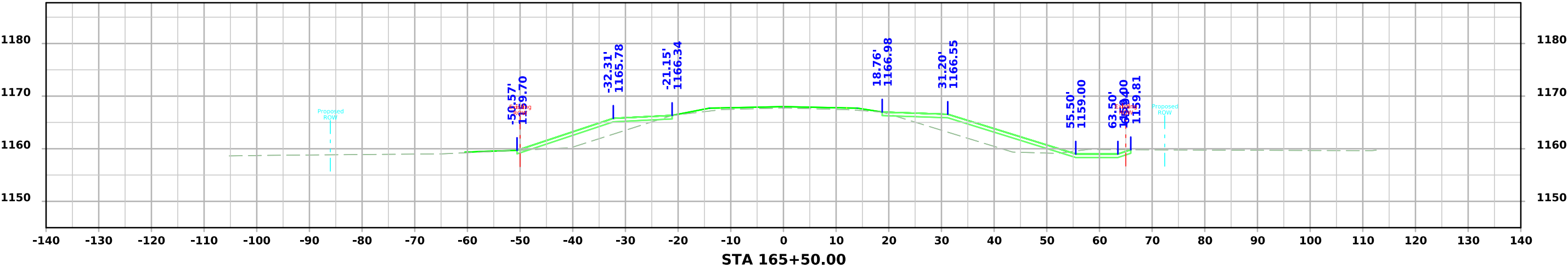
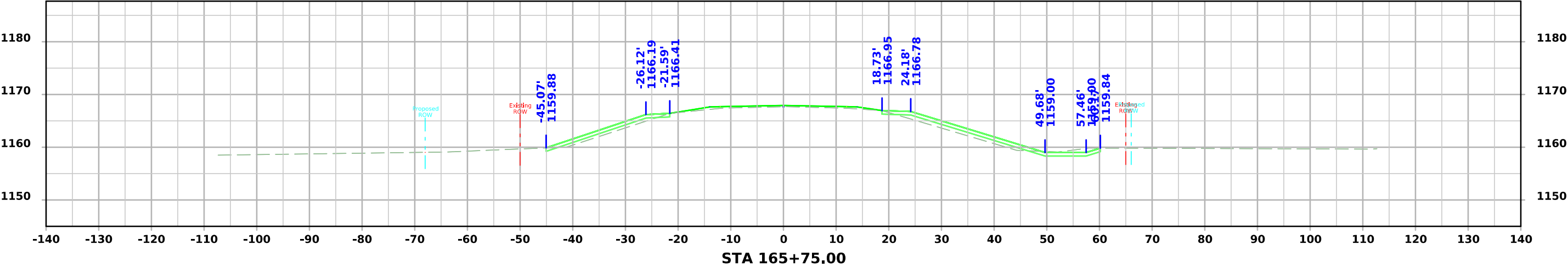
ML- IA 31



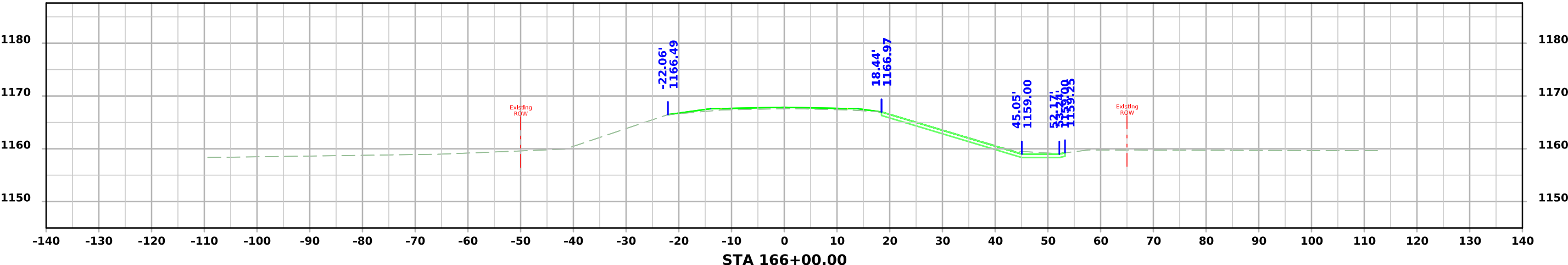
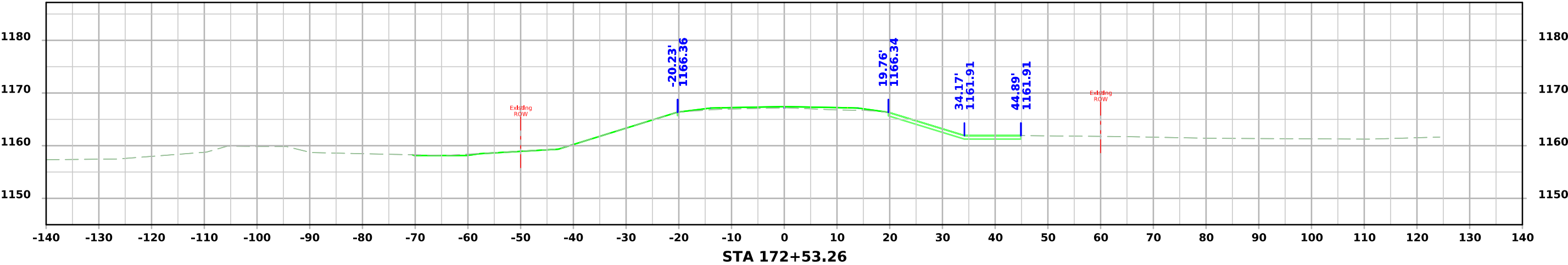
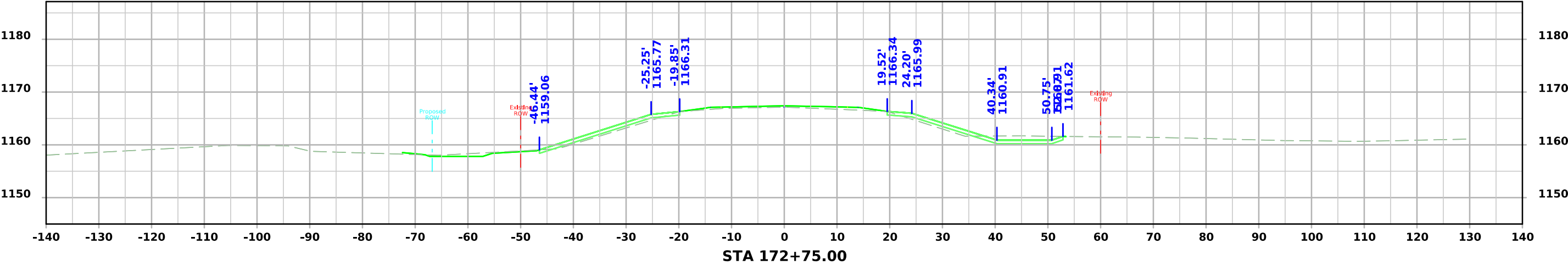
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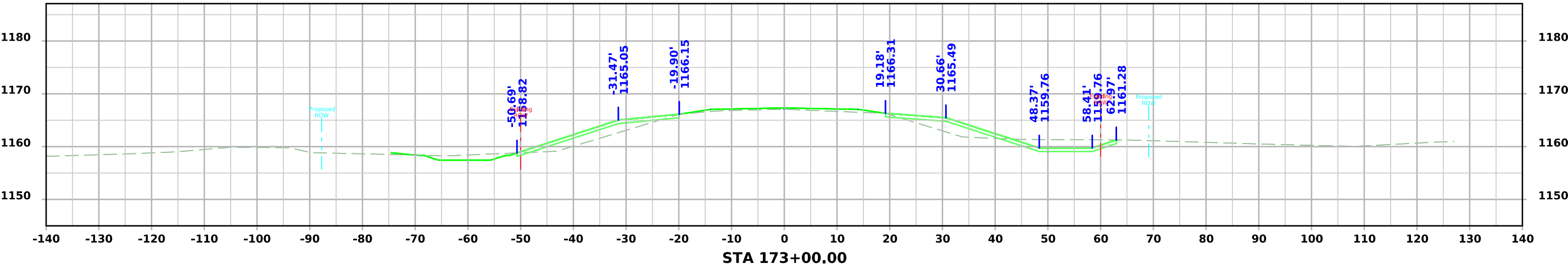
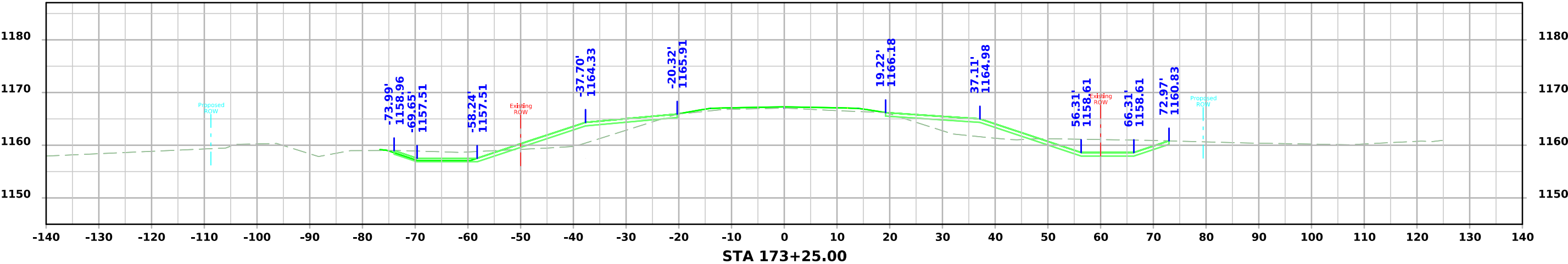
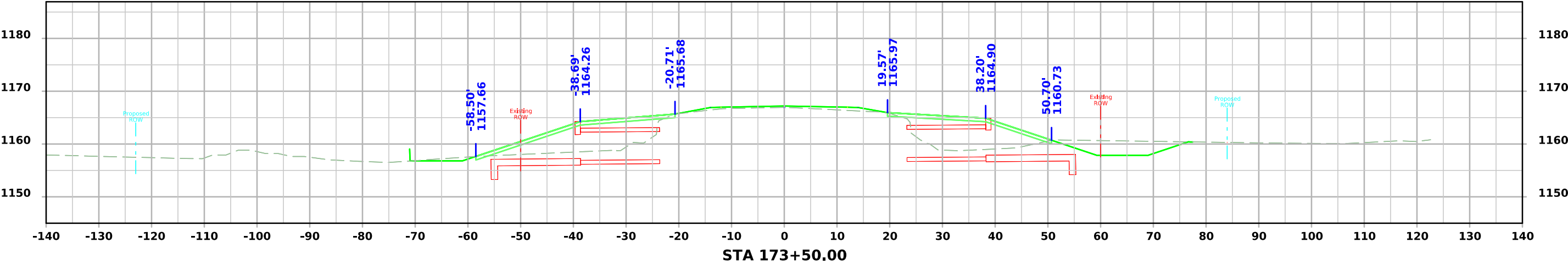
ML- IA 31



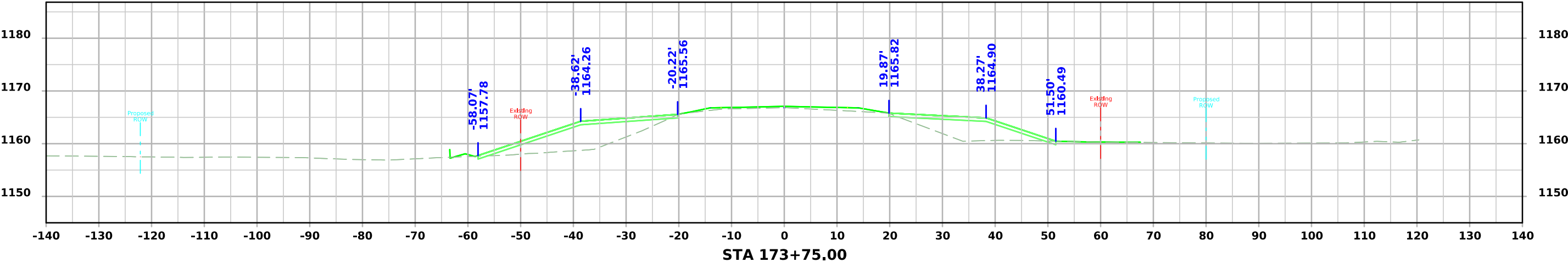
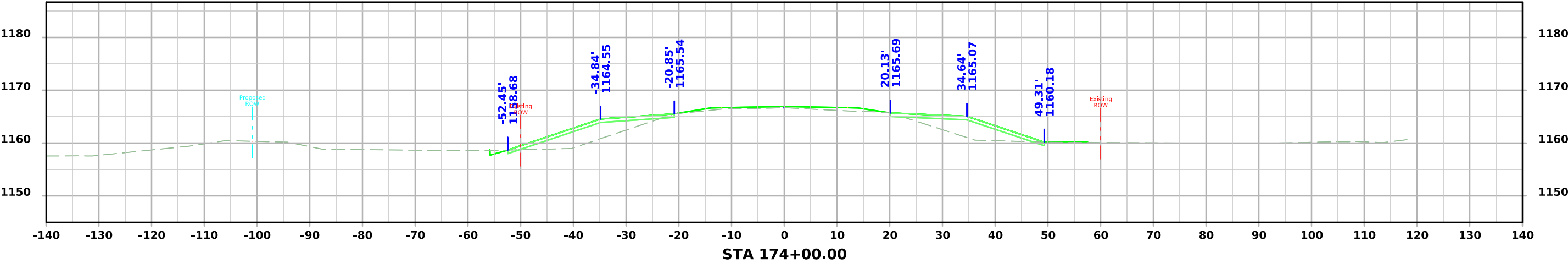
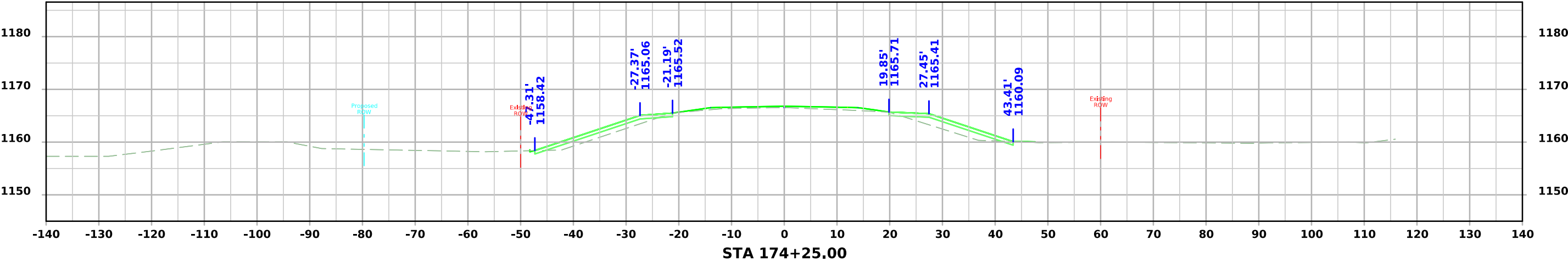
ML- IA 31



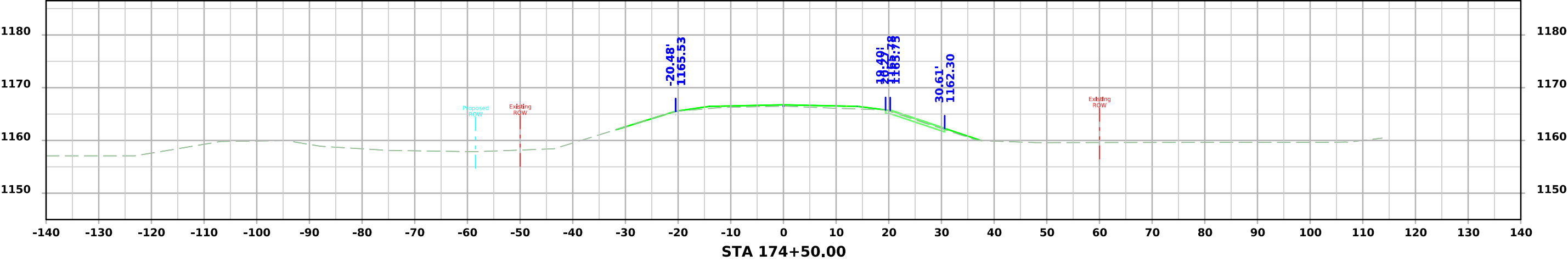
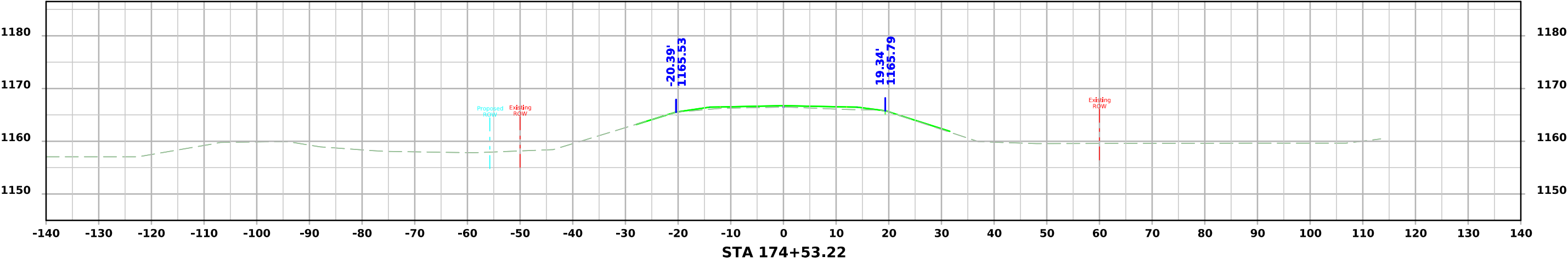
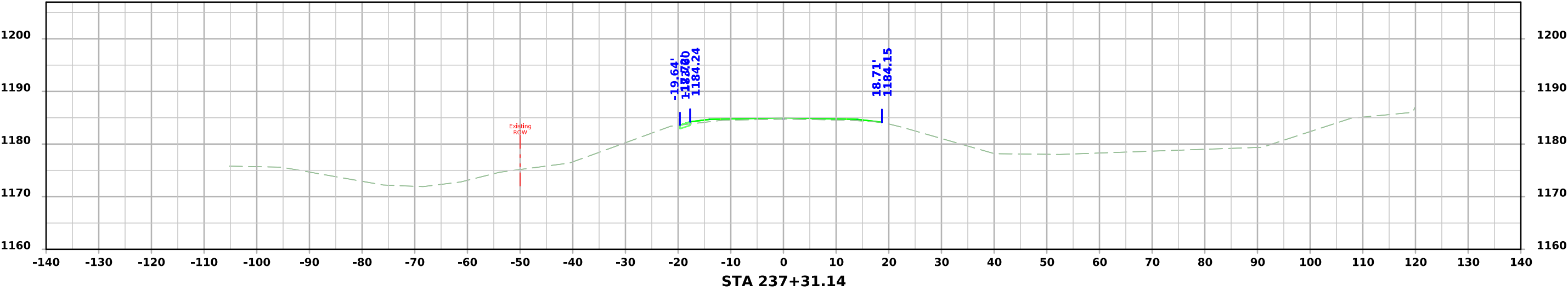
ML- IA 31



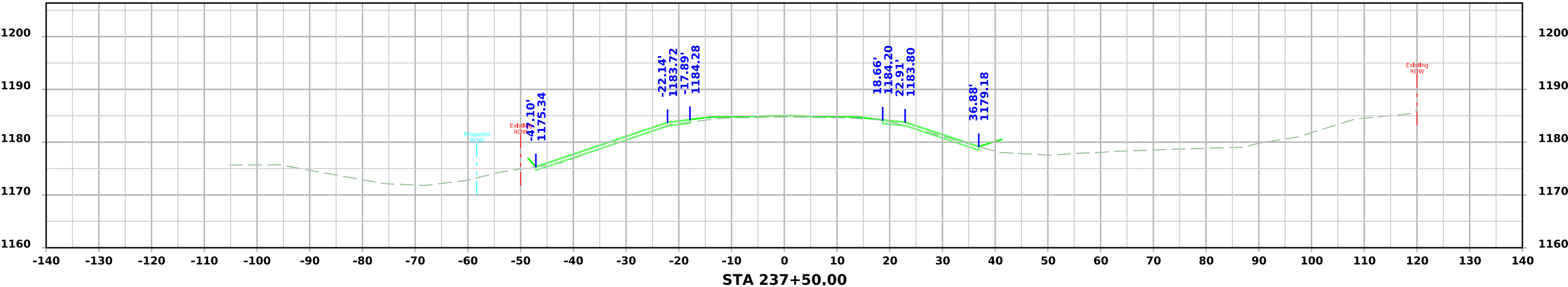
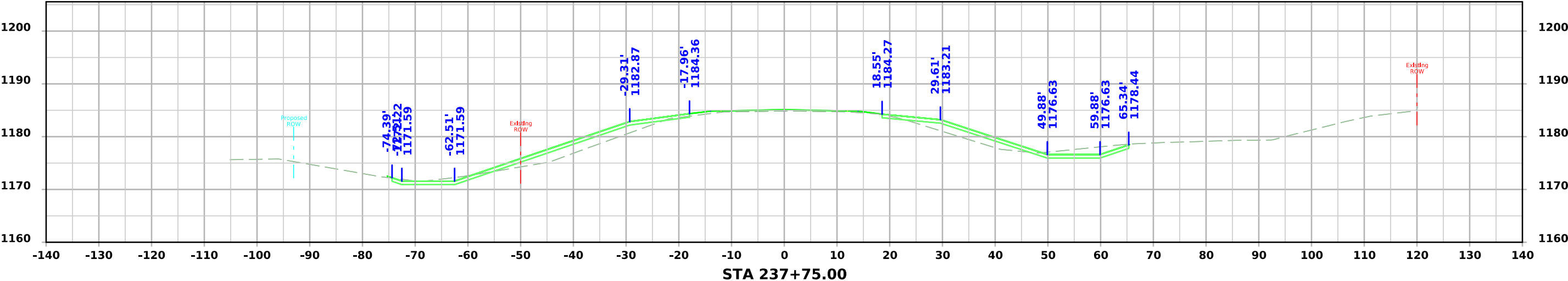
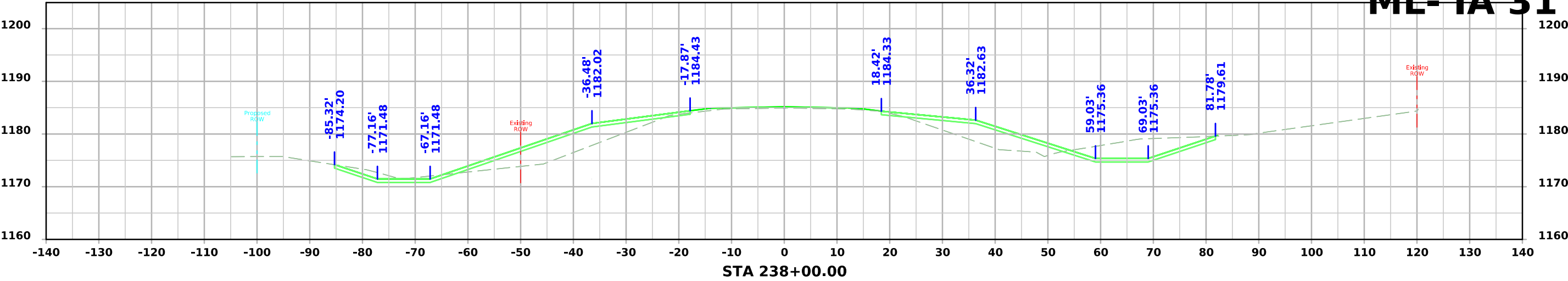
ML- IA 31

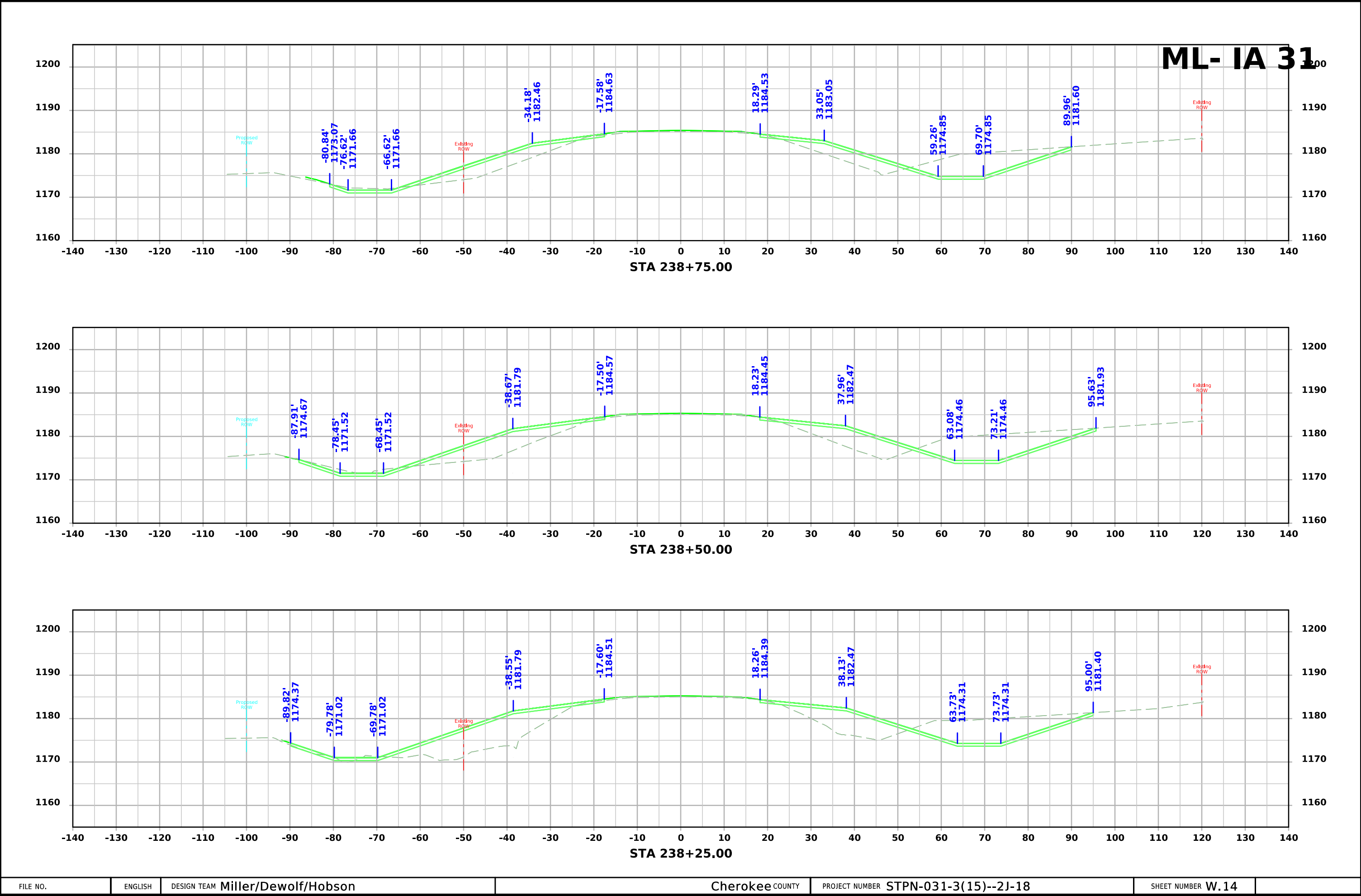


ML- IA 31

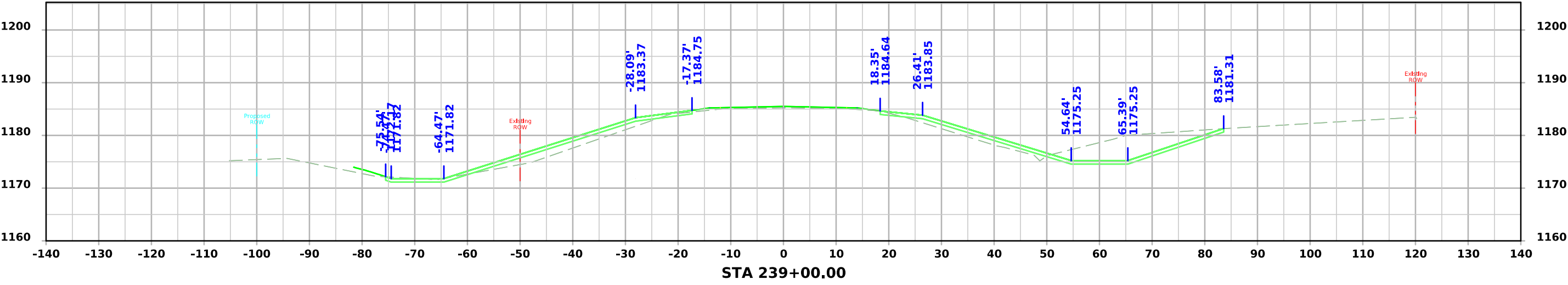
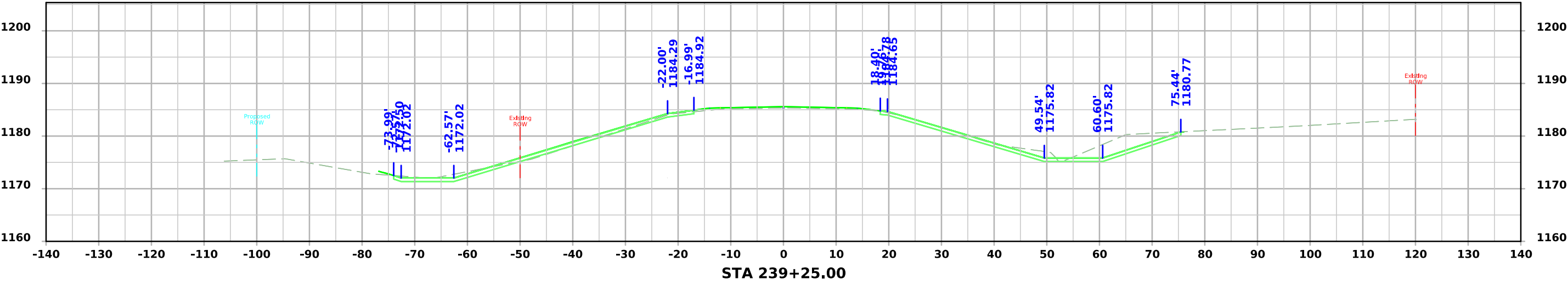
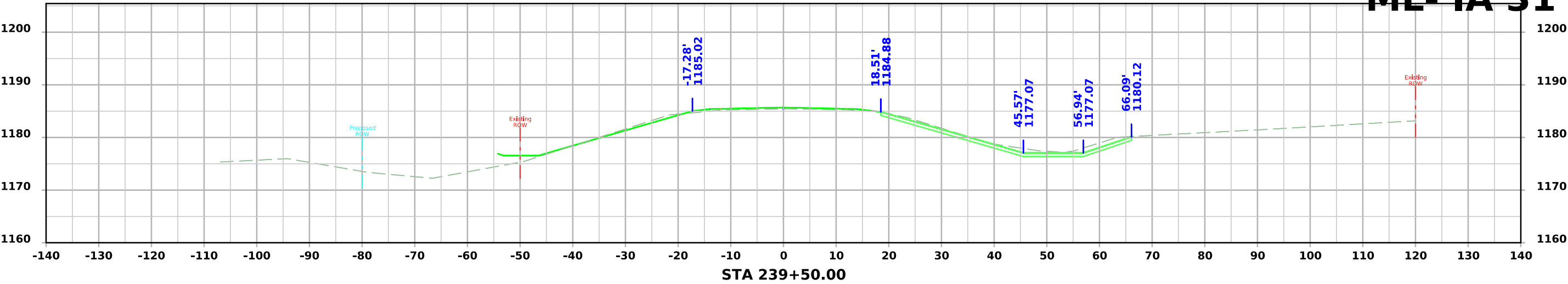


ML-IA-31

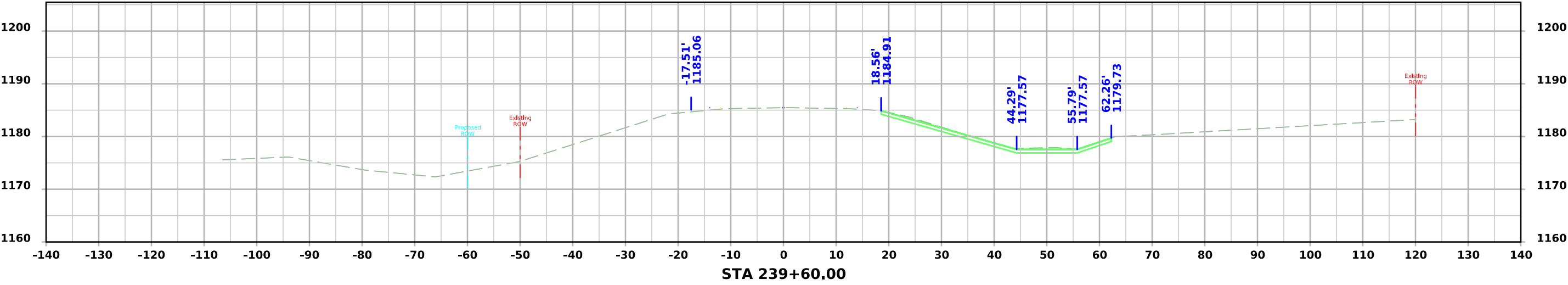
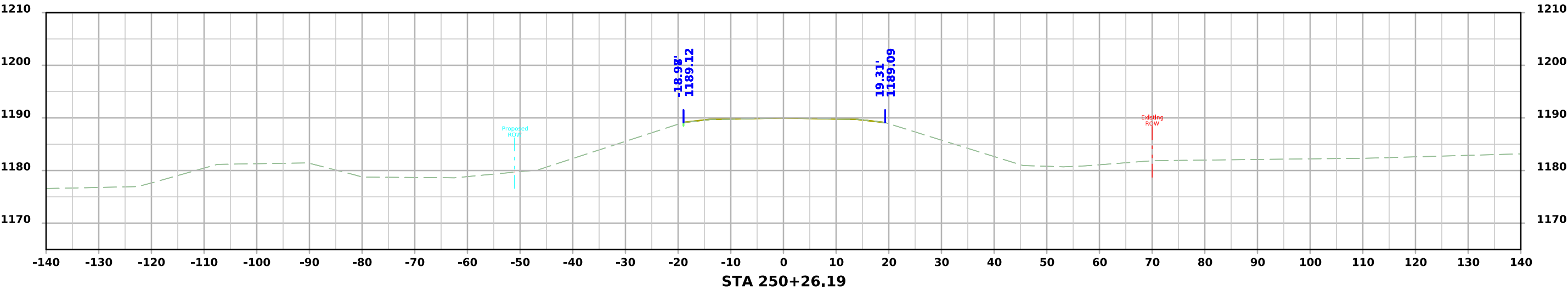
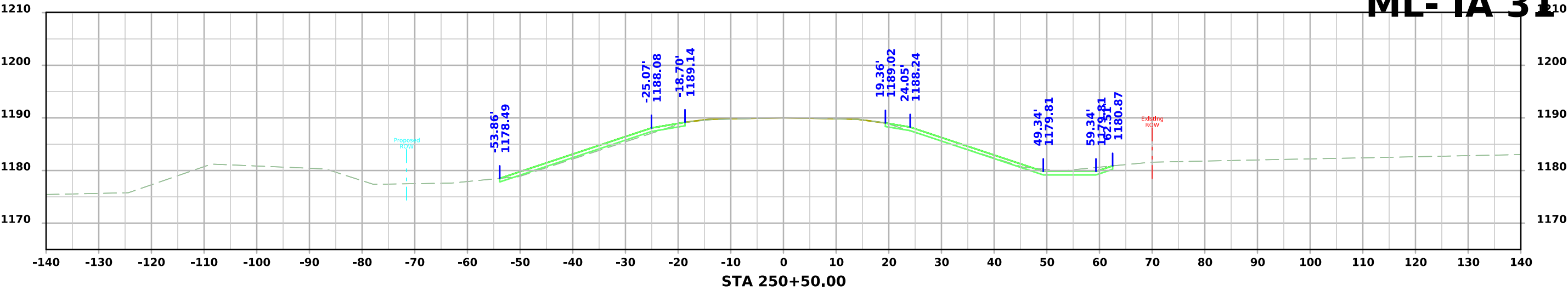




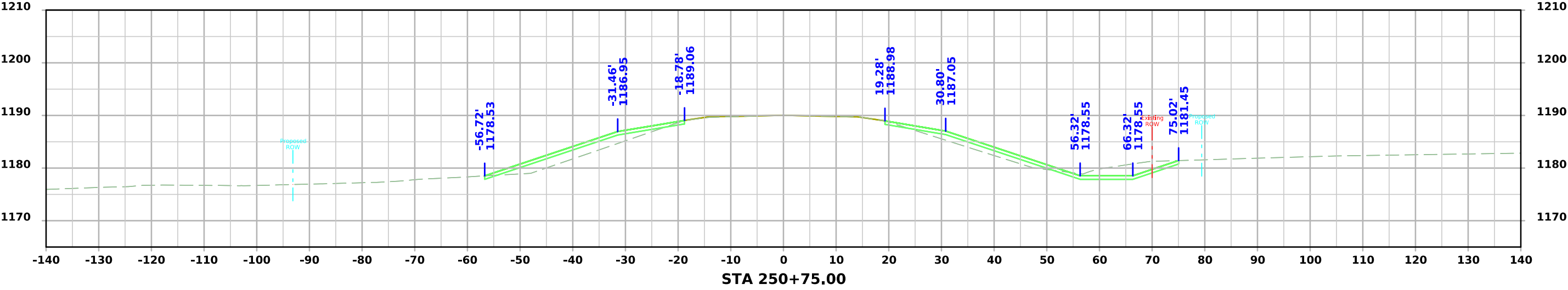
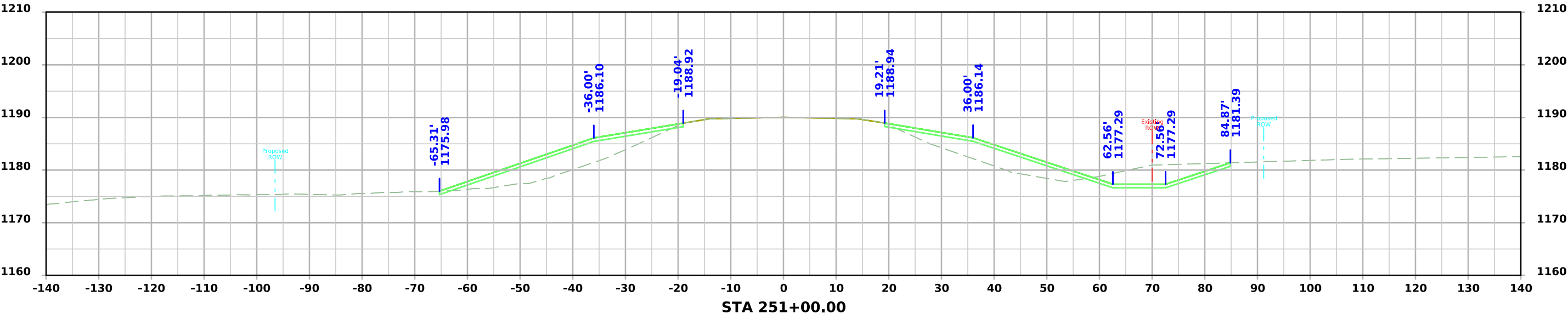
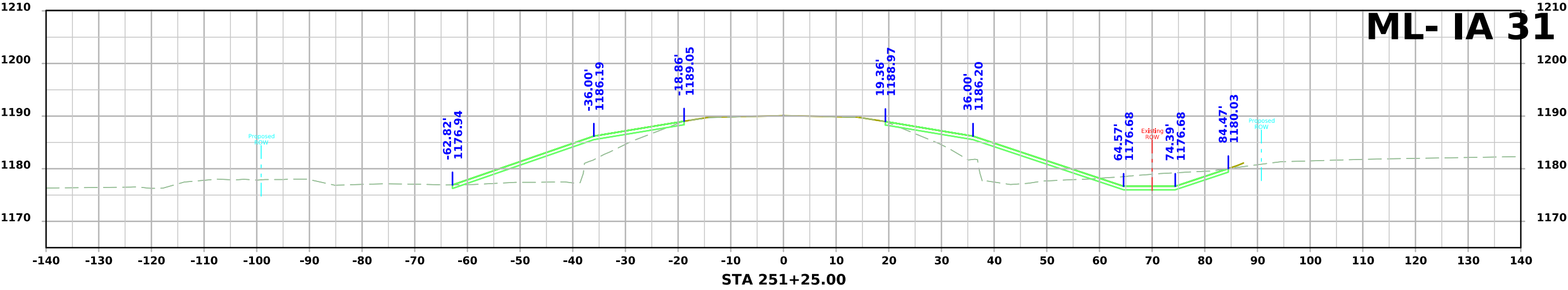
ML- IA 31



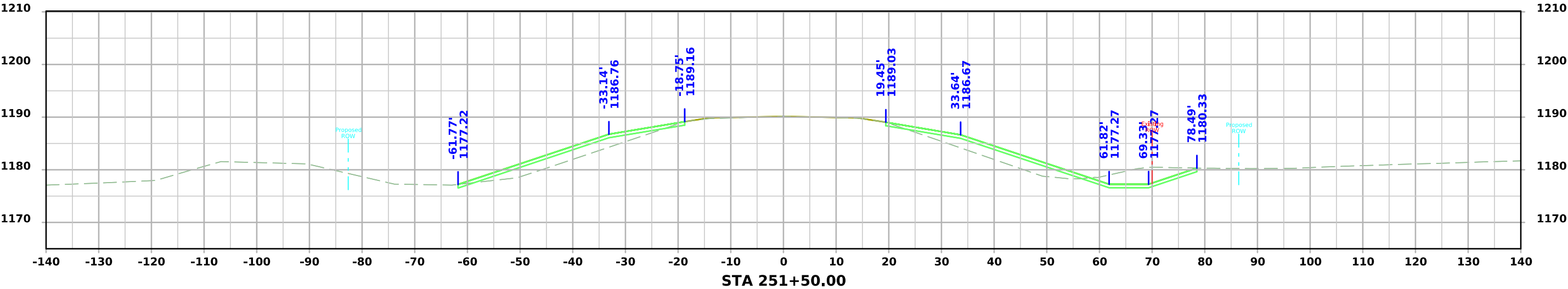
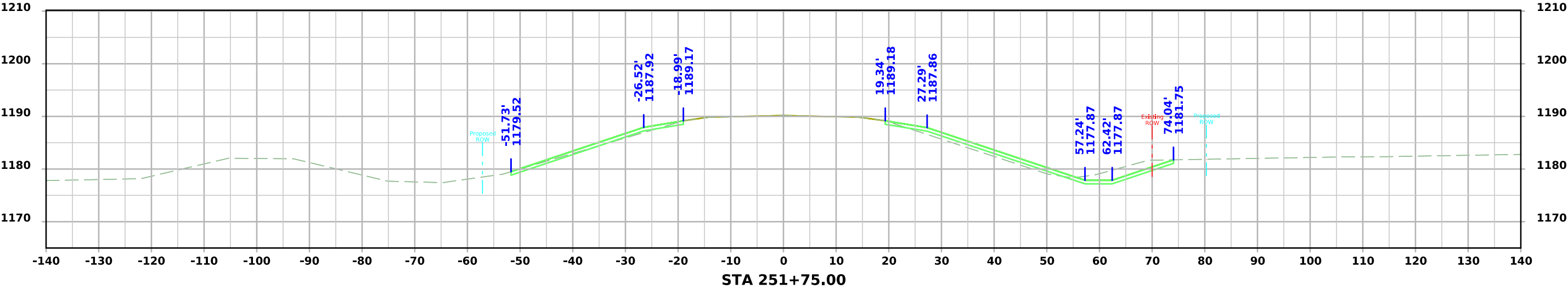
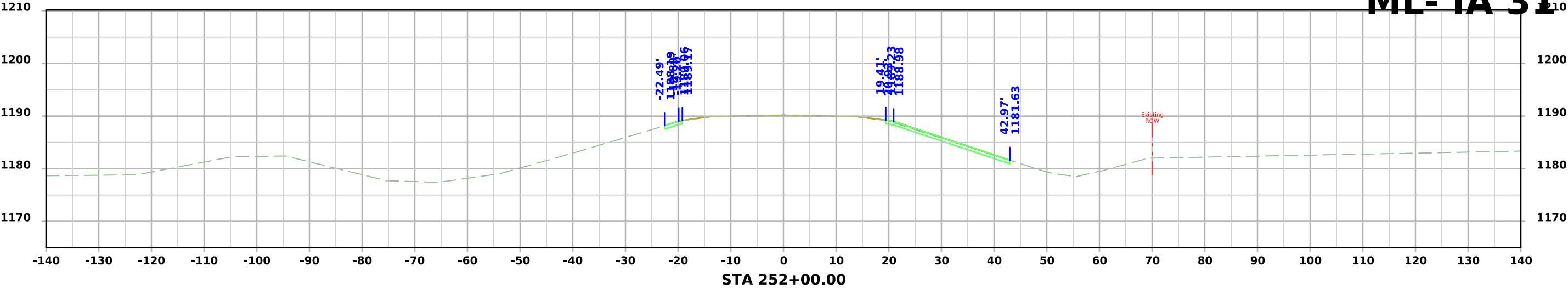
ML- IA 31



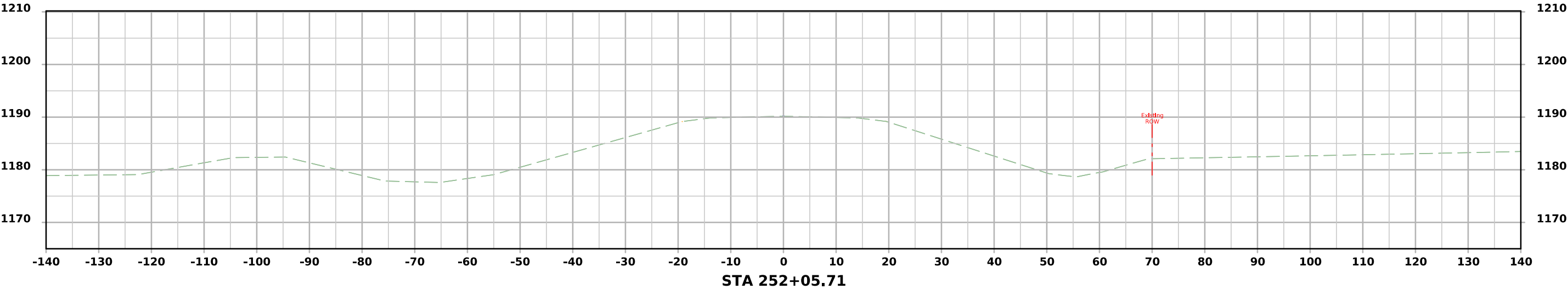
ML- IA 31



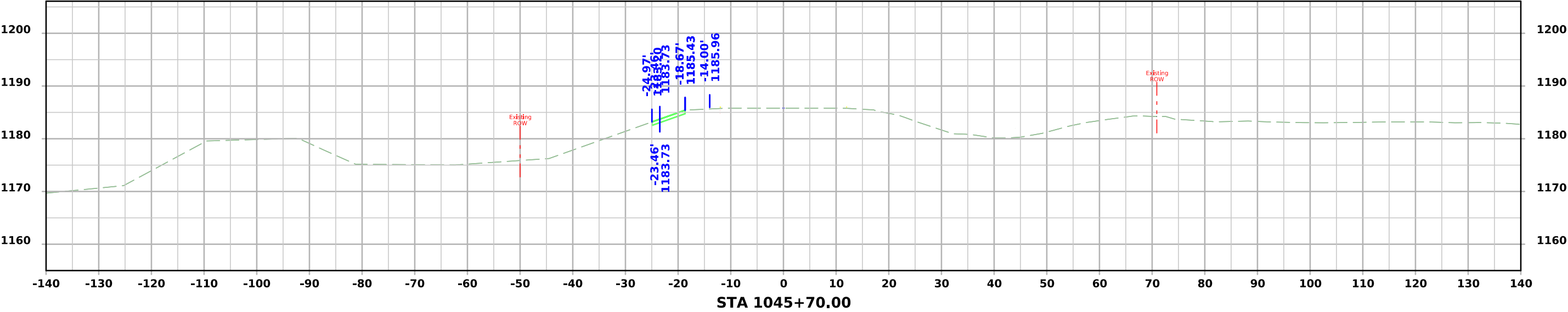
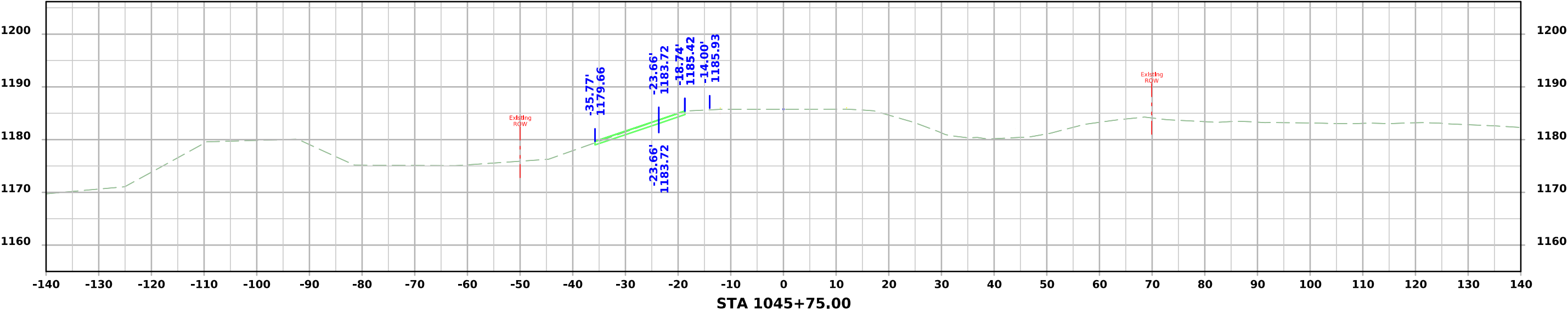
ML- IA 31



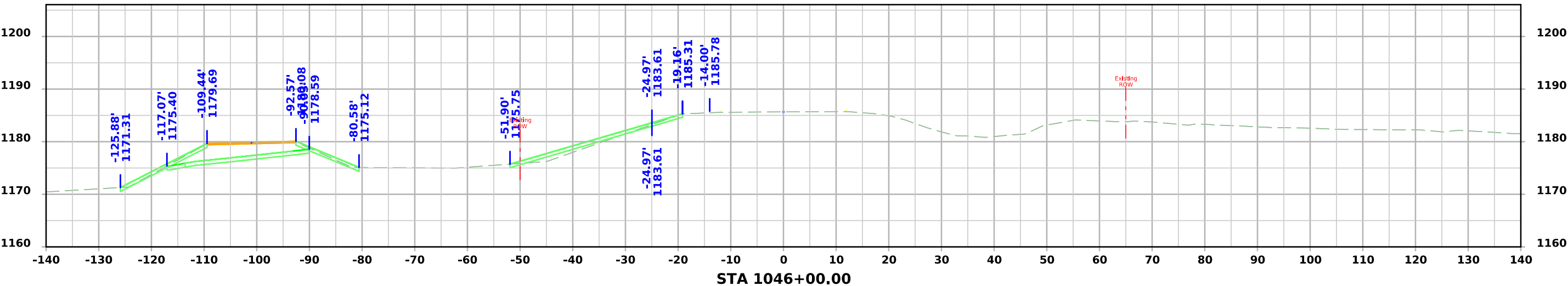
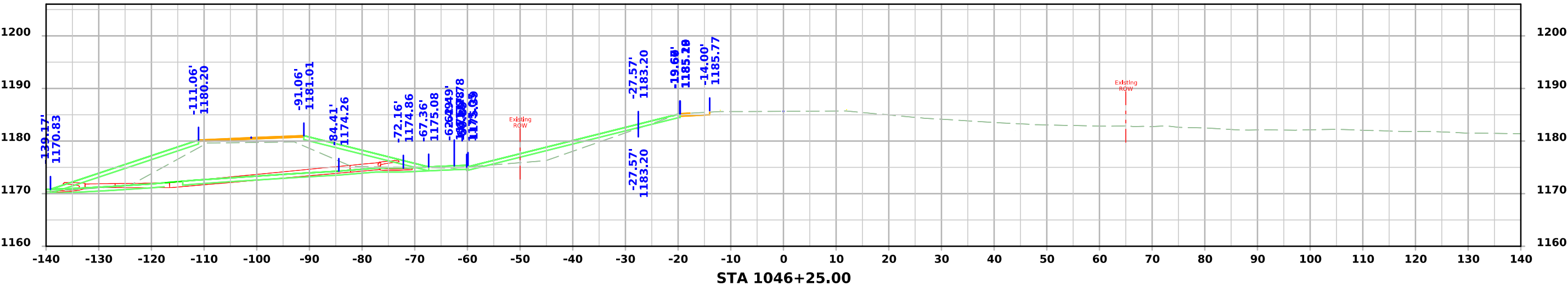
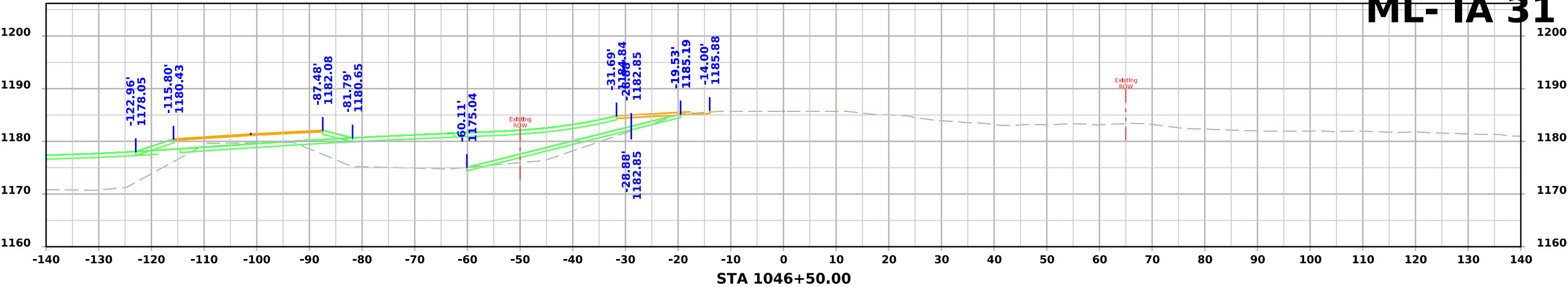
ML- IA 31



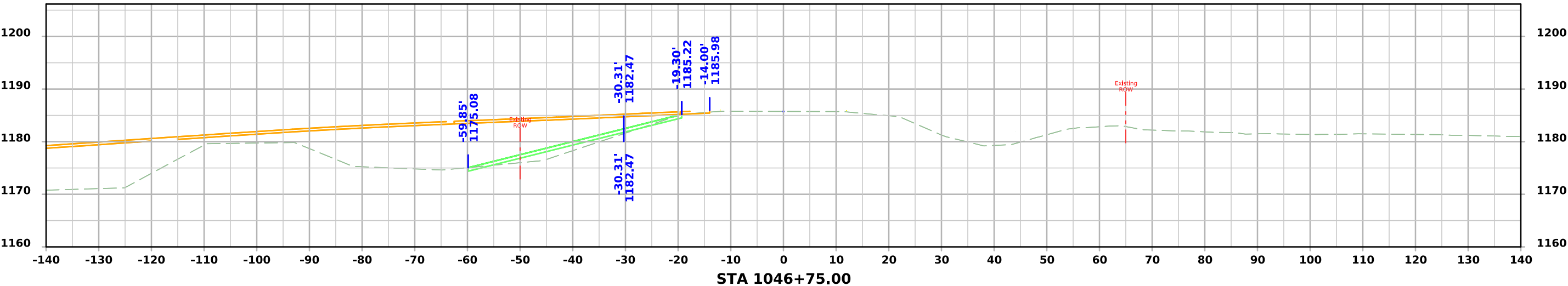
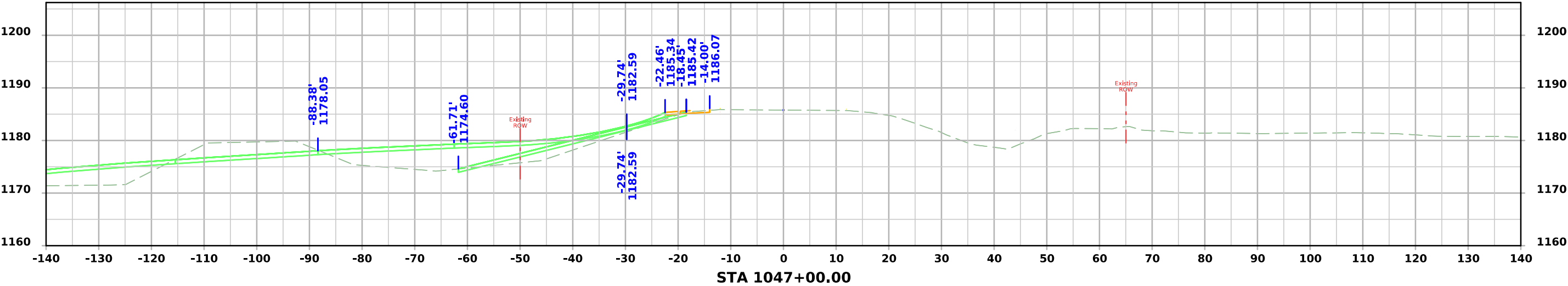
ML- IA 31



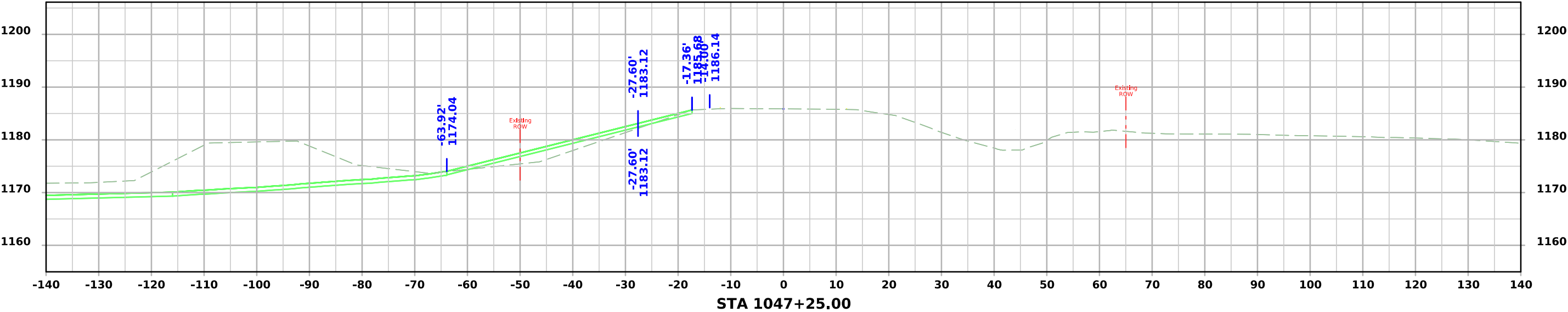
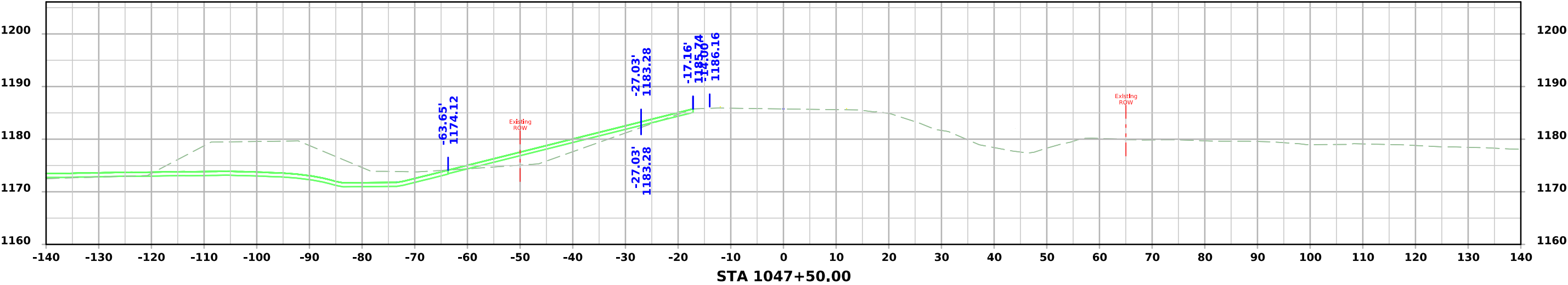
ML- IA 31



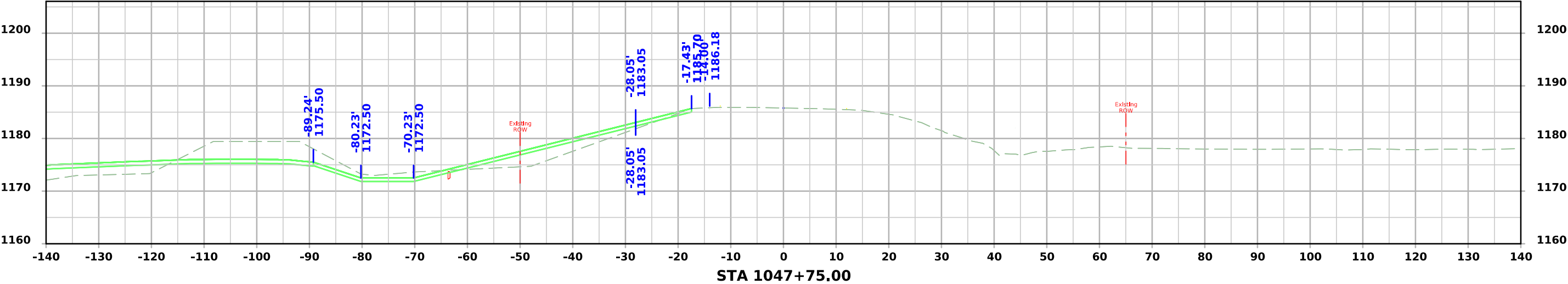
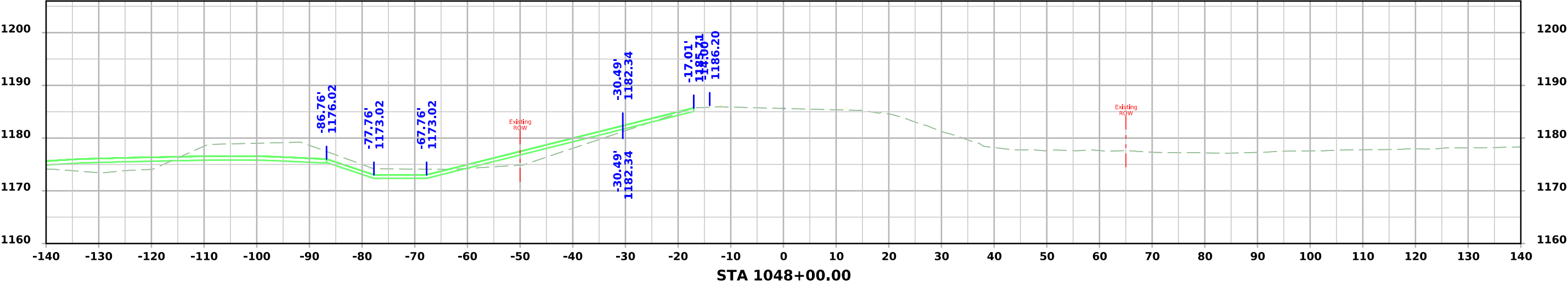
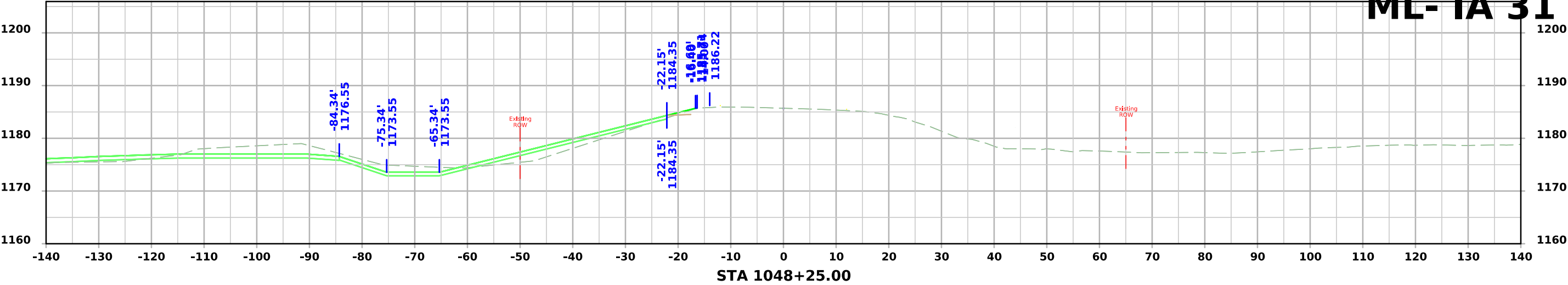
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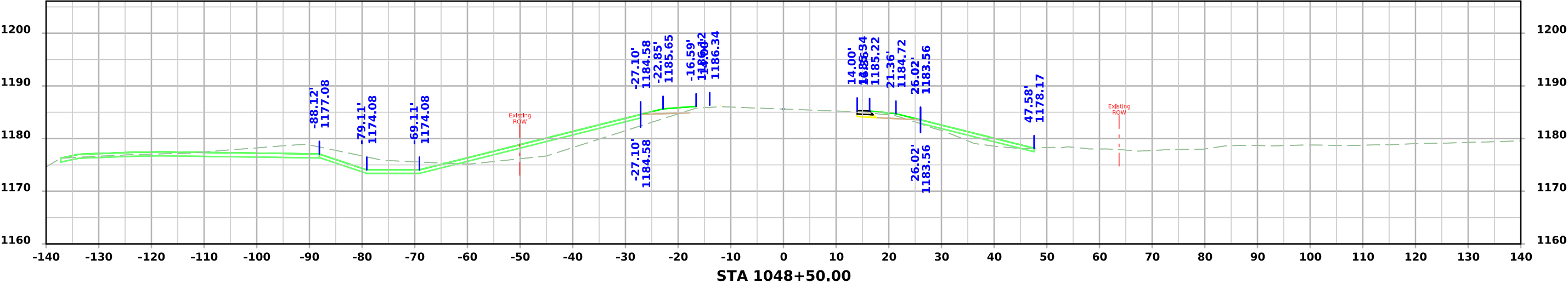
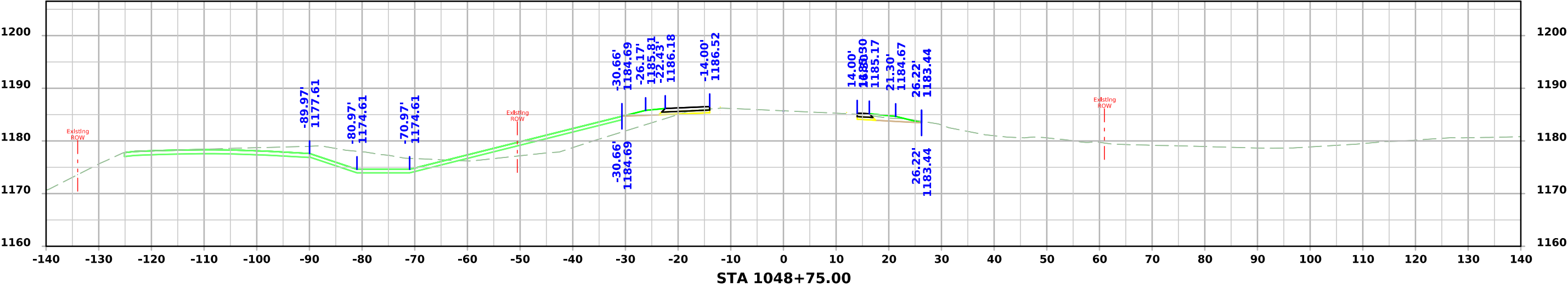
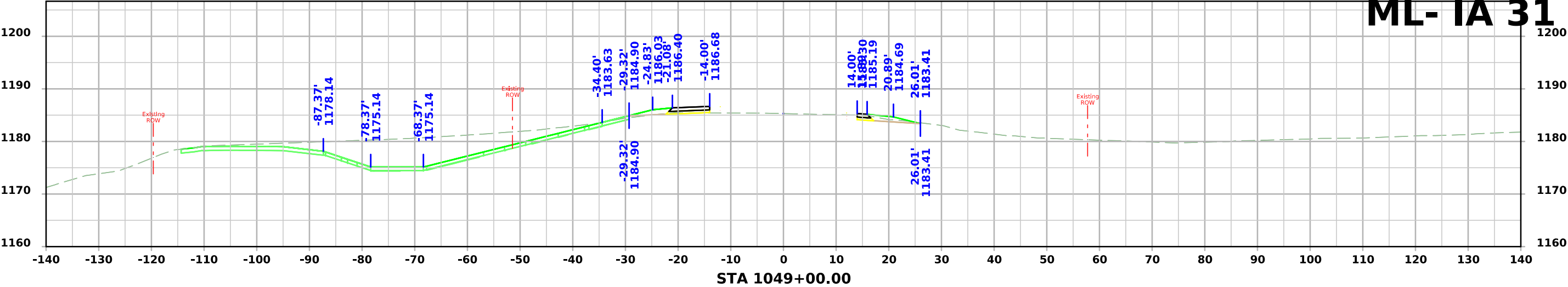
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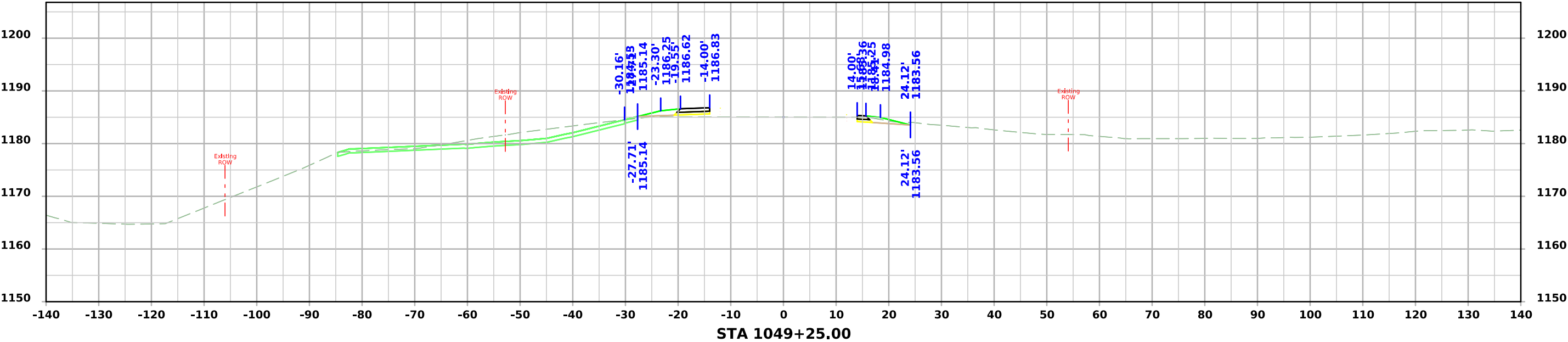
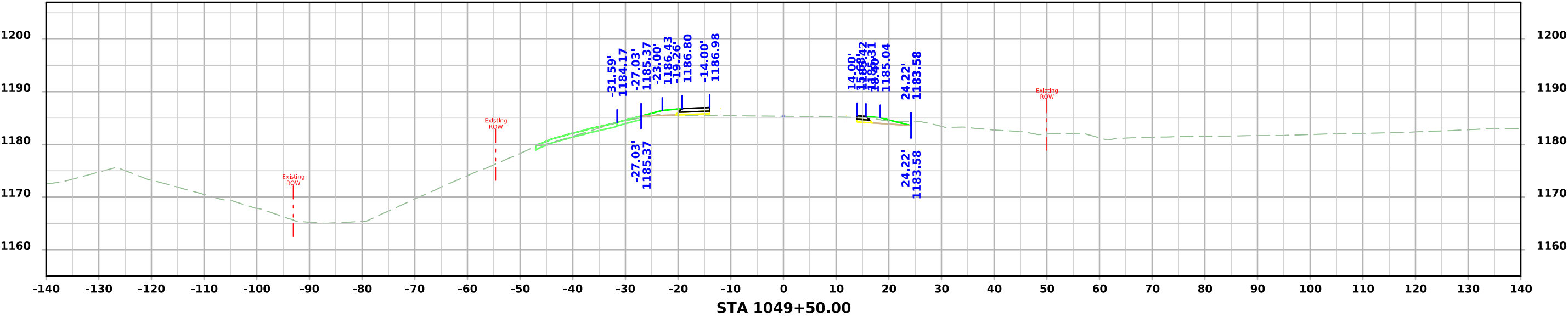
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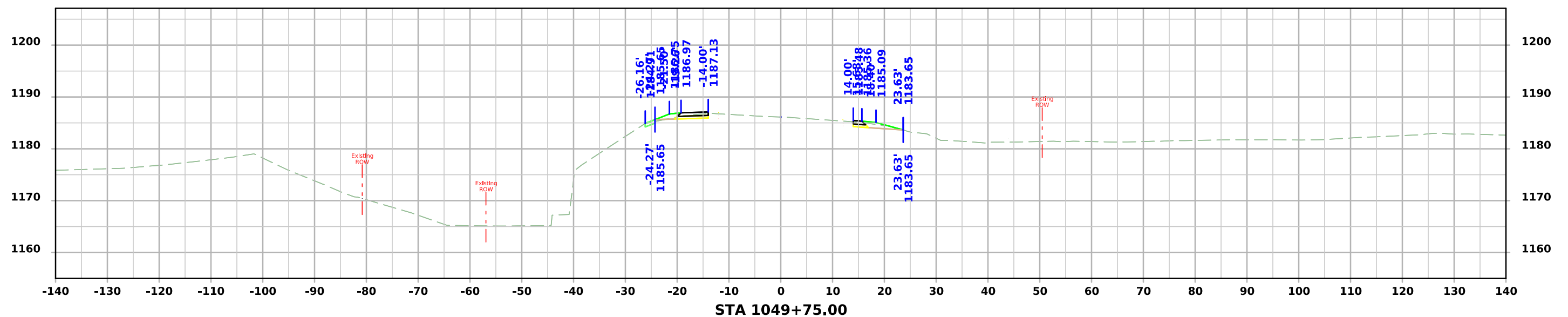
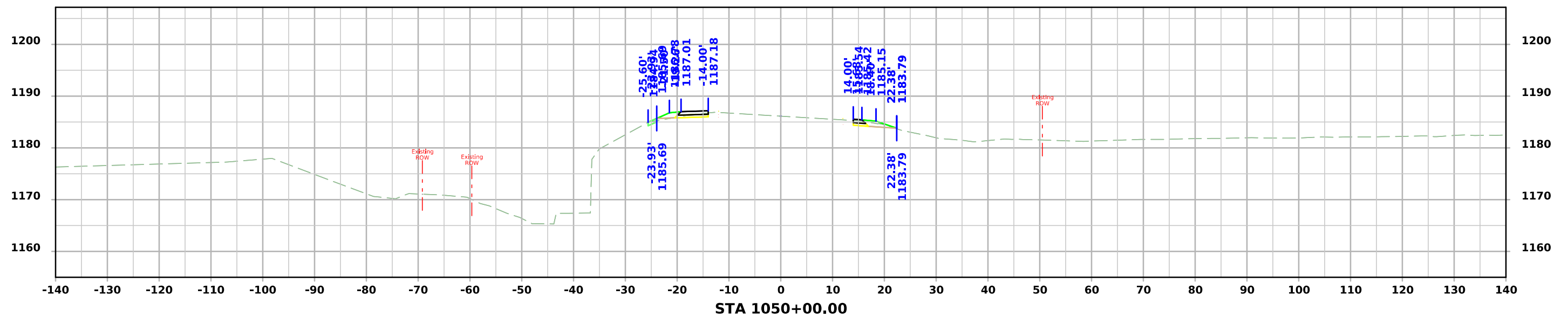


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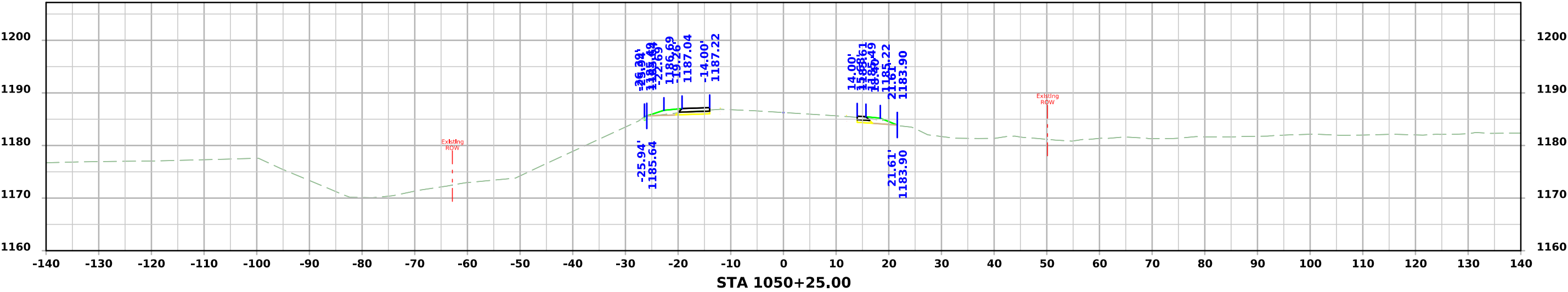
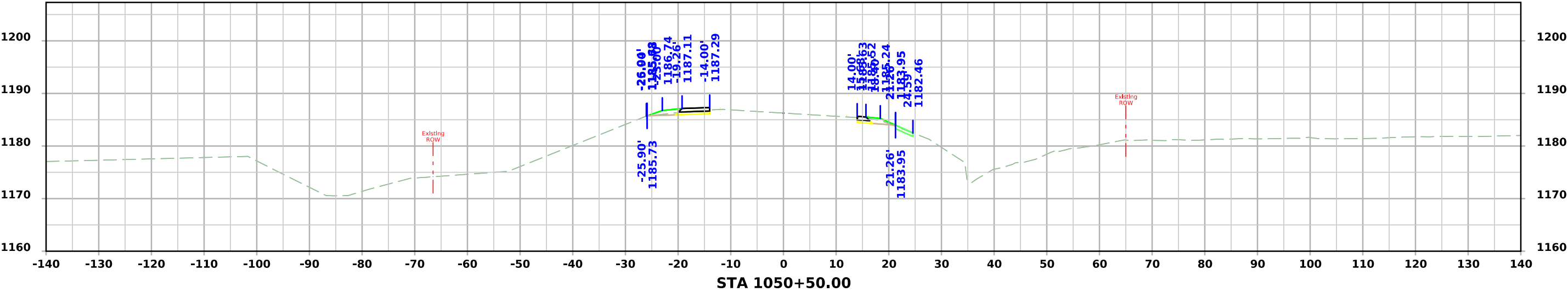


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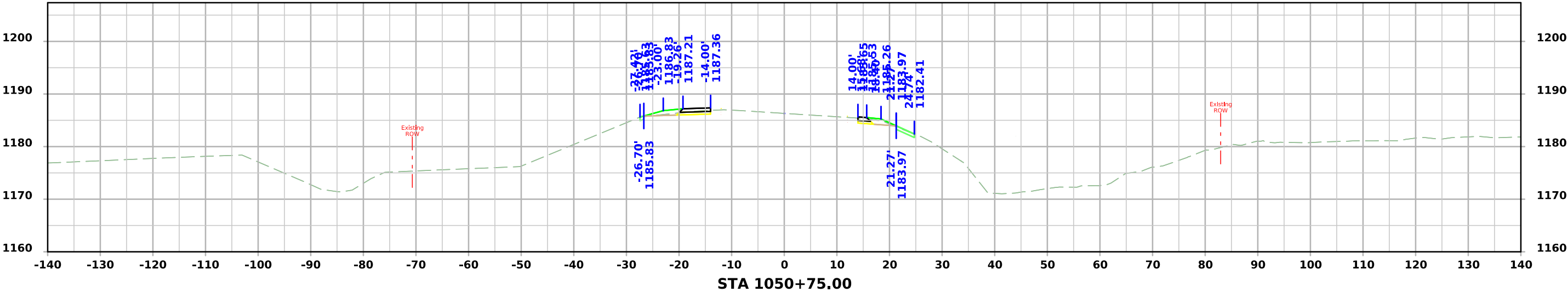
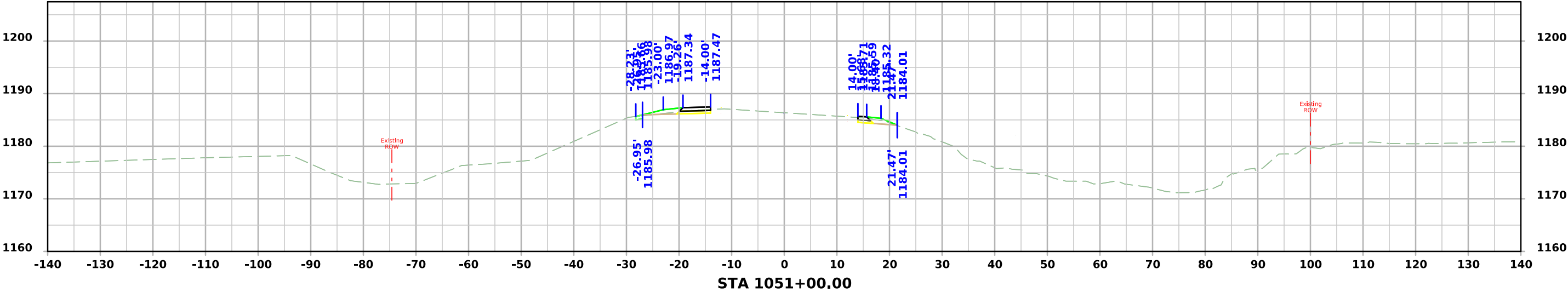


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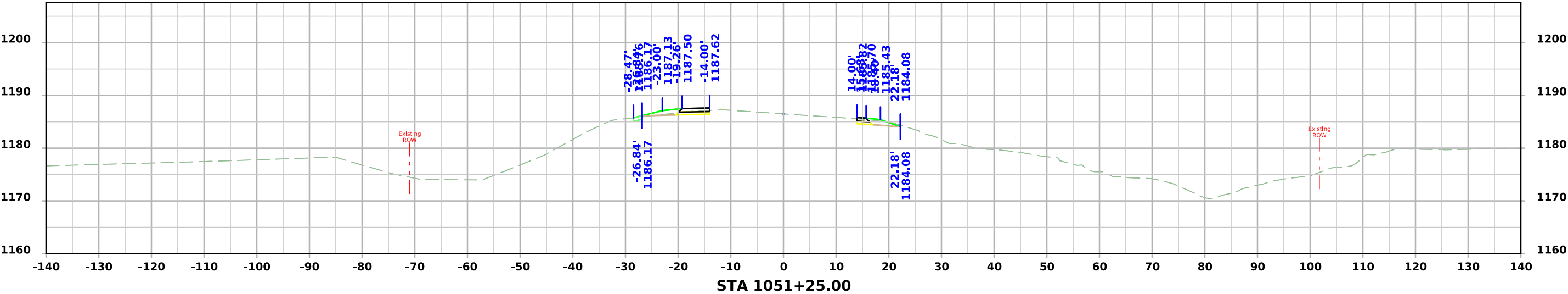
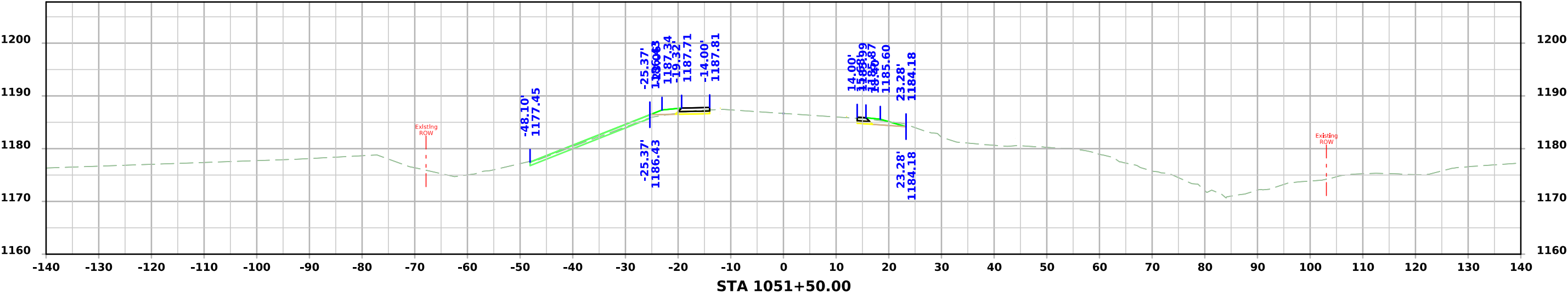
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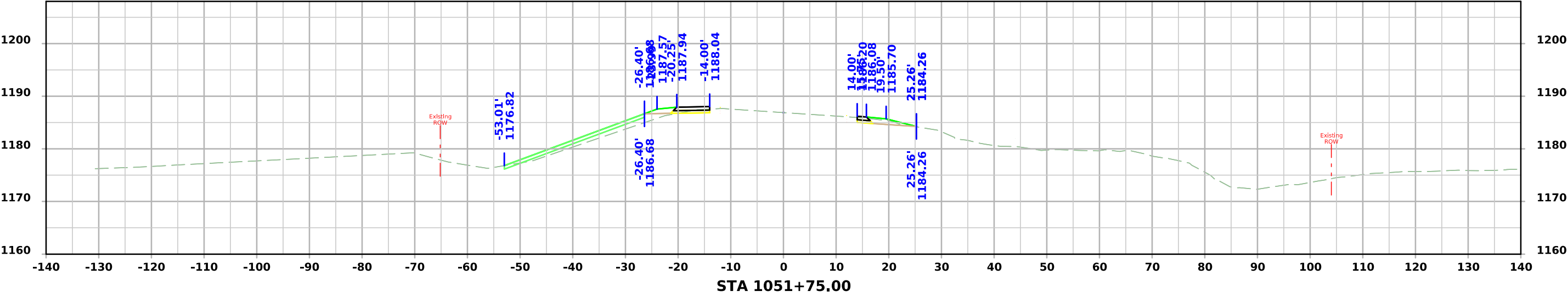
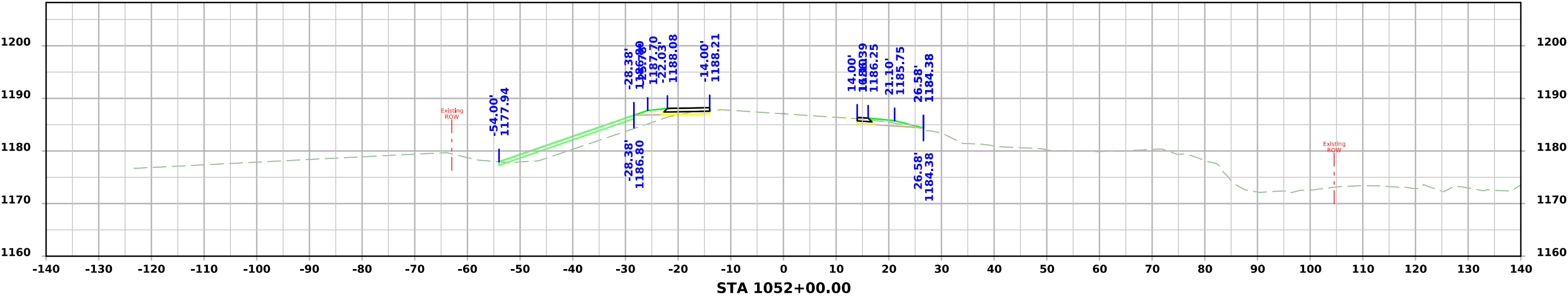
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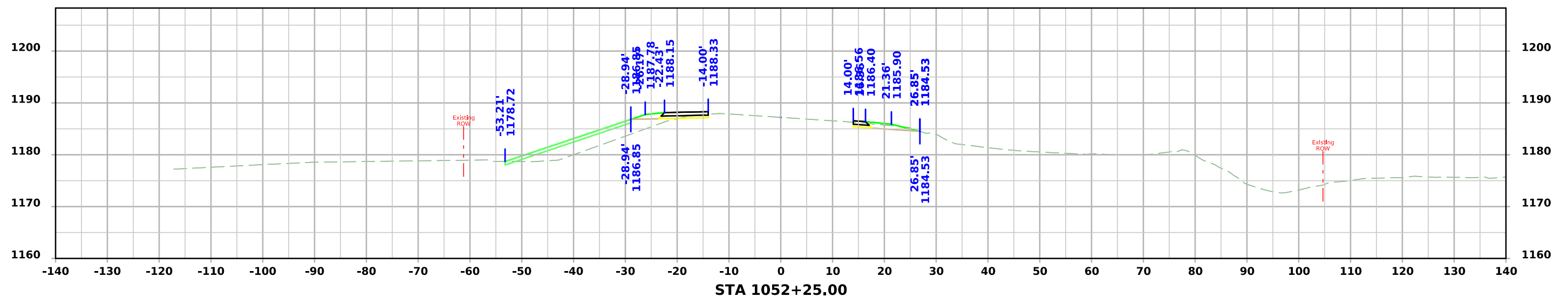
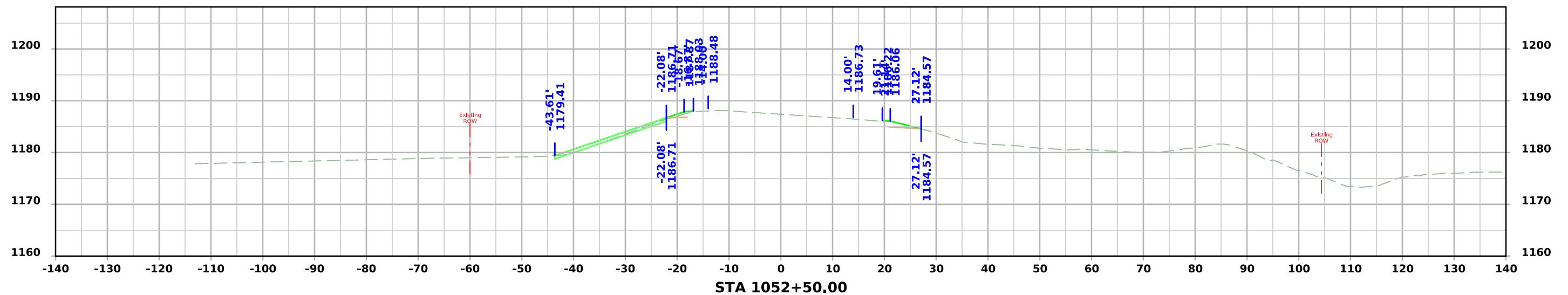


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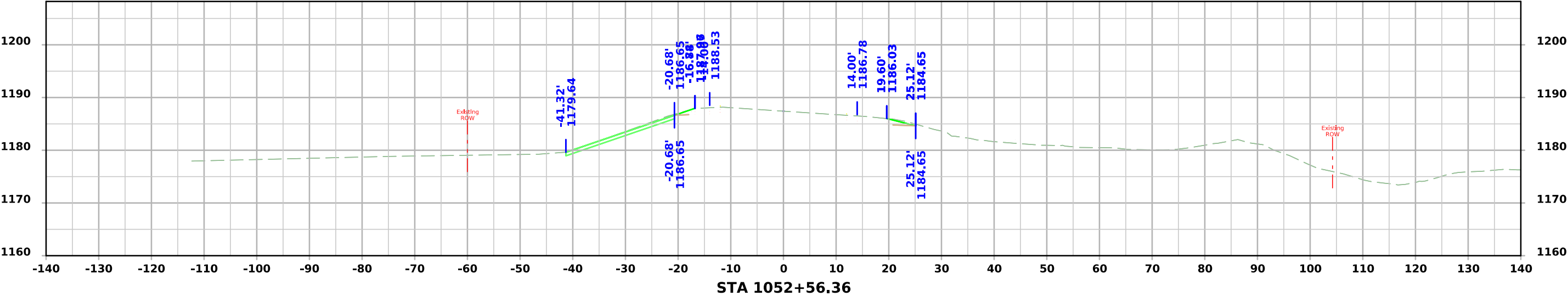


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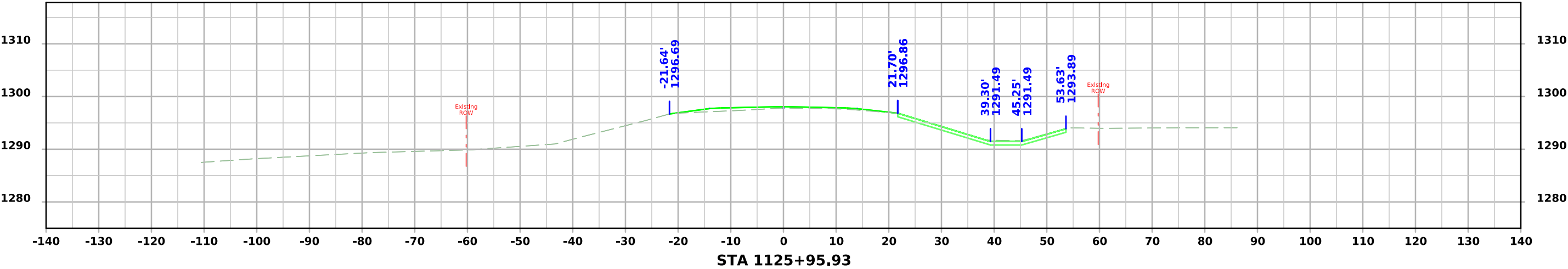
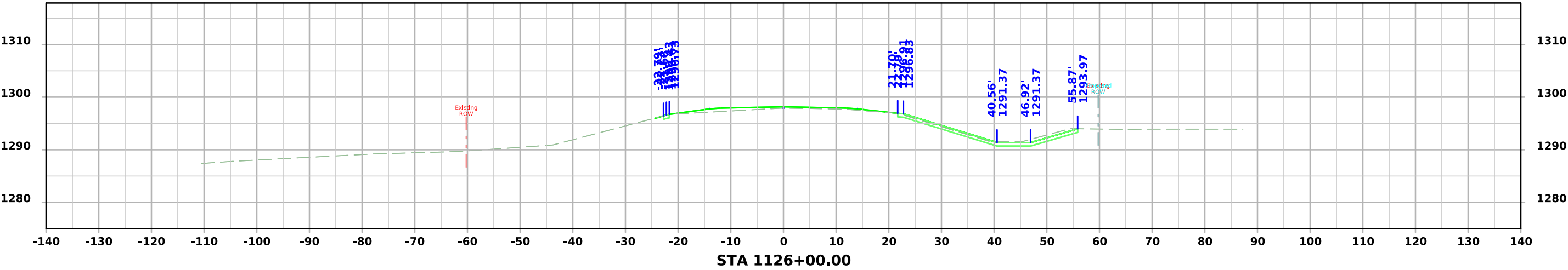
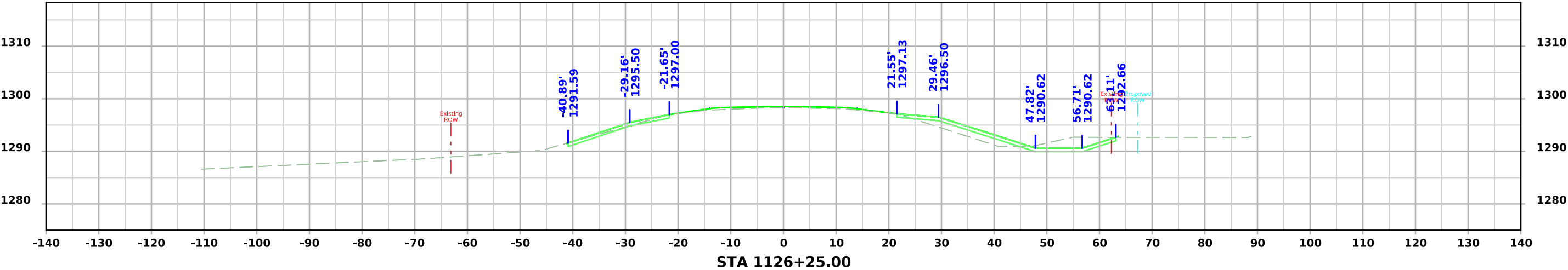


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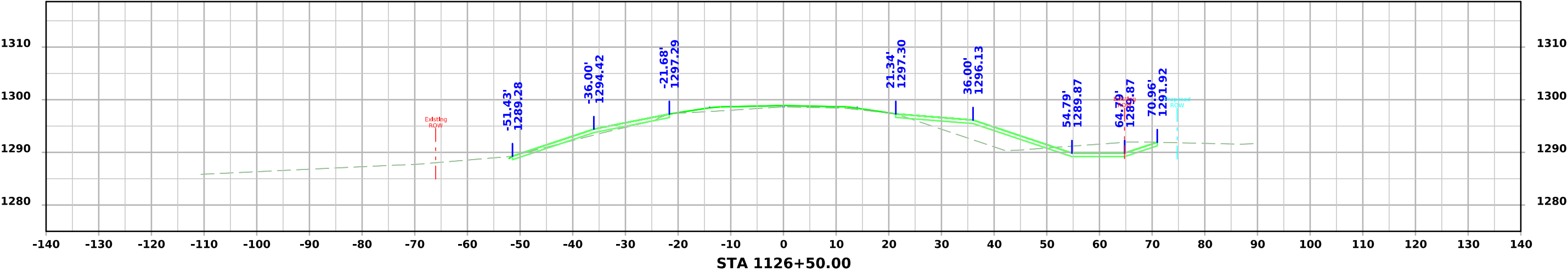
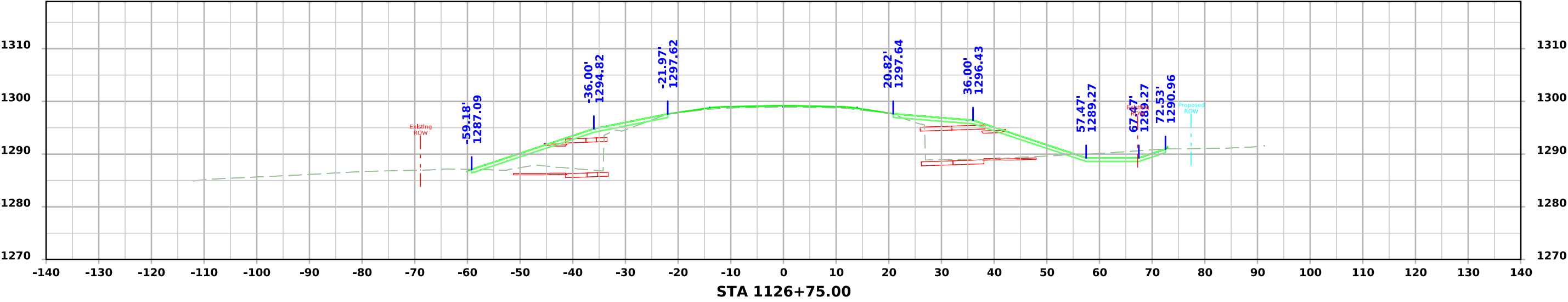
ML- IA 31



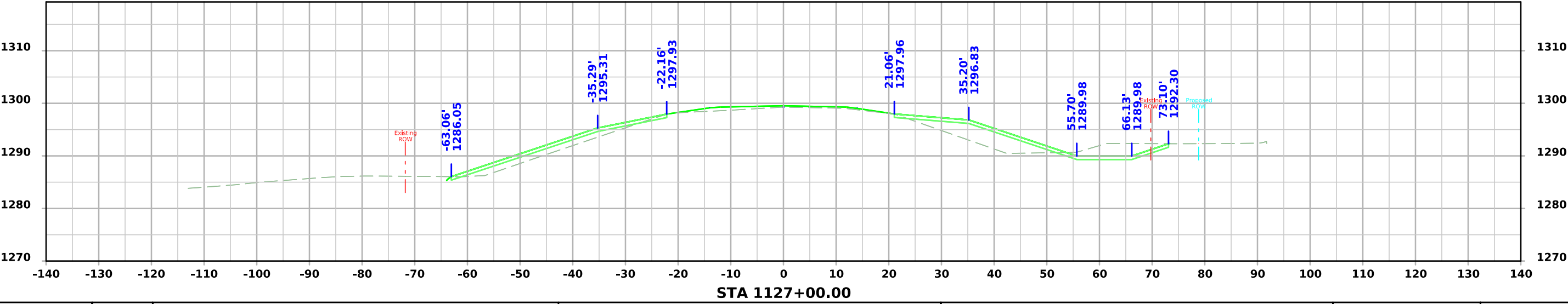
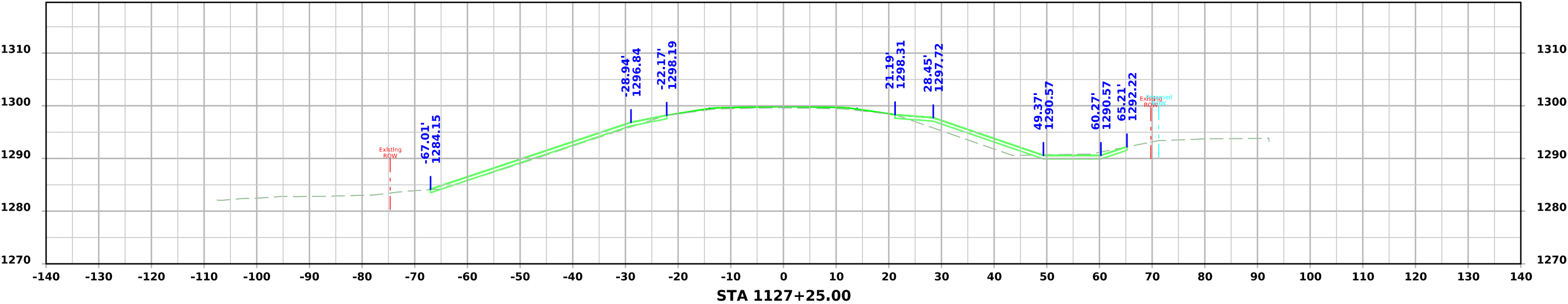
ML- IA 31



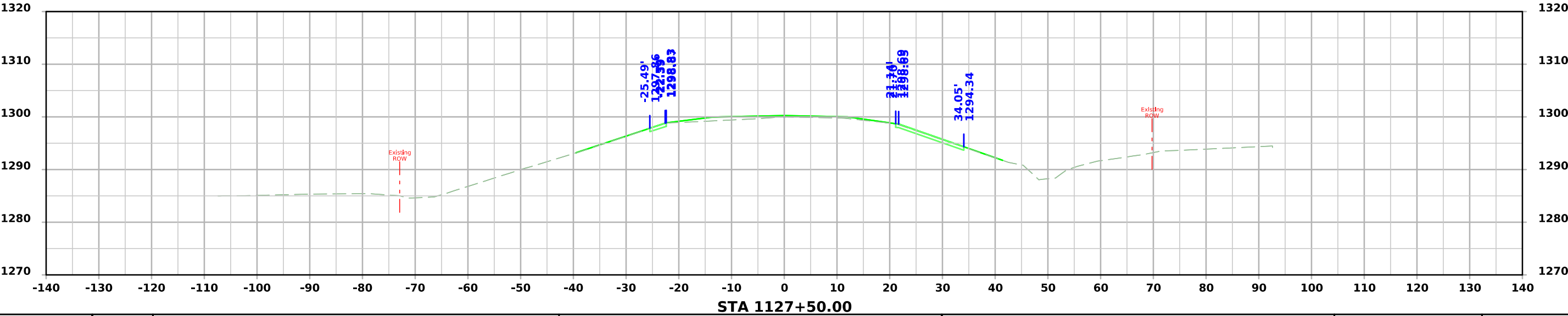
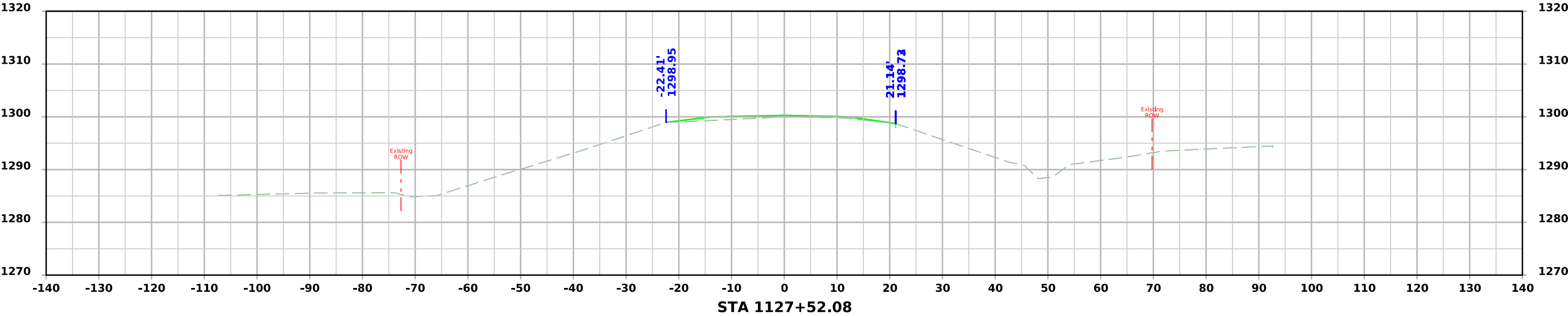
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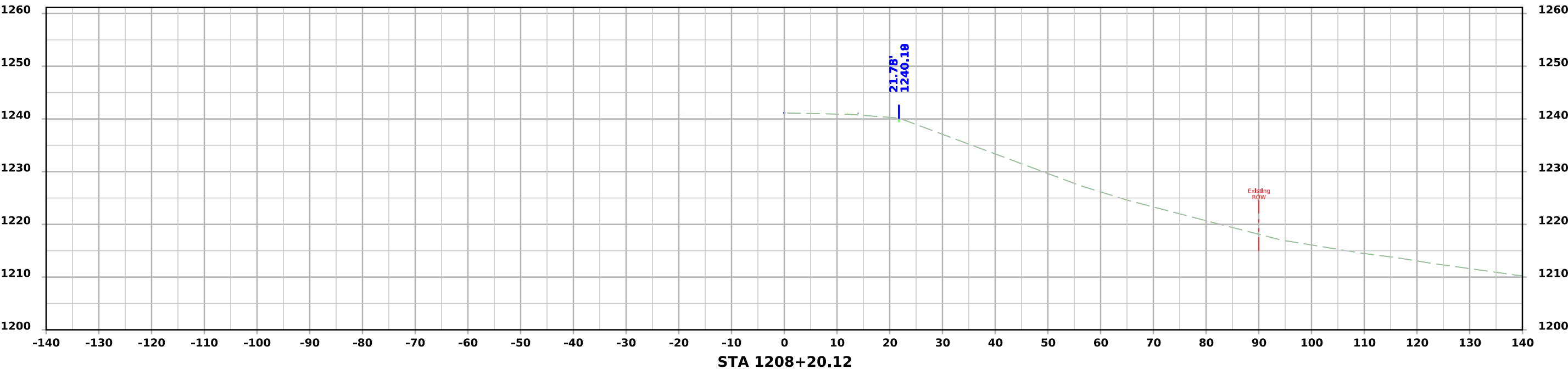
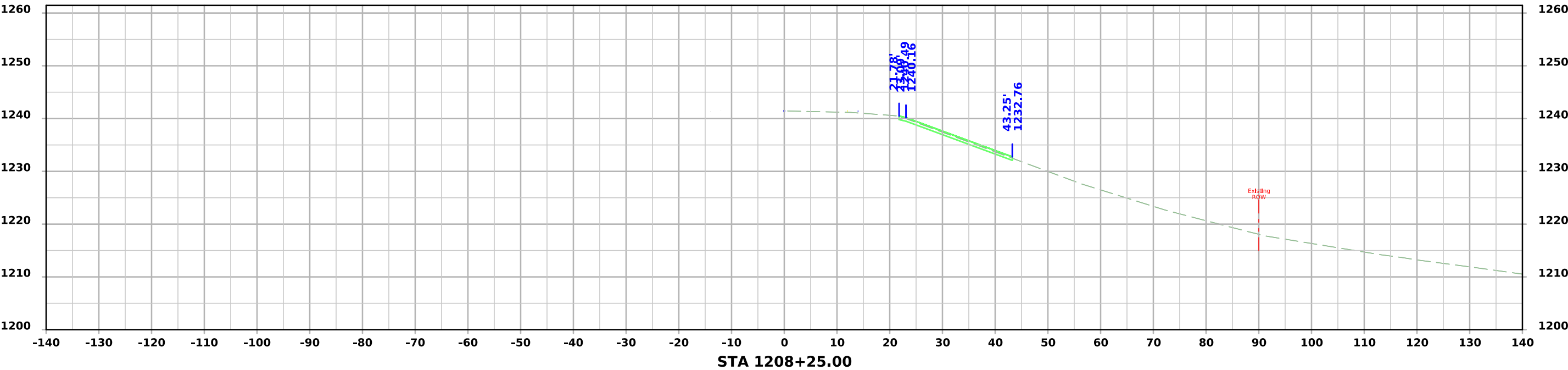
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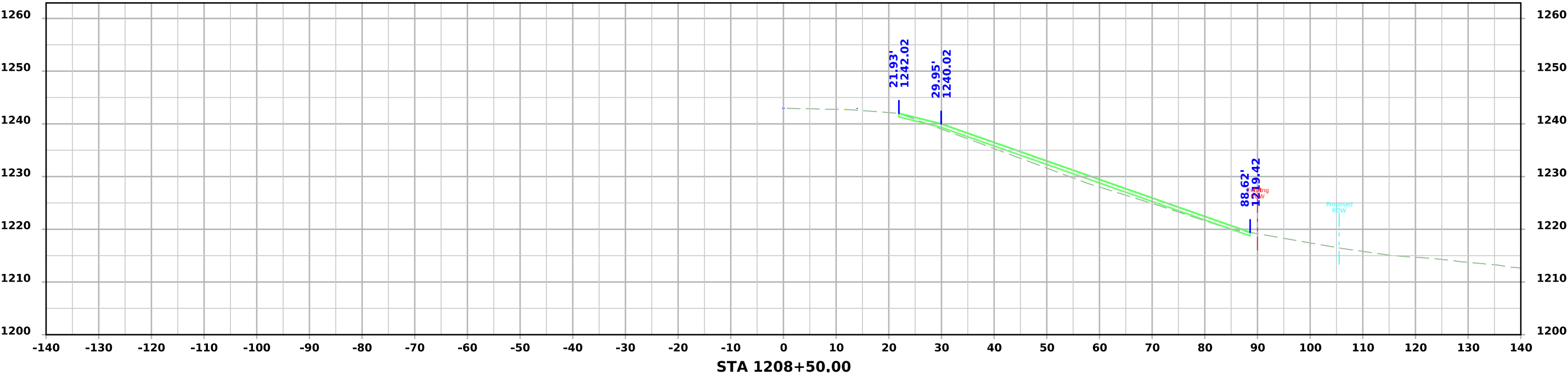
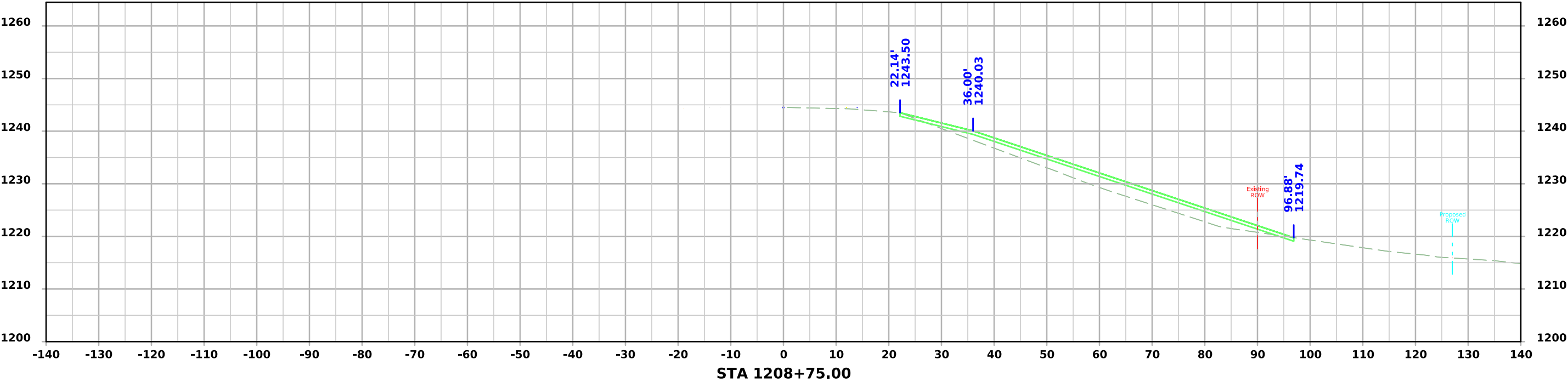
ML- IA 31



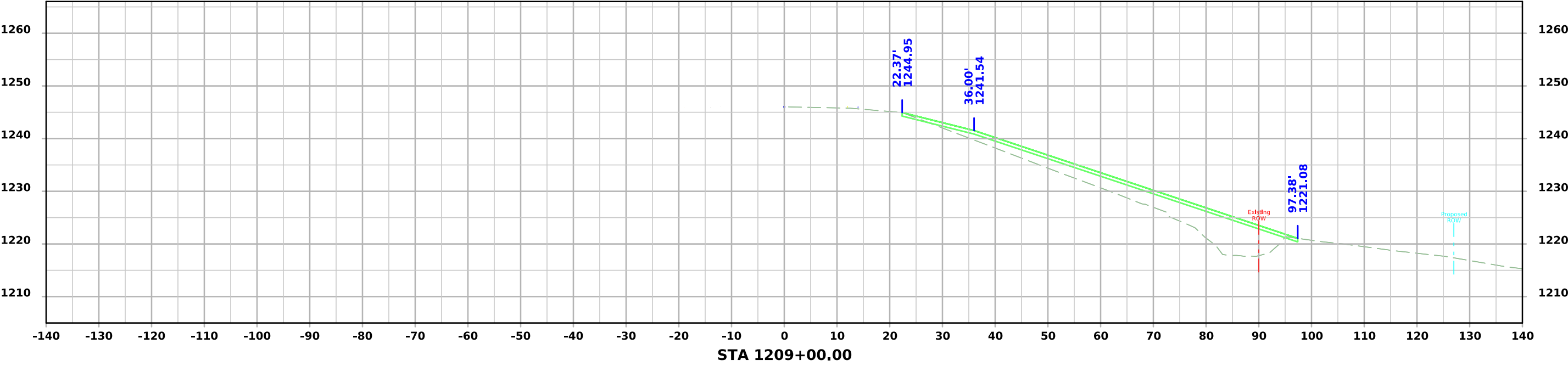
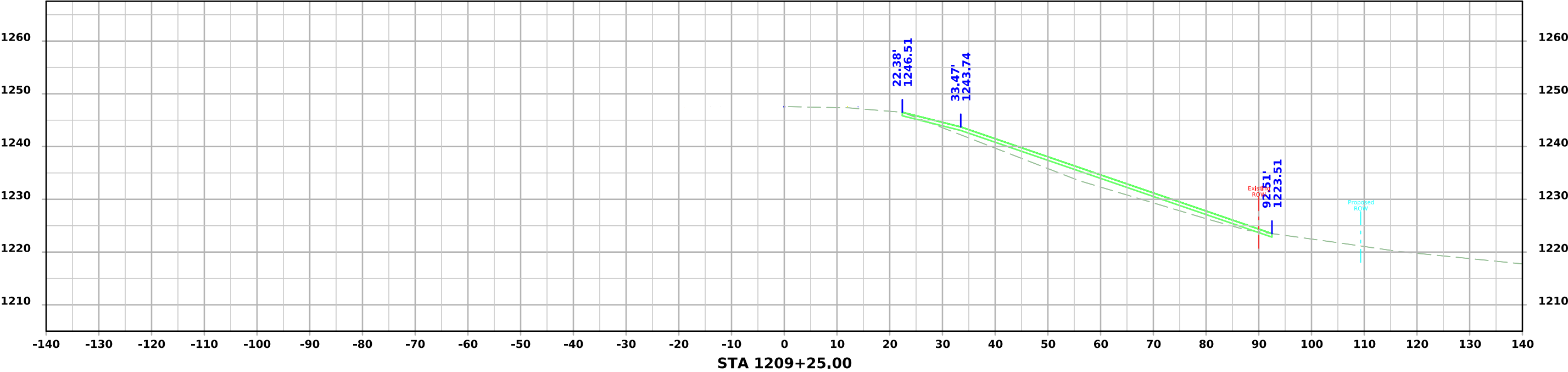
ML- IA 31



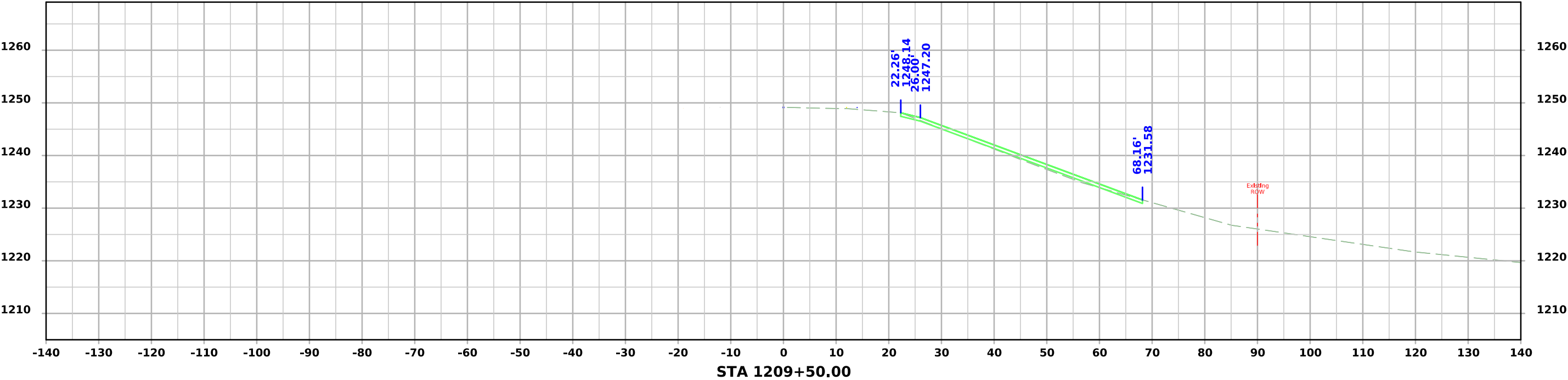
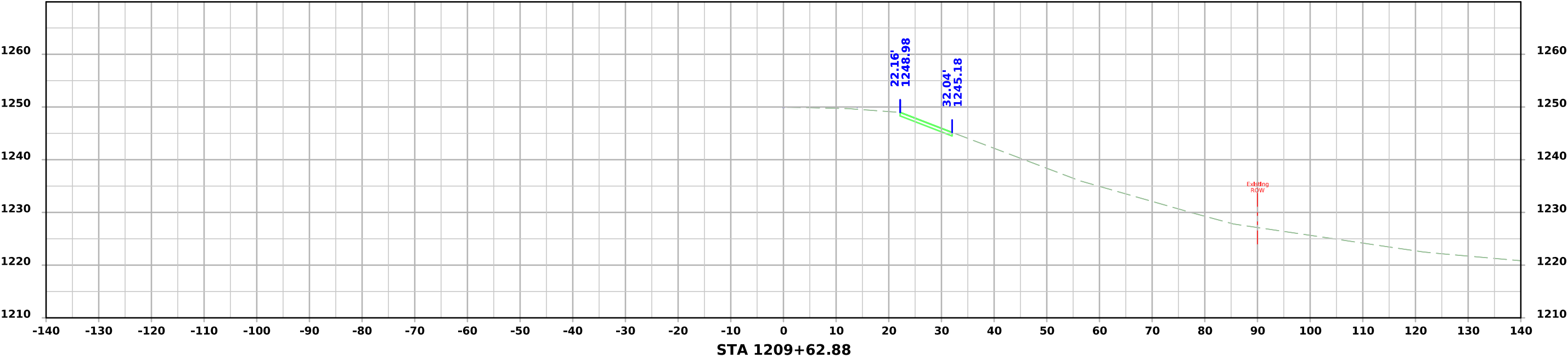
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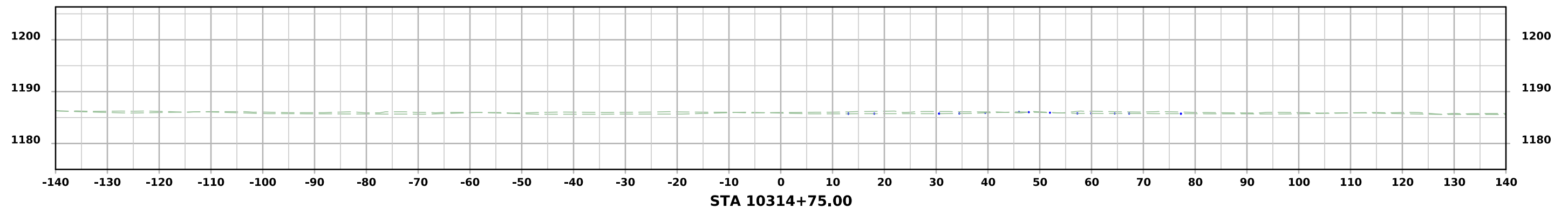
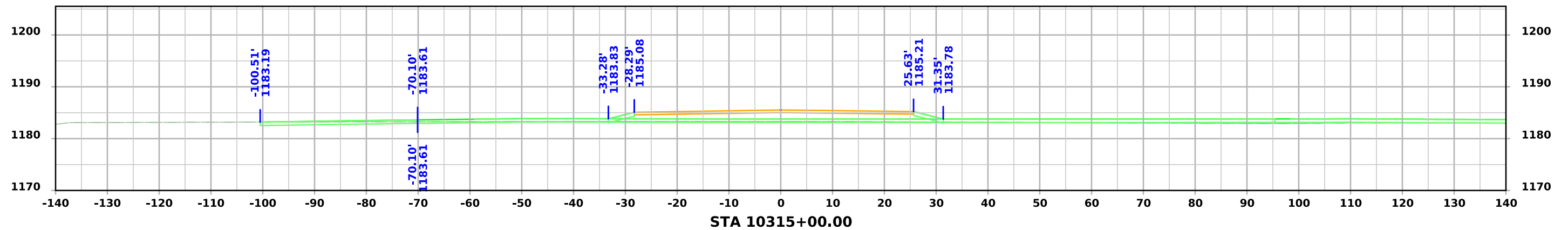
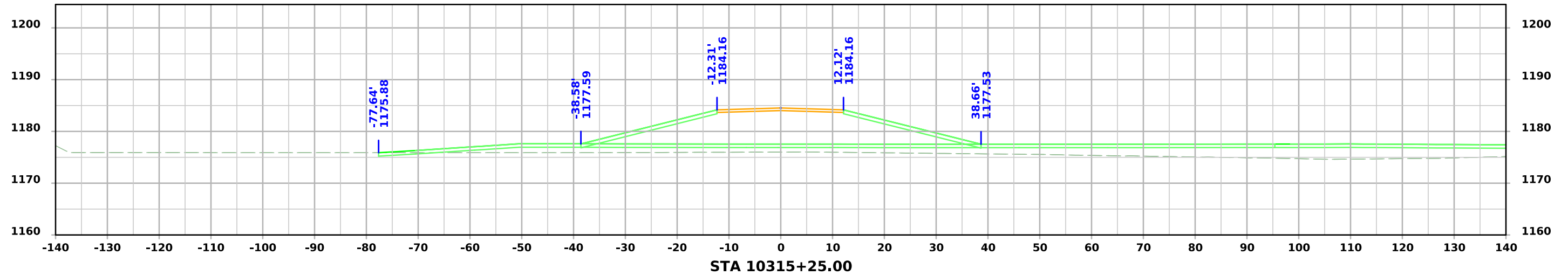
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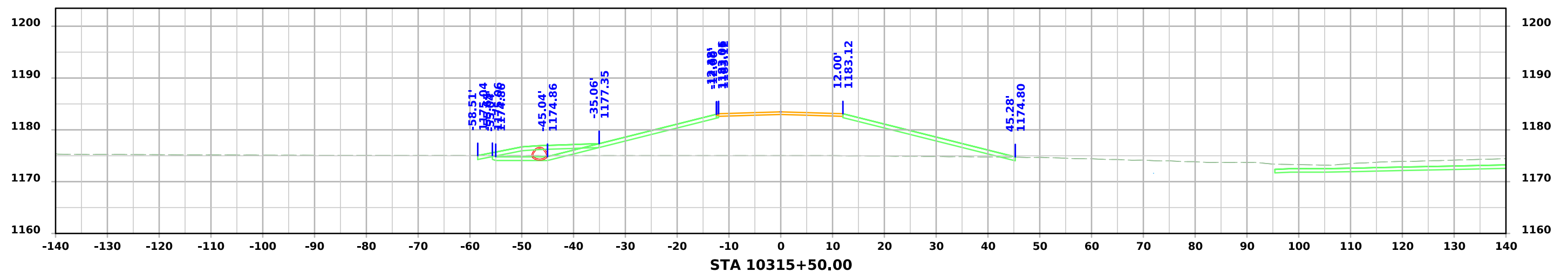
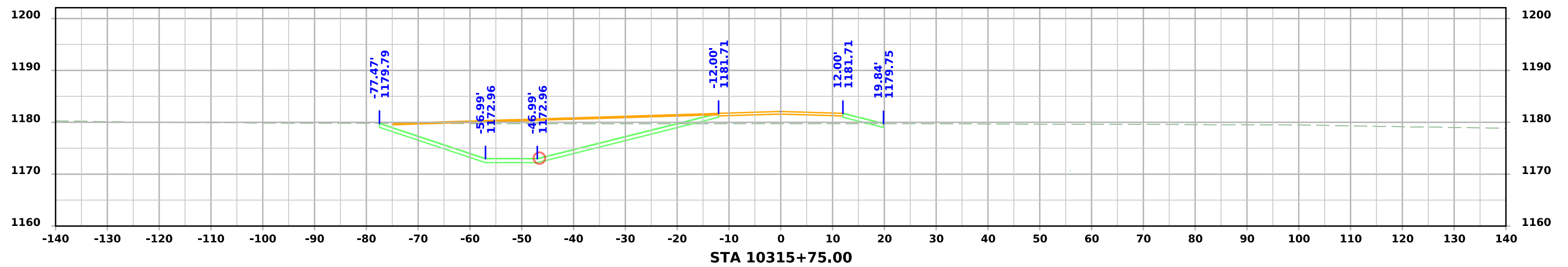
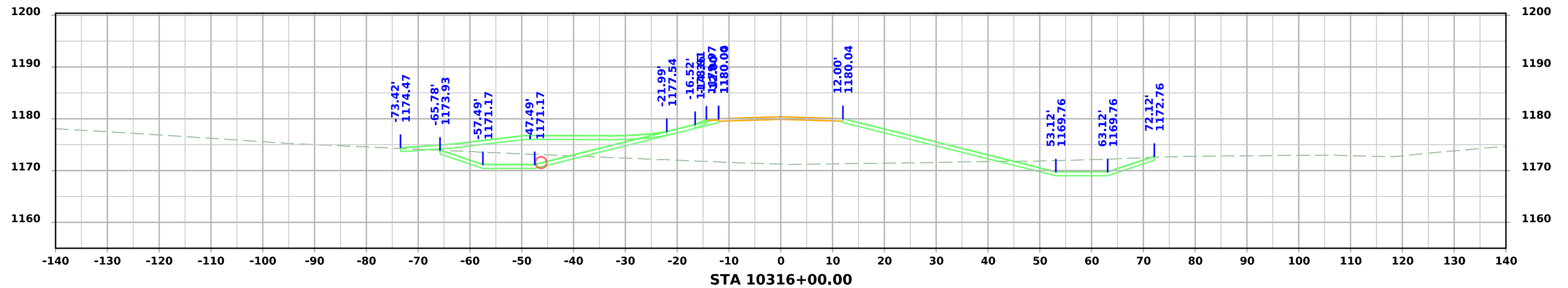
ML- IA 31



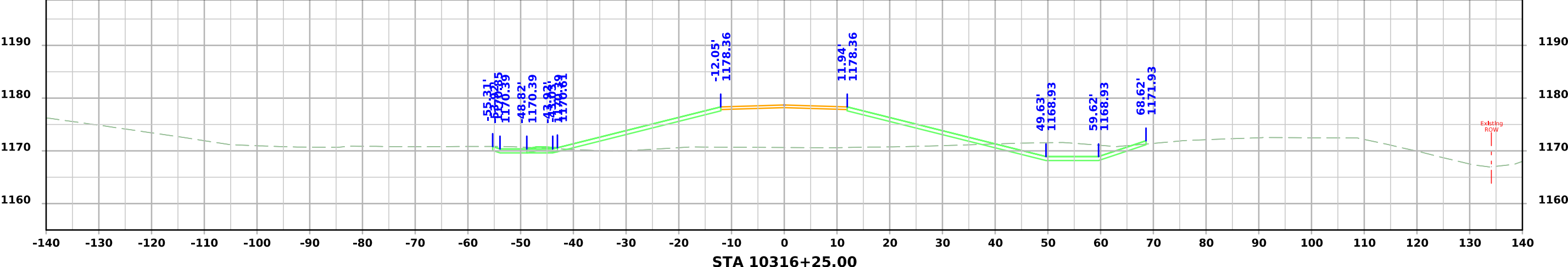
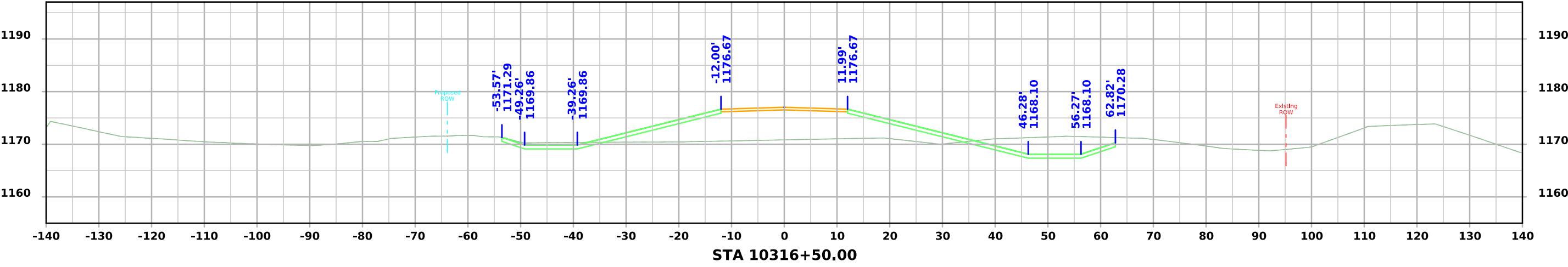
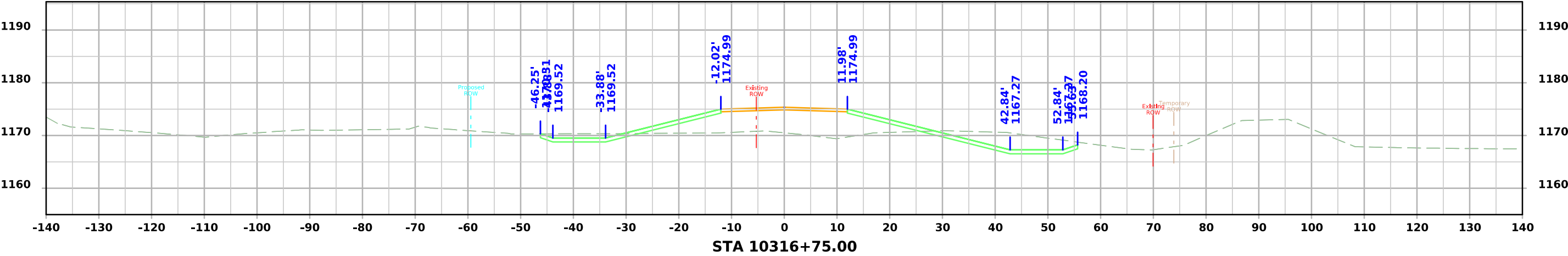
SR - E 4th Ave



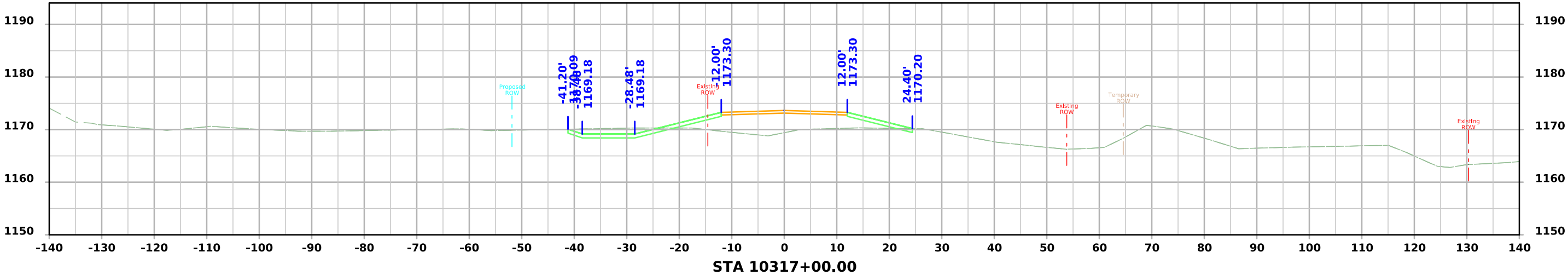
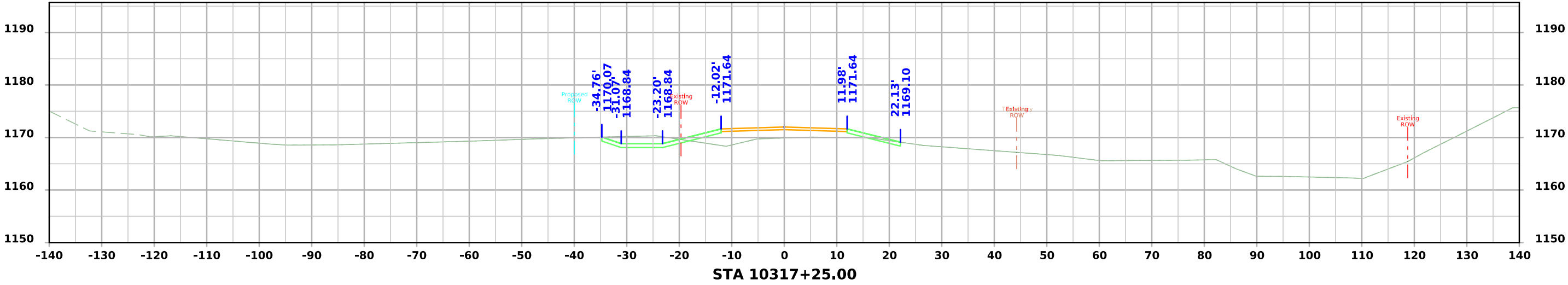
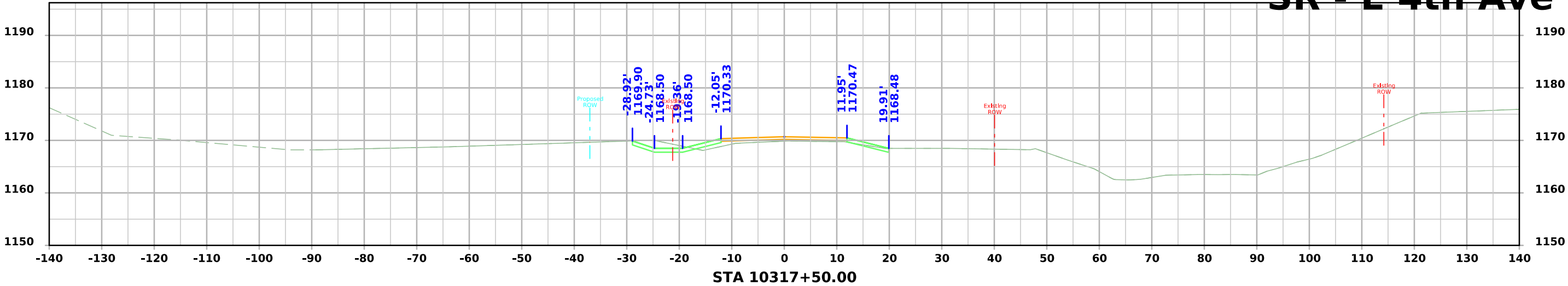
SR - E 4th Ave



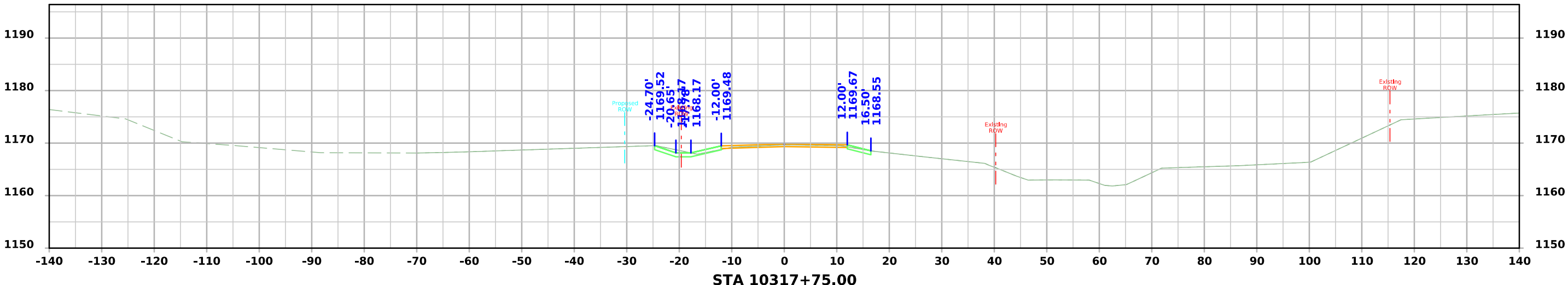
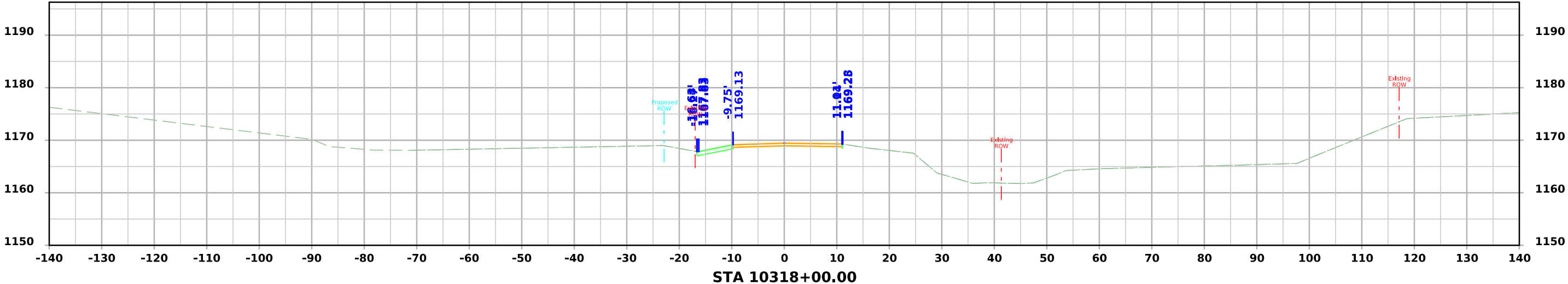
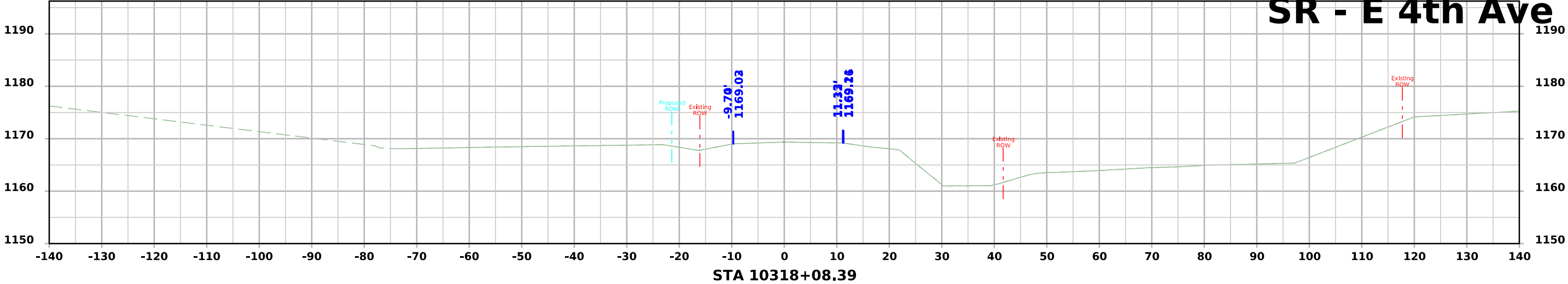
SR - E 4th Ave



SR - E 4th Ave



SR - E 4th Ave



SR - Entrance

