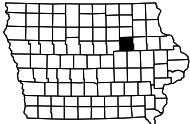


BLACK HAWK COUNTY

BRIDGE REPLACEMENT
BRF-281-1(052)--38-07

LETTING DATE
12-15-2026



PLANS OF PROPOSED IMPROVEMENT ON THE
PRIMARY ROAD SYSTEM
BLACK HAWK COUNTY
BRIDGE REPLACEMENT
Elk Run Creek 0.3 mi E of Co Rd V43

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

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



For Project Location Map
Refer to Sheet No. A.2

DESIGN DATA RURAL				
2027	AADT	1,133	V.P.D.	
2047	AADT	1,280	V.P.D.	
2047	DHV	132	V.P.H.	
	TRUCKS	9	%	
Total				
Design ESALs		277,590		

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

PRELIMINARY PLANS

Subject to change by final design.

D5 PLAN - Date: 03-25-2026

REVISIONS

TOTAL

..

PROJECT IDENTIFICATION NUMBER

22-07-281-010

PROJECT NUMBER

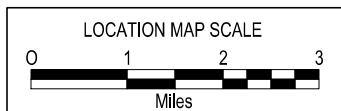
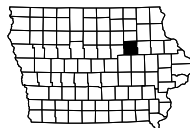
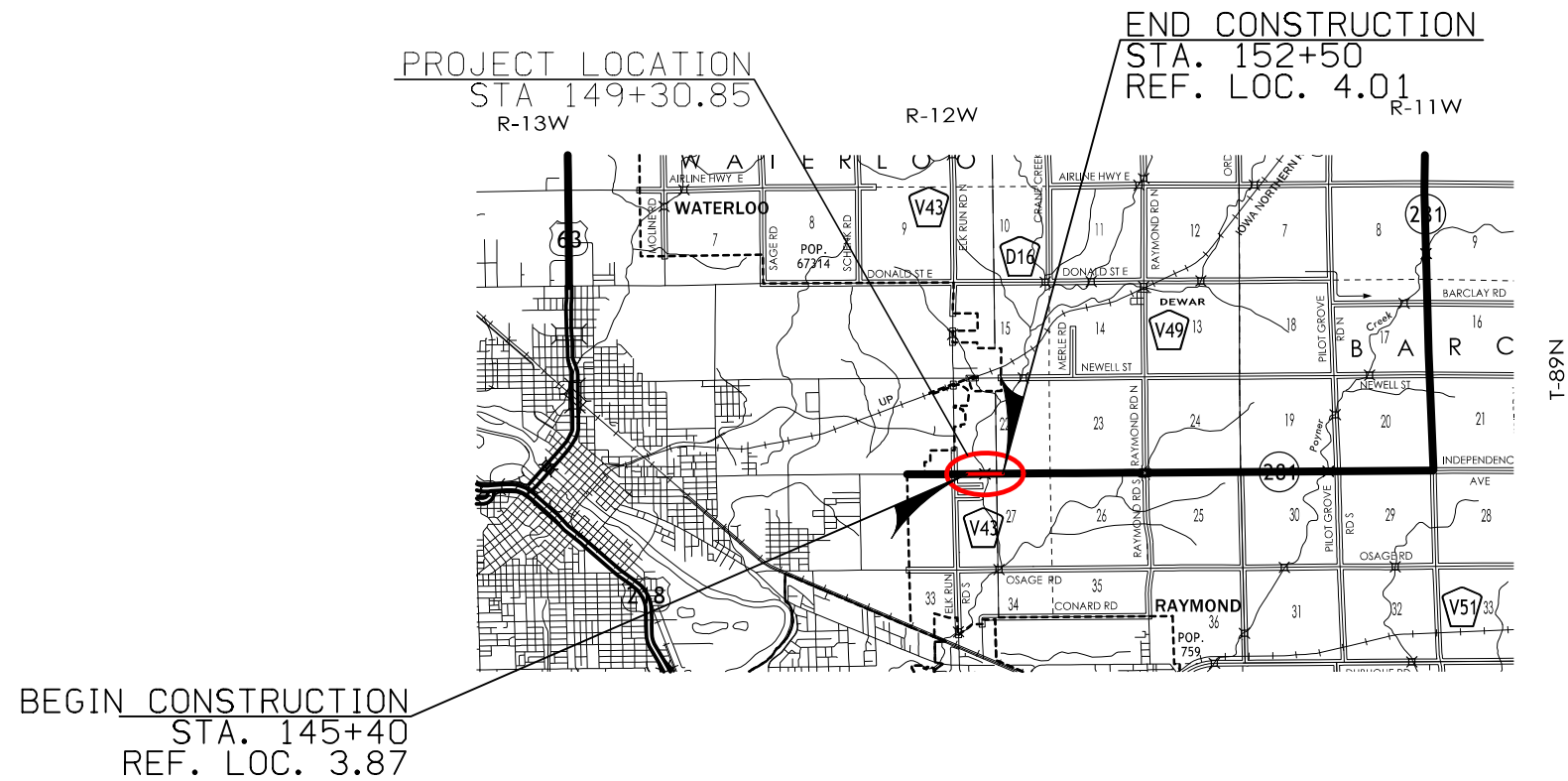
BRF-281-1(052)--38-07

R.O.W. PROJECT NUMBER

STPN-281-1(053)--2J-07

INDEX OF SHEETS

No.	DESCRIPTION
A Sheets	Title Sheets
A.1	Title Sheet
A.2	Location Map Sheet
B Sheets	Typical Cross Sections and Details
* B.1 - 4	Typical Cross Sections and Details
D Sheets	Mainline Plan and Profile Sheets
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2	IA 281 Plan / Profile Sheets
G Sheets	Survey Sheets
* G.1 - 3	Reference Ties and Bench Marks
J Sheets	Traffic Control and Staging Sheets
J.1	Traffic Control Plan
J.1	511 Travel Restrictions
J.1	Staging Notes
J.1	Coordinated Operations
* J.101 - 102	Detour Route
L Sheets	Geometric, Staking and Jointing Sheets
L.1	Geometric & Staking IA 281
V Sheets	Bridge and Culvert Situation Plans
V.1 - 2	Bridge and Culvert Situation Plans
W Sheets	Mainline Cross Sections
W.1 - 7	Mainline Cross Sections
X Sheets	Culvert Cross Sections
X.1 - 3	Culvert Cross Sections
	* Color Plan Sheets

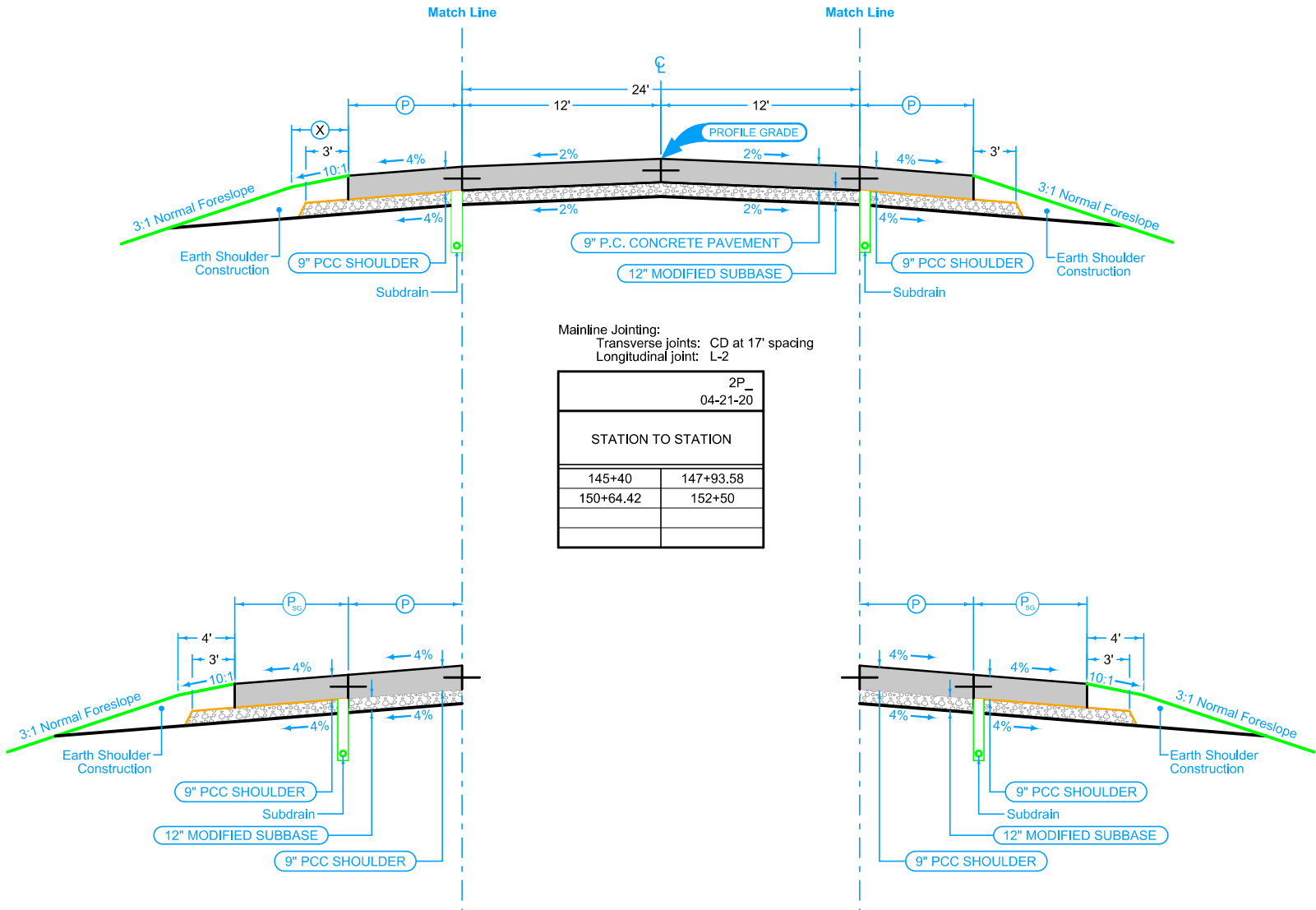


Paved Shoulder

2_G_SR_04-21-20			
STATION TO STATION		(P) Feet	(X) Feet
145+40	147+12	4	0
151+46	152+50	4	4

Paved Shoulder

2_G_SR_04-21-20		
STATION TO STATION		(G) Feet
145+40	146+85	4
151+80	152+50	4



Paved Shoulder at Guardrail

PCC Shoulder Jointing:
Longitudinal joint: BT-1 or BT-5
Transverse joints: C at mainline spacing

2_P_Guard_04-21-20			
STATION TO STATION		(P) Feet	(P _{sg}) Feet Feet
147+12	147+93.58	8	See Detail 7158-M for Details
150+64.42	151+46	8	See Detail 7158-M for Details

Paved Shoulder at Guardrail

PCC Shoulder Jointing:
Longitudinal joint: BT-1 or BT-5
Transverse joints: C at mainline spacing

2_P_Guard_04-21-20			
STATION TO STATION		(P) Feet	(P _{sg}) Feet Feet
146+85	147+93.58	8	See Detail 7158-M for Details
150+64.42	151+80	8	See Detail 7158-M for Details

See Tab 100-24 or 100-25 for pavement quantities.

See Tab 112-9 for shoulder quantities.

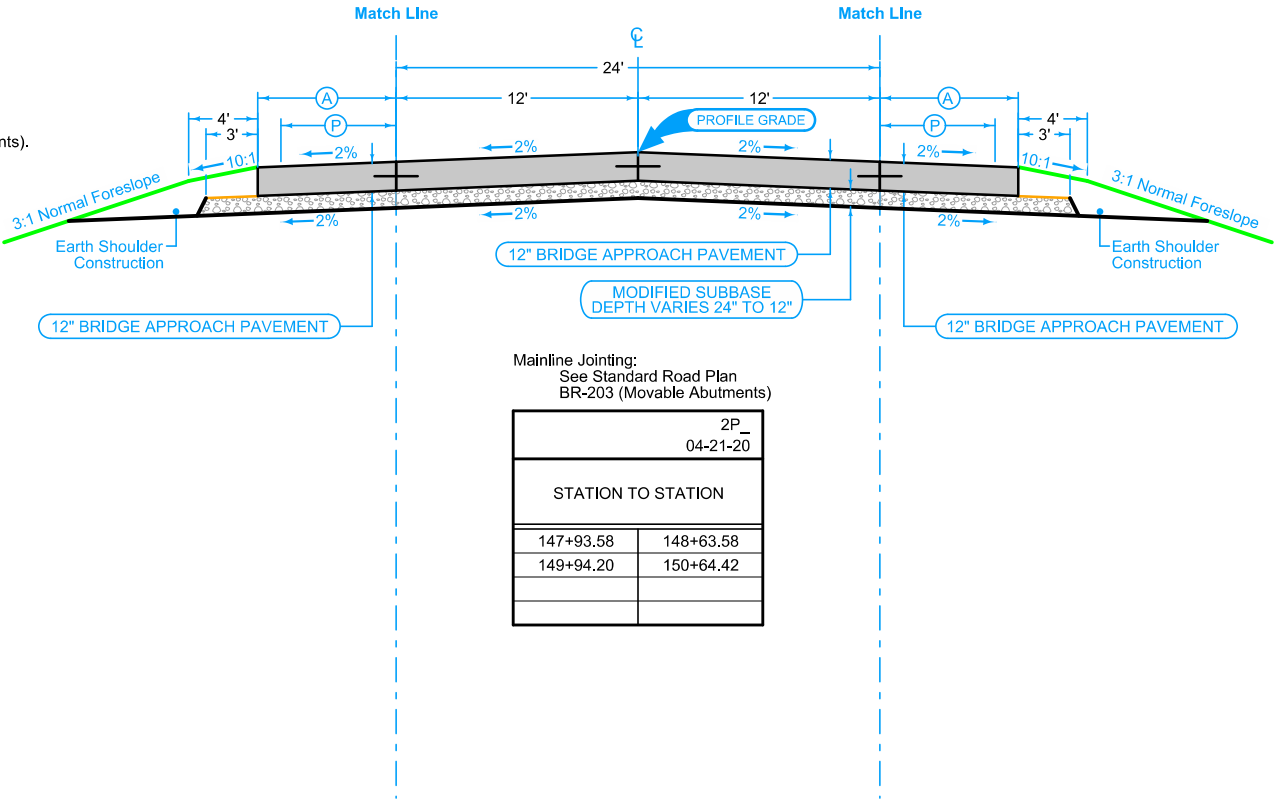
IA 281

Mainline, Paved Shoulder,
and Paved Shoulder at Guardrail

Shoulder at Bridge Approach

Mainline Jointing:
See Standard Road Plan BR-203 (Movable Abutments).

2_P_FullIPCC_04-20-21			
STATION TO STATION		P Feet	A Feet
147+93.58	148+63.58	8	9.58
149+94.20	150+64.42	8	9.58



Mainline Jointing:
See Standard Road Plan
BR-203 (Movable Abutments)

2P_04-21-20	
STATION TO STATION	
147+93.58	148+63.58
149+94.20	150+64.42

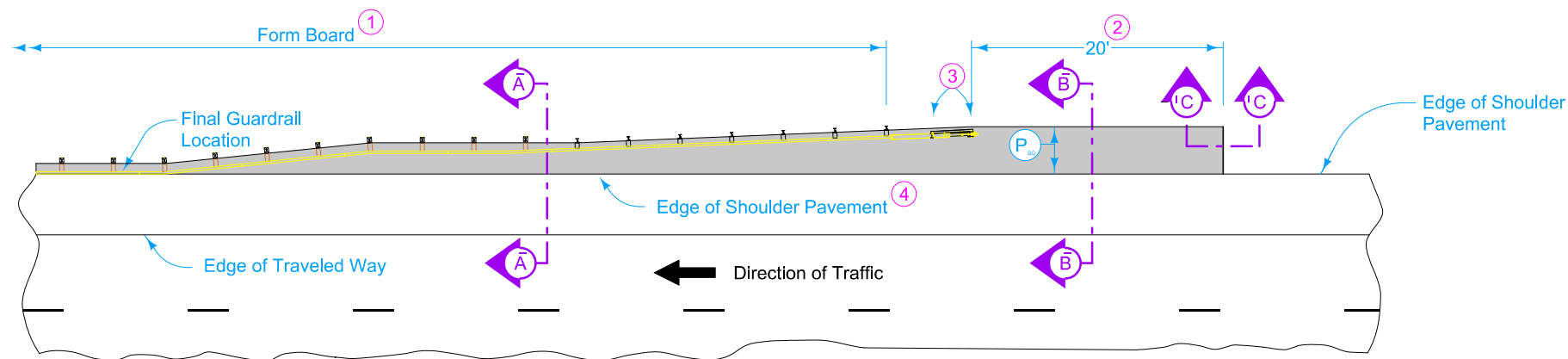
Shoulder at Bridge Approach

Mainline Jointing:
See Standard Road Plan BR-203 (Movable Abutments).

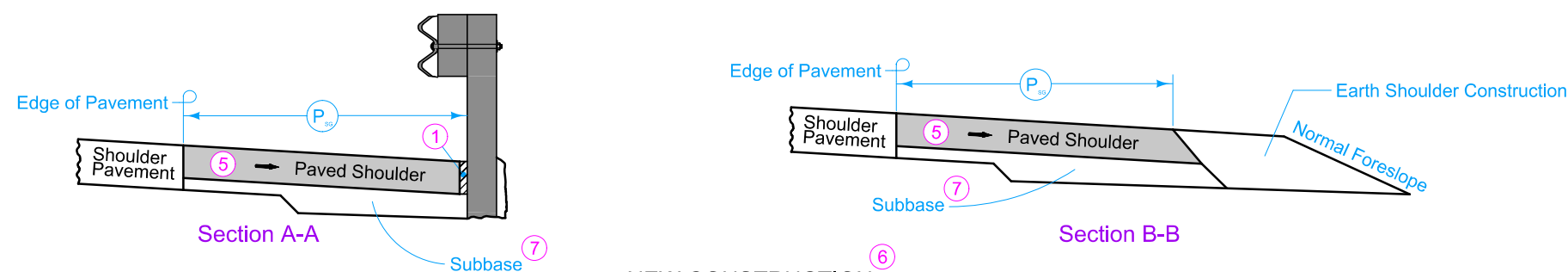
2_P_FullIPCC_04-20-21			
STATION TO STATION		P Feet	A Feet
147+93.58	148+63.58	8	9.58
149+94.20	150+64.42	8	9.58

See Tab 112-6 for Bridge Approach Pavement quantities.
See Standard Road Plan BR-203 (Movable Abutment) for details.

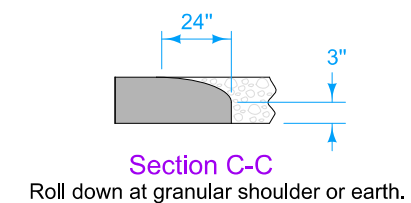
IA 281
Bridge Approach Pavement



PLAN VIEW



NEW CONSTRUCTION

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

7158-M
MODIFIED

9" PCC Paved Shoulder at Guardrail. See below for 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 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. Removal and installation of guardrail will be allowed with no additional payment if disrupted during pavement installation.
- 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 full width paved shoulder as one operation.
- ⑦ Refer to other details in the plan.

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

TL1D, Lumen Tech. (CenturyLink) - Quality D
Sadie Hull
(918) 547-0147
sadie.hull@lumen.com

GL1D, MidAmerican Engery Gas - Quality D
Jordyn Weber
(319) 291-4728
jlweber@midamerican.com

PPA, MidAmerican Energy Electric
Jordyn Weber
(319) 291-4728
jlweber@midamerican.com

The following utilities were marked 'CLEAR' by Survey and are hereby provided for information purposes:

MEDIACOM
Scott Lagow
(845) 544-9655
clagow@mediacomcc.com

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

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

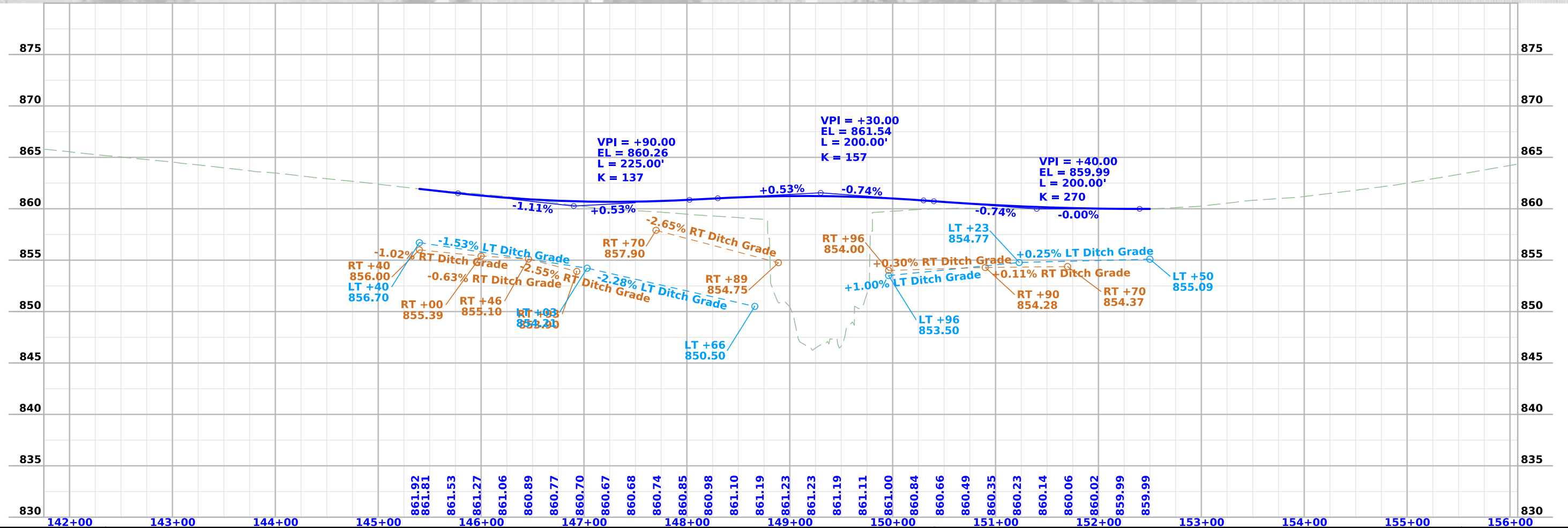
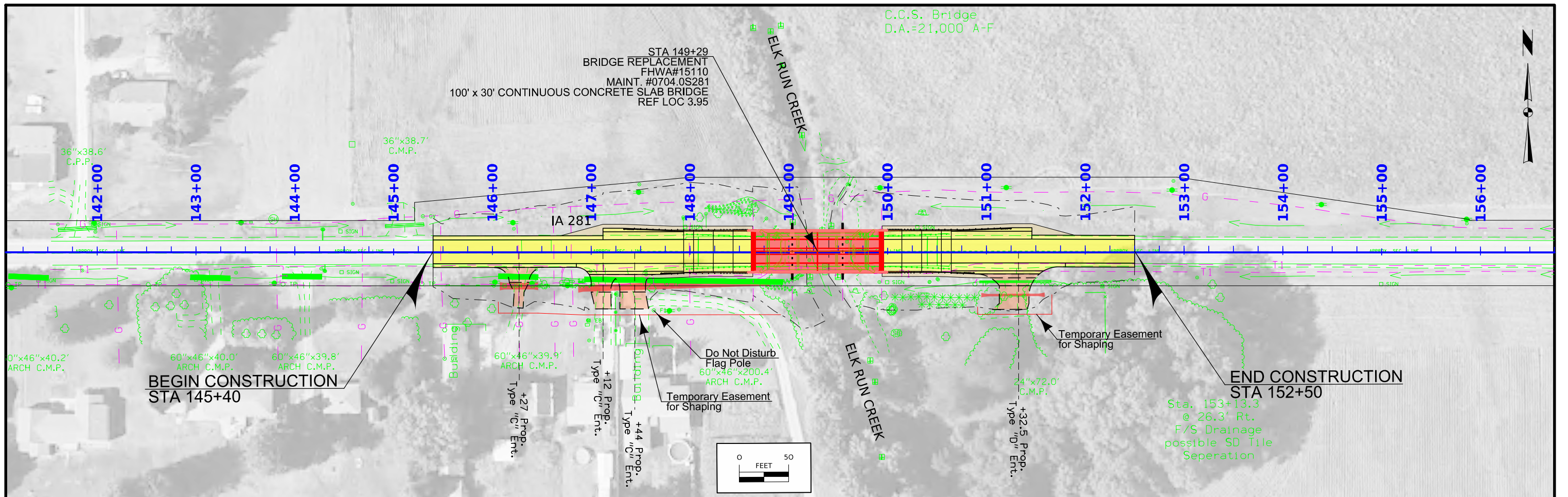
	Survey Line
	Section Corner
	Ground Line Intercept
	Saw Cut
	Guardrail
	Trench Drain
	HighTension Cable Guardrail
	Sheet Pile
	Pavement Removal
	Clearing & Grubbing Area

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)



Survey Information

SURVEY INDEX

County : Black Hawk
Project Code : 22-07-281-010
Phase Number : BRF-281-1(052)--38-07
Location : Elk Run Creek 0.3 mi E of Co Rd V43
Work Code : 2022-Bridge Replacement-CCS
Project Directory : 0728101022

Survey Personnel

Geoff Tinker – Survey Party Chief (Sr. Land Surveyor)
Kokou Allade – Assistant Survey Party Chief

Date(s) of Survey

Begin Date 04/02/2025
End Date 05/12/2025

General Information

This project is a Full DTM Field Survey along IA 281 for Elk Run Creek Bridge at 0.3mi. East of County Road V43.

Utility Information

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

Project Control

Coordinates were determined for primary project control points by conducting concurrent six-hour static observations, comprised of One (1) Static Session. Post processing was constrained to Iowa Real Time Network reference station “Waterloo” (IAWA) and checked upon station “Independence” (IAIN). For additional details of the control survey, contact the Preliminary Survey department.

PROJECT DATUM: NAD83(2011) for EPOCH 2010.00 (IaRTN 2019 ADJUSTMENT)
COORDINATE SYSTEM: IOWA REGIONAL COORDINATE SYSTEM ZONE 5
(U.S. SURVEY FOOT)
VERTICAL DATUM: NAVD88
GEOID MODEL: 2018u3

Alignment Information

The horizontal alignment for Iowa Hwy. 281 is a retracement of 1955 As-built Plans No. FN-62 (Doc. ID 615696), together with Centerline Description in Easement for Public Highway per Black Hawk County WD Bk. 116 p155 filed Aug. 15th, 1955. Survey stationing was equated to the plan BOP Sta. 132+38.70 at the Northwest (NW.) Corner of Section 27-T89N-R12W and carried ahead to East without equation throughout the survey.

Survey stationing relates to As-built plan stationing “and” Easement for Public Highway Centerline description as follows:

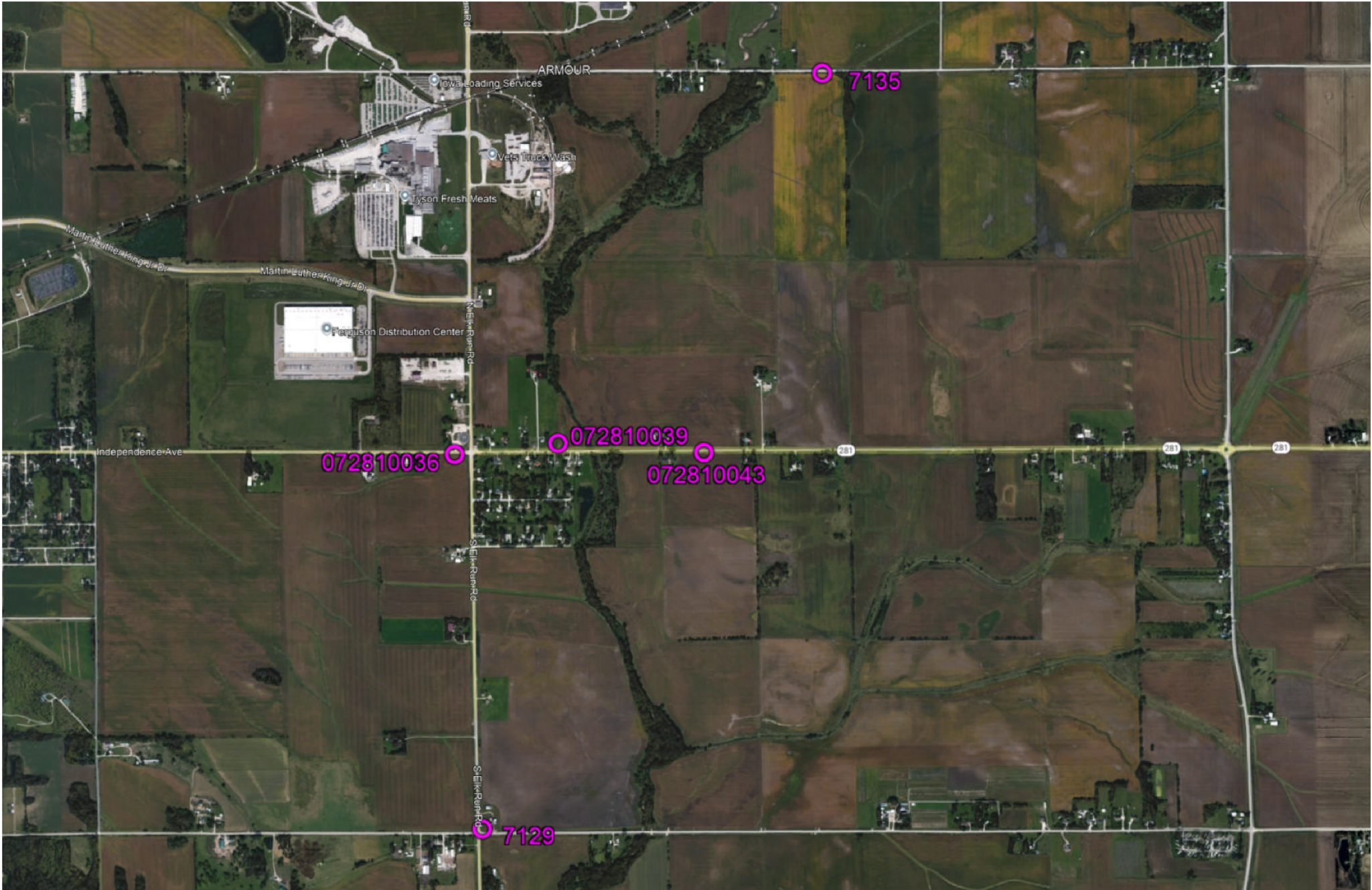
PI Sta. 132+38.7 As-built Plans Project No. FN-62 (vs. WD Bk.116 p155 = 132+39)
Survey PI 132+38.70 = NW. Corner Sect. 27-T89N-R12W

PI Sta. 151+44.60 As-built Plans Project No. FN-62 and WD Bk.116 p155
Survey PI Sta. 151+44.60 at 2.1ft. North of North line NW. 1/4 Sect. 27-T89N-R12W
Defl. 0°13’39” RT. (Calc.) vs. 0°13’30” RT. (FN-62 Plans)

PI Sta. “Unspecified” in As-built Plans Project No. FN-62
PI Sta. 158+76.0 per WD Bk.116 p155 Easement for Public Highway Centerline
Survey PI Sta. 158+76.96 = North 1/4 Corner Sect. 27-T89N-R12W

CONTROL POINT VICINITY MAP

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



HORIZ. DATUM: NAD83(2011) for EPOCH 2010.00 (IaRTN 2019 Adjustment) - Iowa RCS Zone 05 (U.S. Survey Foot)

VERT. DATUM: NAVD88 - Geoid Model: 2018u3

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

HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING
HORIZ. DATUM: NAD83(2011) for EPOCH 2010.00 (IaRTN 2019 Adjustment)
Ia. Regional Coordinate System Zone 05 (U.S. Survey Foot)
VERT. DATUM: NAVD88
Geoid Model: 2018u3

PointName	Northing	Easting	Elevation	Code-Description
7129	8839396.50	15497711.19	854.21	CP Fnd. CCP Berntsen 6ft. L. Rod Mon. w/ Cap under Access Cover flush w/ Ground at Black Hawk County GPS Network CP #94-129 per County Tie Sheet details
7135	8849887.14	15502594.03	870.33	CP Fnd. CCP Berntsen 6ft. L. Rod Mon. w/ Cap under Access Cover flush w/ Ground at Black Hawk County GPS Network CP #94-135 per County Tie Sheet details.
72810036	8844622.17	15497373.92	874.25	FENO SET 1m. L. FENO Mon. -3in. Dp. located about 235ft. West of CL Intersection IA Hwy. 281 and Elk Run Road at 35.3ft. South of CL IA281 (Independence Ave.); and 2.3ft. East of Sta. 130 Sign; and 23.1ft. South of Edge HMA Pavement; and 35.5ft. East/SE. of Phone Ped.; and 6ft. North of Field Edge
72810039	8844759.47	15498830.01	859.29	FENO SET 1m. L. FENO Mon. -6in. Dp. located about 1222ft. East of CL Intersection IA Hwy. 281 and Elk Run Road at 109ft. North of CL IA281 (Independence Ave.); and 60ft. North of Wood Fence Post (w/o Fence); and 89.3ft. NW. of Top West end CMP at Field Entrance; and 88.7ft. North/NE. of Stop Ahead Sign; and 144ft. North/NW. of Sta. 145 Sign at South side IA281.
72810043	8844605.07	15500869.90	871.15	FENO SET 1m. L. FENO Mon. -6in. Dp. located about 3260ft. East of CL Intersection IA Hwy. 281 and Elk Run Road at 34.6ft. South of CL IA281 (Independence Ave.); and 1.7ft. South of Sta. 165 Sign; and 85.7ft. SW. of Power Pole at North side IA281; and 5.3ft. North of Field Edge.

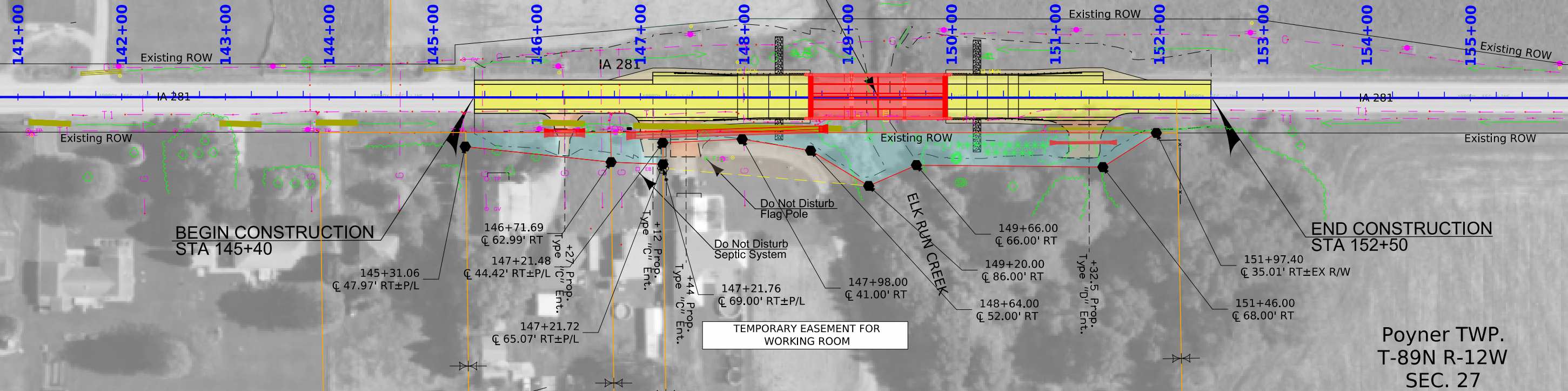
NO ACCESS RIGHTS ARE TO BE ACQUIRED ON THIS PROJECT.

Poyner TWP.
T-89N R-12W
SEC. 22

Eugene W Etringer
Sandra K Etringer

STA 149+29
BRIDGE REPLACEMENT
FHWA#15110
MAINT. #0704.0S281
100' x 30' CONTINUOUS CONCRETE
SLAB BRIDGE
REF LOC 3.95

ELK RUN CREEK



BEGIN CONSTRUCTION
STA 145+40

END CONSTRUCTION
STA 152+50

Poyner TWP.
T-89N R-12W
SEC. 27

Harold Nichols
CP: Jerry R Jacobsen
CP: Sabrina J Martin

Mariah A Porter

Michael J Kugler

Right of Way Design Information	
THIS SHEET INCLUDED FOR INFORMATION ONLY	
ROW Team: Fredrickson / Hinrichsen	
ROW #: STPN-281-1(053)--2J-07	
Plan Date: 2/20/2026	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition
	Permanent Acquisition County
	Permanent Acquisition City

108-23A
08-01-08

TRAFFIC CONTROL PLAN

IA 281:

A. Route will be closed during construction. Contractor shall install hard closure at MP 3.95 on IA 281, per TC-252.

B. Access to all properties shall be maintained at all times.

C. Offsite detour will be provided and installed by the Contractor. Refer to J.101-J.102 for detour.

Contractor shall contact Kip Siems, Waterloo Highway Maintenance Supervisor, (319) 233-3055 a minimum of 10-days in advance of the closure for the coordination of the detour signing.

111-01
04-17-12

COORDINATED OPERATIONS

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

Project	Type of Work
To Be Determined	

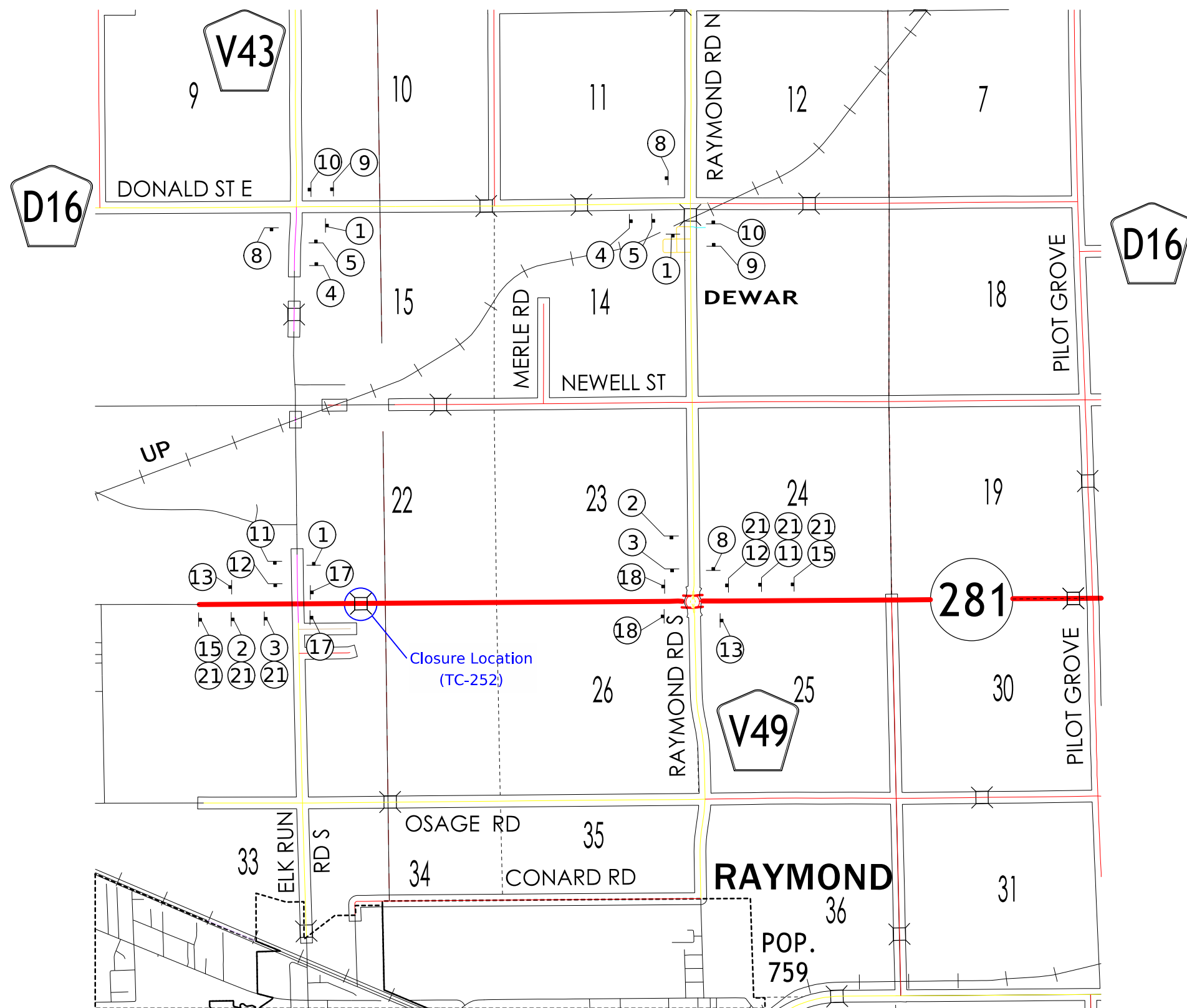
108-25
10-21-14

511 TRAVEL RESTRICTIONS												
Route	Direction	County	Location Description	Feature Crossed	Object Type	Maint. Bridge No., Structure ID, or FHWA No.	Type of Restriction	Existing Measurement	Construction Measurement	Construction Measurement as Signed	Projected As Built Measurement	Remarks
			No Travel Restrictions Expected									
												</

108-26A
08-01-08

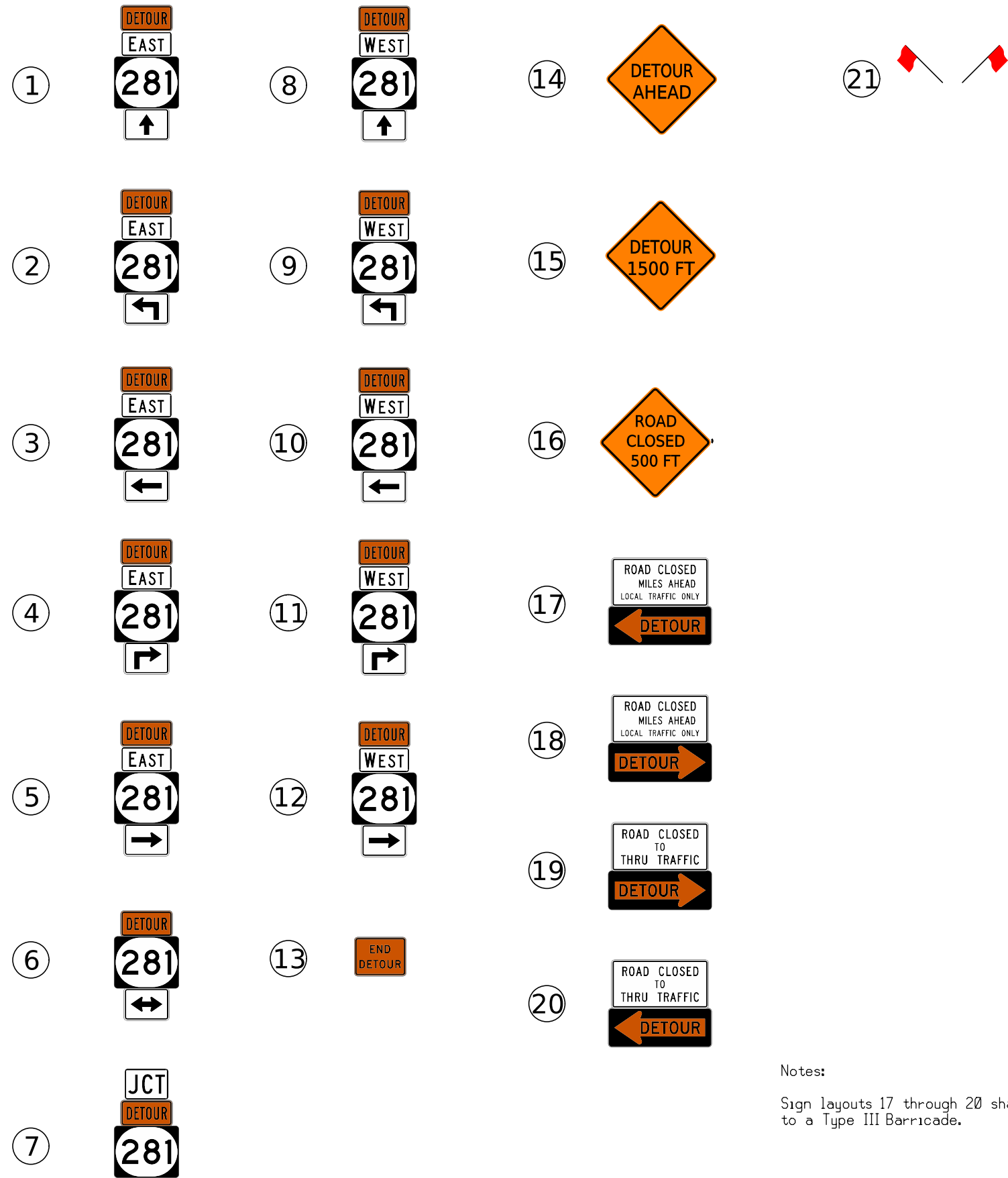
STAGING NOTES

A. (TO BE DETERMINED) shall be completed prior to closing IA 281 and initiating the detour.



Detour Route
Imagery & Sign Placement Not to Scale

DETOUR SIGNING LAYOUTS



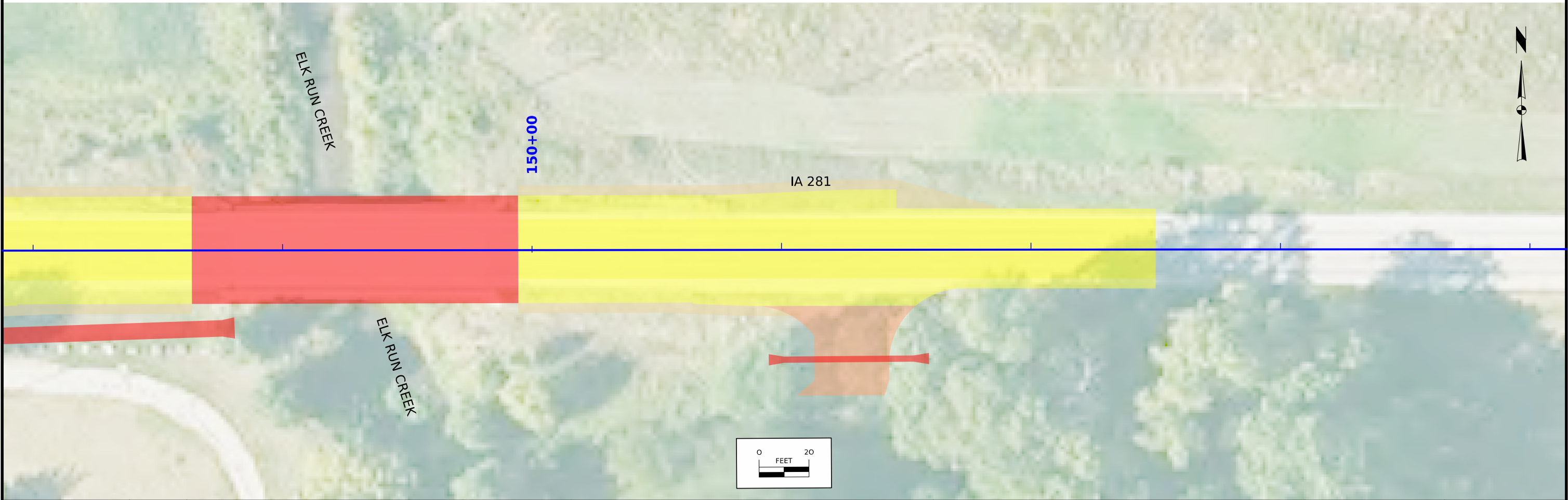
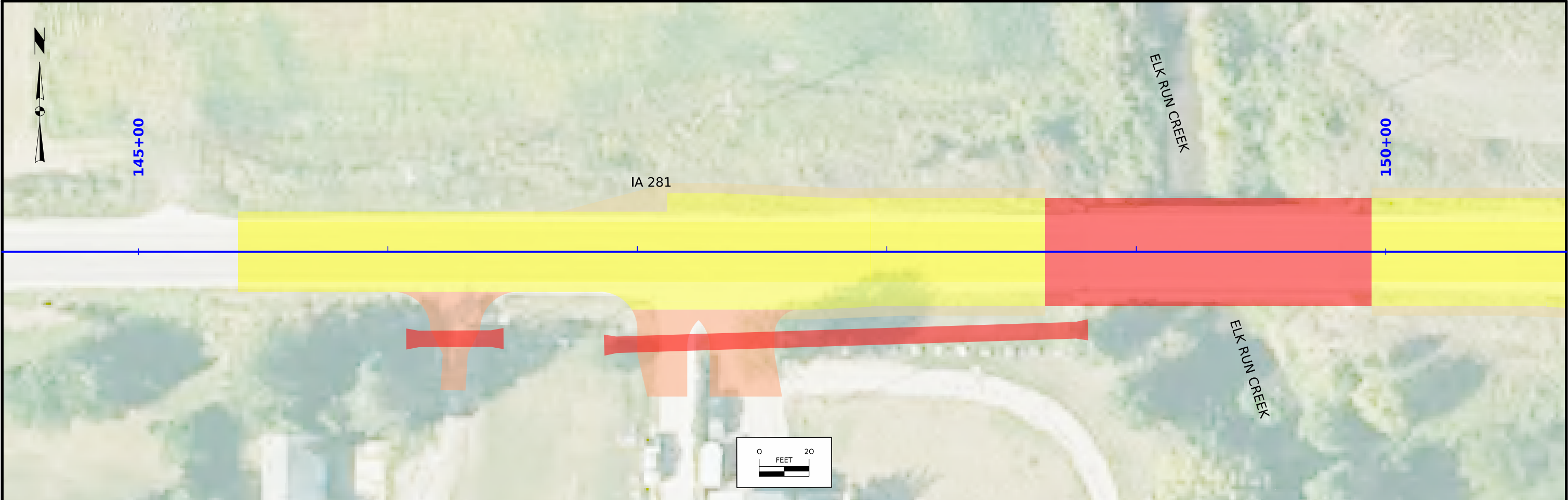
Notes:
Sign layouts 17 through 20 shall be attached to a Type III Barricade.

SIGN INVENTORY

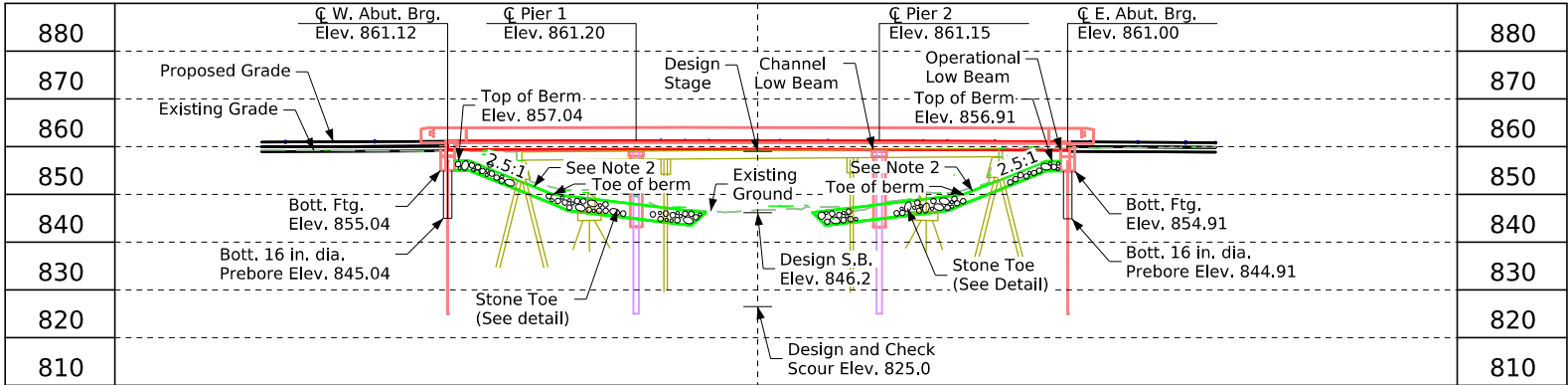
	MUTCD ID	Size		MUTCD ID	Size
	M2-1	21" x 15"		M5-1	21" x 15"
	M3-2	24" x 12"		M5-1B	21" x 15"
	M3-4	24" x 12"		M6-1	21" x 15"
	M3-1	24" x 12"		M6-3	21" x 15"
	M3-3	24" x 12"		M6-6	21" x 15"
	M4-8	12" x 6"		M6-6B	21" x 15"
	M1-5	24" x 24"		M6-4	21" x 15"
	M1-5	30" x 24"		M5-2	21" x 15"
	M1-4	24" x 24"		M5-2B	21" x 15"
	M1-4	30" x 24"		M6-2	21" x 15"
	M1-1	24" x 24"		M6-2B	21" x 15"
	M1-1	30" x 24"		W20-2	48" x 48"
	R11-4	60" x 30"		W20-2	48" x 48"
	R11-3A	60" x 30"		W20-3	48" x 48"
	M4-10	48" x 18"			
	M4-10	48" x 18"			
	M4-8A	24" x 18"			

High Level Warning Devices (Flag Trees) Refer to MUTCD 6F.62 for more information

Notes:
1) More sign types may be referenced in the sign inventory than are used in the detour layout. Refer to the specific layout for additional details.
2) When a detour is established for any Interstate route, all M2, M3, M4, M5, and M6 series signs must use the blue background with white legend. Refer to the MUTCD Standard Highway Signs book for more information.
3) Route shields (M1-1, M1-4, M1-5) used for the detour signage must match that of the route that is being detoured. No substitutions will be allowed.

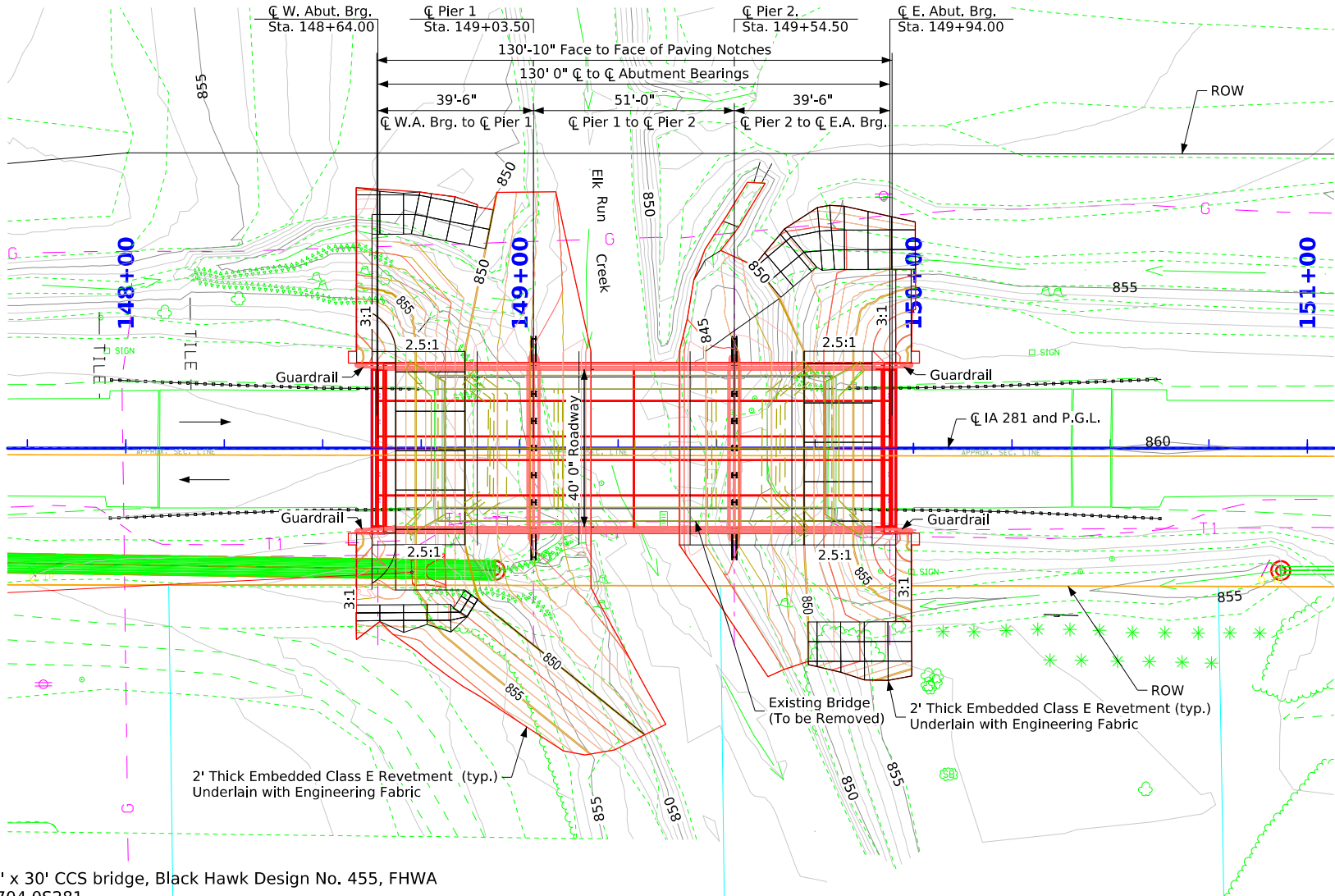


Control Point: 72810039 Northing 8844759.47, Easting 15498830.01, Elev. 859.29 FENO SET 1m.L FENO Mon. -6in. Dp. located about 1222ft. East of CL Intersection IA Hwy 281 and Elk Run Road at 109ft North of CL IA 281 (Independence Ave.); and 60 ft. North of Wood Fence Post (w/o Fence); and 89.3ft. NW. of Top West end CMP at Field Entrance; and 88.7ft. North/NE of Stop Ahead Sign; and 144ft. North/NW of Sta. 145 Sign at South side IA 281.



BRG TSL Longitudinal Section Along CL Approach Roadway

- Notes:
- Top of slab at centerline roadway is 0.03' below profile grade due to the parabolic crown.
 - Class E Revetment is embedded and underlain with engineering fabric. Typical thickness is 2', except at the key-ins and bridge berm stone toe. See details.



Typical Bridge Section

Traffic Estimate

2027 AADT	1133 V.P.D.
2047 AADT	1280 V.P.D.
2047 DHV	132 V.P.H.
TRUCKS	9 %
Total	
Design ESALs	277,590

+0.5348 % -0.7417 %

VPI Sta. = 149+30.000 VC = 200.000'
VPI Elev. = 861.544

Proposed Profile Grade IA 281

Hydraulic Data

RIDB: ElkRun_Black_4.77
Drainage Area = 25.4 Sq. Mi.
Stream Slope (HGL) = 6.0 Ft./Mi.
Avg. Low Water Stage = 847.6

Operational Low Beam = 858.8
Channel Low Beam = 859.0

Q₂₅ = 5200 cfs
Stage = 858.0

Q₅₀ = QOT = 6390 cfs
Stage = 858.5
Operational Freeboard = 0.3 ft.
Avg. Bridge Velocity = 5.7 fps

Q₁₀₀ = 7550 cfs (Design)
Stage = 859.0
Operational Freeboard = -0.2 ft.
Backwater = 0.9 ft.
Avg. Bridge Velocity = 6.6 fps

Q₂₀₀ = 9770 cfs
Stage = 859.9
Calculated Design and Check Scour = 825.0
(Includes Adjustment for Pressure Flow)

Q₅₀₀ = 10,700 cfs
Stage = 860.2
Channel Freeboard = -1.2 ft.

Roadway Overtop 859.99
Sta. 152+50

Site is located within
Black Hawk County F.I.S., Dated 5-8-2024.
F.I.S. Datum = Project Datum.
F.I.S. Base Flood = 6500 cfs
used for no-rise information.

Location

IA 281 over Elk Run Creek
T-89N R-12W
Section 22 & 27
East Waterloo Township
Black Hawk County
FHWA No. 15111
Bridge Maint. No. 0704.05281
Latitude 42.498130°
Longitude -92.252594°

Preliminary

Design For 0 Degree Skew
130'-0" x 40'-0" Continuous
Concrete Slab Bridge

39'-6" End Spans 51'-0" Interior Span

Situation Plan

STA. 149+29.00 (IA 281) Turn-in Date: December 2025

Black Hawk County

IOWA DEPARTMENT OF TRANSPORTATION
Design No. 0127 Design Sheet No. 1 of 2 FHWA No. 15111

Utilities Note:

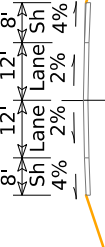
Utilities shown on this sheet are for information only. See Road Design sheets for utility information.

General Utility Symbols:

G - Gas Line
T1 - Telephone Line
- Power Poles

Situation Plan

Typical Approach Section



General Notes:

Remove existing structure 100' x 30' CCS bridge, Black Hawk Design No. 455, FHWA No. 15110, Maintenance No. 0704.05281.

Work under this design includes remove of the original 70' x 18' pony truss span bridge foundation remnants.

Abutments and piling to minimum elevation 848 or deeper as needed
Piers to the bottom footing elevations, approximate elevation 844.5.

The project will impact an Iowa Flood Center (IFC) sensor gage ELKRN01 for Elk Run Creek on Independence Ave (IA 281) near Waterloo. Contact the IFC 30 days prior to construction that may impact the sensor. IFC Contact: Breanna Shea 1-319-384-1729.

Control Point: 72810039 Northing 8844759.47, Easting 15498830.01, Elev. 859.29 FENO SET 1m.L FENO Mon. -6in. Dp. located about 1222ft. East of CL Intersection IA Hwy 281 and Elk Run Road at 109ft North of CL IA 281 (Independence Ave.); and 60 ft. North of Wood Fence Post (w/o Fence); and 89.3ft. NW. of Top West end CMP at Field Entrance; and 88.7ft. North/NE of Stop Ahead Sign; and 144ft. North/NW of Sta. 145 Sign at South side IA 281.

Designer Notes:

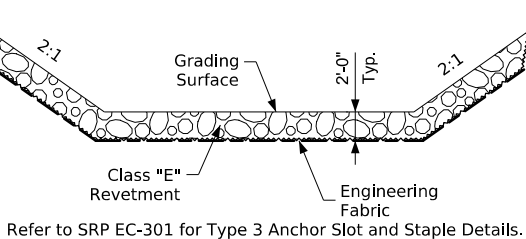
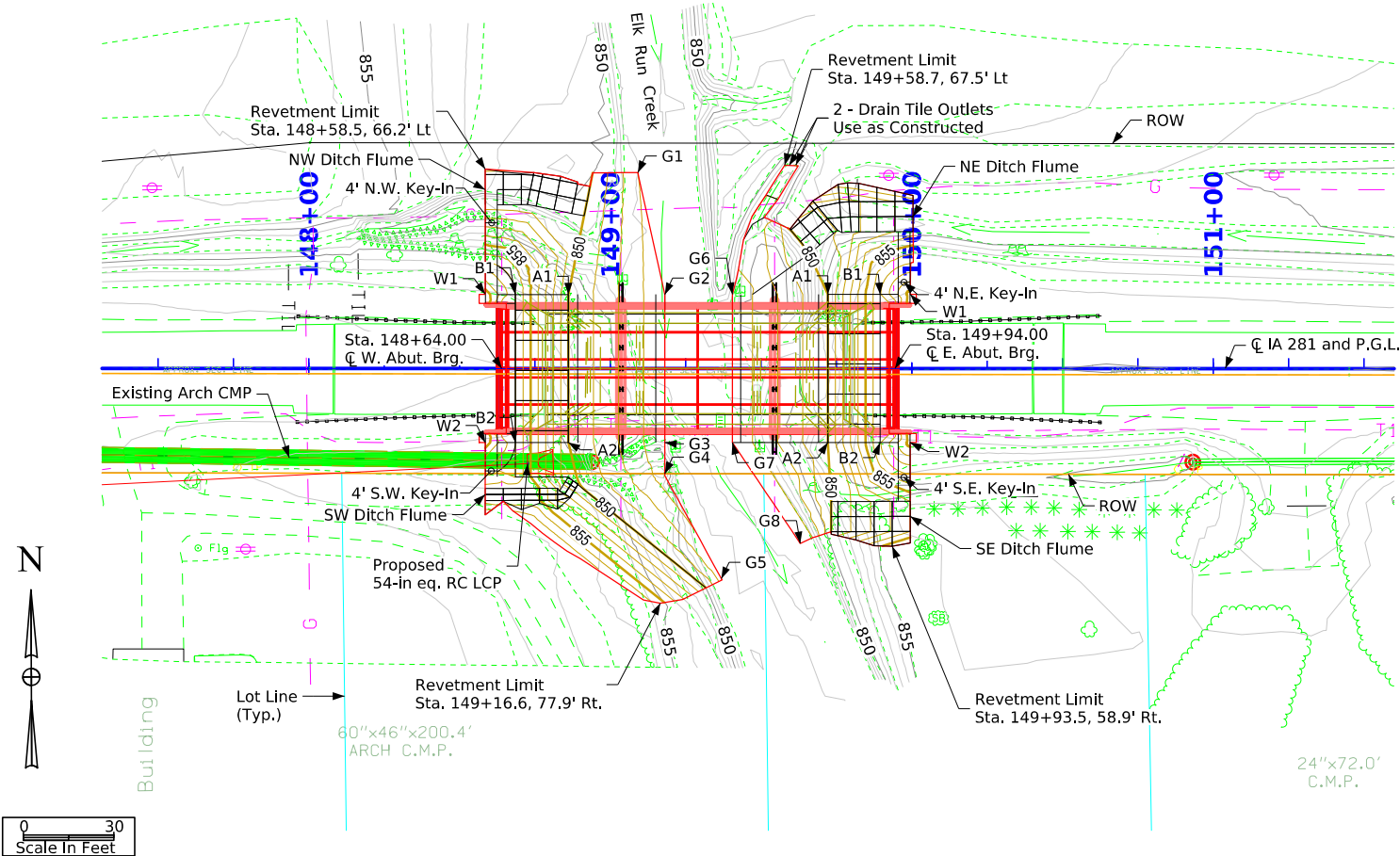
- Standard Bridge index: J40-25 Continuous Concrete Slab Bridge Standards.
- TL-4 Single Slope bridge railing proposed.
- Fully encased pile bent pier proposed due to the unsupported length to scour. A maximum anticipated pier width of 2.5' was used in the hydraulic model.
- The bridge does not meet Iowa DOT's desired operational or channel freeboard per BDM 3.2.2.4. Reasons include site impacts and costs that would be needed to sufficiently raise the profile grade. The new bridge will provide a higher low beam than the existing bridge. Final design aspects in the BDM related to inundation required. Note the bridge will be in a sluice or orifice pressure flow condition at high floods.
- The proposed bridge layout is intended to avoid potential conflicts with the existing bridge foundations. However, based on the minimal information available about the old Pony Truss bridge, there is a potential for conflicts with the old pony truss bridge battered piling at depths.
- Density used for Class E revetment is 1.5T/CY.
- Due to the potential for pressure flow conditions through the bridge during large floods, the berm lining Class E revetment is extended up to the end of wings and wing armoring. For this reason, the typical wing armoring details utilizing erosion stone will not be applicable. Quantities will be included in the Bridge Bridge Berm Armoring Quantities Table.
- Aesthetics are not proposed.
- An Iowa DNR flood plain development permit is not required.
- There appear to be conduits on the existing bridge. The final designer should assume some effort in determining any need for utilities on the bridge.
- The Site Plan and Situation Plan sheets each have a B01 saved view defined.
- There is a saved view for the B01 Situation Plan and B01 Site Plan sheet. Let me (Patricia S) know if this doesn't work for you, as I'm looking for feedback on keeping the intended levels on or off.
- The top deck surface is turned off in the OBM model. However, I was not able to turn off the top deck surface (extending to the POI) per the new deck template, because it is on the same level as the actual deck surface.

Berm Slope Location Table						
Points	West Abutment			East Abutment		
	Station	Offset	Elev.	Station	Offset	Elev.
A1	148+86.10	24.58' Lt.	850.00	149+72.22	24.58' Lt.	850.00
A2	148+86.10	24.58' Rt.	850.00	149+72.22	24.58' Rt.	850.00
B1	148+68.50	24.58' Lt.	857.04	149+89.50	24.58' Lt.	856.91
B2	148+68.50	24.58' Rt.	857.04	149+89.50	24.58' Rt.	856.91
W1	148+58.50	24.58' Lt.	860.59	149+99.50	24.58' Lt.	860.45
W2	148+58.50	24.58' Rt.	860.59	149+99.50	24.58' Rt.	860.45

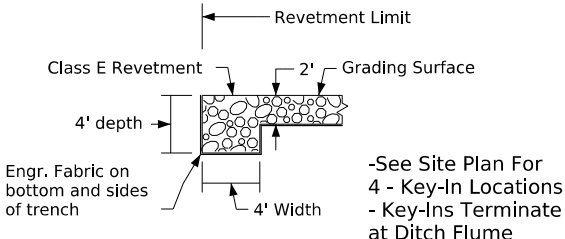
Berm slope elevations reflect the grading surface.

Estimated Berm Armoring Quantities				
Location	Revetment CL. E (Ton)	Erosion Stone (Ton)	Engineering Fabric (SY)	CL. 10 Channel Excavation (CY)
Berm Lining - West Abutment	926.9	0.0	994.4	617.9
Berm Lining - East Abutment	743.3	0.0	790.5	495.5
Totals	1670.2	0.0	1784.9	1113.4

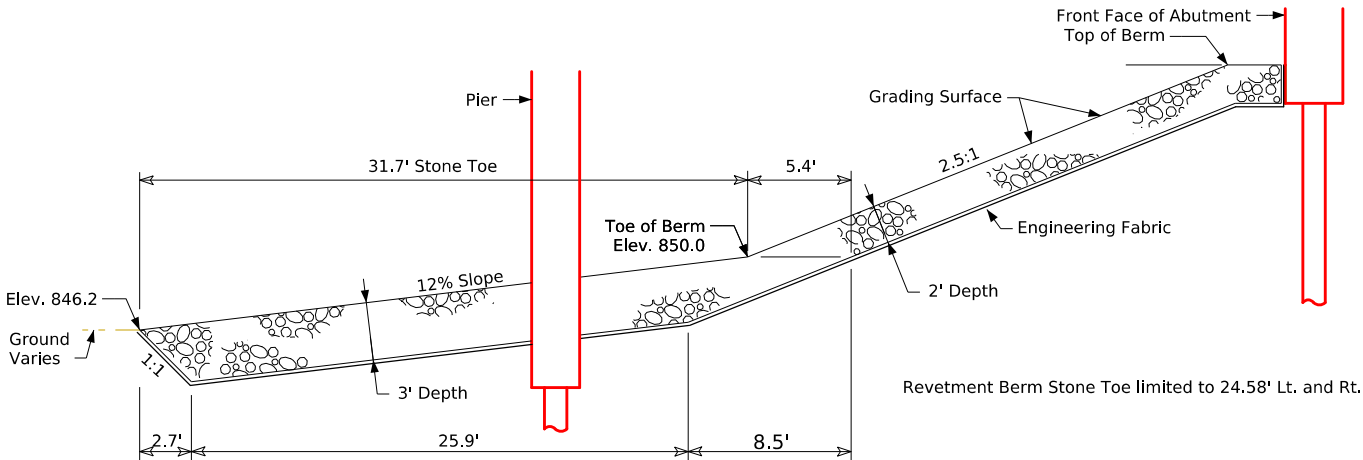
Excavation quantity calculated from grading surface. Excavation quantity is for embedded revetment core out only, and does not include excavation to the grading surface. Excavation quantity to the grading surface is determined by Road Design and included in the Road Plans. Class E revetment is proposed at wings in lieu of the typical wing armoring detail, and quantities are included in the table.



Typical Ditch Flume Erosion Protection



Typical Section Thru Key-in Trench



Section Thru Embedded Revetment Berm with Stone Toe Details

Bench Grading and Stone Toe Detail Control Points

- G1: Sta. 149+09.15, 65.08' Lt., Elev. 847.0: N.W. Grading and Revetment Limit, Begin Taper to Widen Bench
- G2: Sta. 149+18.10, 24.58' Lt., Elev. 846.2: Full West Berm Bench Width, Begin West Berm Stone Toe Detail
- G3: Sta. 149+18.10, 24.58' Rt., Elev. 846.2: End West Berm Stone Toe Detail
- G4: Sta. 149+18.10, 35.52' Rt., Elev. 846.5: Begin Bench Width Reduction Taper
- G5: Sta. 149+36.87, 69.72' Rt., Elev. 847.5: S.W. Grading and Revetment Limit
- G6: Sta. 149+40.56, 24.58' Lt., Elev. 846.2: Full East Berm Bench Width, Begin East Stone Toe Detail
- G7: Sta. 149+40.56, 24.58' Rt., Elev. 846.2: End East Berm Stone Toe Detail
- G8: Sta. 149+63.05, 58.03' Rt., Elev. 846.4: S.E. Grading and Revetment Limit

Site Plan

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: Patricia G. Schwarz Date: 12-15-25

Printed or Typed Name: Patricia G. Schwarz

My license renewal date is December 31, 2026

Pages or sheets covered by this seal: Situation Plan, Site Plan

Preliminary

Design For 0 Degree Skew

130'-0" x 40'-0" Continuous Concrete Slab Bridge

39'-6" End Spans 51'-0" Interior Span

Situation Plan - Site

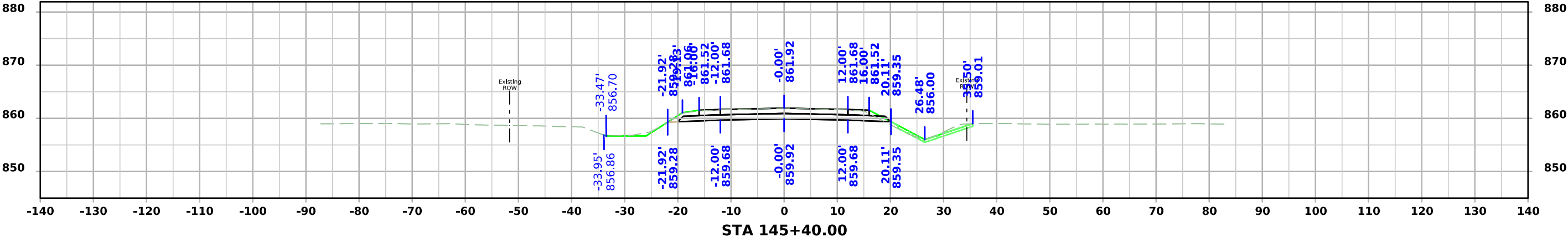
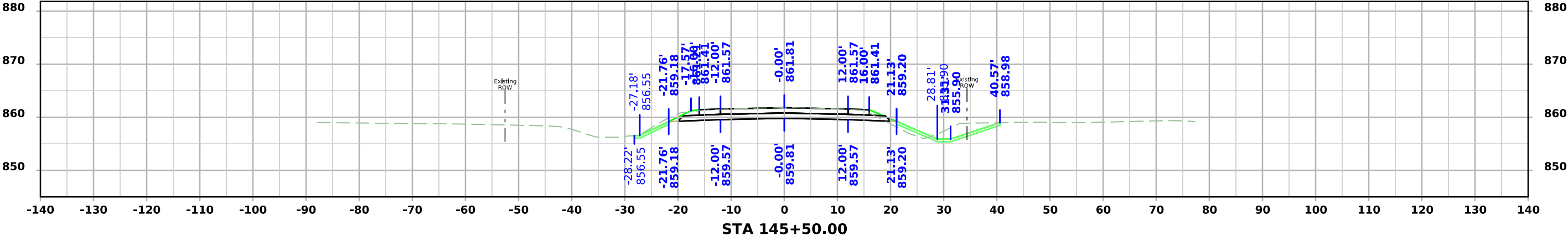
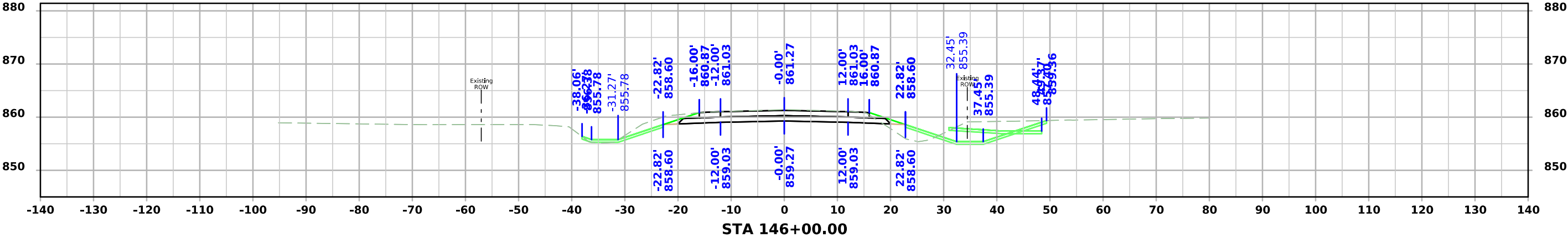
STA. 149+29.00 (IA 281) Turn-in Date: December 2025

Black Hawk County

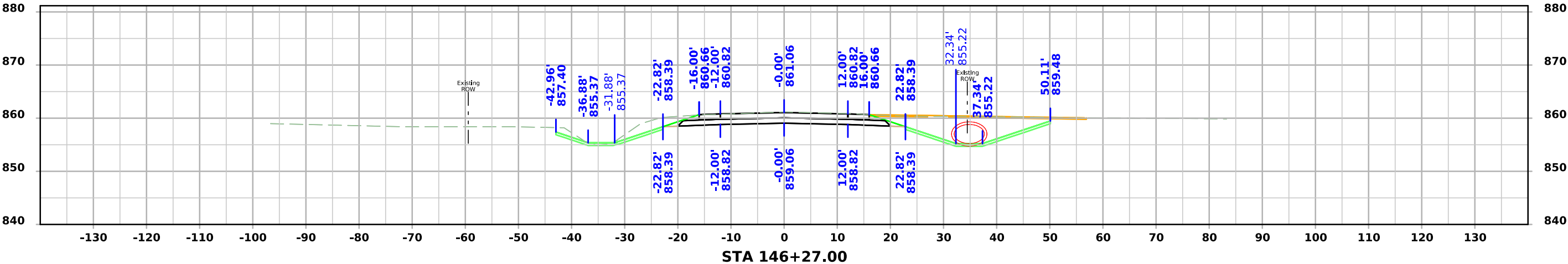
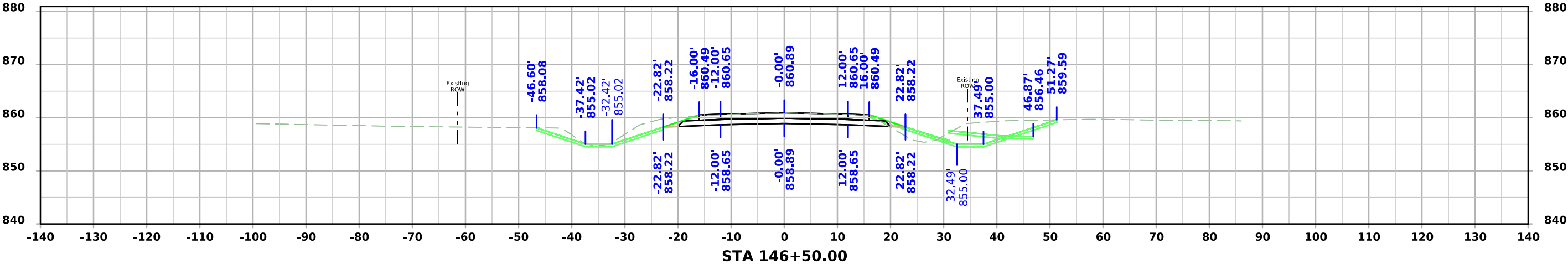
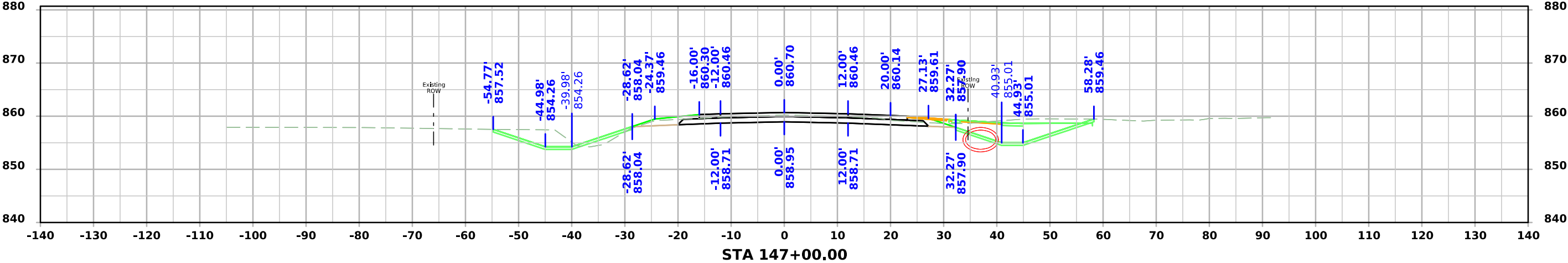
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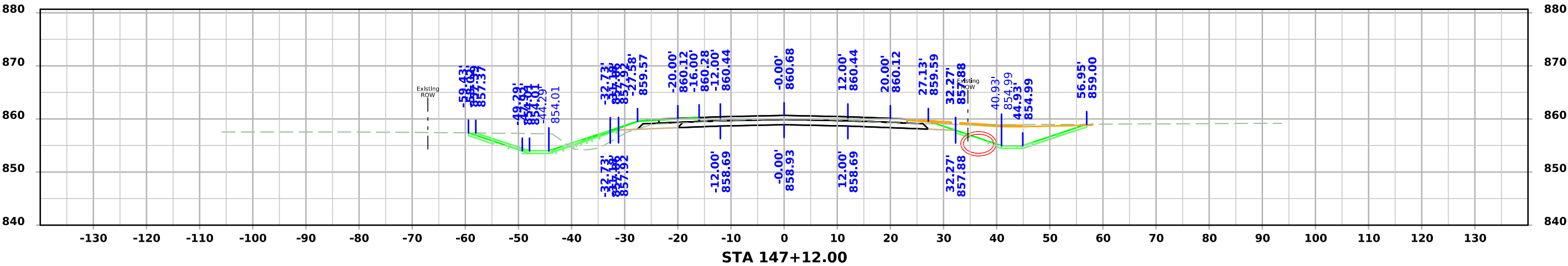
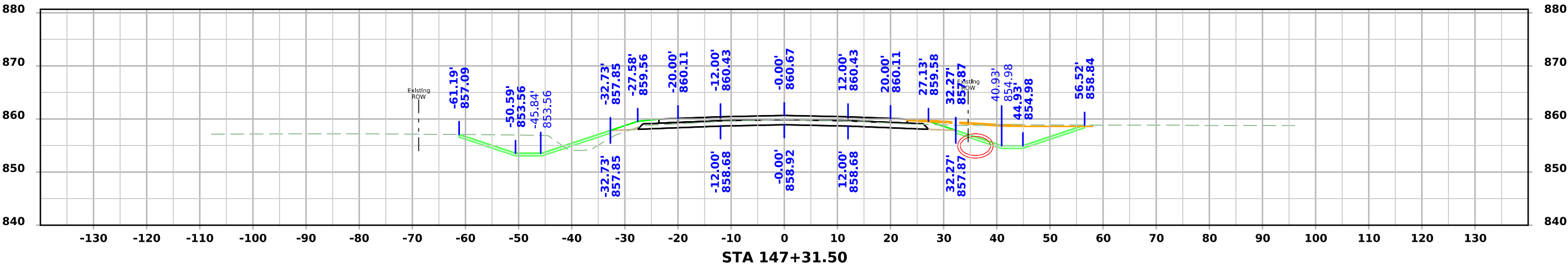
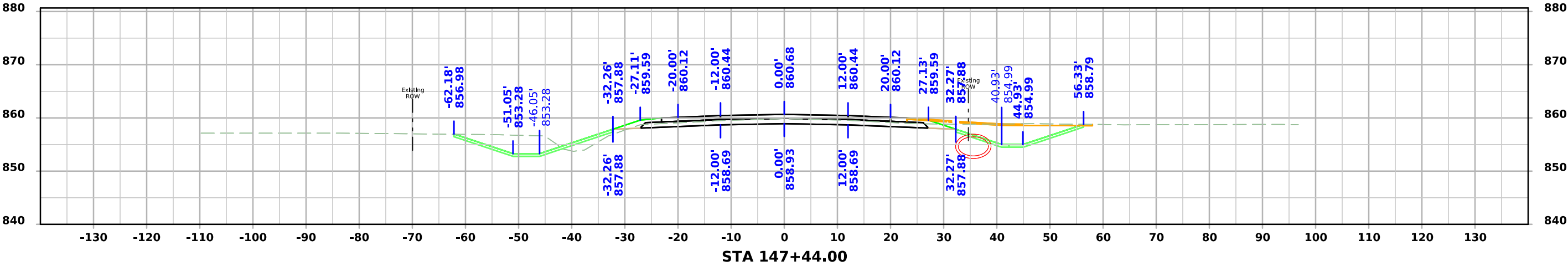
ML - IA 281



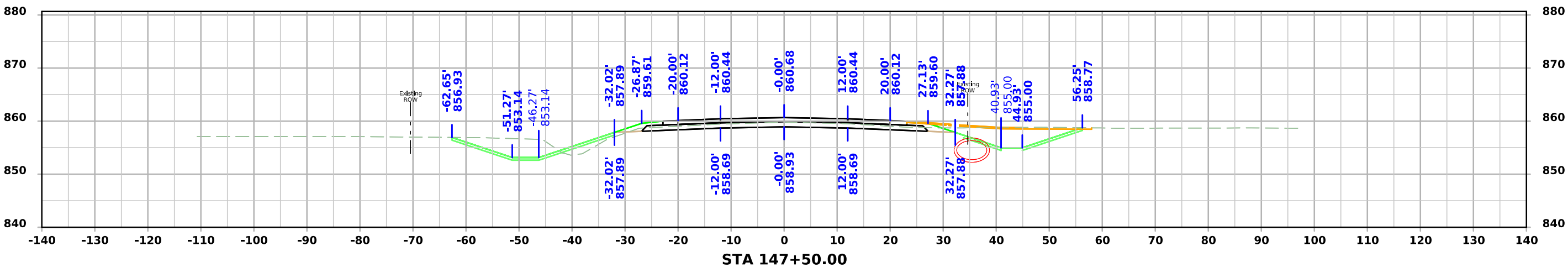
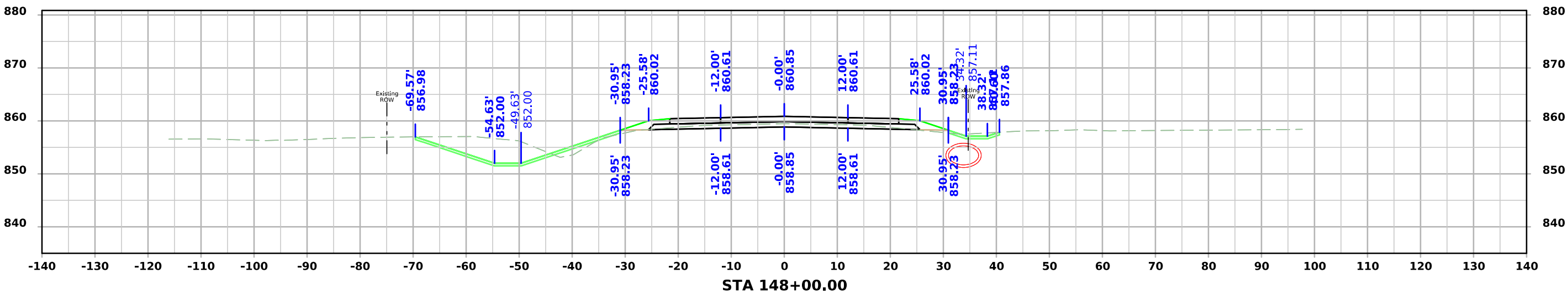
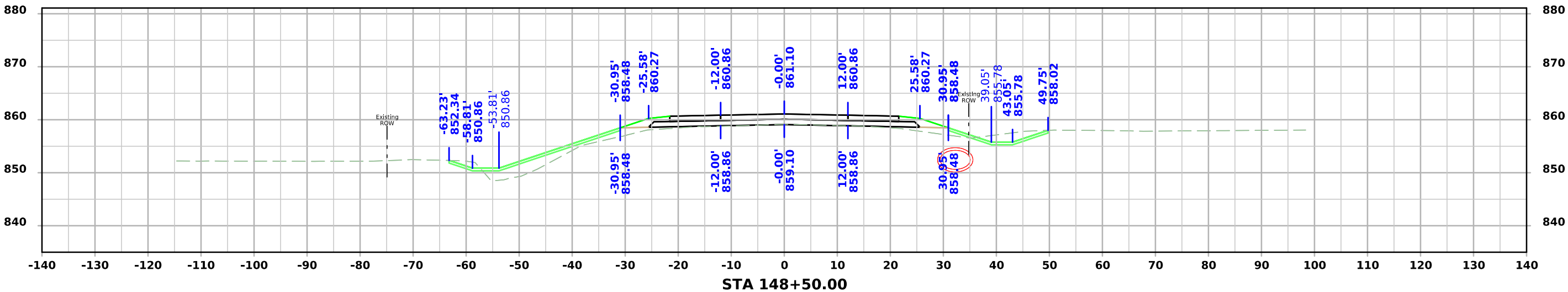
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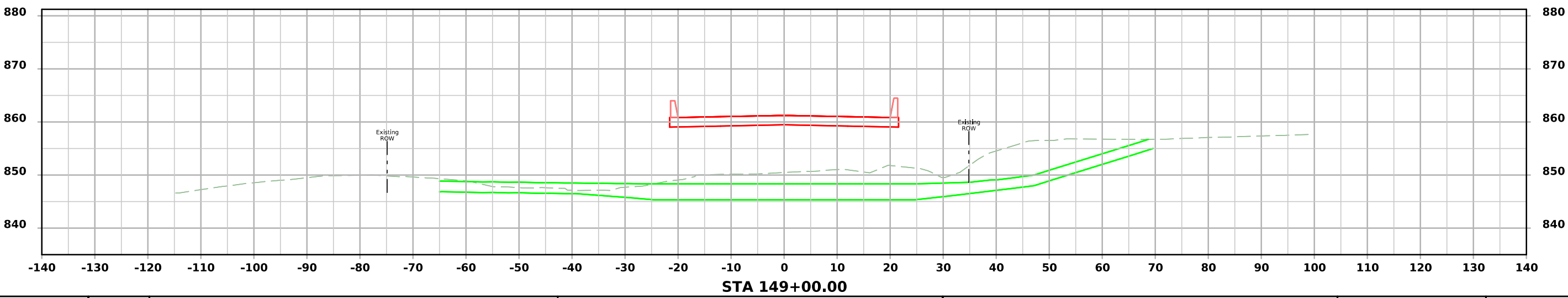
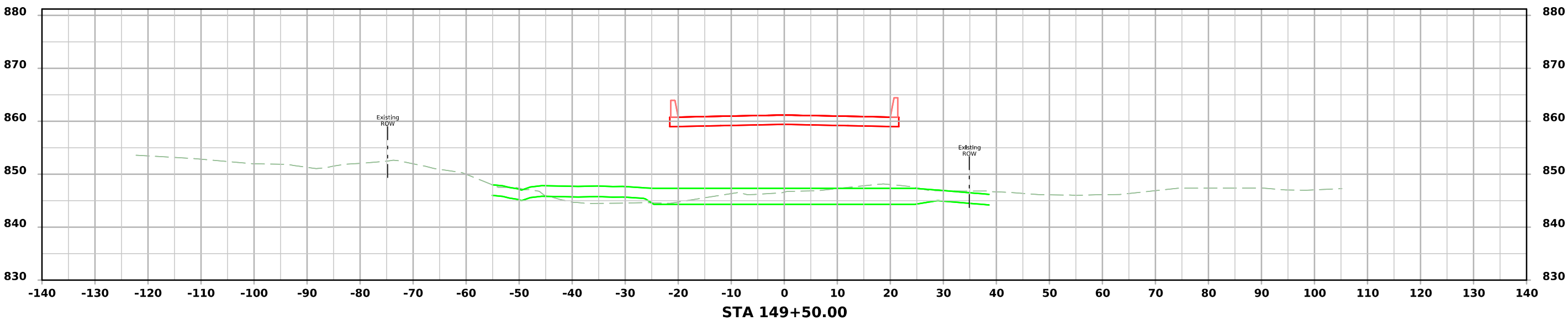
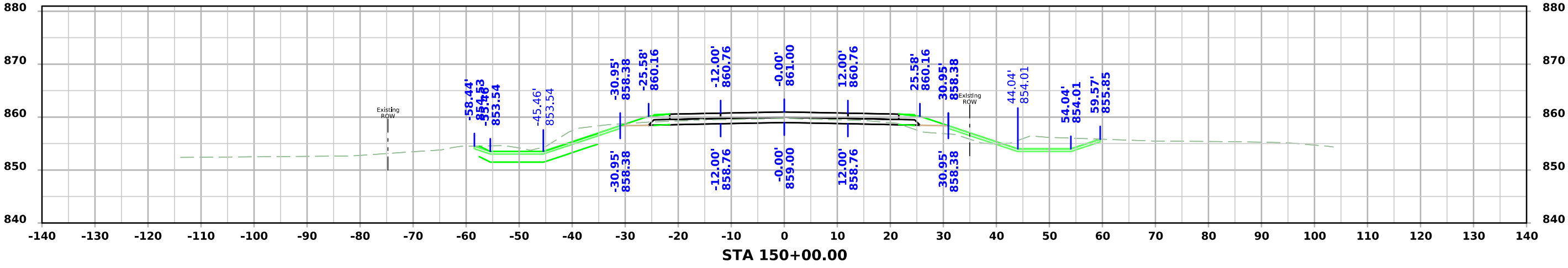
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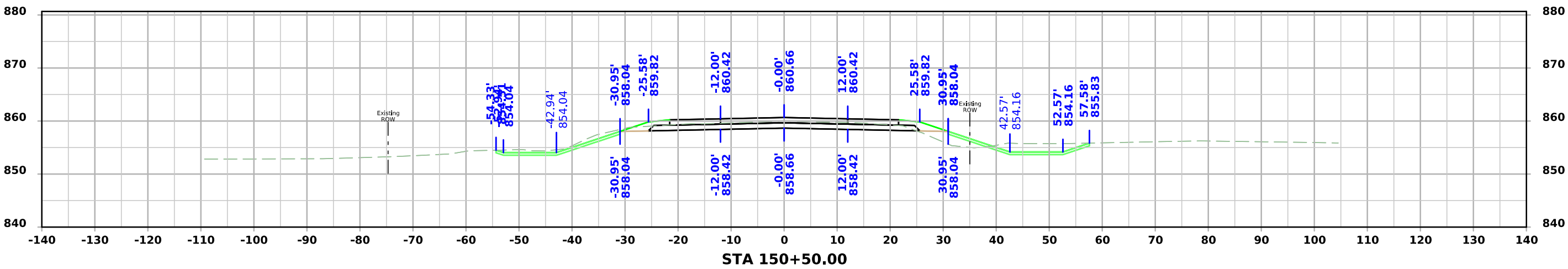
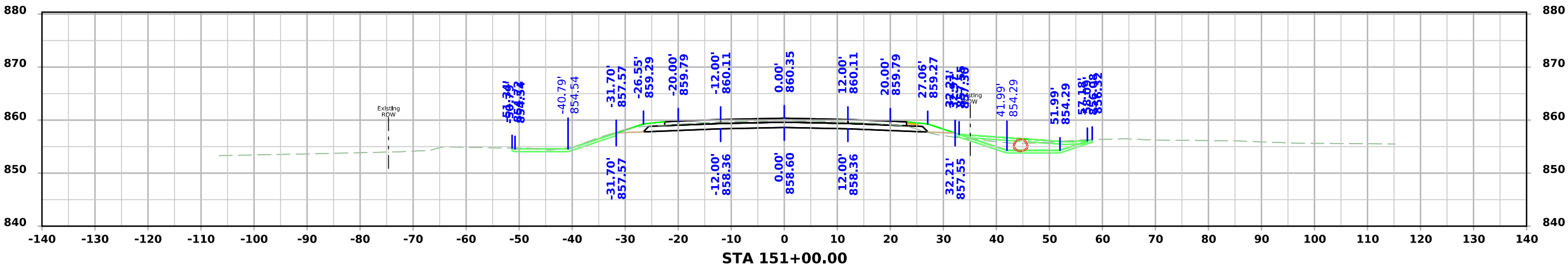
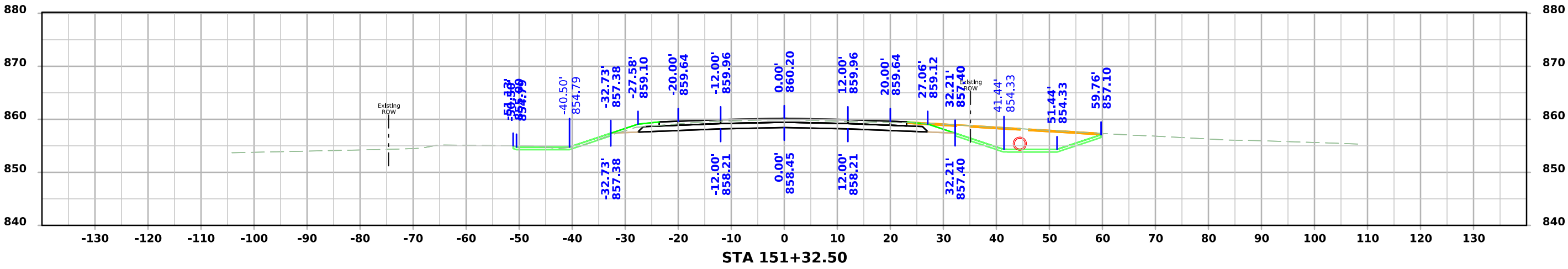
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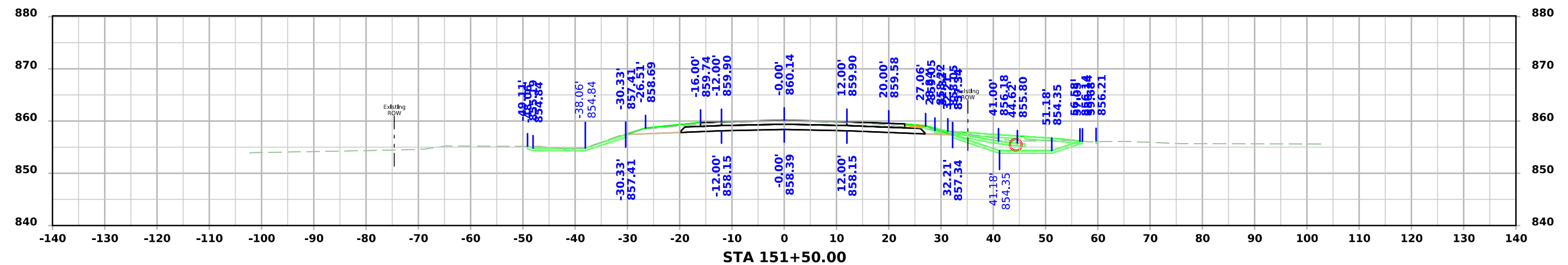
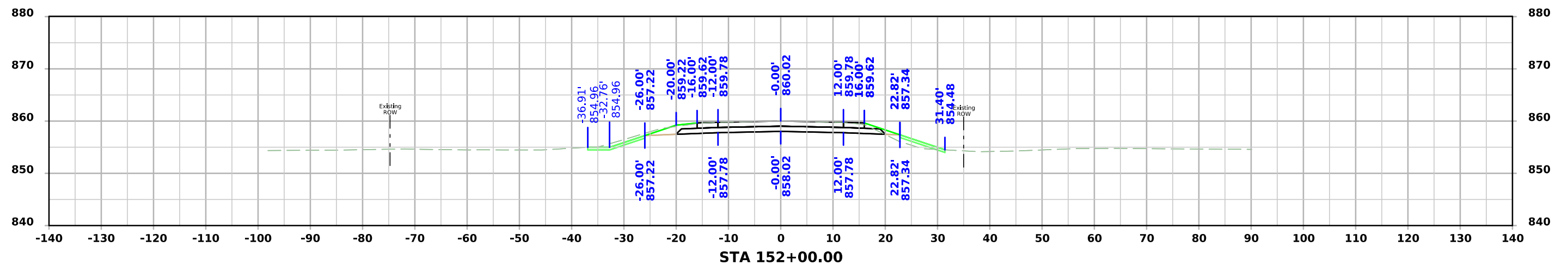
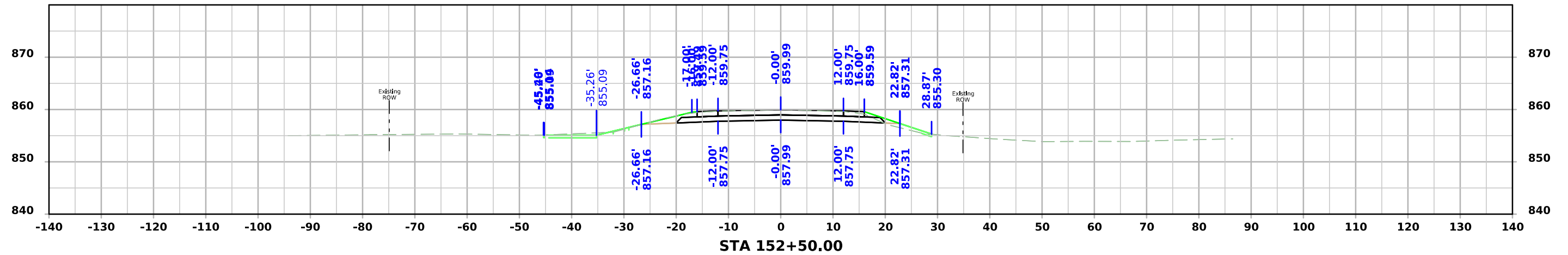
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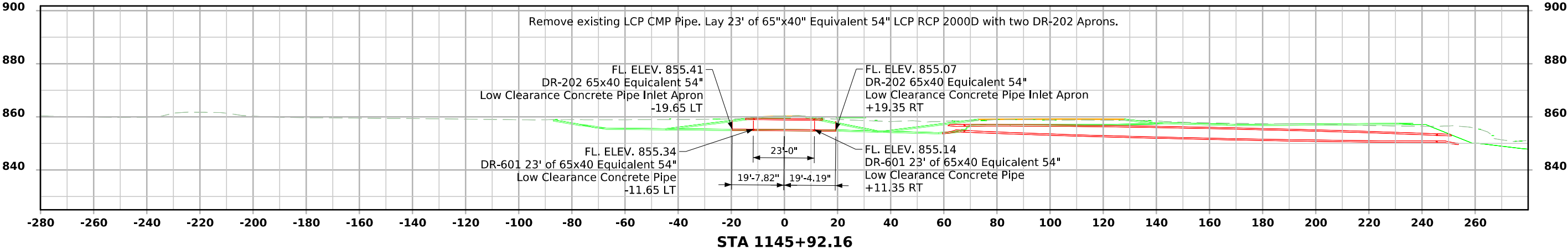
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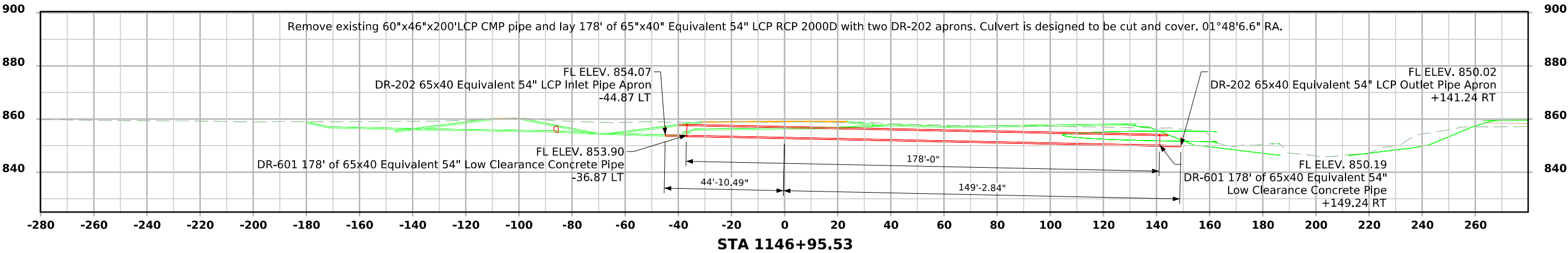
ML - IA 281



GeomENT_146+27



GeomENT_147+31.5



GeomENT_151+32.5

