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* D.2	IA 9
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* J.2 - 3	Stage 1 and 2
V Sheets	Bridge and Culvert Situation Plans
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* W.2 - 10	Mainline Cross Sections
	* Color Plan Sheets



PLANS OF PROPOSED IMPROVEMENT ON THE
PRIMARY ROAD SYSTEM
DICKINSON COUNTY
Bridge Replacement
W Fork Little Sioux River 4.9 Mi W of IA 86

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

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



REVISIONS

TOTAL
..
PROJECT IDENTIFICATION NUMBER
21-30-009-020
PROJECT NUMBER
BRF-009-3(29)--38-30
R.O.W. PROJECT NUMBER
STPN-009-3(30)-2J-30

D4 PLAN - Jul 22, 2025

PRELIMINARY PLANS

Subject to change by final design.

D5 PLAN - July 11, 2024

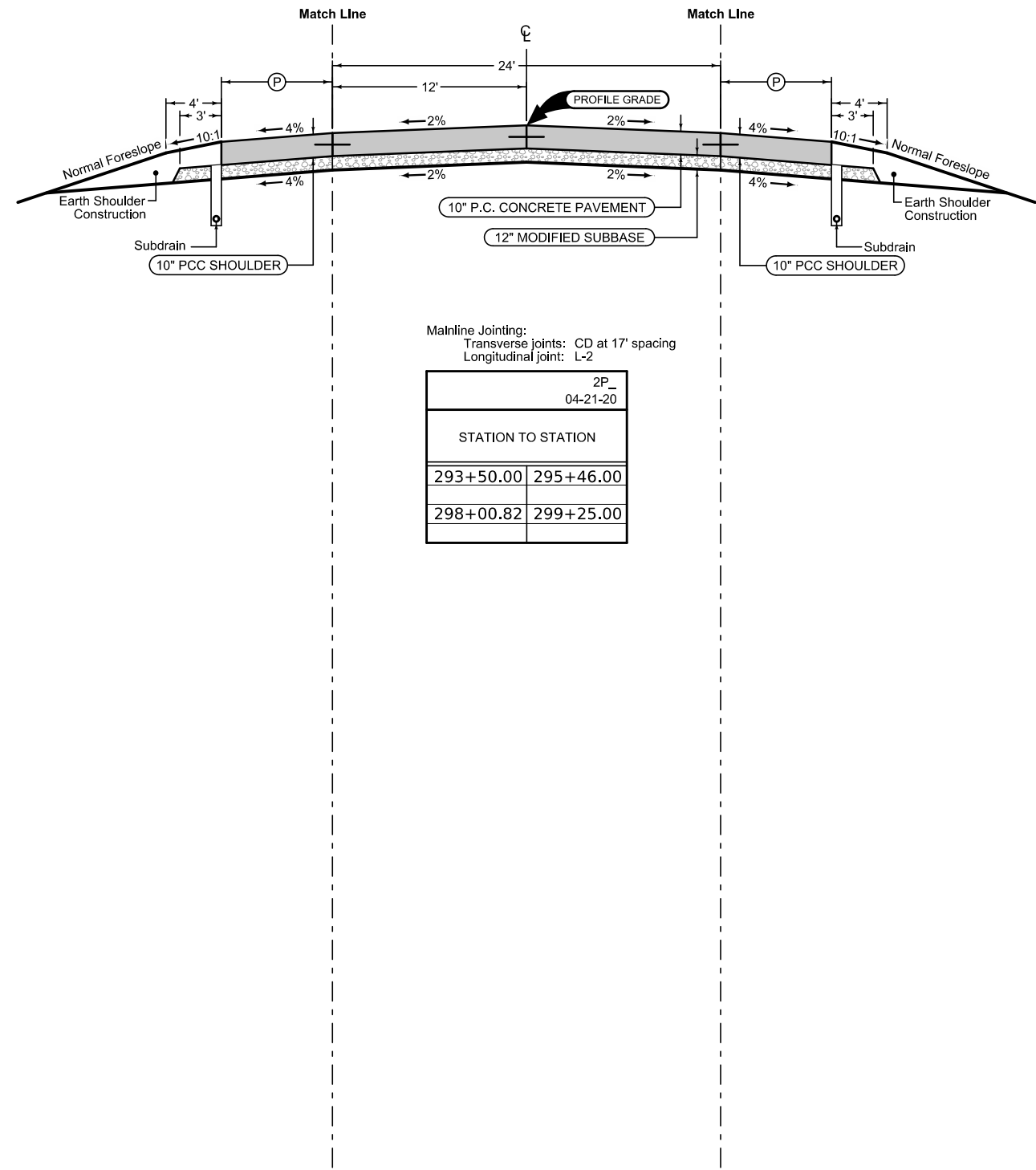
DESIGN DATA RURAL			
2026	AADT	4,500	V.P.D.
2046	AADT	4,900	V.P.D.
2046	DHV	510	V.P.H.
	TRUCKS	10	%
	Total Design ESALs	--	

INDEX OF SEALS			
SHEET NO.	NAME	TYPE	BID QUANTITY SHEETS
A.1	Michael J. Janecek	Primary Signature Block	X
V.1	Phillip M. Harpole	Hydraulic Design	

Full Depth PCC Shoulder

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

2_P_FullPCC_ 04-20-21		
STATION TO STATION	(P)	Feet
292+74.97	295+01.20	8
295+01.20	295+62.95	VAR
297+96.69	298+73.70	VAR
298+73.70	300+71.26	8



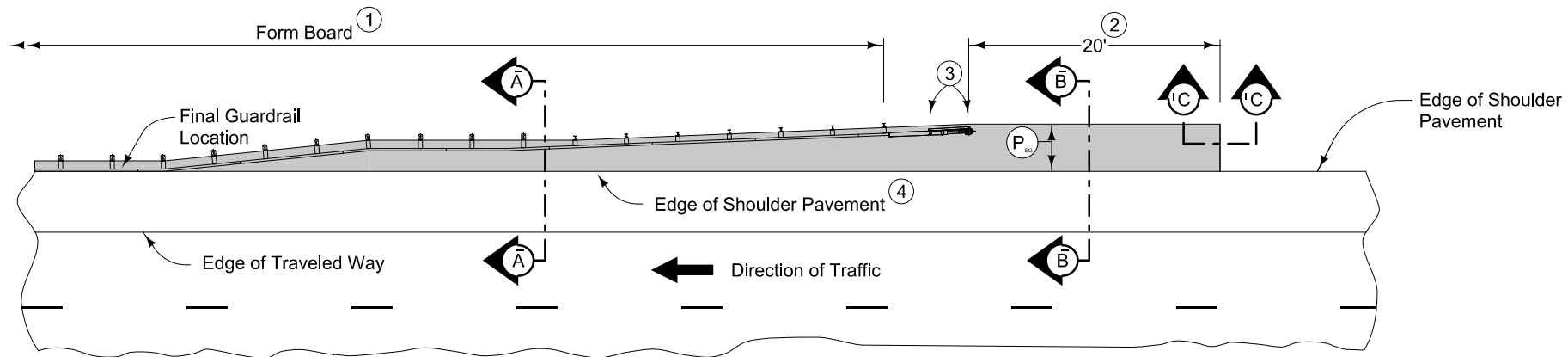
Mainline Jointing:
 Transverse joints: CD at 17' spacing
 Longitudinal joint: L-2

2P_ 04-21-20	
STATION TO STATION	
293+50.00	295+46.00
298+00.82	299+25.00

Full Depth PCC Shoulder

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

2_P_FullPCC_ 04-20-21		
STATION TO STATION	(P)	Feet
293+24.36	294+73.34	8
294+73.34	259+51.86	VAR
297+83.16	298+53.26	VAR
298+53.26	300+22.76	8



PLAN VIEW

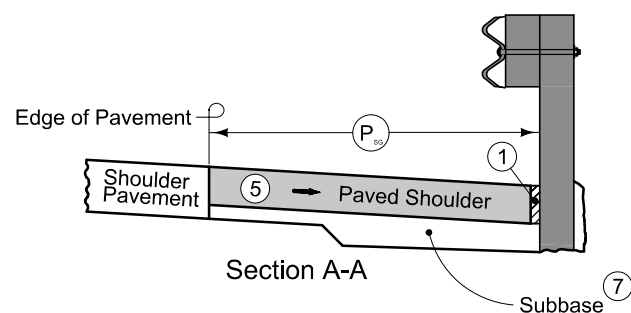
9" HMA Paved Shoulder at guardrail. 8" PCC may be substituted with the following jointing layout:

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.

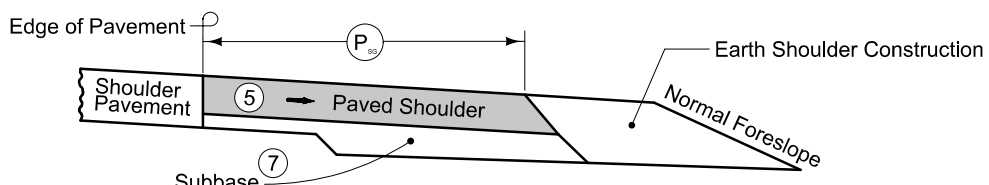
Compaction of HMA is required to face of guardrail post. Hand compaction will be allowed under guardrail. Removal and reinstallation of guardrail will be allowed with no additional payment.

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 'KT' (per PV-101) joint for PCC shoulder. 'B' (per PV-101) joint for HMA 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.

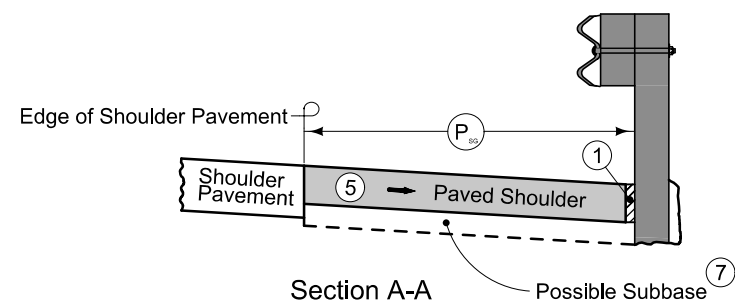


Section A-A

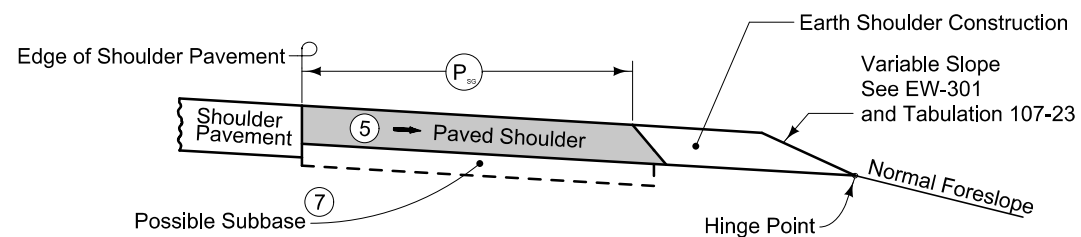


Section B-B

NEW CONSTRUCTION

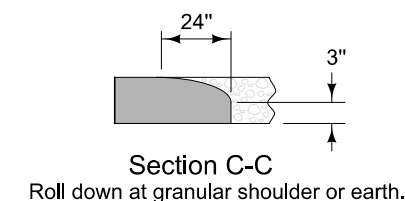


Section A-A



Section B-B

EXISTING SHOULDER



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

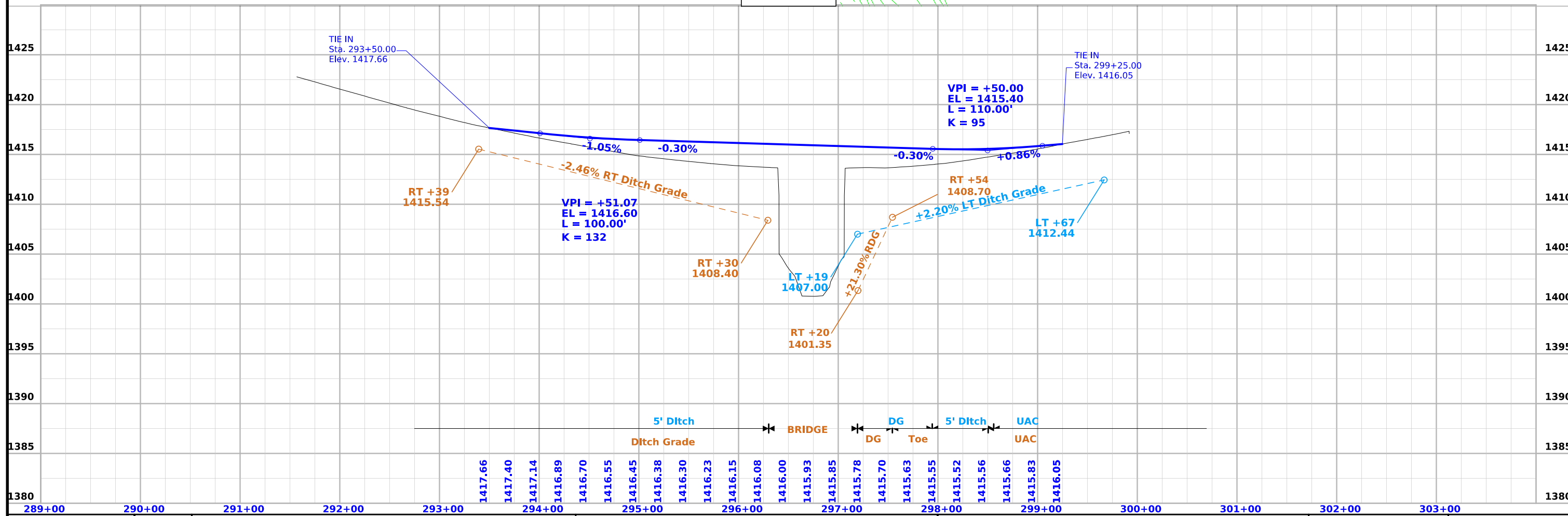
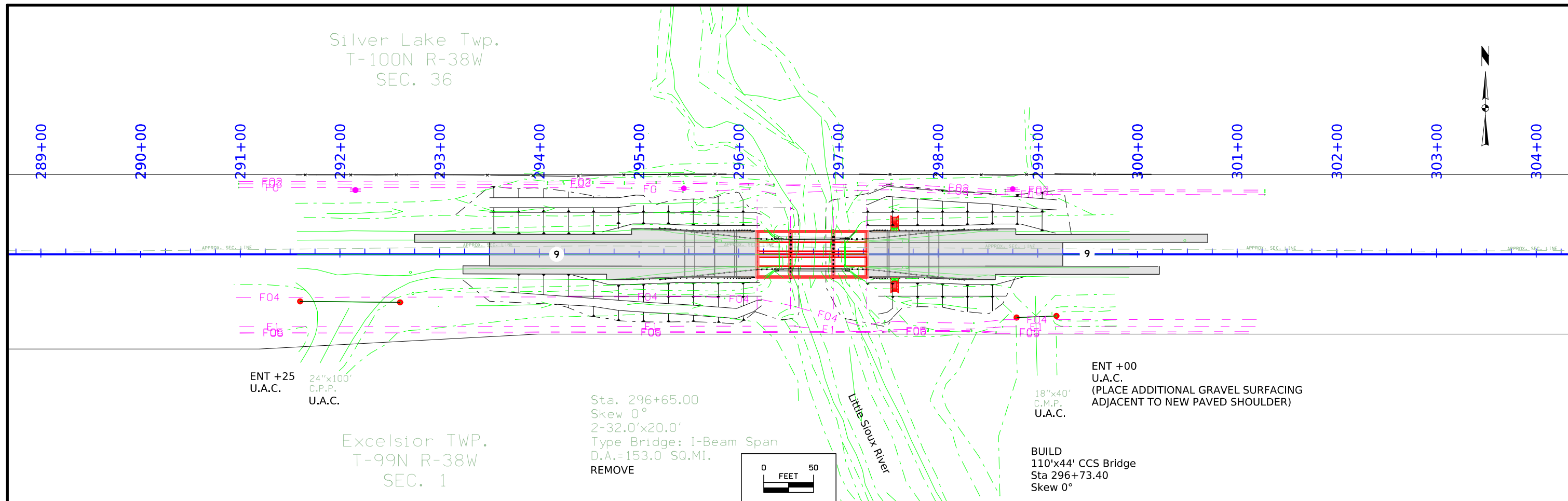
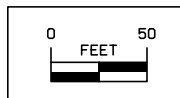
Silver Lake Twp.
T-100N R-38W
SEC. 36

Excelsior TWP.
T-99N R-38W
SEC. 1

Sta. 296+65.00
Skew 0°
2-32.0'x20.0'
Type Bridge: I-Beam Span
D.A.=153.0 SQ.MI.
REMOVE

ENT +00
U.A.C.
(PLACE ADDITIONAL GRAVEL SURFACING
ADJACENT TO NEW PAVED SHOULDER)

BUILD
110'x44' CCS Bridge
Sta 296+73.40
Skew 0°



289+00	290+00	291+00	292+00	293+00	294+00	295+00	296+00	297+00	298+00	299+00	300+00	301+00	302+00	303+00									
1417.66	1417.40	1417.14	1416.89	1416.70	1416.55	1416.45	1416.38	1416.30	1416.23	1416.15	1416.08	1416.00	1415.93	1415.85	1415.78	1415.70	1415.63	1415.55	1415.52	1415.56	1415.66	1415.83	1416.05

Survey Information

SURVEY INDEX

County: Dickinson
PIN: 21-30-009-020
Project Number: BRF-009-3(29)--38-30
Location: Little Sioux River 4.9 mi W of IA 86
Type of Work: Topographic Survey
Project Directory: 3000902021

Survey Personnel

Murray Berting – PLS
Gavin Gear – Land Survey Technician

Date(s) of Survey

Begin Date 11/04/2022
End Date 03/29/2023

General Information

Measurement units for this survey are US survey feet. This survey is for proposed bridge reconstruction and reconstruction of State Highway 9, over the Little Sioux River. Project datum and control information is provided by Shive-Hattery Inc. This project is a Preliminary Survey. This survey request was for the bridge over the Little Sioux River, State Highway 9 corridor and the Little Sioux River.

Project Control

Nearby Iowa Real Time Network reference stations were utilized to obtain horizontal and vertical control on primary project control points. (3) three-minute observations were taken with a minimum two-hour time span between and used in a weighted average to obtain final coordinate values. 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 01
(U.S. SURVEY FOOT)
VERTICAL DATUM: NAVD88
GEOID MODEL: 2012bu2

Alignment Information

The horizontal alignment for U.S. Hwy 9 this survey is a retrace of As-built Plans No. FN-9-3-(1)-21-30. Survey stationing was equated to the plan PI at Sta. 261+66.10 and run back without equation and run ahead with equation (POT Sta. 286+32.60 = POT Sta. 286+37.0)

Survey stationing relates to as built plan stationing as follows:

PI Sta. 261+66.10 (NW Corner Sec 1-99-38) As-built plans Project No. FN-9-3-(1)-21-30
Survey PI Sta. 261+66.10

POT Sta. 286+32.60 = POT Sta. 286+37.0 (1959 Survey) Not Found

Survey POT Sta. 288+07.89 (N ¼ Corner Sec 1-99-38)

POT Sta. 296+73.40 (CL Bridge) As-built plans Project No. FN-564 (March 2, 1964)

PI Sta. 314+46.40 As-built Plans Project No. FN-9-3-(1)-21-30
Survey POT Sta. 314+45.22

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 01 (U.S. Survey Foot)

VERT. DATUM: NAVD88 - Geoid Model: 2012bu2

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 01 (U.S. Survey Foot)
 VERT. DATUM: NAVD88
 Geoid Model: 2012bu2

POINT NAME	NORTHING	EASTING	ELEVATION	FEATURE DEFINITION-DESCRIPTION
202	9683912.082	11494156.78	1425.747333	CP CUT X BALL RAIL
205	9684074.525	11492263.87	1433.325667	CP CUT X BALL RAIL
207	9683904.476	11492208.59	1443.458333	CP 5/8" IR W/ YELLOW IDOT CAP @ REF SIGN
208	9683899.995	11492094.06	1446.989667	CP CUT X BALL RAIL

108-23A
08-01-08

TRAFFIC CONTROL PLAN

1) While bridge and approaches are being removed and replaced, traffic shall be maintained on IA 9 at all times by staged construction with temporary signals allowing one lane of traffic. (TC-217)

2) Signage and devices shall be furnished, installed, maintained, and removed by Contractor.

108-26A
08-01-08

STAGING NOTES

Stage 1:
Construct temporary pavement at EB shoulders.
Remove and replace south (WB) portion of IA 9 roadway, approaches and bridge with traffic shifted to EB lane using temporary signals.

Stage 2:
Remove and replace north half of roadway, approaches and complete bridge structure with traffic shifted to WB lane and temporary pavement using temporary signals.

Stage 3:
Complete approach and roadway to re-establish centerline with IA 9 traffic shifted to EB lane and shoulder using temporary signals.

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
IA 9	Both	DICKINSON	Bridge over Little Sioux River	Little Sioux River	Bridge		Width					

111-01
04-17-12

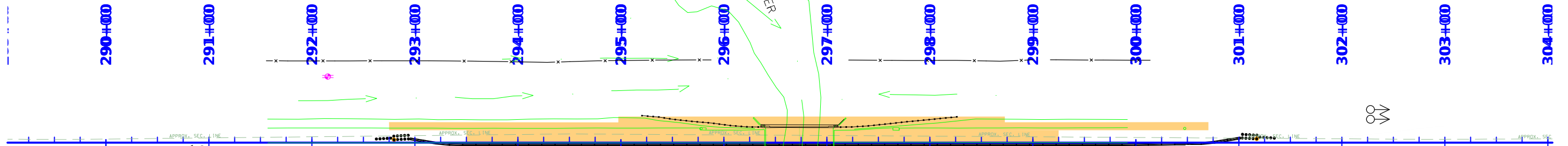
COORDINATED OPERATIONS

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.

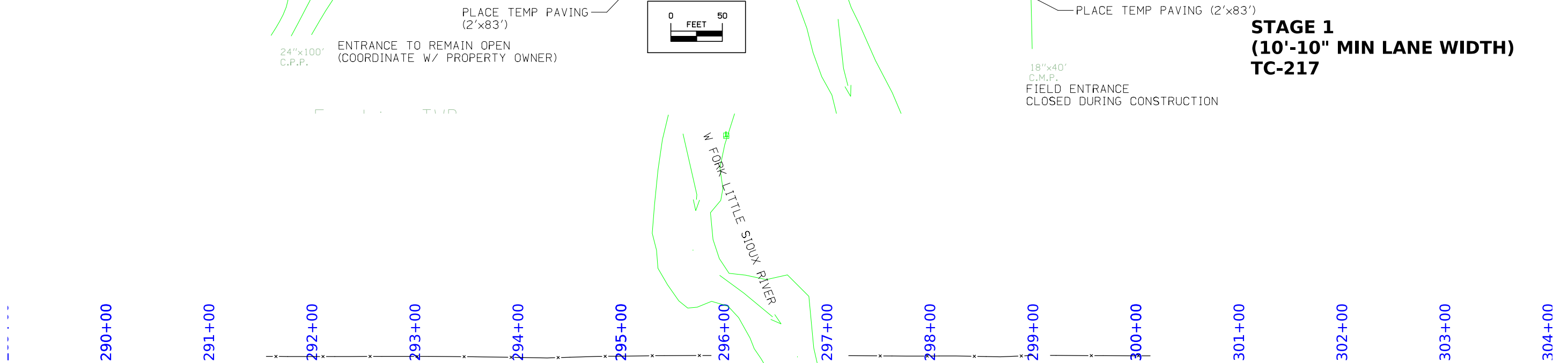
Project	Type of Work
None Provided	

Silver Lake Twp.
T-100N R-38W
SEC. 36

Sta. 296+73.40
Skew 0°
2-32.0'x20.0'
Type Bridge: I-Beam Span
D.A.=153.0 SQ.MI.
REMOVE



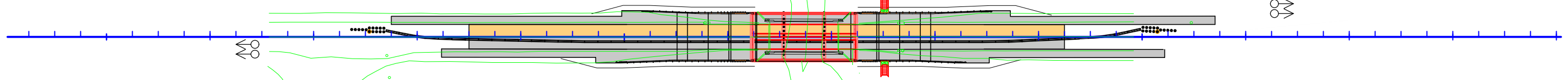
**STAGE 1
(10'-10" MIN LANE WIDTH)
TC-217**



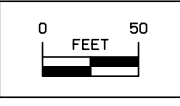
**STAGE 2
(12' MIN LANE WIDTH)
TC-217**

290+00 291+00 292+00 293+00 294+00 295+00 296+00 297+00 298+00 299+00 300+00 301+00 302+00 303+00 304+00

W. FORK LITTLE SIOUX RIVER



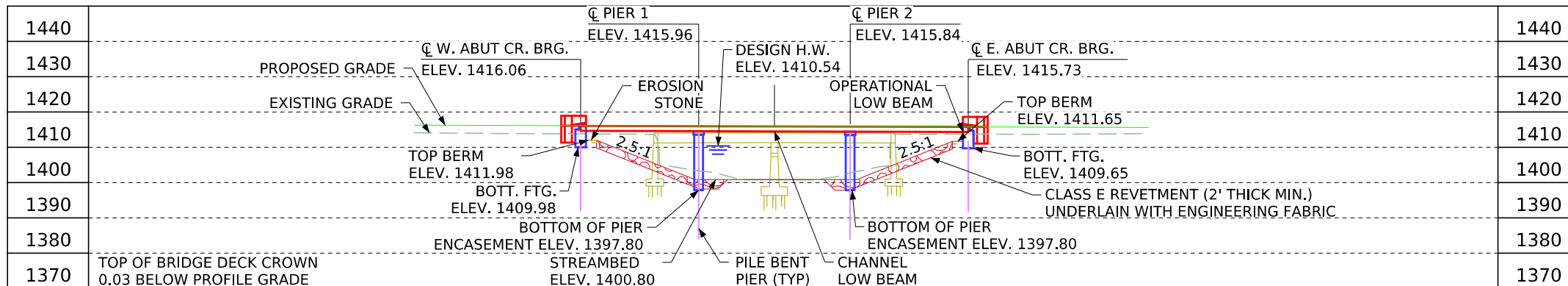
ENTRANCE TO REMAIN OPEN
(COORDINATE W/ PROPERTY OWNER)



FIELD ENTRANCE
CLOSED DURING CONSTRUCTION

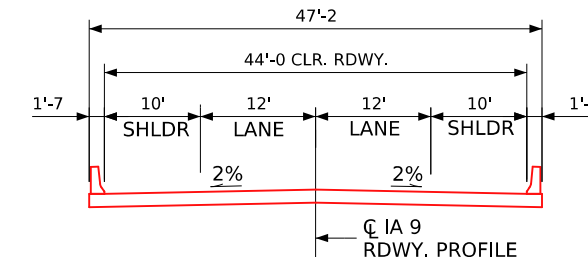
**STAGE 3
(12' MIN LANE WIDTH)
TC-217**

Control Point: POINT NAME 205, Y=9684074.525, X=11492263.87, Z=1433.326, CP CUT X BALL RAIL

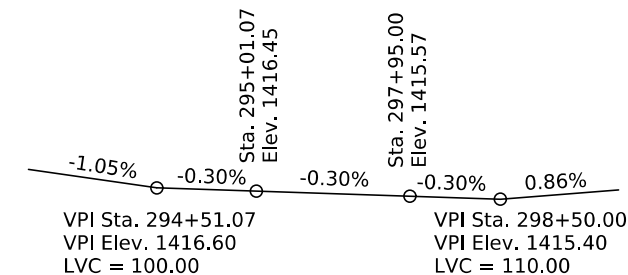


LONGITUDINAL SECTION ALONG Q APPROACH ROADWAY

PRELIMINARY DESIGN SCOUR ELEV. = 1395.29
VERIFY ELEVATIONS WHEN SOIL BORINGS ARE COMPLETE



TYPICAL BRIDGE SECTION



PROPOSED PROFILE GRADE IA 9

Hydraulic Data

RIBD: LittleSiouxR_WF_Dick4.52
Drainage Area = 153 Sq. Mi.
Stream Slope = 5.51 Ft./Mi.
Avg. Low Water Stage = 1401.6

Q₂₅ = 3,385 CFS
Stage = 1410.06

Q₅₀ = 4,095 CFS
Stage = 1410.54
Channel Low Beam = 1413.92
Avg. Bridge Velocity = 6.33 FPS

Q₁₀₀ = 4,870 CFS
Stage = 1411.09
Operational Low Beam = 1413.75
Backwater = 0.58 Ft.
Avg. Bridge Velocity = 7.06 FPS

Q₂₀₀ = 5,720 CFS
Stage = 1411.53
Calculated Design Scour = 1395.29

Q₅₀₀ = 6,690 CFS
Stage = 1411.98
Avg. Bridge Velocity = 8.62 FPS
Calculated Check Scour = 1395.10

Roadway Overtop 1415.51
Sta. 298+33.37

Location

IA 9 over West Fork
Little Sioux River
T-100N & T-99N R-38W
Sections 36 & 1
Silver Lake & Excelsior Twp.
Dickinson County
FHWA No. 023701
Bridge Maint. No. 3065.4s009
Latitude 43.430414°
Longitude -95.275864°

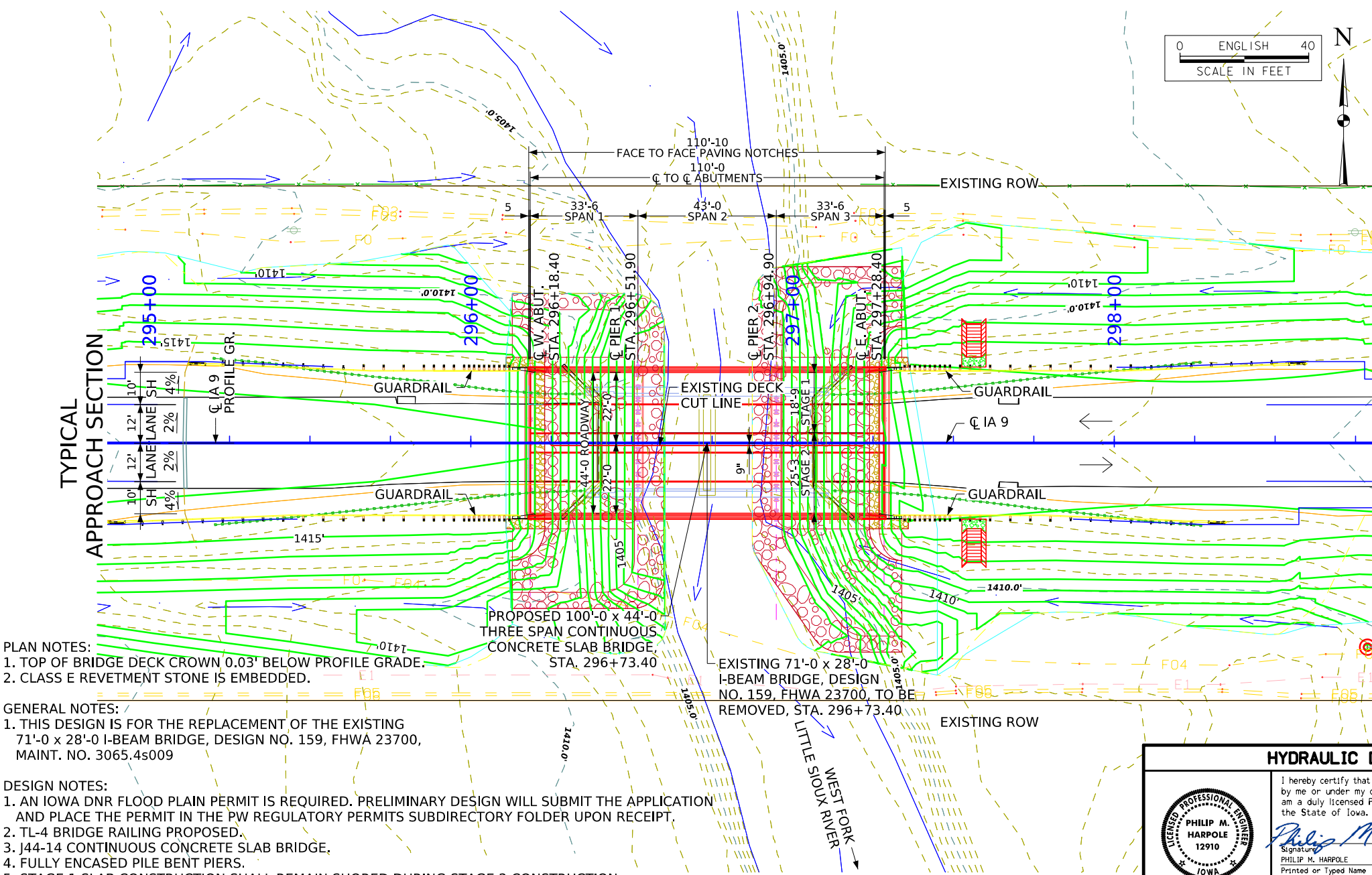
Traffic Estimate

2026 AADT 4,500 V.P.D.
2046 AADT 4,900 V.P.D.
2046 DHV 510 V.P.H.
Trucks 10 %
Total
Design ESALs

Utilities Legend

Symbol - Type

 Utilities shown on this sheet are for information only. See road design sheets for final utility information.



- PLAN NOTES:
1. TOP OF BRIDGE DECK CROWN 0.03' BELOW PROFILE GRADE.
 2. CLASS E REVETMENT STONE IS EMBEDDED.

- GENERAL NOTES:
1. THIS DESIGN IS FOR THE REPLACEMENT OF THE EXISTING 71'-0 x 28'-0 I-BEAM BRIDGE, DESIGN NO. 159, FHWA 23700, MAINT. NO. 3065.4s009

- DESIGN NOTES:
1. AN IOWA DNR FLOOD PLAIN PERMIT IS REQUIRED. PRELIMINARY DESIGN WILL SUBMIT THE APPLICATION AND PLACE THE PERMIT IN THE PW REGULATORY PERMITS SUBDIRECTORY FOLDER UPON RECEIPT.
 2. TL-4 BRIDGE RAILING PROPOSED.
 3. J44-14 CONTINUOUS CONCRETE SLAB BRIDGE.
 4. FULLY ENCASED PILE BENT PIERS.
 5. STAGE 1 SLAB CONSTRUCTION SHALL REMAIN SHORED DURING STAGE 2 CONSTRUCTION.
 6. REMOVE EXISTING CONCRETE EROSION CONTROL BLANKET AT ABUTMENTS.

SITUATION 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.

Philip M. Harpole 07-12-2024
Signature Date
PHILIP M. HARPOLE
Printed or Typed Name
My license renewal date is December 31, 2025

Pages or sheets covered by this seal: V.1, V.2, V.3

Design For 0° Skew

110'-0 X 44'-0 CONTINUOUS CONCRETE SLAB BRIDGE

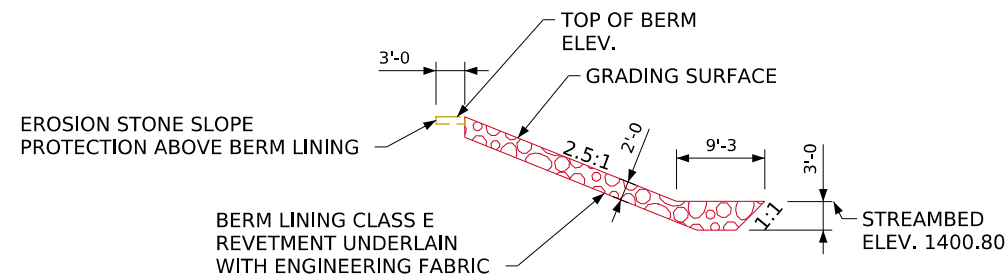
33'-6 END SPANS 43'-0 INTERIOR SPAN

SITUATION PLAN

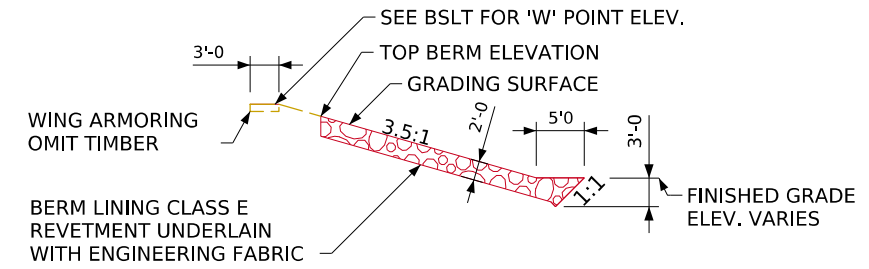
STA. 296+73.40 (IA 9) JULY 2024

DICKINSON COUNTY
IOWA DEPARTMENT OF TRANSPORTATION

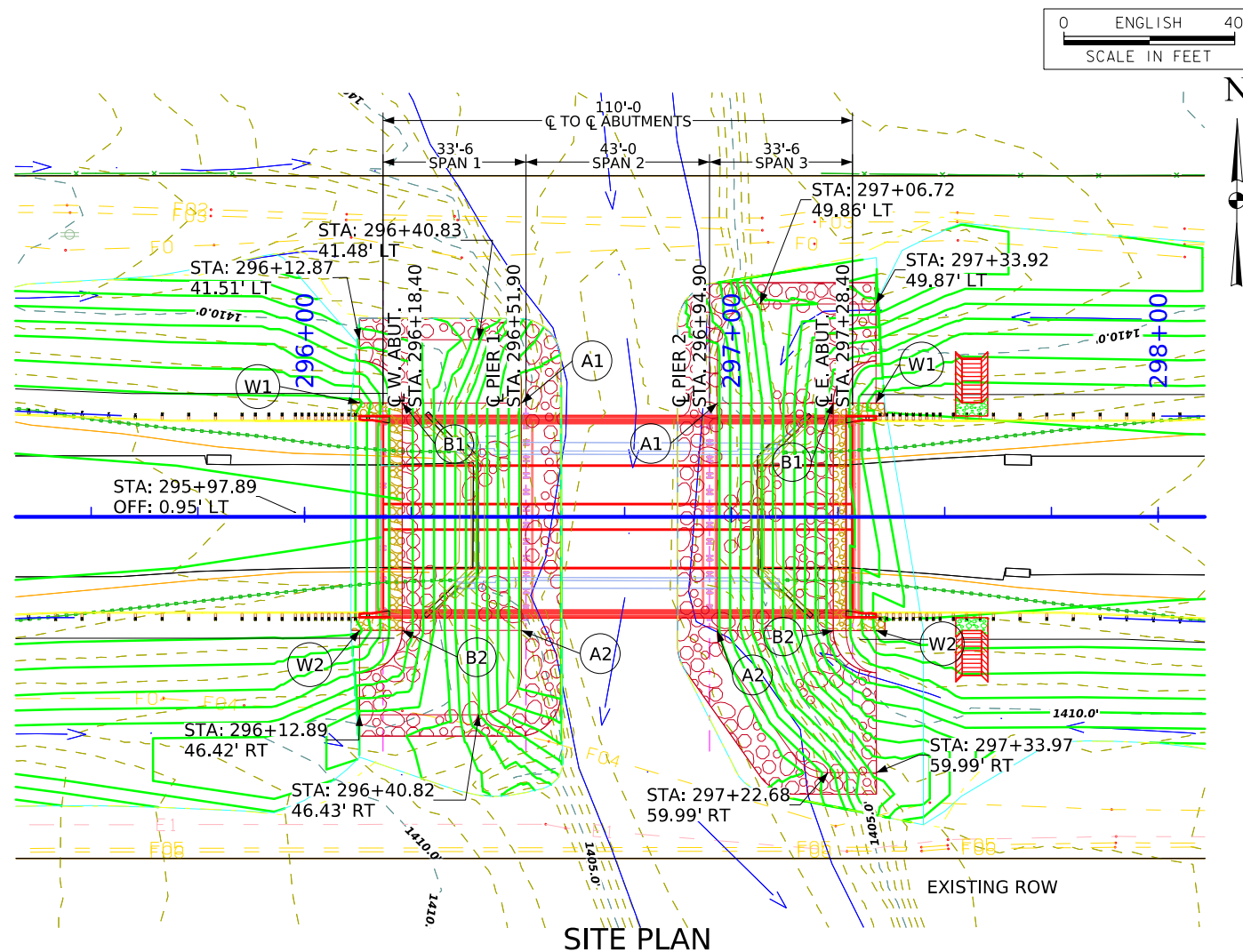
Design No. 0126 Design Sheet No. 1 of 3 FHWA/Asset 023701



SECTION THRU EMBEDDED REVETMENT BERM



SECTION THRU EMBEDDED REVETMENT BERM
NORMAL TO BRIDGE WING AT 'W' POINT



SITE PLAN

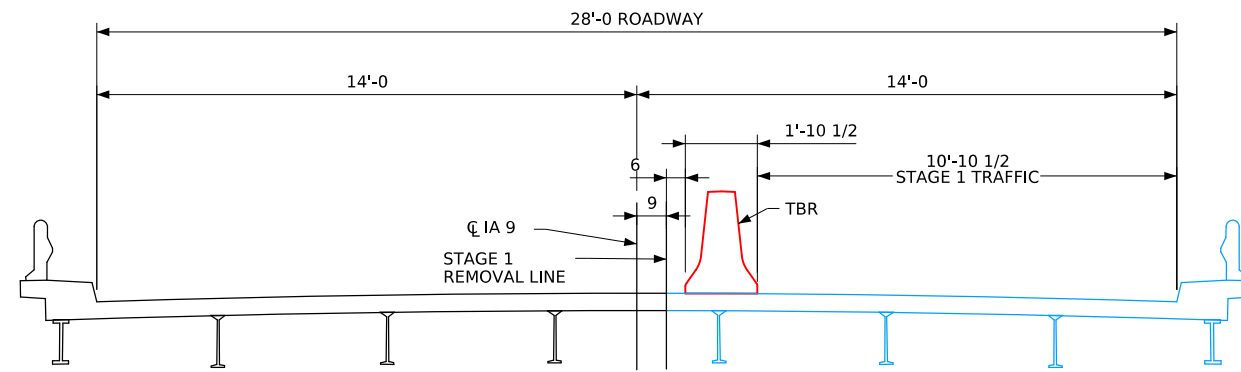
Points	West Abutment			East Abutment		
	Station	Offset	Elev.	Station	Offset	Elev.
A1	296+50.83	26.58' LT	1400.80	296+96.72	26.58' LT	1400.80
A2	296+50.83	26.58' RT	1400.80	296+96.72	26.58' RT	1400.80
B1	296+22.90	26.58' LT	1411.98	297+23.90	26.58' LT	1411.65
B2	296+22.90	26.58' RT	1411.98	297+23.90	26.58' RT	1411.65
W1	296+12.90	26.58' LT	1415.52	297+33.90	26.58' LT	1415.16
W2	296+12.90	26.58' RT	1415.52	297+33.90	26.58' RT	1415.16

Berm slope elevations reflect the grading surface.

Location	Revetment CL. E (Ton)	Erosion Stone (Ton)	Engineering Fabric (SY)	Excavation (CY)
Berm Lining - West Abutment	518.5	7.2	505.5	328.5
Berm Lining - East Abutment	599.9	7.2	585.4	379.4
Totals	1118.4	14.4	1090.9	707.9

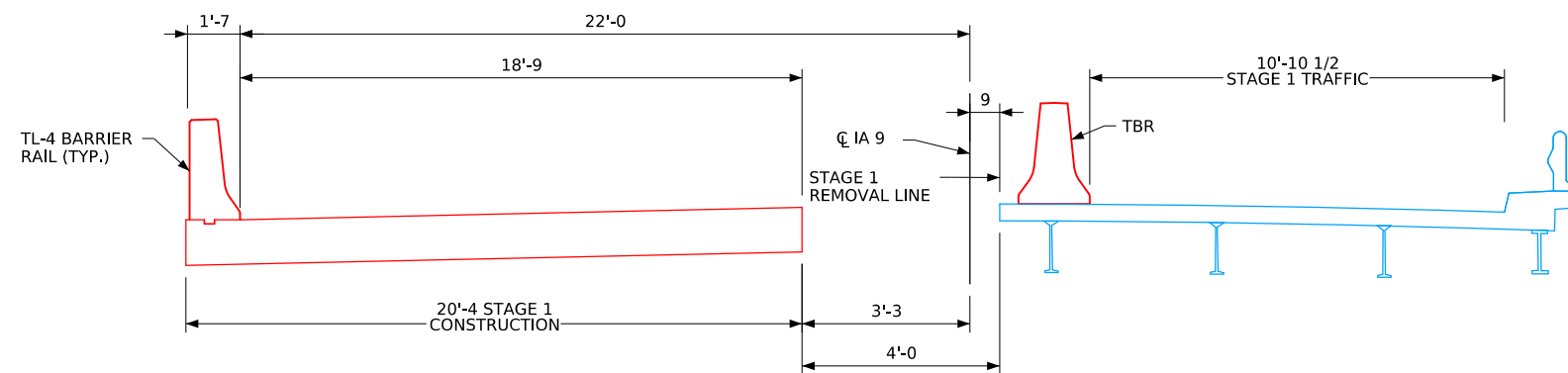
Excavation quantity calculated from grading surface.

Design For 0° Skew
100'-0 X 44'-0 CONTINUOUS CONCRETE SLAB BRIDGE
 30'-6 END SPANS 39'-0 INTERIOR SPAN
SITUATION PLAN - SITE
 STA. 296+73.40 (IA 9) JULY 2024
DICKINSON COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION
 Design No. 0126 Design Sheet No. 2 of 3 FHWA/Asset 023701

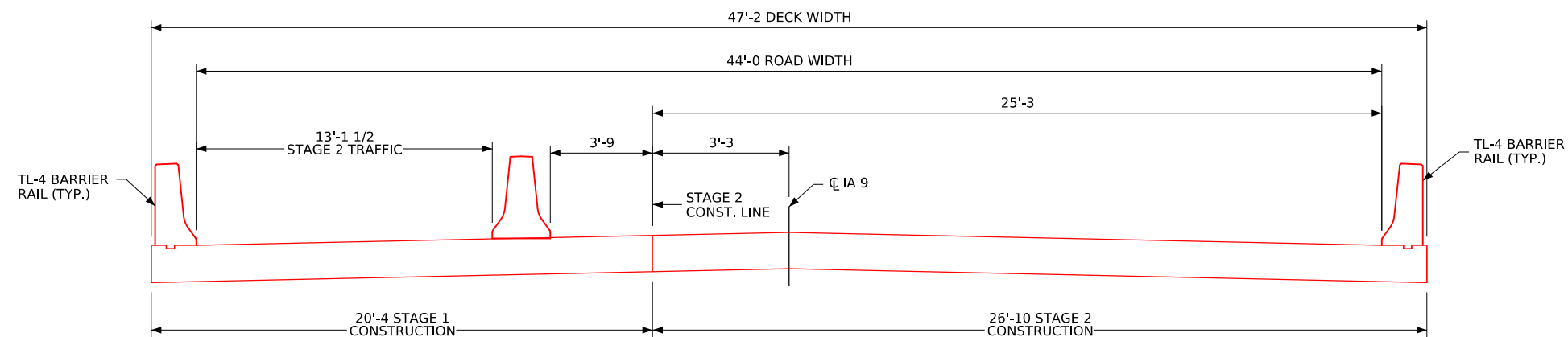


TBR - TEMPORARY BARRIER RAIL

STAGE 1 REMOVAL



STAGE 1 CONSTRUCTION



STAGE 2 CONSTRUCTION

Design For 0° Skew
**100'-0 X 44'-0 CONTINUOUS
 CONCRETE SLAB BRIDGE**
 30'-6 END SPANS 39'-0 INTERIOR SPAN
SITUATION PLAN
 STA. 296+73.40 (IA 9) JULY 2024
DICKINSON COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION
 Design No. 0126 Design Sheet No. 3 of 3 FHWA/Asset 023701

CROSS SECTION VIEW COLOR LEGEND

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

NOTES:

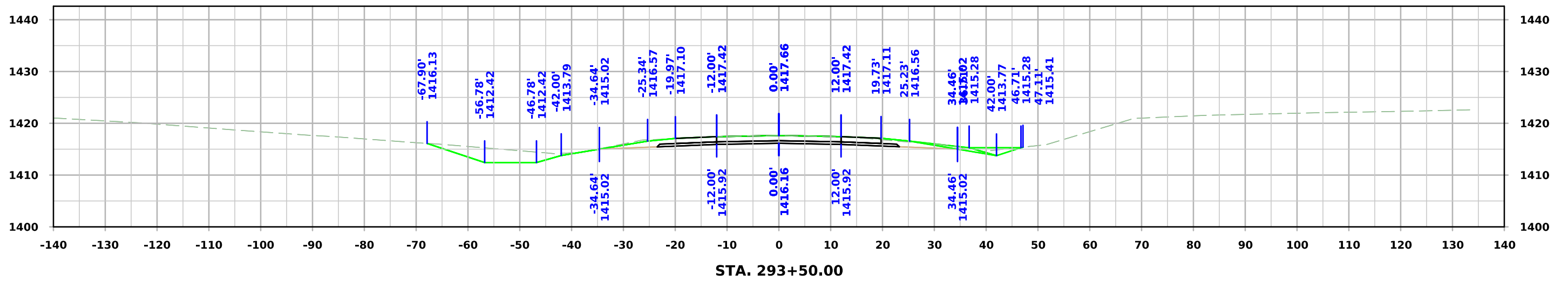
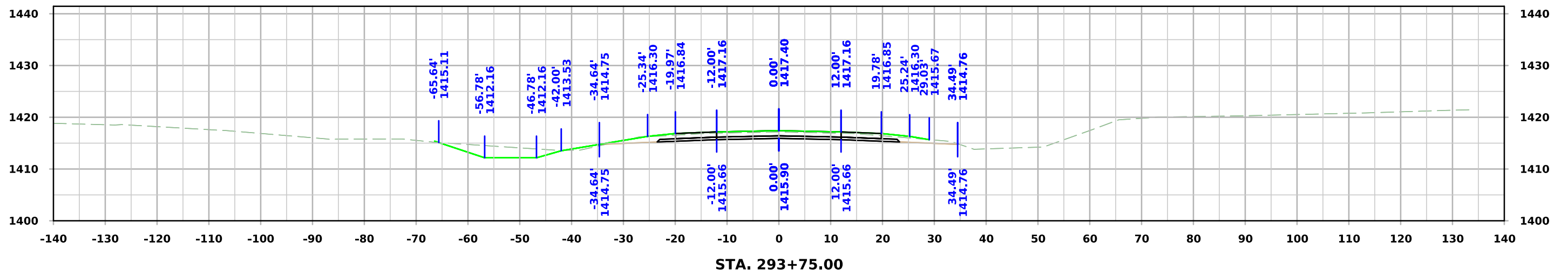
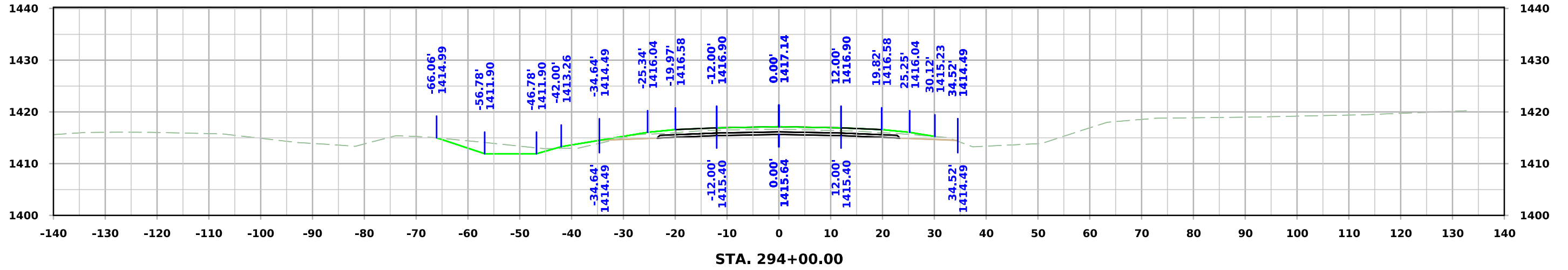
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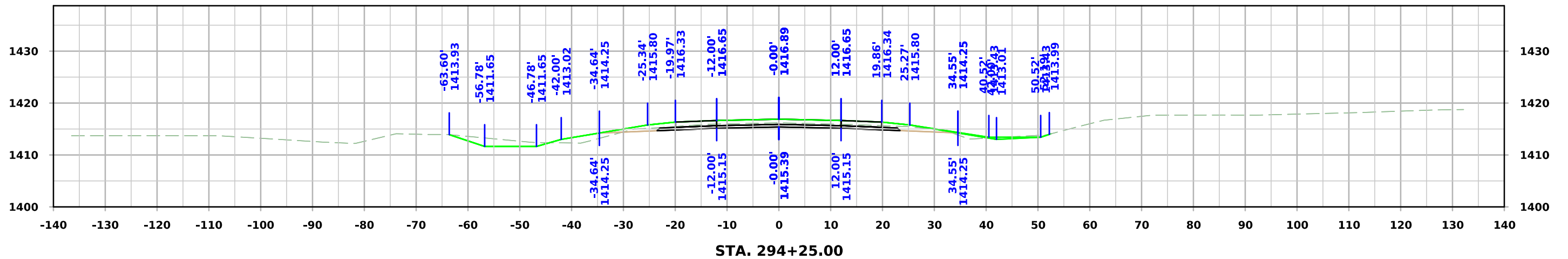
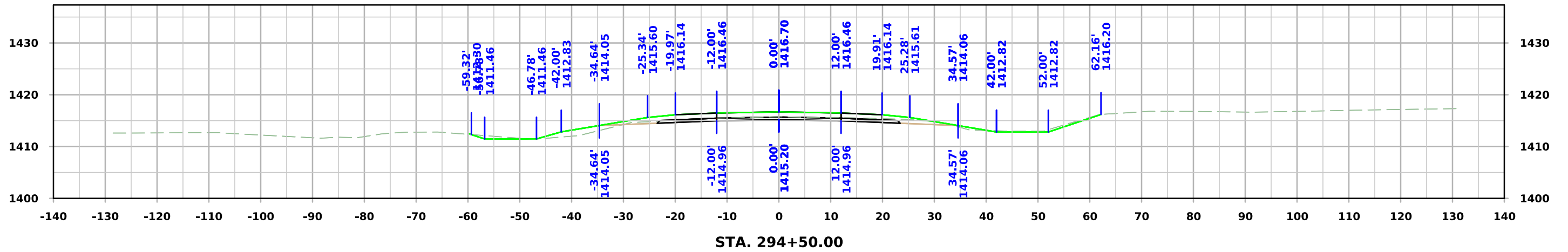
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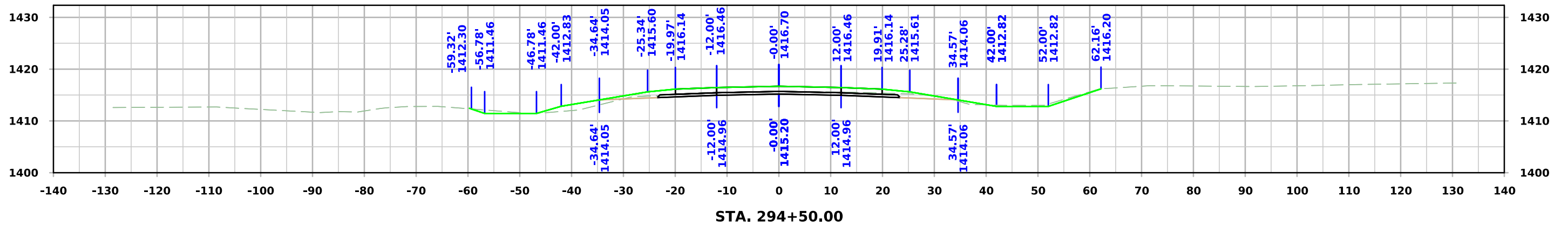
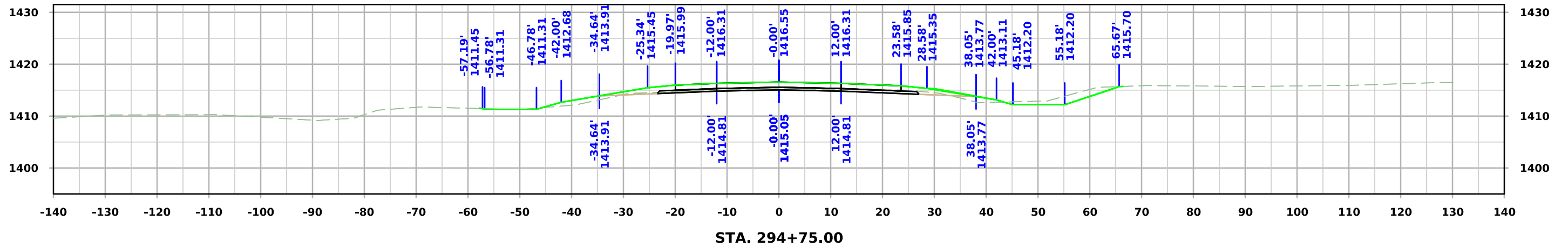
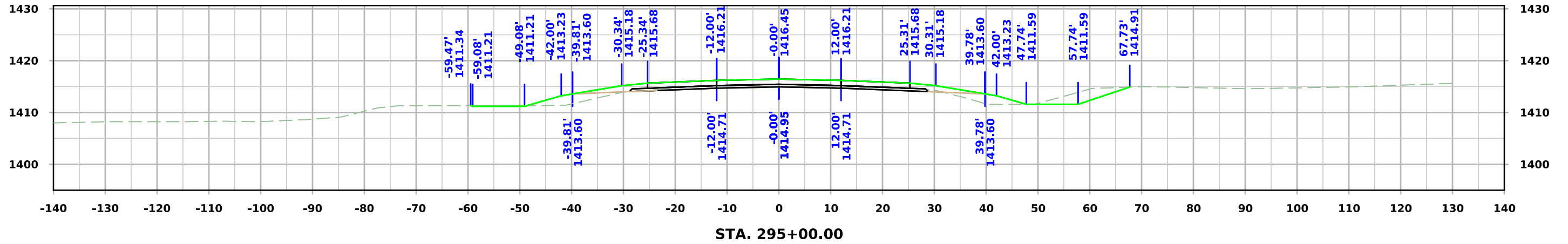
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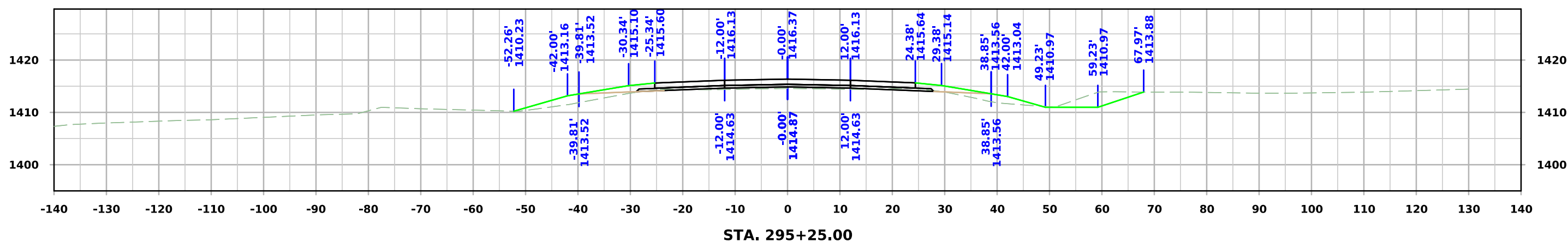
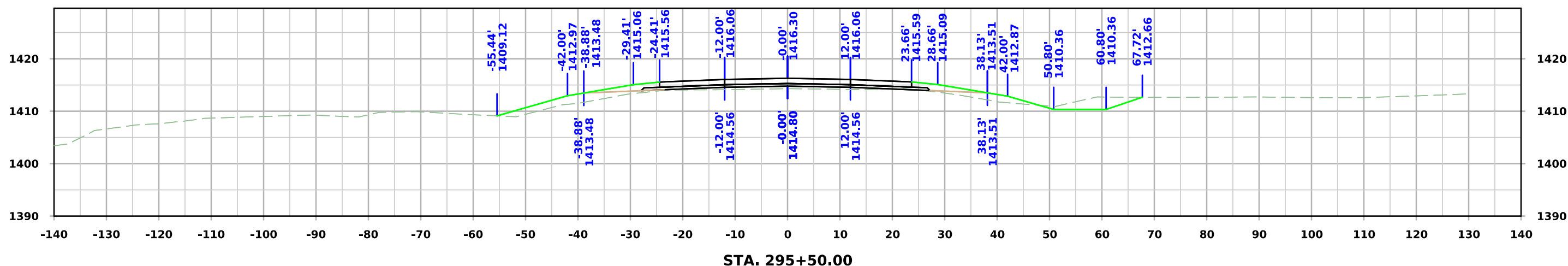
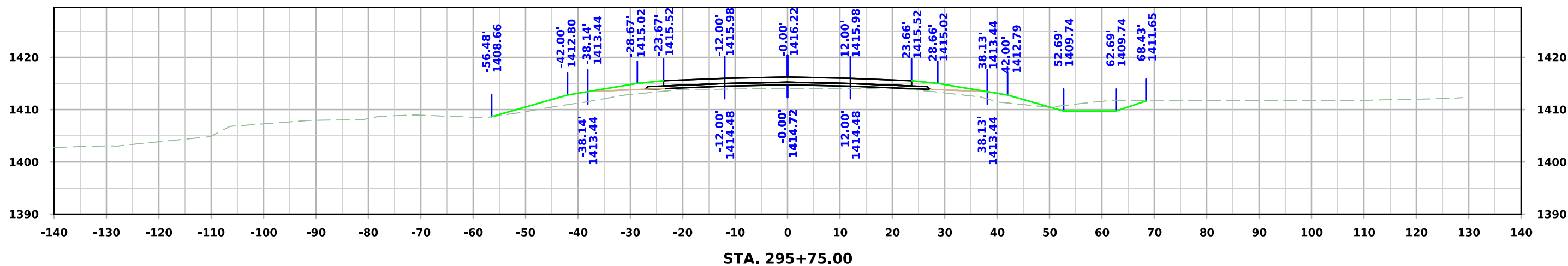
CROSS SECTIONS LEGEND AND INFORMATION SHEET

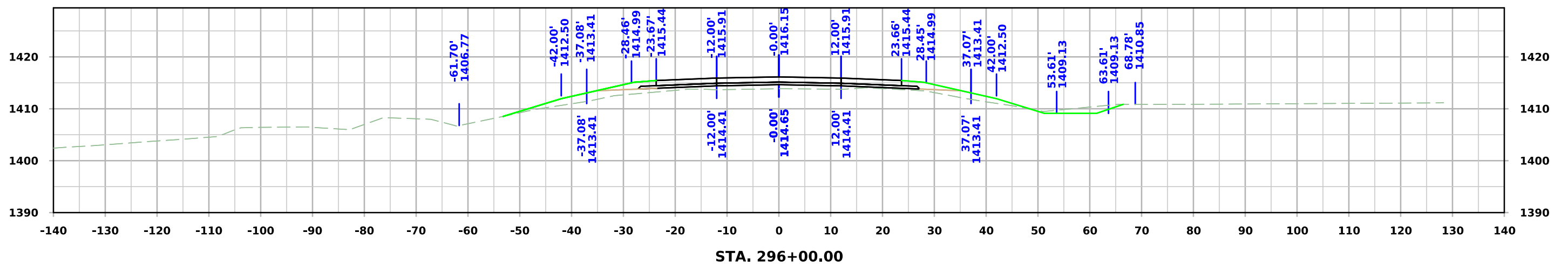
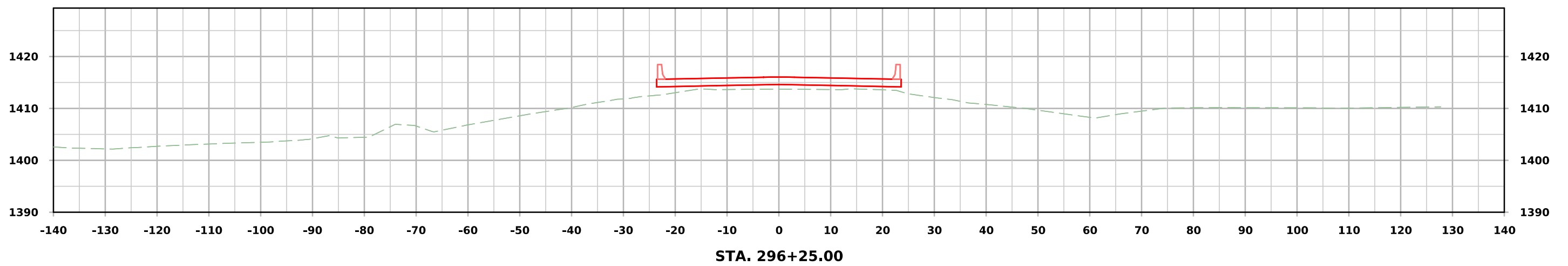
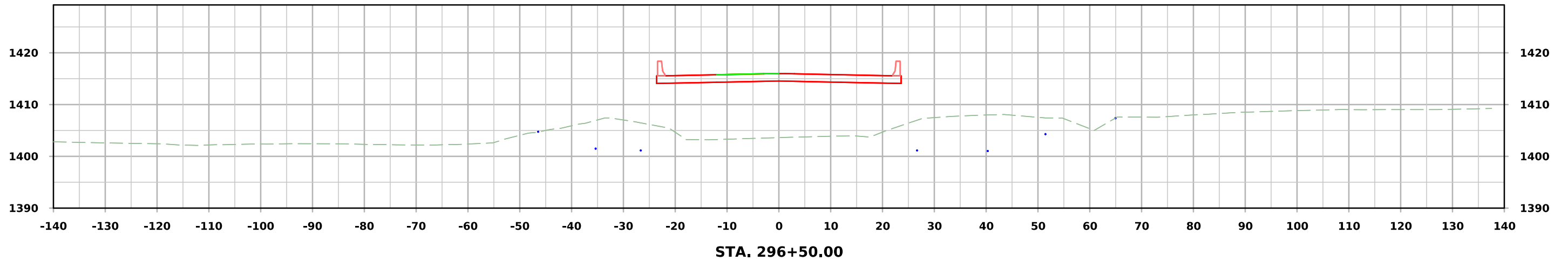
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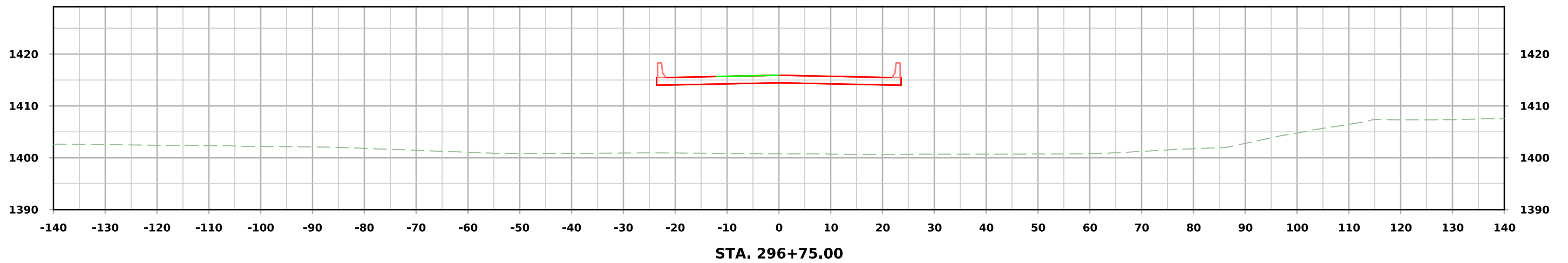
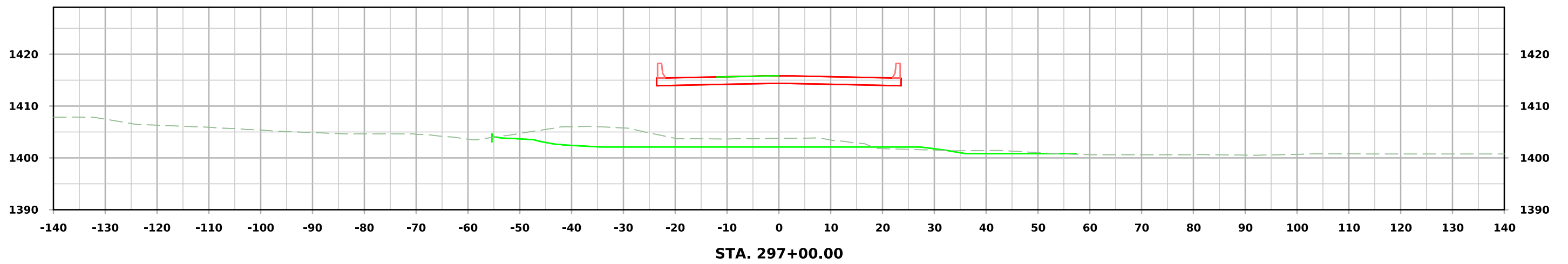
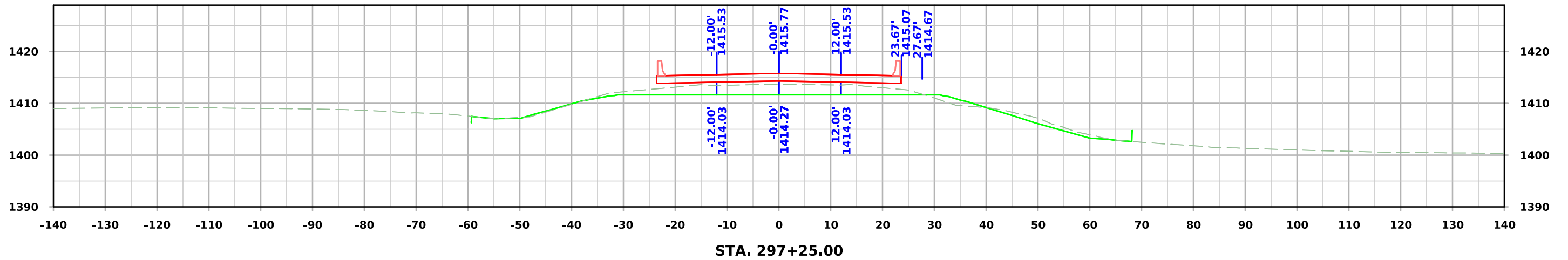


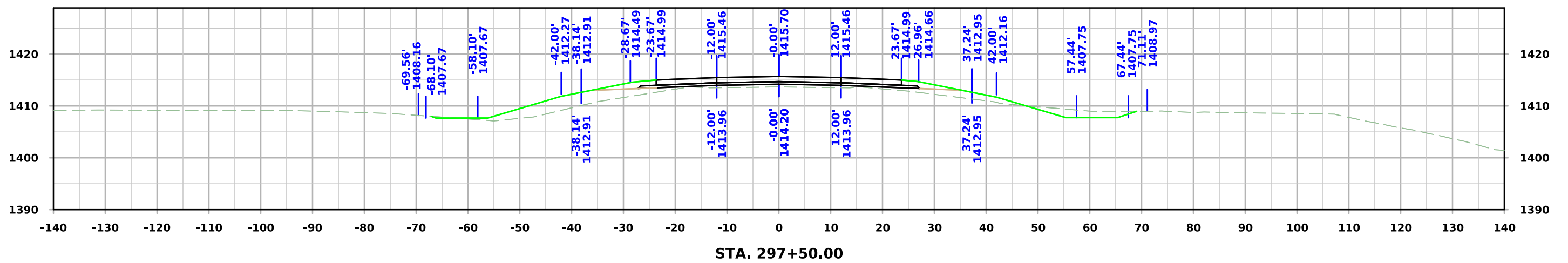
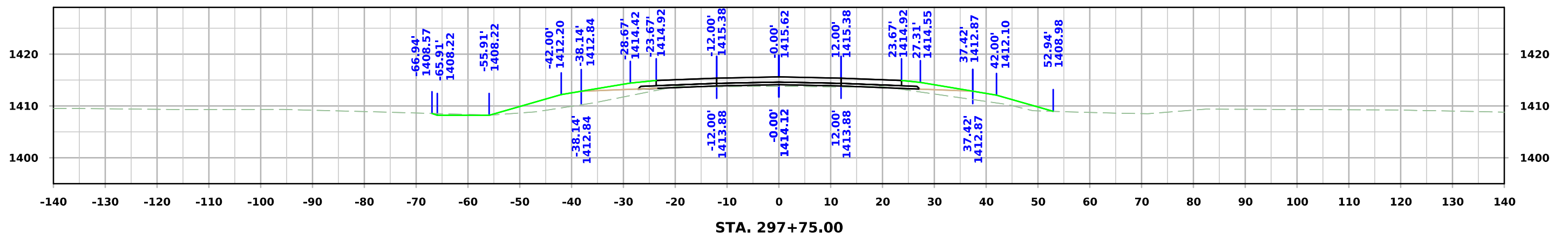
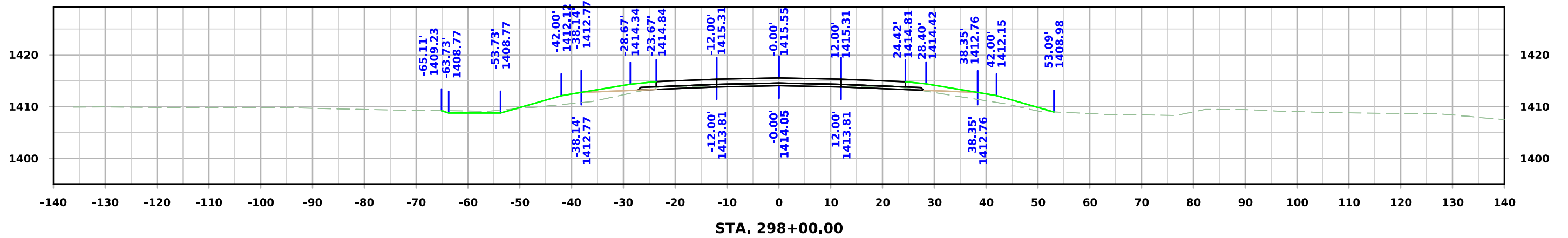


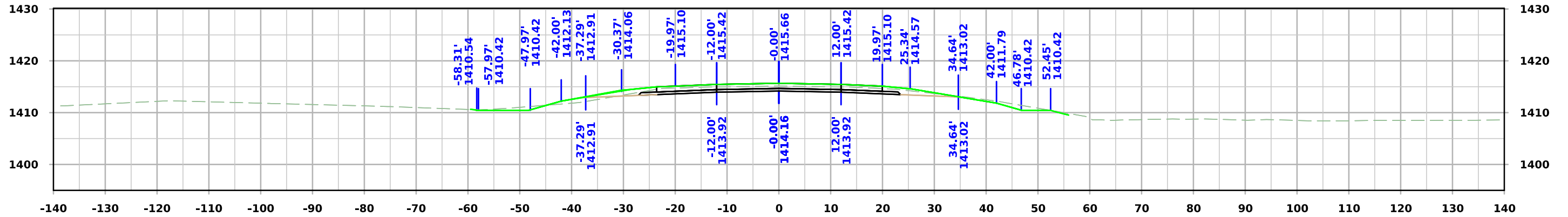




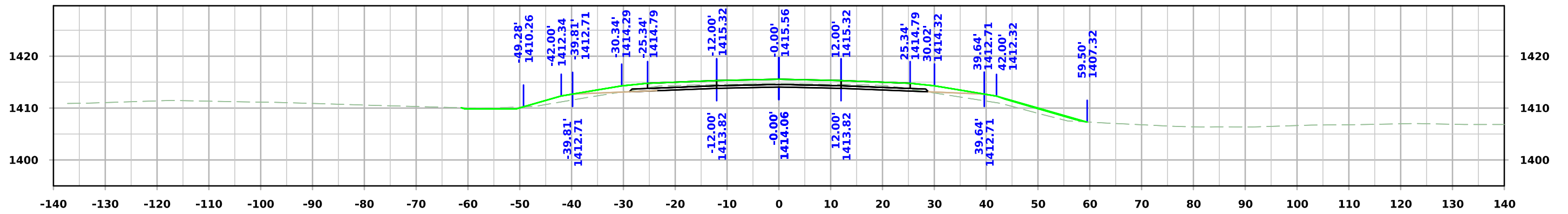




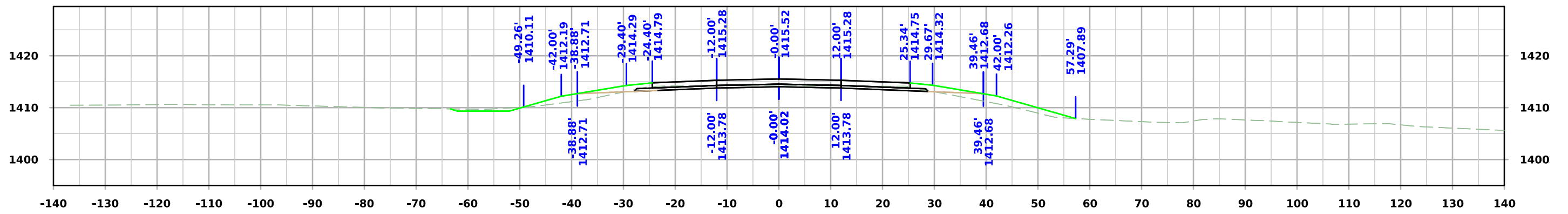




STA. 298+75.00



STA. 298+50.00



STA. 298+25.00

