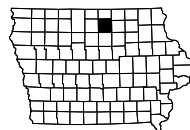


CERRO GORDO COUNTY

BRIDGE REPLACEMENT - CCS
BRFN-122-1(24)--39-17

LETTING DATE
Dec 19, 2023



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	Typical Cross Sections and Details
D Sheets	Mainline Plan and Profile Sheets
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2	IA 122
G Sheets	Survey Sheets
G.1 - 3	Reference Ties and Bench Marks
G.4	Horizontal Control Tab.
J Sheets	Traffic Control and Staging Sheets
J.1	Traffic Control Plan
V Sheets	Bridge and Culvert Situation Plans
* V.1 - 2	Bridge and Culvert Situation Plans
W Sheets	Mainline Cross Sections
* W.1 - 8	IA 122
	* Color Plan Sheets



PLANS OF PROPOSED IMPROVEMENT ON THE
PRIMARY ROAD SYSTEM
CERRO GORDO COUNTY
BRIDGE REPLACEMENT - CCS
Willow Creek 4.4 mi E of I-35 (EB)

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

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



REVISIONS

TOTAL
20
PROJECT IDENTIFICATION NUMBER
19-17-122-010
PROJECT NUMBER
BRFN-122-1(24)--39-17
R.O.W. PROJECT NUMBER
STPN-122-1(25)--2J-17

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

DESIGN DATA RURAL			
2024	AADT	14,300	V.P.D.
2044	AADT	16,100	V.P.D.
20	-- DHV	--	V.P.H.
	TRUCKS	6	%
	Total		
	Design ESALs	--	

INDEX OF SEALS		
SHEET NO.	NAME	TYPE
A.1	Kelly C. Bell	Primary Signature Block

PRELIMINARY PLANS

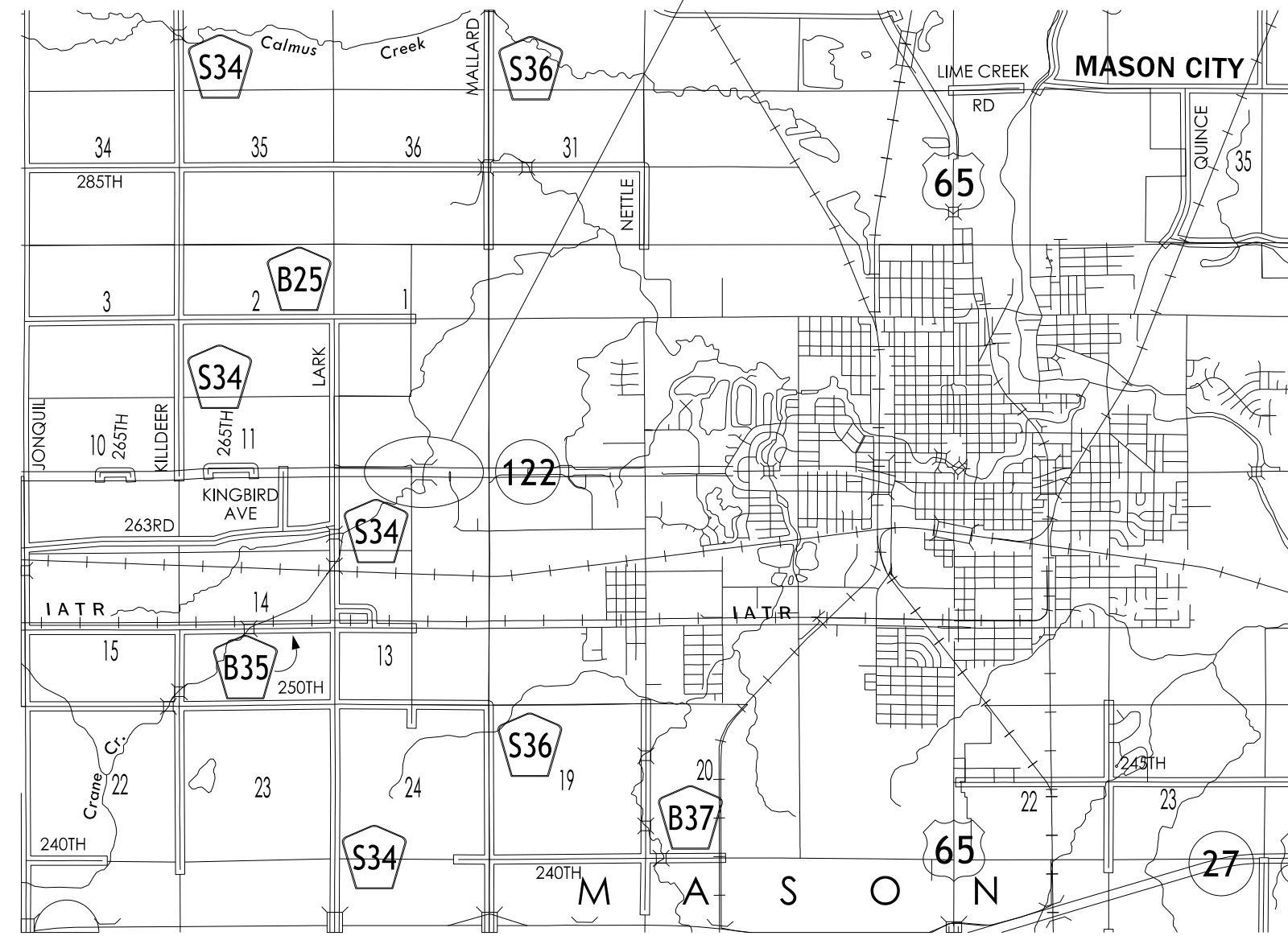
Subject to change by final design.

D3/D5 PLAN - Date: 12-29-2021

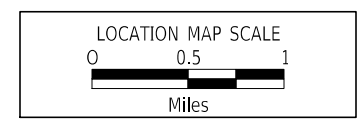
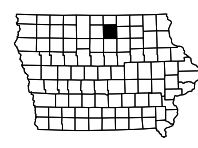
PROJECT LOCATION
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 FHWA No. 18780
 Maint. No. 1704.7R122

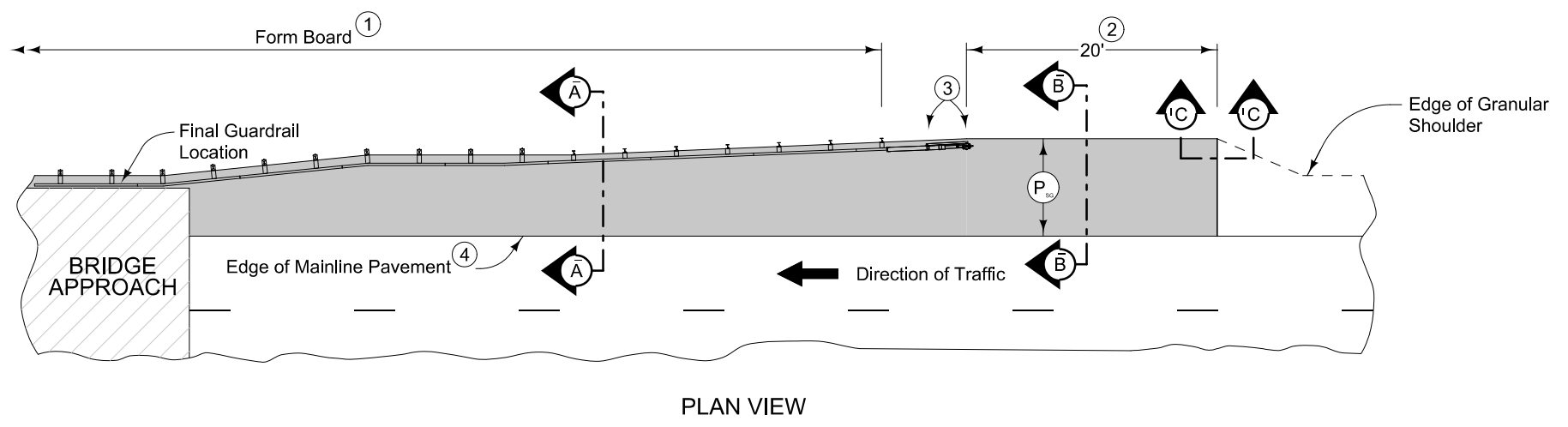
R-21W

R-20W



T-96N



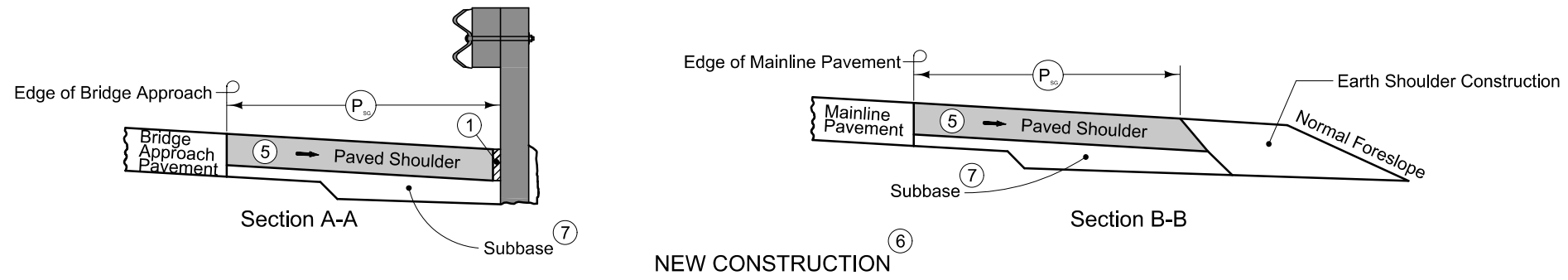


8" PCC may be substituted with the following jointing layout:

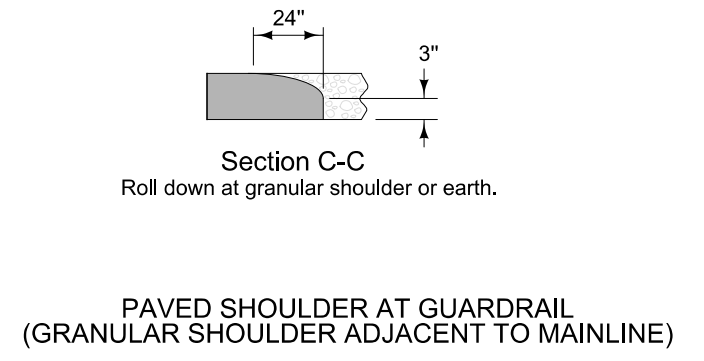
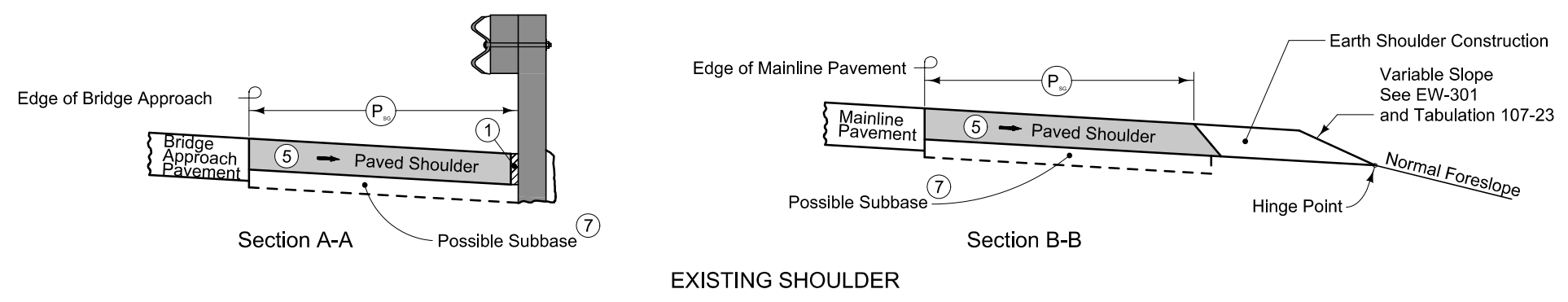
Match mainline pavement joint spacing. When mainline pavement is 8" or greater in thickness, place additional transverse 'C' joints in shoulder at mid-panel of the mainline pavement. Place longitudinal 'C' joint at P/2 from edge of mainline pavement when P is greater than 10' wide. Terminate longitudinal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

Paved guardrail shoulder designed assuming 12" blockouts.

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.
- 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 'KT' (per PV-102) 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

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.	
Yellow	(4)		Proposed Pavement Shading
Yellow	(68)		Proposed Shoulder, Paved Full Depth
Yellow	(132)		Proposed Shoulder, Paved Partial Depth
Orange	(70)		Proposed Shoulder, Granular
Yellow	(220)		Proposed Entrance, Paved
Red	(3)		Proposed Structures

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

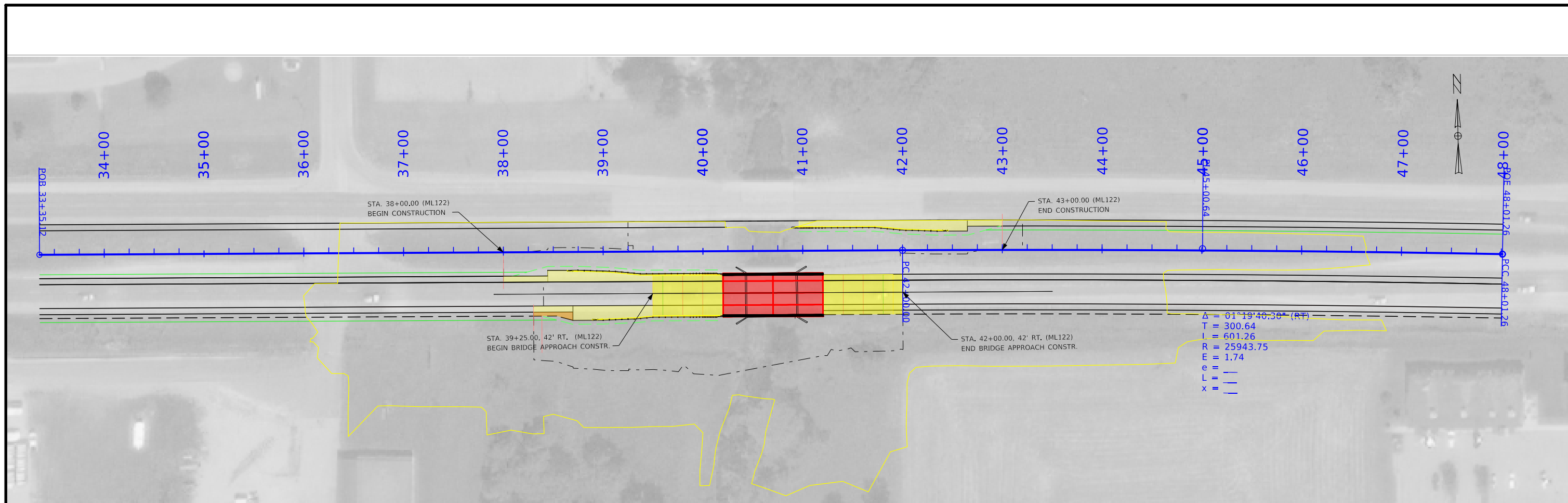
LINEWORK		Design Color No.	
Green	(2)		Existing Ground Line Profile
Blue	(1)		Proposed Profile and Annotation
Magenta	(5)		Existing Utilities
Blue, Light	(230)		Proposed Ditch Grades, Left
Black	(0)		Proposed Ditch Grades, Median
Rust	(14)		Proposed Ditch Grades, Right

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

- ### RIGHT-OF-WAY LEGEND
- -
 -
 -
 -
 -
 -
 -

PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

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



Survey Information

Cerro Gordo County
BRFN-122-1(24)—39-17
Willow Creek 4.4 mi E of I-35 (EB)
Bridge Replacement
PIN 19-17-122-010
Sap-759.2

Cerro Gordo County Control mark 415 designated G15MC has a published Elev. of 1167.03
Survey Elev. = 1166.95

Cerro Gordo County Control mark 416 designated G16MC has a published Elev. of 1160.96
Survey Elev. = 1160.89

This survey observed 1 As-Built plan benchmark to compare to local ground control:

BM 39A Project F-18-5(8)—20-17 Grading Plan Elev. 1158.04
BM 501 this Survey Elev. = 1157.83

Horizontal Control

The project coordinate system for this survey is Iowa RCS Zone 2 (U.S. Survey Feet). This survey control is relative to IaRTN reference stations. IaRTN Reference Station coordinates are relative to the National Reference Station network datum: NAD83 (2011) for Epoch 2010.00. Coordinates were determined by conducting one concurrent six-hour static observation at project control Pts. 415, 416, and AIR. Additional control points were placed throughout the project using a GNSS Base-Rover setup relative to Pts. 415 and 416.

Alignment Information

The horizontal alignment for Iowa Hwy 122 this survey is a retrace of As-built Plans No. F-18-5(8)—20-17. Survey stationing was equated to the plan PI at Sta. 45+00.64 and run back without equation throughout the survey.

Survey stationing relates to as built plan stationing as follows:

PI Sta. 33+35.11 As-built Plans Project No. F-18-5(8)—20-17
Survey PI Sta. 33+35.12

PI Sta. 45+00.64 As-built Plans Project No. F-18-5(8)—20-17
Survey PI Sta. 45+00.64

Party Personnel

Jason Page- Survey Party Chief
John Hahn- Assistant Survey Party Chief

Date(s) of Survey

Begin Date 01/28/2021
End Date 05/11/2021

General Information

Measurement units for this survey are US survey feet. This survey is for proposed Iowa Highway 122 East bound bridge over Willow Creek replacement. Project datum and control information is provided by Design Survey Office. This project is a Partial DTM with Photo control. This survey request was for the Iowa 122 East bound corridor only.

Vertical Control

Vertical datum for this survey is NAVD88 (Computed using Geoid12b). GRS80 Ellipsoidal Height was computed at project Pts. 415, 416, & AIR by conducting one concurrent 6-hour static observation. Additional benchmarks were placed throughout the project using a GNSS Base-Rover setup relative to Pt. 415 and Pt. 416. Two observations with a minimum of 4-hours between were collected and used in a weighted average.

This survey observed 1 NGS Control Monument with published NAVD88 height to compare to local ground control:

NGS CBN designated AIR has a published Elev. Of 1194.7
Survey Elev. = 1194.56

This survey observed 2 local area county Control Monuments with published NAVD88 heights to compare to local ground control:

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 2

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

1a. Regional Coordinate System Zone 2
Project Control Marks are Bench Marks

Point Name	Northing	Easting	Elevation	Code	Description
AIR	9794594.308	12343553.448	1194.559	CP	FND NGS CBN STATION DESIGNATED AIR AT AIRPORT ENT 0.2 MI NORTH OF IA 122 87 FT WEST OF ENT ROAD CTR 18 FT SOUTH OF CROSSOVER CTR AND 85 FT EAST OF EXIT ROAD CTR
415	9793943.703	12363670.709	1166.951	CP	FND CERRO GORDO CO GPS CNTRL POINT DESIGNATED G15MC IN NW QUAD OF IA 122 AND EISENHOWER AVE 200 FT NORTH OF IA 122 27 FT WEST OF EISENHOWER AVE AND 59 FT SOUTH OF PAVED ENT
416	9794038.122	12358515.971	1160.886	CP	FND CERRO GORDO CO GPS CNTRL POINT DESIGNATED G16MC IN NE QUAD OF LARK AVE AND 4TH ST SW FRONTAGE RD 56 FT EAST OF LARK AVE AND 10 FT NORTH OF 4TH ST SW FRONTAGE RD

108-23A
08-01-08

TRAFFIC CONTROL PLAN

IA 122 traffic will be maintained via an off-site detour.

108-25
10-21-14

511 TRAVEL RESTRICTIONS

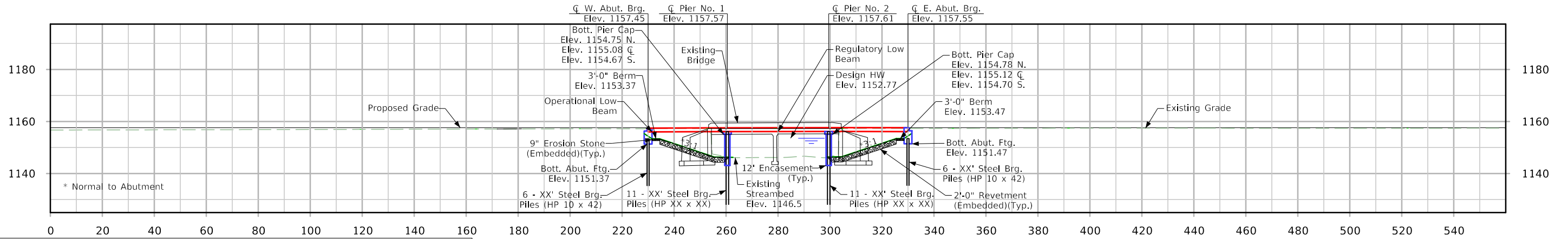
Route	Direction	County	Location Description	Feature Crossed	Object Type	Maint. Bridge No., Structure ID, or FHWA No.	Type of Restriction	Existing Measurement	Construction Measurement	Construction Measurement as Signed	Projected As Built Measurement	Remarks
			No Travel Restrictions Expected.									

111-01
04-17-12

COORDINATED OPERATIONS

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

Project	Type of Work
None Provided.	



Longitudinal Section Along Approach Roadway

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: _____ Date: _____
 Dallas R. Schechinger
 Printed or Typed Name
 My license renewal date is December 31, 20 22

Pages or sheets covered by this seal: V.1 - V.2

Hydraulic Data

Drainage Area = 76.9 Sq. Mi.
 Stream Slope = 6.20 Ft./Mi.
 Avg. Low Water Stage = 1,146.8

Q50 = 1,804 CFS
 Stage = 1,152.77
 Regulatory Low Beam = 1,155.7
 Avg. Bridge Velocity = 5.7 FPS

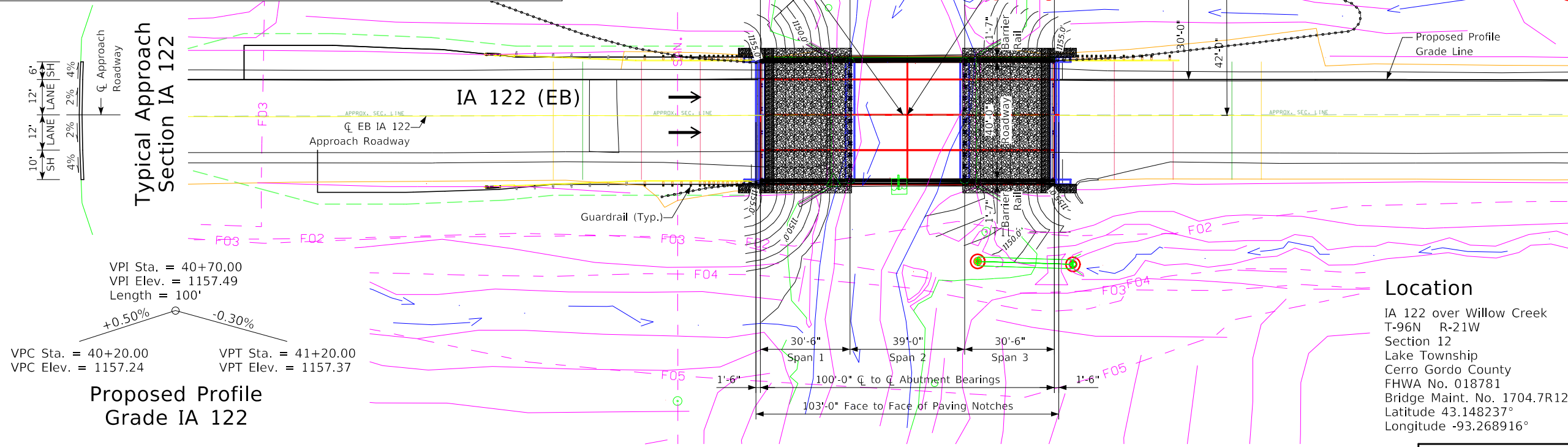
Q100 = 2,057 CFS
 Stage = 1,153.09
 Operational Low Beam = 1,155.6
 Backwater = 0.61 Ft.
 Avg. Bridge Velocity = 6.1 FPS

Q200 = 2,320 CFS
 Stage = 1,153.32
 Calculated Design Scour = 1,141.8

Q500 = 2,658 CFS
 Stage = 1,153.75
 Avg. Bridge Velocity = 7.0 FPS
 Calculated Check Scour = 1,141.6

Roadway Overtop 1156.3
 Sta. 36+80.00

Typical Bridge Section



Utilities Legend

SAN. - Sanitary Sewer
 F02 - Fiber Optic
 F03 - Fiber Optic
 F04 - Fiber Optic
 F05 - Fiber Optic

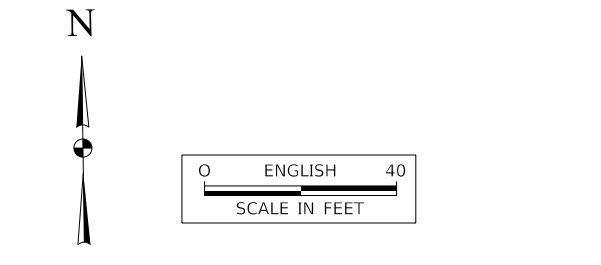
Utilities Shown on this sheet are for information only, see road design sheets for final utility information.

Location

IA 122 over Willow Creek
 T-96N R-21W
 Section 12
 Lake Township
 Cerro Gordo County
 FHWA No. 018781
 Bridge Maint. No. 1704.7R122
 Latitude 43.148237°
 Longitude -93.268916°

Traffic Estimate

2024 AADT	14,300	V.P.D.
2044 AADT	16,100	V.P.D.
20-- DHV	--	V.P.H.
Trucks	5 %	
Total		
Design ESALs	--	



Situation Plan

- Design Notes:
- Standard Bridge Index No. J40
 - TL-5 Bridge Railing Proposed
 - Individually Encased Pile Bent Piers Proposed
 - An Iowa DNR Flood Plain Permit is Required
- General Notes:
- This design is for the replacement of the existing 49'-3" x 40'-0" Continuous Concrete Slab Bridge, Cerro Gordo Design No. 160, FHWA No. 018780, Maint. No. 1704.7R122.
- Plan Notes:
- Top of bridge deck at centerline roadway is 0.27' above the profile grade to account for deck cross slope and parabolic crown.
 - Class E revetment stone is embedded.
 - The bridge will be designed to withstand applicable effects of ice and the horizontal stream loads and uplift forces associated with the Q₁₀₀.

Design For 0° Skew

100'-0" x 40'-0" Continuous Concrete Slab Bridge

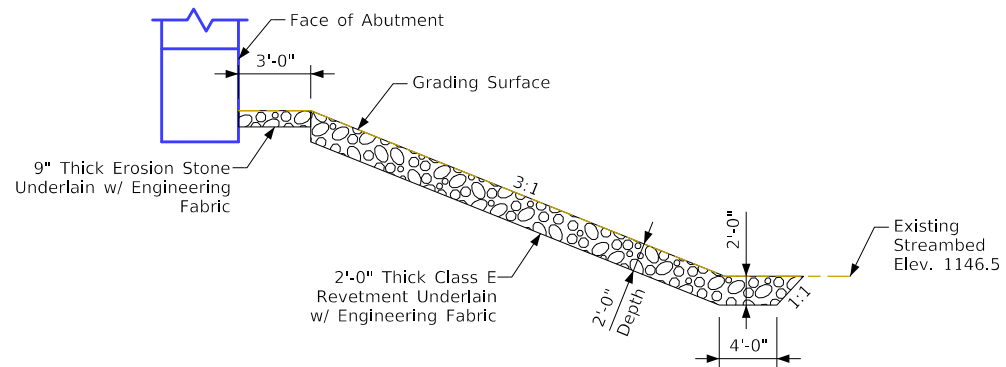
30'-6" End Spans 39'-0" Interior Span

Situation Plan

STA. 40+20.00, 42.0' RT. (IA 122 EB) November 2021

Cerro Gordo County
 IOWA DEPARTMENT OF TRANSPORTATION

Design No. 924 Design Sheet No. 1 of 2 File No. 32176



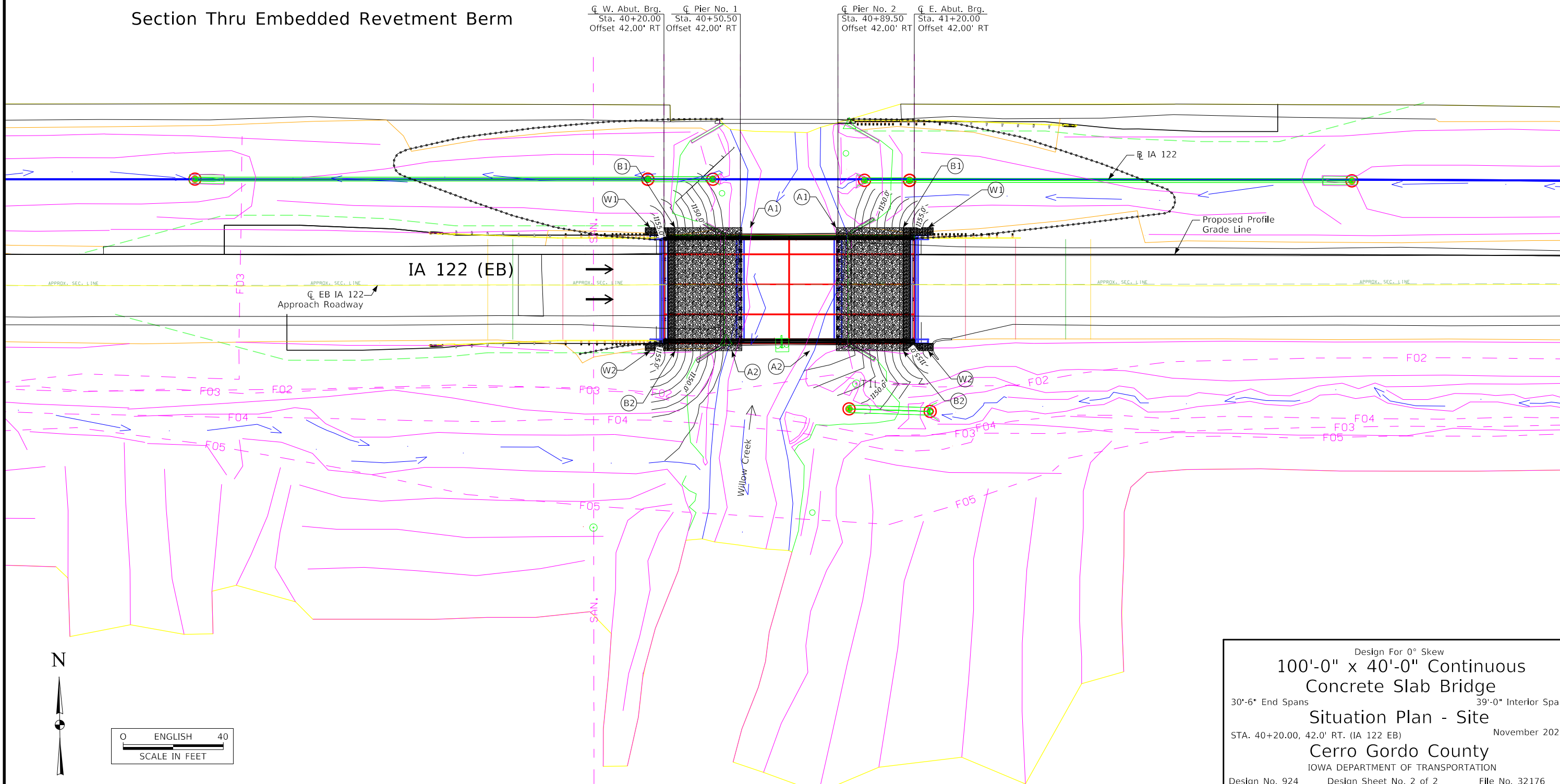
Section Thru Embedded Revetment Berm

Points	West Abutment			East Abutment		
	Station	Offset	Elev.	Station	Offset	Elev.
A1	40+54.45	19.42' RT	1146.20	40+88.79	19.42' RT	1146.36
A2	40+47.16	68.58' RT	1146.34	40+77.79	68.58' RT	1146.14
B1	40+24.50	19.42' RT	1153.37	41+15.50	19.42' RT	1153.47
B2	40+24.50	68.58' RT	1153.37	41+15.50	68.58' RT	1153.47
W1	40+14.50	19.42' RT	1156.94	41+25.50	19.42' RT	1157.08
W2	40+14.50	68.58' RT	1156.86	41+25.50	68.58' RT	1157.00

Berm slope elevations reflect the grading surface. Offsets are given from the IA 122 baseline. All points are 3'-0" from the edge of the bridge deck.

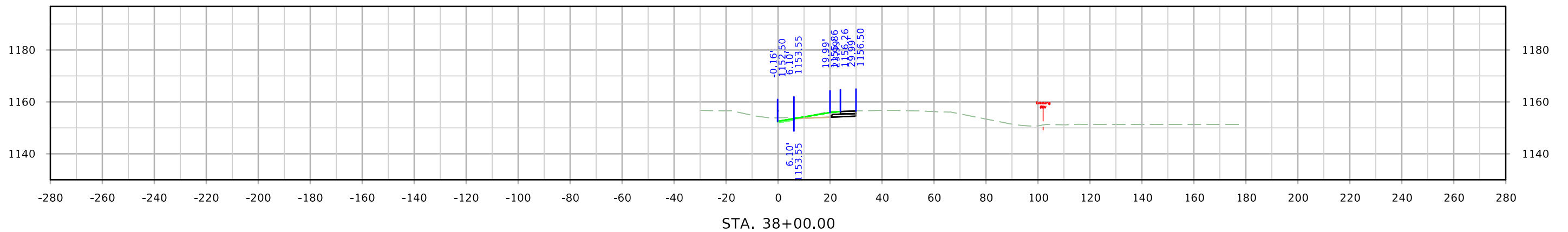
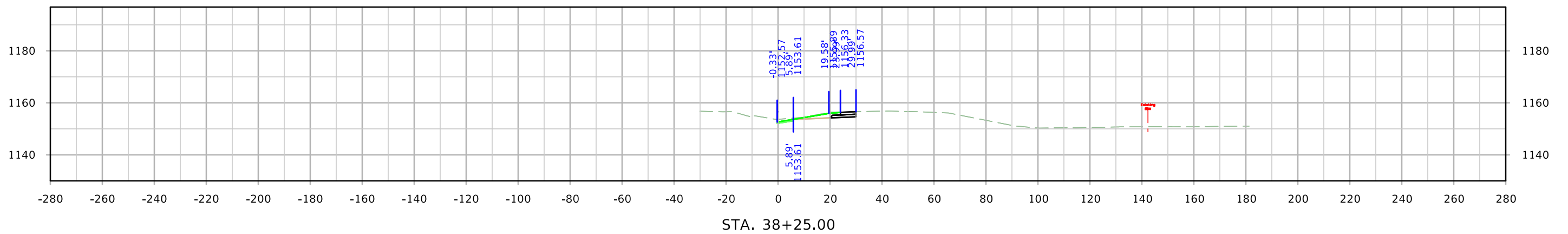
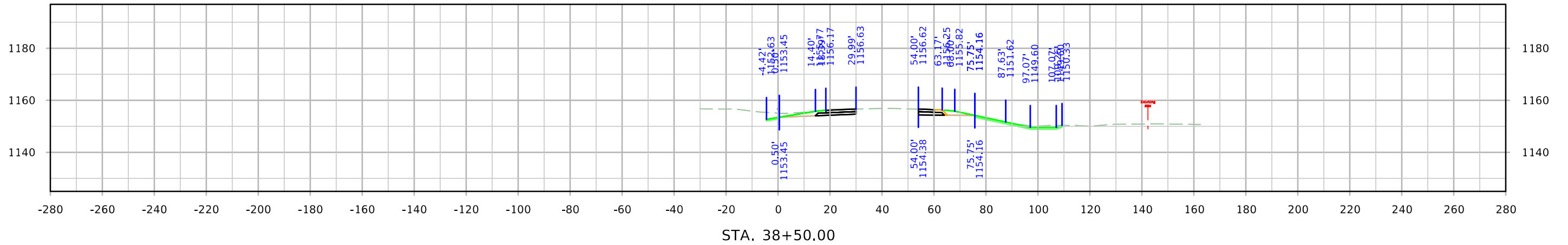
Estimated Berm Armoring Quantities				
Location	Revetment CL. E (Ton)	Erosion Stone (Ton)	Engineering Fabric (SY)	Excavation (CY)
Berm Lining - West	165	20	165	115
Berm Lining - East	165	20	165	115
Totals	330	40	330	230

Excavation quantity calculated from grading surface and includes only the excavation required to embed the slope protection. Revetment based on density of 1.6 ton/CY. Erosion stone based on a density of 120 lb/CF.

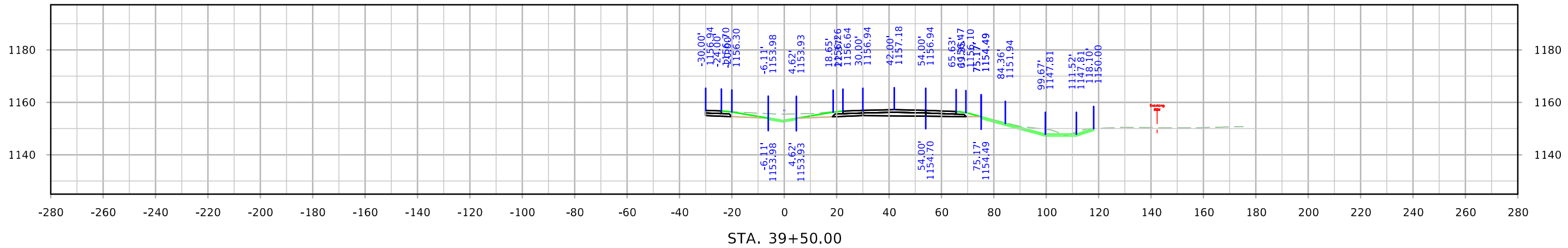
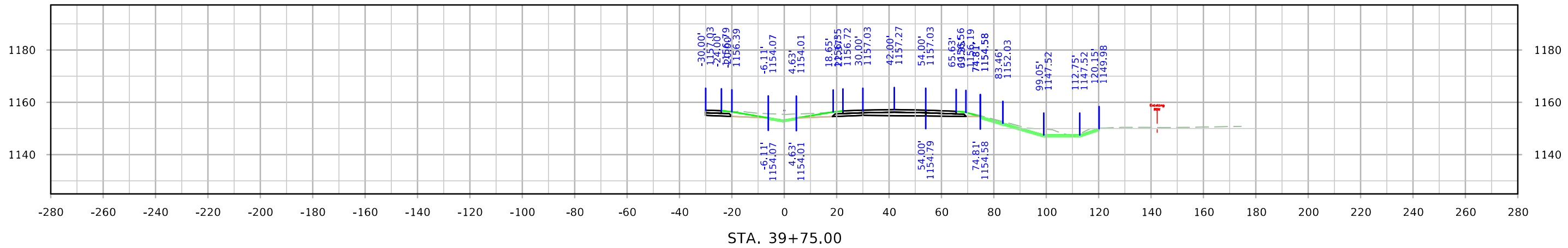
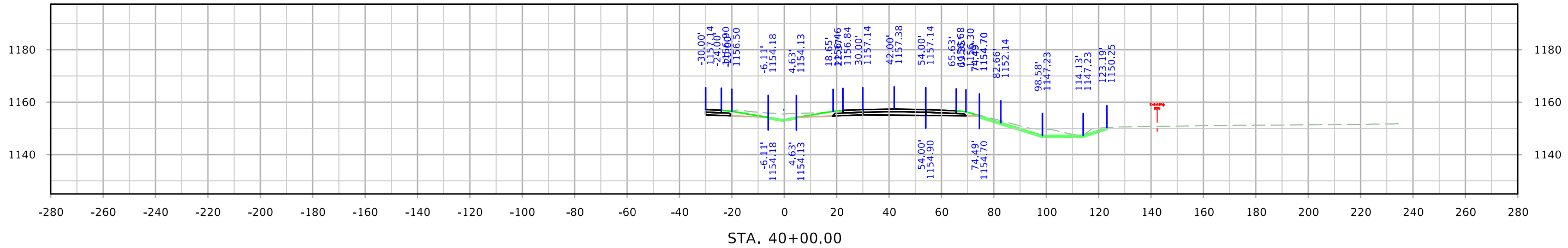


Design For 0° Skew
100'-0" x 40'-0" Continuous Concrete Slab Bridge
 30'-6" End Spans 39'-0" Interior Span
Situation Plan - Site
 STA. 40+20.00, 42.0' RT. (IA 122 EB) November 2021
Cerro Gordo County
 IOWA DEPARTMENT OF TRANSPORTATION
 Design No. 924 Design Sheet No. 2 of 2 File No. 32176

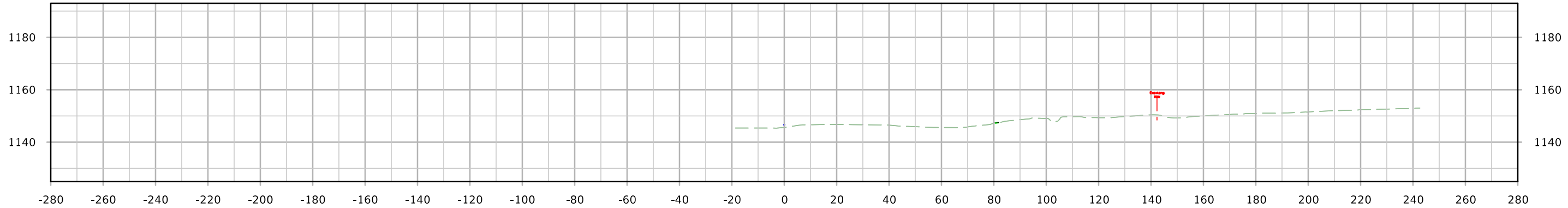
ML - IA 122



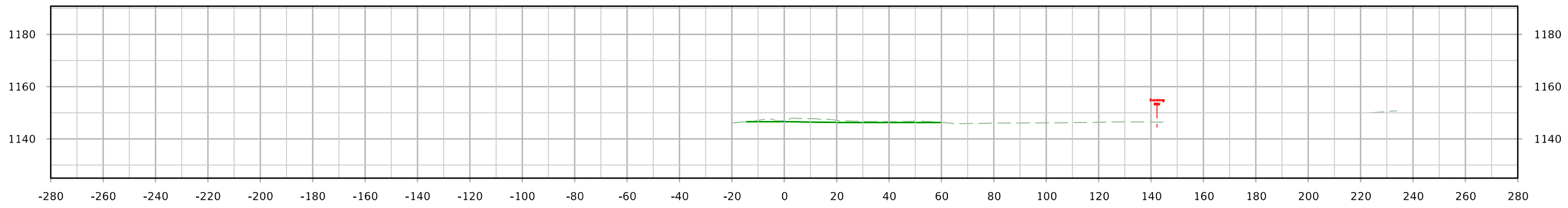
ML - IA 122



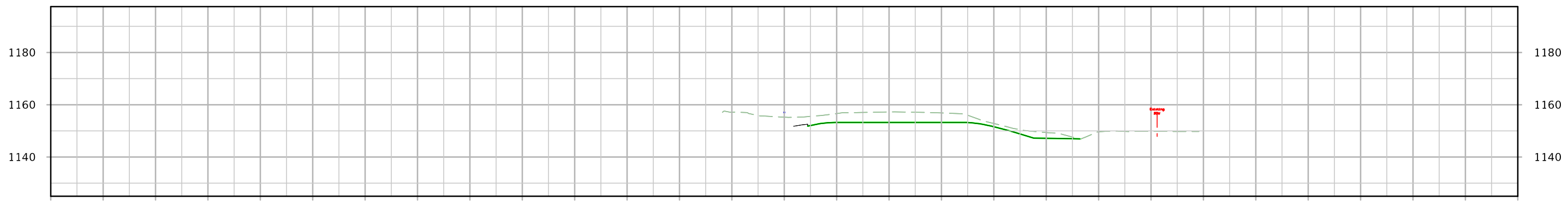
ML - IA 122



STA. 40+75.00

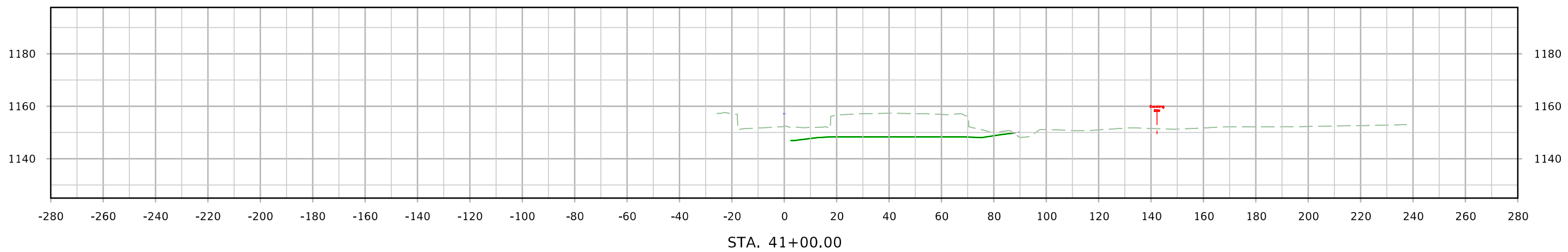
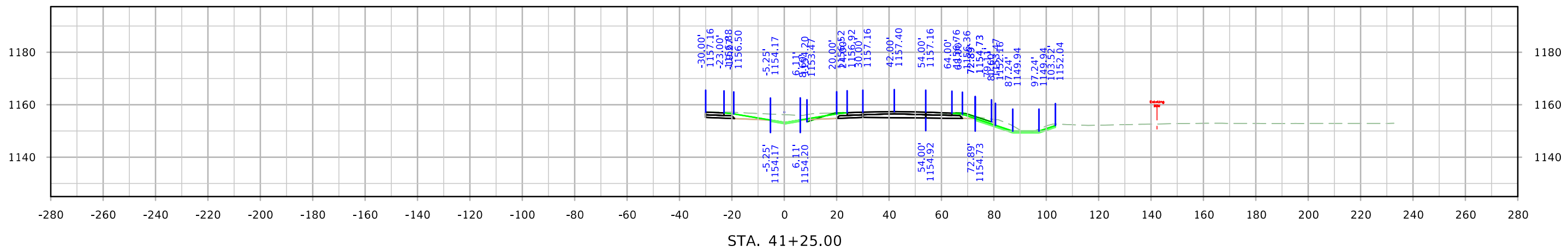
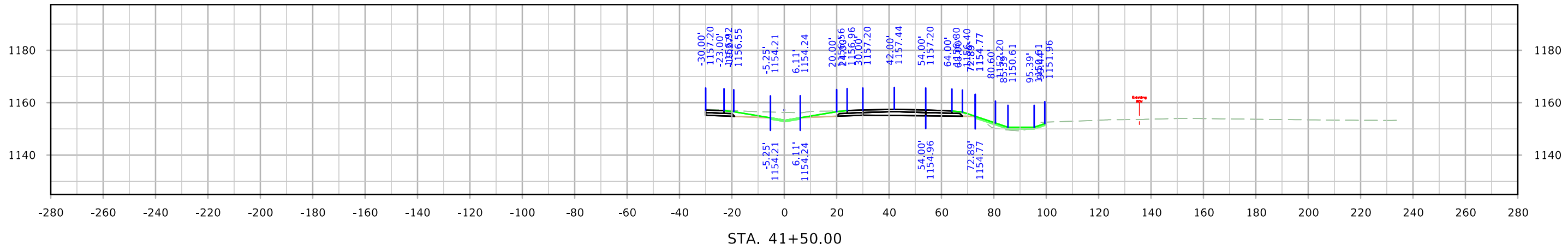


STA. 40+50.00

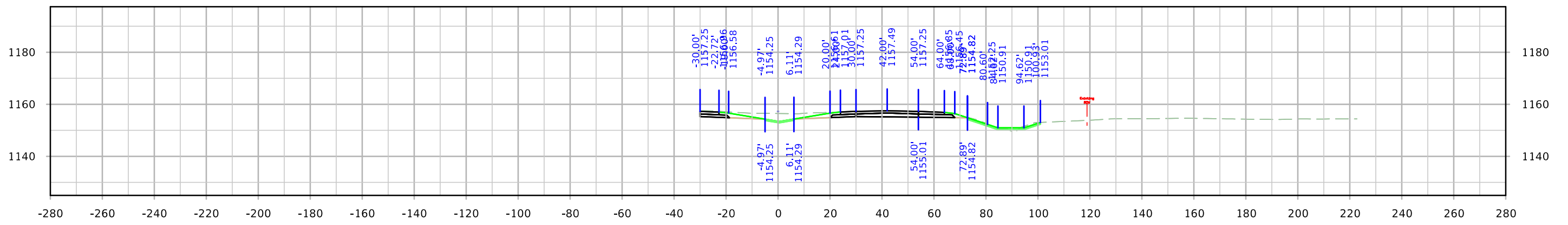
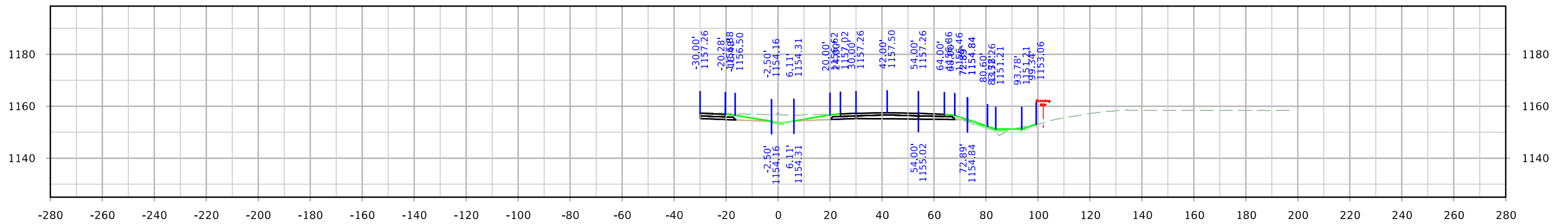
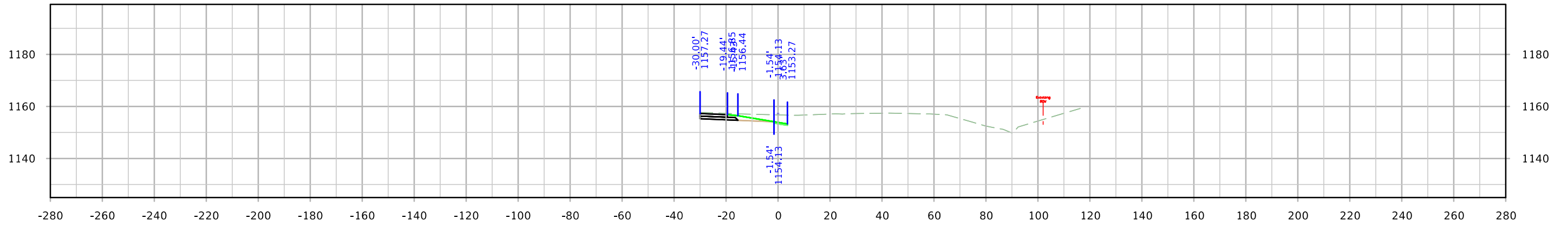


STA. 40+25.00

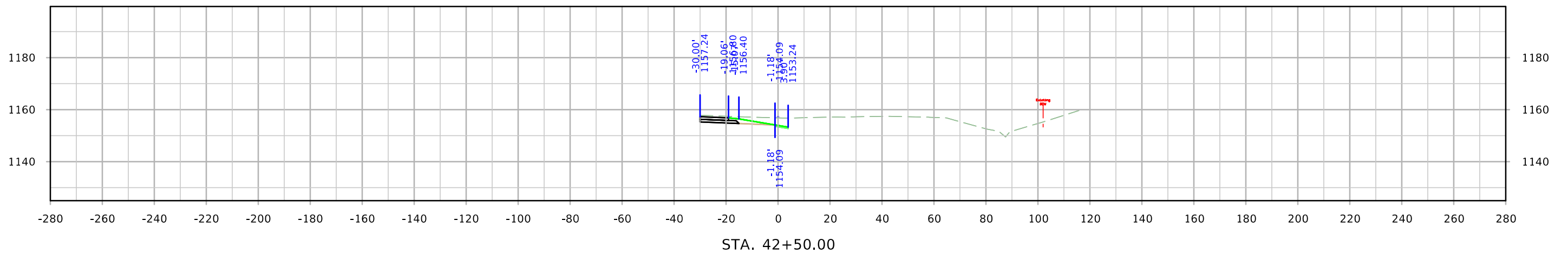
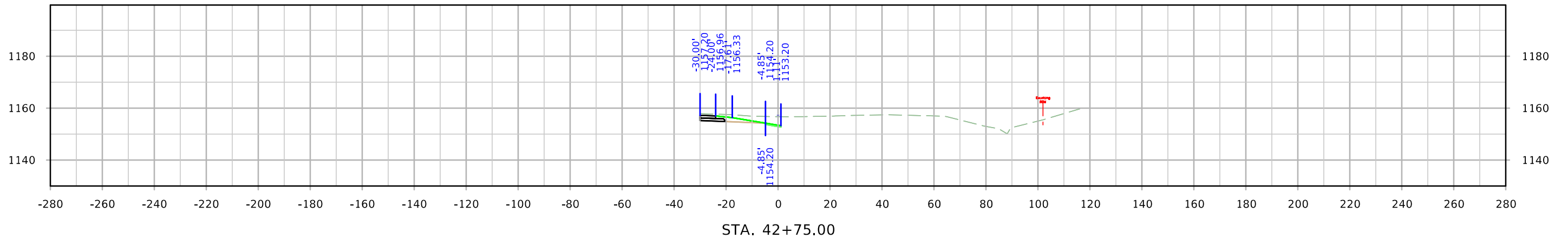
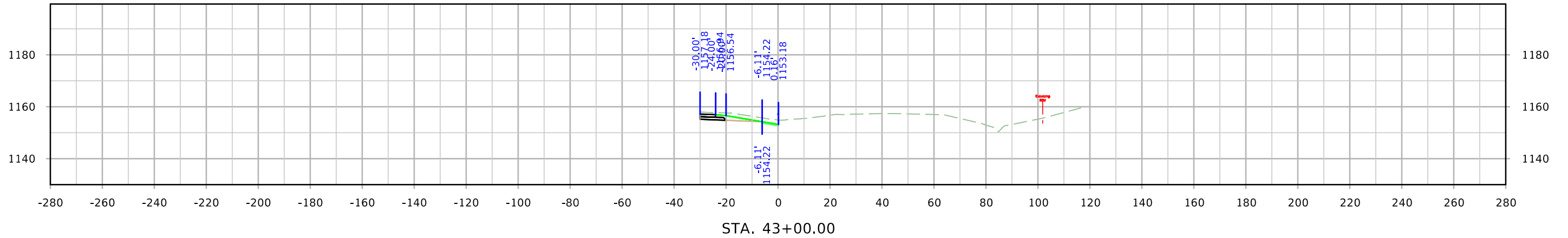
ML - IA 122



ML - IA 122



ML - IA 122



ML - IA 122

