Bridge Replacement - PPCB
IMX-080-2(275)76--02-01
LETTING DATE Oct 19 2027

ADAIR COUNTY

INDEX OF SHEETS	
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A.10 - 12	Design Criteria
A.13	Field Exam Notes/Questions
B Sheets	**Typical Cross Sections and Details**
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D Sheets	**Mainline Plan and Profile Sheets**
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* W.1	Cross Sections Legend & Symbol Information Sheet
* W.2 - 13	Mainline Cross Sections
	* Color Plan Sheets

IOWA DOT

PLANS OF PROPOSED IMPROVEMENT ON THE

INTERSTATE ROAD SYSTEM

ADAIR COUNTY

Bridge Replacement - PPCB

Co Rd N54 Interchange at Adair

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

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

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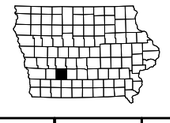
www.iowaonecall.com
811 Know what's below. Call before you dig.

REVISIONS

TOTAL
43
PROJECT IDENTIFICATION NUMBER
23-01-080-040
PROJECT NUMBER
IMX-080-2(275)76--02-01
R.O.W. PROJECT NUMBER
IMN-080-2(276)76--0E-01



DESIGN DATA RURAL			
2028	AADT	3200	V.P.D.
2048	AADT	4000	V.P.D.
20 –	DHV	–	V.P.H.
TRUCKS		40	%
Total Design ESALs		–	

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

D3 PLAN - Date: 2/14/25
D5 PLAN - Date: 7/18/25
P9 PLAN - Date: 12/17/25
D4 PLAN - Date: 6/22/27

PRELIMINARY PLANS

Subject to change by final design.

D2 PLAN - Date: 12-16-24

FILE NO.	ENGLISH	DESIGN TEAM Jia/Schoenrock/Evans	ADAIR COUNTY	PROJECT NUMBER IMX-080-2(275)76--02-01	SHEET NUMBER A.1

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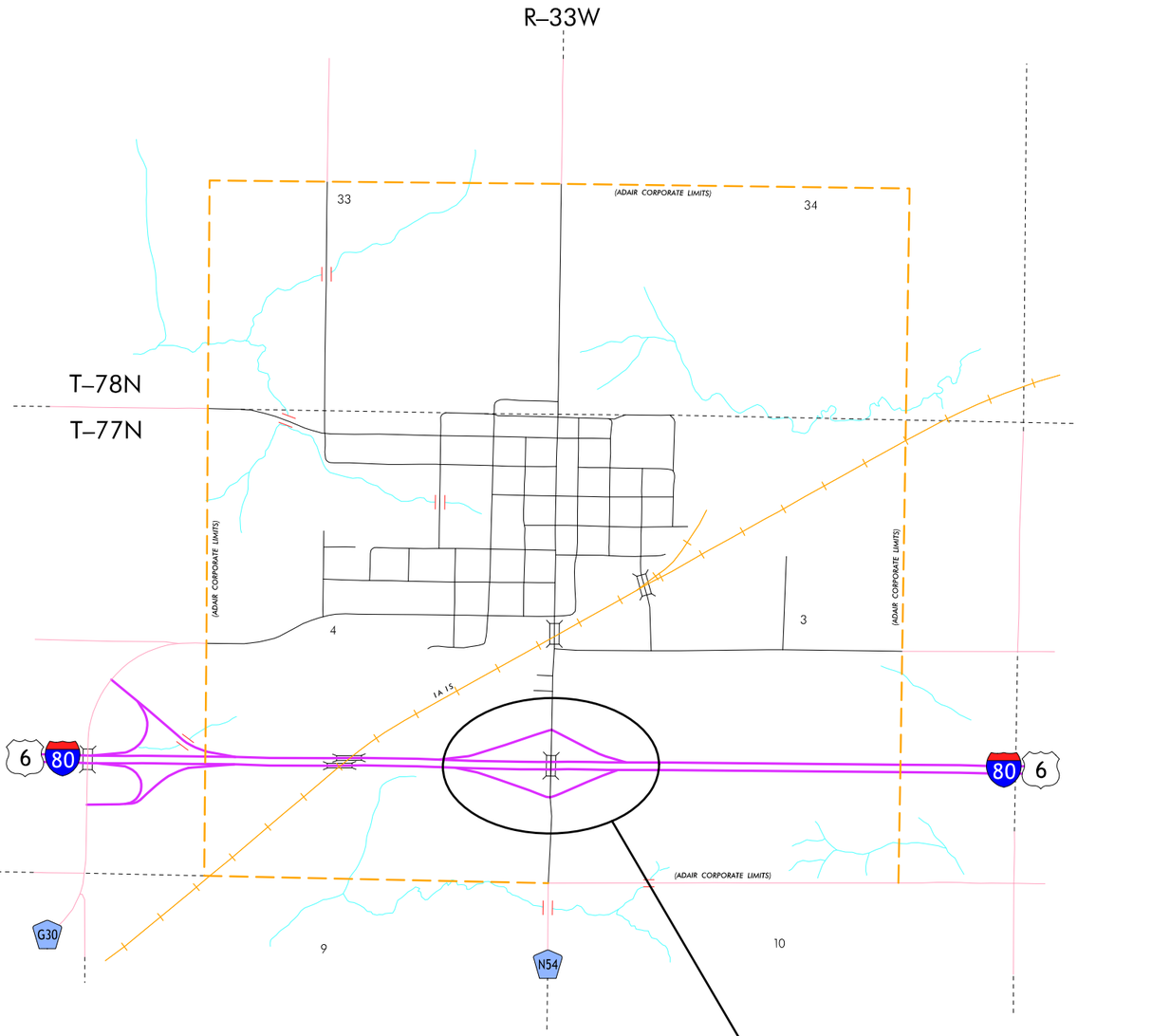


11 – 04 – 15

LEGEND

INTERSTATE ROUTE	35
FREEWAY OR EXPRESSWAY ROUTE	30
U.S. NUMBERED ROUTE	6
BUSINESS ROUTE	6
STATE NUMBERED ROUTE	44
UNSIGNED ROUTE	461
COUNTY NUMBERED ROUTE	R38
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	9, T-81N, R-30W

SCALE IN MILES

0 0.1 0.2 0.3 0.4 0.5 0.75 1.0

SCALE IN KILOMETERS

0 0.1 0.2 0.3 0.4 0.5 1.0 1.5 2.0

HIGHWAY AND STREET MAP OF

ADAIR
IOWA

PREPARED BY

IOWA DEPARTMENT OF TRANSPORTATION

PLANNING, PROGRAMMING, AND MODAL DIVISION

OFFICE OF SYSTEMS PLANNING

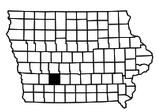
PHONE (515) 239-1664

IN COOPERATION WITH

UNITED STATES DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

01–0022



FILE NO.	ENGLISH	DESIGN TEAM Jia/Schoenrock/Evans	ADAIR COUNTY	PROJECT NUMBER IMX-080-2(275)76--02-01	SHEET NUMBER A.2

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IOWA DEPARTMENT OF TRANSPORTATION

TO OFFICE:	District 4	**DATE:**	Mar 06, 2024
ATTENTION:	Scott, Schram	**PROJECT:**	Adair County IMX-080-2(275)76--02-01
FROM:	John Bartholomew		PIN: 23-01-080-040 Co Rd N54 Interchange at Adair
BUREAU:	Design		Maint. No. 0176.3O080 FHWA: 13120
SUBJECT:	Project Concept Statement; (Final Approval, D0)		Design: 3258 / 201

This project involves the Replacement of the I-80 bridge (Maint. No 0176.3O080) over Co Rd N54 Interchange at Adair.

A concept review was held on Jan 03, 2024. Those present included Scott Schram, Wes Mayberry, Nathaniel Epperson, Daniel Redmond, and Travis Malone from the District 4 Office; Jimmy Ellis, Abraham Kuol from the Bridges and Structures Bureau; Marc Solberg from the Location and Environment Bureau; Scott Ingersoll from Foth and Kevin Patel, John Bartholomew, Anthony Apland from the Design Bureau.

Only one alternative was considered:

1. Remove and replace the existing 219 ft. x 28 ft. bridge with a 232 ft. x 44 ft. prestressed concrete beam bridge utilizing an offsite detour. The alternative is estimated at **$3,004,400**.

Alternative 1 is the preferred alternative. Additional right of way/right of entry will not be required. Traffic will be maintained by an offsite detour.

The Draft Project Concept Statement was sent out for review and comment with concerns to be resolved by 2/29/2024. Comments received during the review period have been considered and resolved.

This project is recommended for construction in 2028. The Design Bureau will coordinate plan preparation with assistance from the Bridges and Structures Bureau.

JEB: ara
Attach.
cc:

C. Purcell
M. Dell
M. Swenson
S. Majors
D. Newell
W. Sorenson
A. Welch
B. Hofer
S. Gent
T. Jerman
M. Todsen
B. Dolan
A. Yates
N. Epperson
J. Garton
O. Lechnowsky
J. Ellis
M. Khoda
S. Seivert
S. Ingersoll
M. Kennerly
J. Nelson
B. Younie
A. Poole
B. Bradley
E. Wright
J. Harris
G. Karssen
S. Anderson
K. Patel
M. Van Dyke
J. Bartholomew
M. Solberg
J. Sallach
S. Suhr
J. Woodcock
S. Sersland
J. Hauber
S. Neubauer
K. Nicholson
M. Nop
D. Sprengeler
K. Brink
J. Laaser-webb
M. Ross
C. Poole
B. Azeltine
D. Stokes
R. Harris
T. Lovan
W. Mayberry
D. Redmond
J. Cihacek
P. Leanos
T. Frank
R. Meyer
K. Olson
FHWA

FINAL PROJECT CONCEPT STATEMENT

Co Rd N54 Interchange bridge at Adair over I-80

Adair County
IMX-080-2(275)76--02-01
PIN: 23-01-080-040
Maint. No. 0176.3O080
FHWA No. 13120

Highway Division
Design Bureau

John Bartholomew, P.E.
515-239-1540

March 06, 2024

I. STUDY AREA

A. Project Description

This project involves the replacement of the Co Rd N54 Interchange bridge at Adair (Maint. No 0176.3O080) over I-80. This project will extend beyond the 70 ft. of bridge approach approximately 150 ft. on both side of the bridge.

Only one Alternative was considered for this project:

1. Remove and replace the existing 219 ft. x 28 ft. bridge with a 232 ft. x 44 ft. prestressed concrete beam bridge utilizing an offsite detour.

B. Need for Project

This is a 219 ft. x 28 ft. prestressed concrete beam bridge that was built in 1958 and reconstructed in 1989. It was overlaid in 1983 and 2010 which is now reaching the end of its service life. The deck is thin, and approximately 40% of the top of deck is hollow. The bottom of deck also has cracking and spalls with exposed rebar. The beams have been damaged by collision and have cracks, spalls, delamination, and exposed steel. The piers have spalling and delamination. The bridge was designed for live loads below current standards.

Due to the condition of the bridge, a replacement is recommended.

Northbound Co Rd N54 Southbound Co Rd N54

C. Present Facility

The existing structure is a 219 ft. x 28 ft., prestressed concrete beam bridge constructed in 1958. The bridge had an overlay done along with the roadway in 2010. County road N54 in the project area is 24 ft. wide PCC pavement with 4 ft. wide PCC shoulders, constructed in 1957. HMA resurfacing was accomplished in 2009.

D. Traffic Estimates

The 2028 construction year and 2048 design year average daily traffic estimates are 3,200 ADT with 40 % trucks and 4,000 ADT with 40 % trucks, respectively.

E. Sufficiency Ratings

The Primary road under Co Rd N54 Interchange bridge at Adair is I-80. I-80 is classified as an "Interstate" route and is a maintenance service level "A" roadway. N54 is a county road.

The Bridge Condition Index is 52.7 and the Bridge Condition Rating is “Fair".

F. Access Control

Access rights will not be acquired for this project.

G. Crash History

During the five-year study period from January 1, 2019 through December 31, 2023, there were 17 crashes including, 1 fatal crash, 3 personal injury crashes, and 13 personal property crashes. The PCR rating is “-0.17”.

II. PROJECT CONCEPT

A. Alternative #1 Bridge replacement

The existing 219 ft. x 28 ft. , PPCB bridge will be replaced with a 2 span, 232 ft. x 44 ft. , PPCB bridge. The typical cross section adjacent to the bridge will consist of a 24 ft. roadway with 10 ft. paved shoulders and 3:1 fore slopes. The existing grade will need to be raised a minimum of 2.5 ft. which will require approximately 225 ft. of roadway reconstruction. New bridge approaches will be constructed. The existing guardrail will be replaced with new guardrail and the shoulders will be paved 20 ft. beyond the ends of the guardrail. Class 10 will be necessary to flatten the existing fore slopes and to construct the new guardrail blisters. Macadam Stone will be placed under the bridge for slope protection. New bridge end drains will be constructed on both ends of the bridge. All disturbed areas will have erosion control, rural seed and fertilizer applied.

It appears that no right of way will be required for this project.
Traffic will be maintained by an off-site detour.

Bridge Items	Estimated Costs
New Bridge	$ 1,607,000
Bridge Removal	$ 75,000
Asbestos Removal	5,000
Macadam Stone	$ 36,000
Mobilization - 10%	$ 172,000
M & C - 20%	$ 378,000
Bridge Costs	**$ 2,273,000**
Roadway Items	
Bridge Approaches	$ 143,200
Removal of Pavement	$ 12,600
PCC Pavement	$ 143,200
Modified Subbase	$ 24,000
Paved Shoulder	$ 54,000
Excavation Class 13 Waste	$ 20,700
Guardrail (Includes Removal)	$ 31,100
Class 10 for Guardrail Blisters	$ 48,400
Bridge End Drains	$ 69,200
Seeding and Fertilizing	$ 1,100
Traffic Control - 5%	$ 44,500
Mobilization - 5%	$ 44,500
M & C - 20%	$ 152,500
Roadway costs	**$ 762,400**
Project Total	**$ 3,030,400**

B. Detour Analysis

County road N54 will be closed, and an offsite detour will be utilized. It is anticipated the detour will be in place for approximately 180 days. The detour would follow Interstate 80, Northbound flow of traffic will follow Eastbound I-80 flow of traffic, Southbound flow of traffic will follow Westbound I-80 flow of traffic. Northbound flow of traffic will use Exit 83 (Casey), approximately 6.5 miles. After turning left onto Antique County Dr, the Detour will return to Adair following the Westbound I-80 for approximately 6.5 miles. Southbound flow of traffic will use Exit 75 (White Pole Road), approximately 1.12 miles. After turning left onto Anita Adair Road, the Detour will return to Adair following the Eastbound I-80 for approximately 1.12 miles. The Out of distance travel is 13 miles. The total distance user cost is anticipated to be $2,454,609. The cost for road maintenance will be $105,580 as calculated by the Gas Tax Method. Detour signing costs will be $10,000.

C. Recommendations

It is recommended that the present structure be replaced as described in the alternative.

D. Construction Sequence

It is anticipated that all work on this project will be awarded to one prime contractor. The Bridges and Structures Bureau will coordinate the plan preparation with assistance from the Design Bureau.

E. ADA Accommodations

There are no bike paths or sidewalks adjacent to Co Rd N54 Interchange bridge; therefore, no ADA accommodations are planned in conjunction with this project. Additionally current development plans do not show future need for a bike path or sidewalk.

F. Special Considerations

This will be a traffic critical project.

The ABC Rating Score of 48 is less than the first stage filter threshold of 50, therefore this bridge will not be considered further for accelerated bridge construction.

During reconstruction of the roadway, modification of existing streetlights should be avoided. A traffic sensor is located near the bridge, this sensor may need to be relocated during this project.

The Location and Environment Bureau, Water Resources, has reviewed the draft concept to determine a Section 404 permit will not be required.

The Location and Environment Bureau, NEPA, has recommended to avoid impact to Saint John's Cemetery and Sunnyhill Cemetery. These cemeteries are within ½ mile of the project area.

The Location and Environment Bureau, Regulated Materials, has identified asbestos in the project, asbestos mitigation will be required for the joint caulking and wherever else identified.

G. Program Status

Site data has been developed by the Design Bureau. This project is listed in the 2024-2028 Iowa Transportation Improvement Program, with $10,000 programmed for right of way in FY 2028, and $10,600,000 for replacement in FY 2028. Costs for this project may be eligible for bridge replacement funds. A schedule of events will be developed following approval of the Project Concept.

JEB:ara

Adair Co.

Co Rd N54 Interchange at Adair
Phase Number: IMX-080-2(275)76--02-01
Pin: 23-01-080-040
Maint. No: 0176.3O080
FHWA: 13120

FILE NO.	ENGLISH	DESIGN TEAM Jia/Schoenrock/Evans	ADAIR COUNTY	PROJECT NUMBER IMX-080-2(275)76--02-01	SHEET NUMBER A.7

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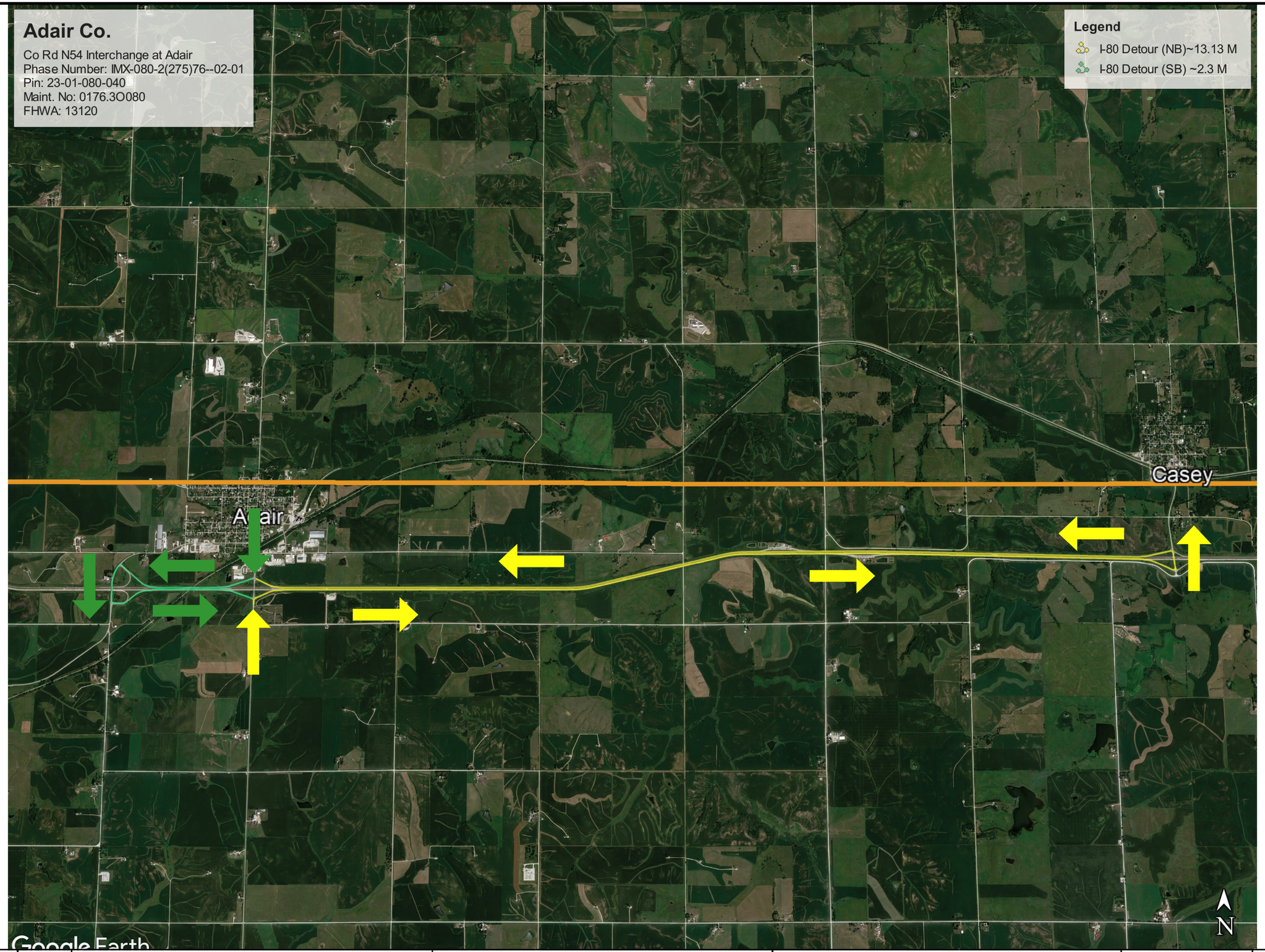
Adair Co.

Co Rd N54 Interchange at Adair
Phase Number: IMX-080-2(275)76--02-01
Pin: 23-01-080-040
Maint. No: 0176.3O080
FHWA: 13120



FILE NO.	ENGLISH	DESIGN TEAM Jia/Schoenrock/Evans	ADAIR COUNTY	PROJECT NUMBER IMX-080-2(275)76--02-01	SHEET NUMBER A.8

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Utility Company Contacts

Roadway	Co Rd N54			
PIN Number	23-01-080-040		**Submittal Date**	
Project Number	IMX-080-2(275)76--02-01			**Approval Date**
District	District 4	**Assistant District Engineer**		
County	ADAIR	**or**		
Route	Co Rd N54 Over I-80	**Office Director**		
Location	Co Rd N54 Interchange at Adair			
Work Type	Bridge Replacement			
Segment Manager	Yanxiao Jia			
Designer	Trevor Schoenrock / Jack Evans			

Design Manual Section 1C-1
Last Updated: 04-29-19

Urban Two-Lane Roadways (Urban Arterials)

Design Element		Preferred	Acceptable Criteria	Project Values
Design speed (mph)		The anticipated posted speed limit	30	35
Maximum superelevation rate (Refer to Section 2A-2)		4%	6%	-
Design lane width (ft)		12	11	12
Full depth paved width (ft)		Design lane width + curb and gutter unit or 14 feet for roadways with shoulders	Match design lane width	12
Right turn lane (ft)		12	10	-
Left turn lane (ft)	With raised or painted median	12 ft + median	10 ft + median	-
	With depressed median	12	10	-
Two-way left turn lane		14	11	-
Parking lane width (ft)		10	7	-
Pavement cross-slope (on tangent sections)	Through lanes	2%	1.5% minimum, 2% maximum	2%
	Auxiliary and turn lanes	3%	3% maximum	-
	Crown break at centerline	4%	4% maximum	4%
Shoulder cross-slope (on tangent sections)	Shoulders	4%	Shoulder cross-slope cannot be less than the adjacent lane, 6% max for paved or granular shoulders, 8% max for earth shoulders	4%
	Curb and gutter units	Match pavement cross-slope	6% maximum	-
	Parking lanes	1% greater than pavement cross-slope	6% maximum	-
Curb type (See Section 3C-2)	Design speed ≤ 45 mph	6-inch standard	any shape	N/A
Foreslope (For fill areas greater than 40 ft, contact the Soils Design Section for assistance)	Adjacent to shoulder	10:1 for 4' then 6:1	3:1	3:1, (1)
	Beyond standard ditch depth and design clear zone	3.5:1	3:1	N/A
	Curbed roadways	2%	not steeper than 3:1	N/A
Backslope (For cut areas greater than 25 feet, contact the Soils Design Section for assistance with backslope benches.)		3:1	2.5:1	N/A
Traverse Slopes	w/ drainage structures	8:1	6:1	
	w/o drainage structures	10:1	6:1	
Ditches (See Section 3G-1)	Outside ditch (depth x width) (ft)	5 x 10	--	N/A
Bridge width—new*	Bridge length ≤ 200 ft	design lane widths + effective shoulder widths (curbed or uncurbed) or design lane width + 3 ft each side (curbed) which ever is greater	design lane widths + effective shoulder widths or curb-to-curb width in curb and gutter section**	
	Bridge length > 200 ft	design lane widths + effective shoulder widths (curbed or uncurbed) or design lane width + 3 ft each side (curbed) which ever is greater	design lane widths + 4 ft offset each side for roadways with shoulders or curb-to-curb width in curb and gutter section**	44'
Bridge width—existing*		design lane widths + no less than 2 ft left and right	design lane widths + 2 ft left and right	28'
Vertical clearance (ft) (above lanes, shoulders and 25 feet left and right of the center of railroad tracks)	Over primary	16.5	16	
	Over non-primary	16.5 at interchange locations, 15 at all other locations	14	
	Over railroad	23.3	23.3	
	Sign trusses and pedestrian bridges	17.5	17	
Structural Capacity		Contact Office of Bridges and Structures	Contact Office of Bridges and Structures	
Level of Service		C	D	

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

Design year ADT =	4000	

Design Manual Section 1C-1
Last Updated: 04-29-19

Effective Shoulder Width and Type for Two-Lane Highways

Preferred (values shown in feet)			Acceptable (values shown in feet)			Project Values
	Rural Roadways	Urban Roadways		Rural Roadways	Urban Roadways	
Turn lanes with shoulders	6	6	Turn lanes with shoulders	6	0	-
Turn lanes with curbs	6	See Section 3C-2	Turn lanes with curbs	6	0	-
	Effective Shoulder Width	Paved Width		Effective Shoulder Width	Paved Width	-
Climbing Lanes	6	4	Climbing Lanes	4	0	-
Two-Lane Highways	Effective Shoulder Width	Paved Width	Two-Lane Highways	Effective Shoulder Width	Paved Width	-
Routes where bicycles are to be accommodated	10	10	Design year ADT > 2000 vpd	8	0*	10
On roadways approaching urban areas (due to increased bike traffic)	10	10				
On all curves with a superelevation rate of 7.0% or greater	10	10				
On roadways with design year ADT > 5000	10	6	Design year ADT between 400 - 2000 vpd	6	0*	
On all other NHS	10	6				
On non-NHS routes with design year ADT > 3000	10	6	Design year ADT < 400 vpd	4	0*	
On non-NHS routes with design year ADT < 3000	8	0*				

*Requires safety edge-Refer to Section 3C-6

Curbs should be located beyond the outer edge of the effective shoulder width in rural areas

Refer to Section 3C-2 for curb offsets in urban areas

Notes:

(1) 10:1 for 5' then 3:1 for grading next to guardrail

(2) Refer to Design Manual 8A-2 and Figure 1 on A.12 for clear zone in low speed urban facilities

Roadway Design Speed (mph) =	35

Design Manual Section 1C-1
Last Updated: 04-29-19

Design Criteria for Low Speed Roadways

Design Element			Preferred Criteria Design Speed, mph					Acceptable Criteria Design Speed, mph					Project Values
			25	30	35	40	45	25	30	35	40	45	
Stopping sight distance (ft) (Refer to Section 6D-1)			155	200	250	305	360	155	200	250	305	360	265
Minimum horizontal curve radius (ft) and superelevation rate (Refer to Sections 2A-2 and 2A-3)	Method 2 superelevation and side friction distribution	e = 4% max	See Table 10 in Section 2A-3					--					N/A
	Method 5 superelevation and side friction distribution	e_{max} = 6%	144	231	340	485	643	144	231	340	485	643	N/A
		e_{max} = 8%	--	--	--	--	--	134	214	314	444	587	N/A
Minimum vertical curve length (ft) (Refer to Section 2B-1)			75	90	105	120	135	75	90	105	120	135	250
Minimum rate of vertical curvature (K) (Refer to Section 2B-1)	crest vertical curves		12	19	29	44	61	12	19	29	44	61	65
	sag vertical curves	roadways without fixed-source lighting	26	37	49	64	79	26	37	49	64	79	N/A
		roadways with fixed-source lighting	26	37	49	64	79	14	20	27	35	44	N/A
Minimum gradient (%)	(Refer to Section 2B-1)		0.5					0.3% with a curb, 0.0% without a curb					0.62
Maximum gradient (%)	(Refer to Section 2B-1)	Urban roadways	5					--	9	8	8	7	4.45
		Rural roadways						--	--	--	6	6	N/A
Clear zone			See "Preferred Clear Zone" table in Section 8A-2					See "Acceptable Clear Zone" table in Section 8A-2					10, (2)

(2) For roadways with a posted speed of 35 mph or less, the preferred clear zone distance is 10 feet and the acceptable clear zone distance is 8 feet. Where the speed limit is 25 mph or less, the preferred clear zone distance remains the same, but the acceptable clear zone distance may be reduced to 6 feet. If sidewalks are not present, consider using a clear zone value that will accommodate them in the future.

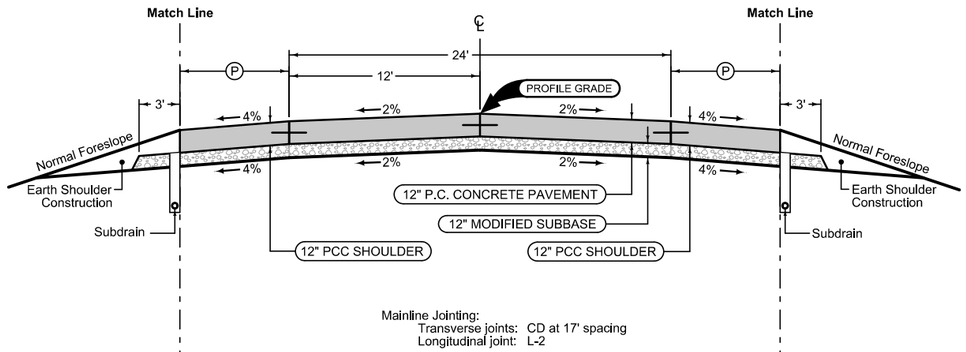
Figure 1: Design Manual 8A-2, Low Speed Urban Facilities

FIELD EXAM NOTES/QUESTIONS		FIELD EXAM NOTES/QUESTIONS	
	- Traffic critial project (I-80?) - Traffic camera pole on SW corner of bridge - Light pole impacts? *Inside of grading - Shoulder on I-80 (remove barrier, add curb)		

Full Depth PCC Shoulder

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

STATION TO STATION		(P) Feet
2_P_FullPCC_ 04-20-21		
4237+86.58	4239+04.27	10
4242+79.19	4243+81.96	10



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

STATION TO STATION	
2P_ 04-21-20	
4237+86.58	4239+04.27
4242+79.19	4243+81.96

Full Depth PCC Shoulder

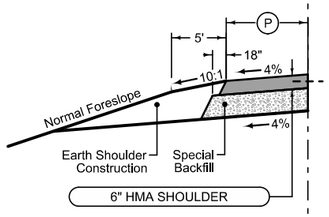
Shoulder Jointing:
Longitudinal joint: BT-2 or L-2
Transverse joints: C at 17' spacing

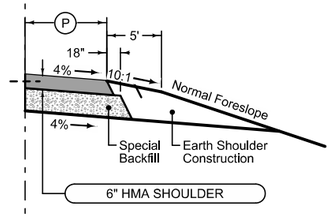
STATION TO STATION		(P) Feet
2_P_FullPCC_ 04-20-21		
4237+86.58	4239+04.27	10
4242+79.19	4243+81.96	10

Paved Shoulder at Guardrail

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

STATION TO STATION		(P) Feet
2_P_Guard_ 04-21-20		
4238+43.21	4239+04.27	Varies
4242+79.19	4243+40.21	Varies



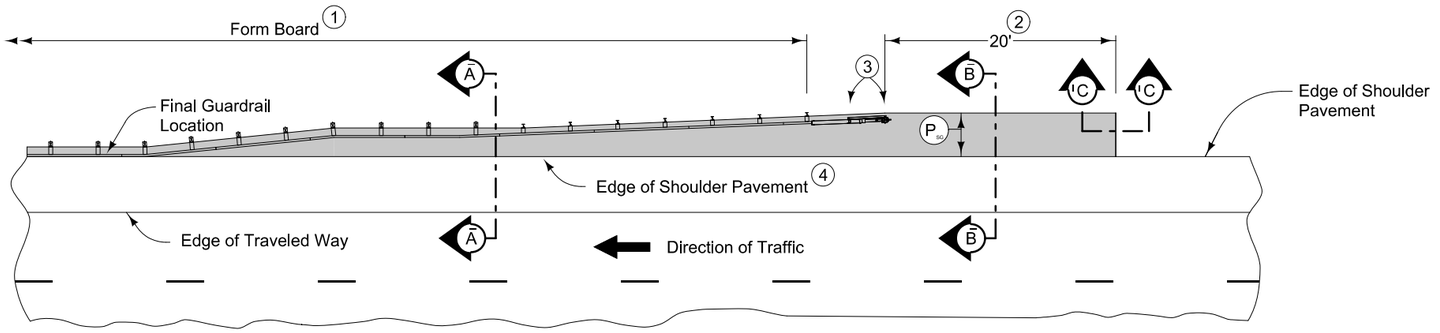


Paved Shoulder at Guardrail

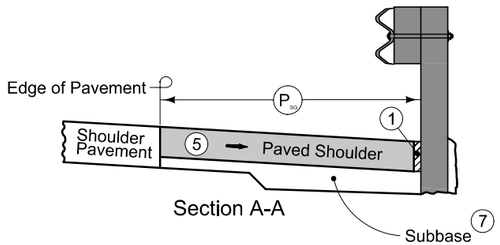
PCC Shoulder Jointing:
Longitudinal joint: BT-1 or BT-5
Transverse joints: C at mainline spacing
HMA Shoulder Jointing:
Longitudinal joint: B

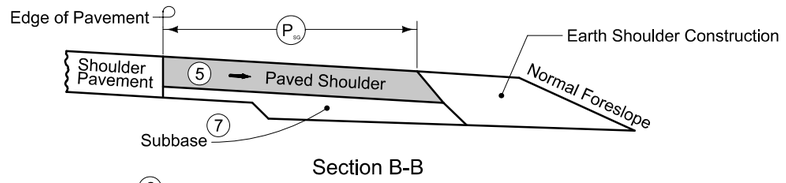
STATION TO STATION		(P) Feet
2_P_Guard_ 04-21-20		
4238+43.21	4239+04.27	Varies
4242+79.19	4243+40.21	Varies

County Road N54

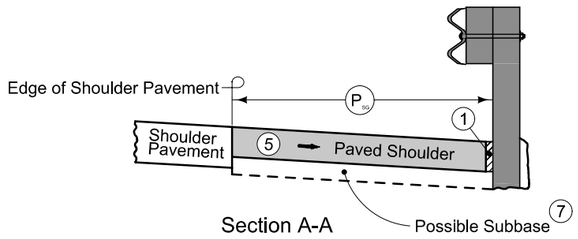


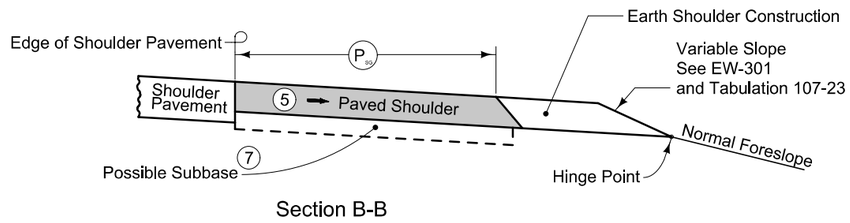
PLAN VIEW





NEW CONSTRUCTION 6





EXISTING SHOULDER

DESIGNER INFO | 7158 MODIFIED

6" HMA Paved Shoulder at guardrail. 6" 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.

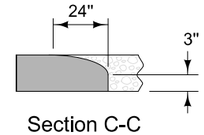
(3) Shoulder may be notched for first 2 posts or post sleeves may be installed through pavement. Do not drive posts through pavement.

(4) 'BT' (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 C-C
Roll down at granular shoulder or earth.

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

ITS Coordination

This project requires coordination with the DOT's ITS Maintenance Contractor to remove existing ITS device (cameras, sensors, poles, etc.) at the locations noted below:

I-80 and Co Rd N54 Interchange

The Contractor shall contact Jason Dale, DOT Traffic Operations, phone (515) 239-1995 at least 14 days prior to construction.

SURVEY SYMBOLS

- Interstate Highway Symbol
- U.S. Highway Symbol
- Iowa Highway Symbol
- County Road Highway Symbol
- Evergreen Tree
- Deciduous Tree
- Fruit Tree
- Shrub (Bushes)
- Timber
- Hedge
- Stump
- Swamp
- Rock Outcrop
- Broken Concrete
- Revetment (Rip Rap)
- Cemetery
- Grave
- Cave
- Sink Hole
- Board Fence
- Chain Link or Security Fence
- Wire Fence
- Terrace
- Earth Dam or Dike (Existing)
- Tile Outlet
- Edge of Water
- Existing Drainage
- Right of Way Rail or Lot Corner
- Concrete Monument
- Well
- Windmill
- Beehive Intake
- Existing Intake
- Existing Utility Access (Manhole)
- Fire Hydrant
- WH Water Hydrant (Rural)
- ST Septic Tank
- C Cistern
- LP L.P. Gas Tank (No Footing)
- UST Underground Storage Tank
- Latrine
- Satellite TV Dish
- WHU Water Hook Up
- RT Radio Tower
- TA Tower Anchor
- Guardrail (Beam or Cable)
- GP Guard Post (one or two)
- Guard Post (over two)
- FP Filler Pipe
- GV Gas Valve
- WV Water Valve
- SL Speed Limit Sign
- MM Mile Marker Post
- SIGN Sign
- TCB Traffic Signal Control Box
- RRB Rail Road Signal Control Box
- TSB Telephone Switch Box
- EB Electric Box

UTILITY LEGEND

- E1 — EL1D, Electric Line Iowa DOT - Quality D
- F0 — F02D, Fiber Optic ICN - Quality D
- F02 — F01D, Fiber Optic Windstream - Quality D
- F03 — F03D, Fiber Optic Iowa DOT - Quality D

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John.Thatcher@windstream.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	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

- Reference Point / Station — 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

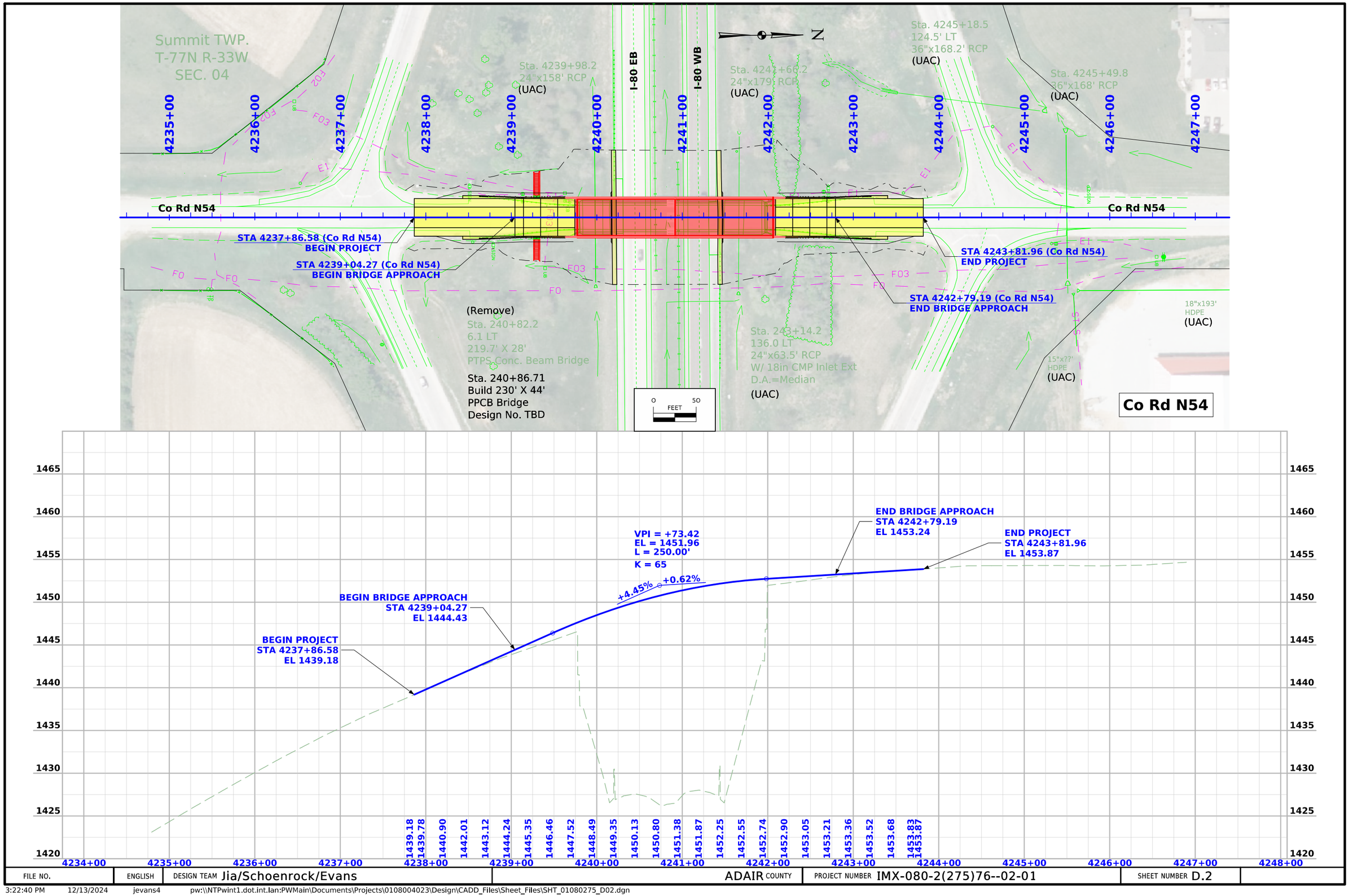
- Proposed Right-of-Way Symbol
- Proposed Right-of-Way Line
- Existing Right of Way
- Existing and Proposed Right-of-Way
- Easement and Existing Right-of-Way
- Easement (Temporary) Symbol
- Easement (Temporary) Line
- Easement
- C/A Access Control
- Property Line Symbol
- Property Line

PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

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

FILE NO.	ENGLISH	DESIGN TEAM Jia/Schoenrock/Evans	ADAIR COUNTY	PROJECT NUMBER IMX-080-2(275)76--02-01	SHEET NUMBER D.1

3:18:12 PM 12/12/2024 jevans4 pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\0108004023\Design\CADD_Files\Sheet_Files\SHT_01080275_LGND.dgn



FILE NO.	ENGLISH	DESIGN TEAM Jia/Schoenrock/Evans	ADAIR COUNTY	PROJECT NUMBER IMX-080-2(275)76--02-01	SHEET NUMBER D.2

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SURVEY INDEX

County: Adair
PIN: 23-01-080-040
Project Number: IMX-080-2(275)76-02-01
Location: Co Rd N54 Interchange at Adair
Type of Work: Bridge Replacement
Project Directory: 0108004023

Survey Personnel

Paul Harry – Survey Party Chief
Bob Fredrickson – Assistant Survey Party Chief

Date(s) of Survey

Begin Date	03/21/2024
End Date	04/24/2024

General Information

This survey is for county road N54 overpass at I-80 bridge replacement. This project is a Full Field DTM survey.

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

Nearby Iowa Real Time Network reference stations were utilized to obtain horizontal and vertical control on primary project control points. Three five-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.

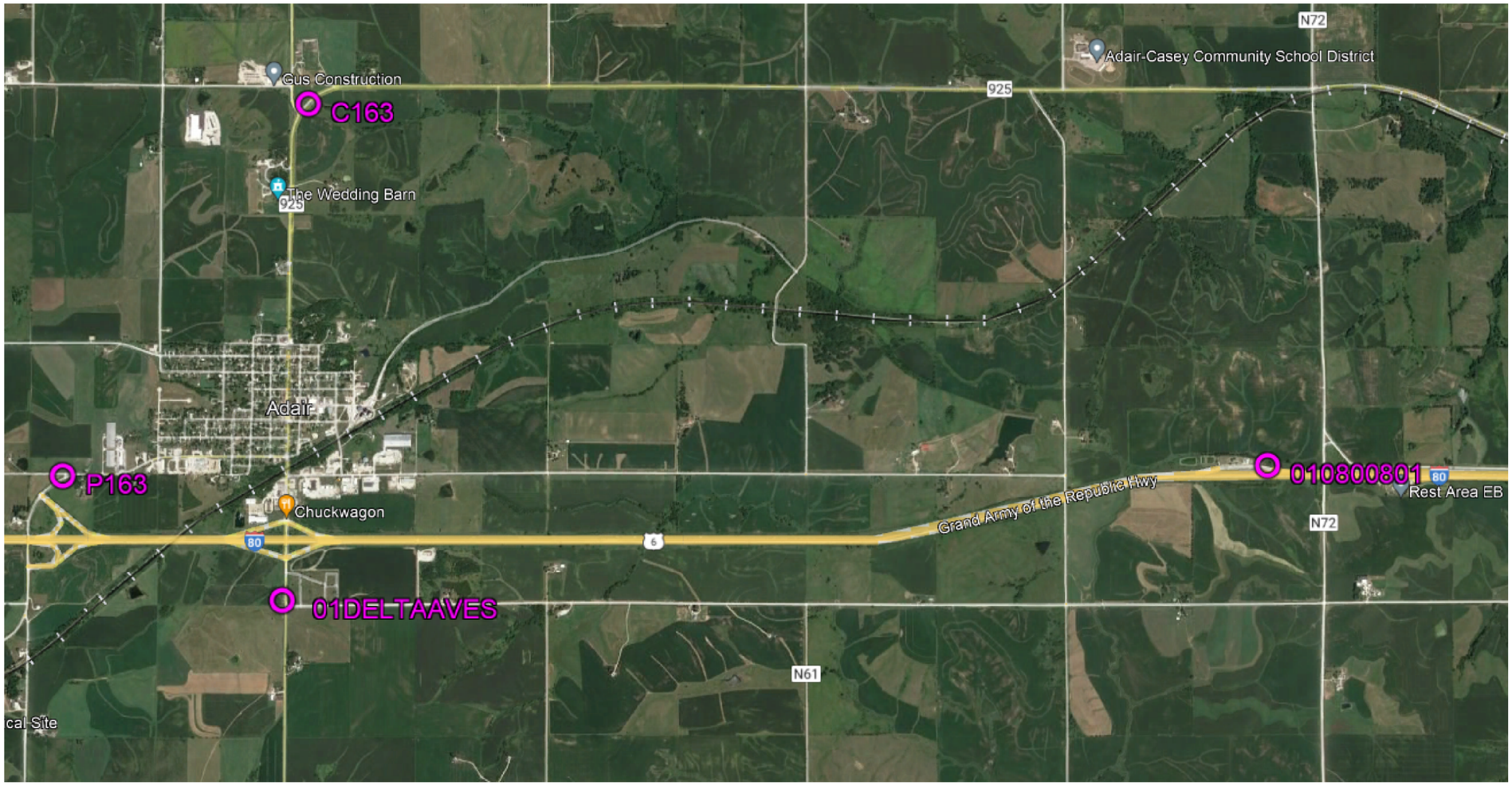
PROJECT DATUM: NAD83(2011) for EPOCH 2010.00 (IaRTN 2019 ADJUSTMENT)
COORDINATE SYSTEM: IOWA REGIONAL COORDINATE SYSTEM ZONE 07 (U.S. SURVEY FOOT)
VERTICAL DATUM: NAVD88
GEOID MODEL: 2018u3

Alignment Information

The horizontal alignment for I-80 and County Rd N54 were provided by the District ROW Office.

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 07 (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 07 (U.S. Survey Foot)
VERT. DATUM: NAVD88
Geoid Model: 2018u3

Ponit Name	Northing	Easting	Elevation	Code- Description
150800801	7254458.02	17517078.51	1310.32	CP FD IDOT FENO MONUMENT AS DESCRIBED ON IDOT PORTAL
01DELTAAVES	7251708.24	17497148.27	1410.13	CP SET FENO MONUMENT NEAR FIELD ENT ALONG N54 0.2MILES SOUTH OF I-80
P163	7254230.19	17492671.91	1430.27	CP FD NGS HARN MONUMENT AS DESCRIBED
C163	7261778.61	17497575.99	1371.28	CP FD NGS MONUMENT AS DESCRIBED

108_23A
8/15/22

TRAFFIC CONTROL PLAN

Co Rd N54

County road N54 over I-80 will be closed during construction. Through traffic will be maintained by an offsite detour. Refer to sheet J.4 for detour route.

I-80

Two lanes of traffic shall be maintained in each direction at all times, except as noted below:

Temporary Lane and Shoulder Closures:

(1) For allowable times on lane and shoulder closures, refer to Allowable Interstate Lane Closure Map Iowa DOT (District 4) shown in other J sheets.

(2) A single lane closure will be allowed for activities such as constructing curbed shoulder on I-80 and placing TBR.

Temporary Road Closures:

(1) During bridge demo and beam setting, I-80 will be closed with one night per direction only. Refer to Tab. 108-23B for allowable times. I-80 traffic will be detoured as per TC-454.

TRAFFIC CONTROL CLOSURE TABLE(S)

* This is to only be used in conjunction with Tabulation 108-23A.
"X" area indicates times that lane closures are not allowed.

Roadway Name	Day	12:00 AM	12:30	1:00	1:30	2:00	2:30	3:00	3:30	4:00	4:30	5:00	5:30	6:00	6:30	7:00	7:30	8:00	8:30	9:00	9:30	10:00	10:30	11:00	11:30	12:00 PM	12:30	1:00	1:30	2:00	2:30	3:00	3:30	4:00	4:30	5:00	5:30	6:00	6:30	7:00	7:30	8:00	8:30	9:00	9:30	10:00	10:30	11:00	11:30
I-80	Sunday	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
I-80	Monday											X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
I-80	Tuesday											X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
I-80	Wednesday											X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
I-80	Thursday											X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
I-80	Friday	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
I-80	Saturday	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Version Date
10 February 2023

I-80 from Exit 110 to Exit 122
Nighttime closures only for Right and Left lanes
Single lane closures allowed Sun through Thurs: 9 PM - 5 AM
No Right or Left lane closures Fri 5 AM through Sun 9 PM

Center Lane closures requires a Left or Right lane closure
Double lane closures allowed Sun through Thurs: 10 PM - 4 AM
No Center lane closures Fri 4 AM through Sun 10 PM

No shoulder closures during peak commuter periods
Mon - Fri: 6 AM - 9 AM; 3 PM - 6 PM Daily

I-29 from Exit 75 to Exit 95
No Restrictions

I-880
No Restrictions

I-680
No Restrictions

I-29 from Exit 56 to Exit 75
No lane closures Fri 2 PM through 6 PM

I-29 from Exit 42 to Exit 56
I-80 from Missouri River to Exit 8
Refer to Council Bluffs Interstate System Map

I-80 from Exit 8 to Exit 110
Nighttime Closures Only
Lane closures allowed Sun through Thurs: 6 PM - 6 AM
No lane closures Fri 6 AM through Sun 6 PM

No shoulder closures during peak commuter periods
Mon - Fri: 6 AM - 9 AM and 3 PM - 6 PM

I-29 from Missouri State Line to Exit 42
No lane closures Fri 2 PM through 6 PM

HARRISON
MILLS
POTTAWATTAMIE
MONTGOMERY
CASS
ADAIR
ADAMS
UNION
CLARKE
MADISON
DALLAS
POLK
GUTHRIE
FREMONT
PAGE
TAYLOR
RINGGOLD
DECATUR

Allowable Interstate Lane and Shoulder Closure Map Iowa DOT District 4

FILE NO.	ENGLISH	DESIGN TEAM Jia/Schoenrock/Evans	ADAIR COUNTY	PROJECT NUMBER IMX-080-2(275)76--02-01	SHEET NUMBER J.3

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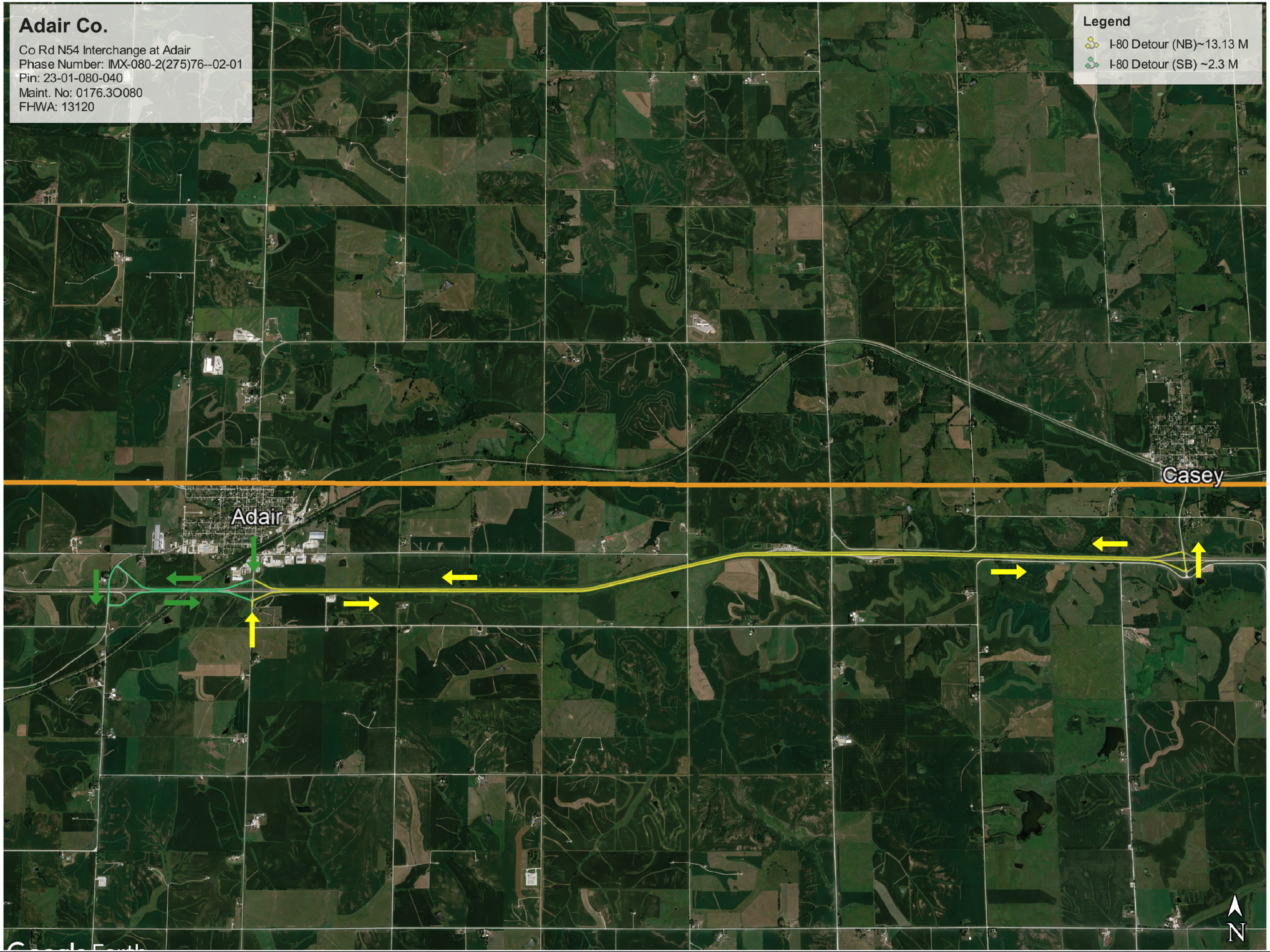
Adair Co.

Co Rd N54 Interchange at Adair
Phase Number: IMX-080-2(275)76--02-01
Pin: 23-01-080-040
Maint. No: 0176.3O080
FHWA: 13120

Legend

- I-80 Detour (NB)~13.13 M
- I-80 Detour (SB) ~2.3 M



FILE NO.	ENGLISH	DESIGN TEAM **Jia/Schoenrock/Evans**	**ADAIR** COUNTY	PROJECT NUMBER **IMX-080-2(275)76--02-01**	SHEET NUMBER **J.4**

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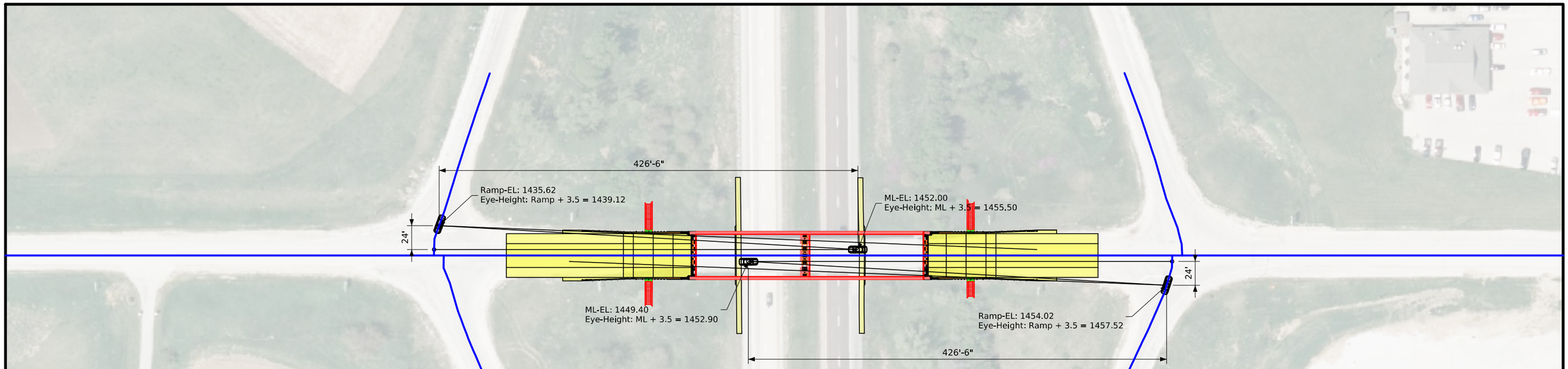


L = 1.47 * V * Tg

Time gap for left turn in passenger car = 8.0
Time gap for left turn in combination truck = 11.5

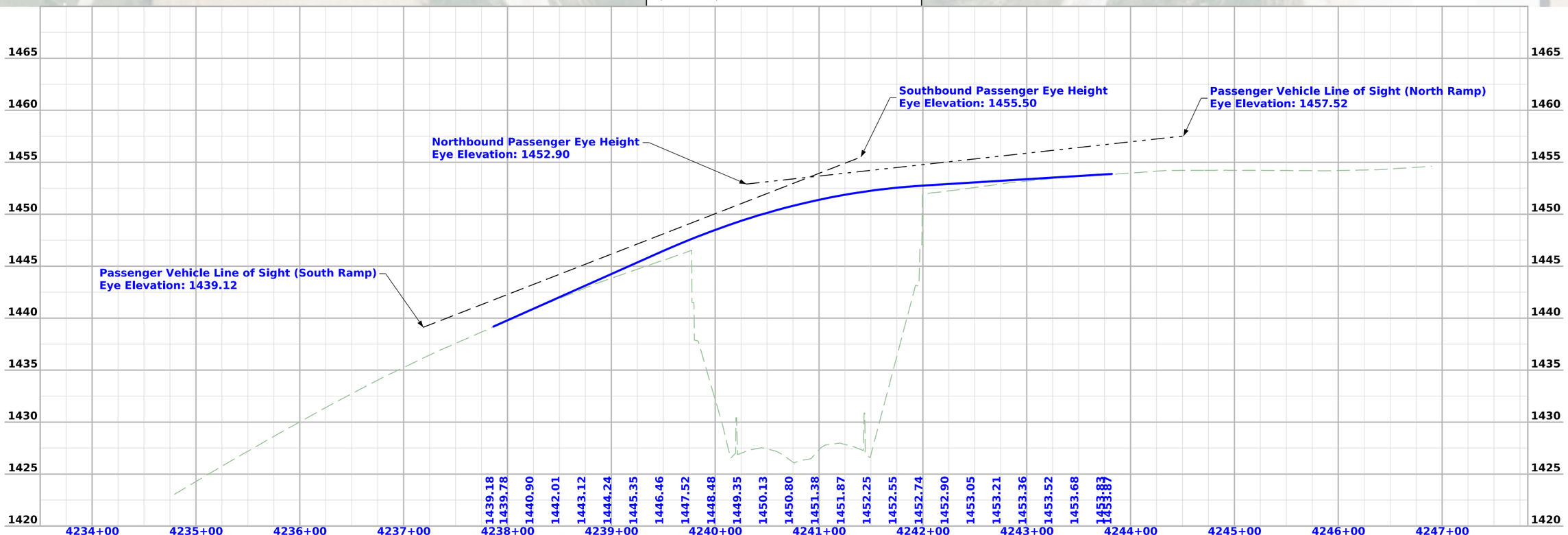
Adjustment for grade = 0.2 for each percent over 3% grade.
Actual grade assumption = 4.45%

Tg adjustment = 0.2 * 1.45 = +0.29 seconds

Time gap adjusted (passenger car) = 8.29 seconds
Time gap adjusted (combination truck) 11.79 seconds

L(passenger) = 1.47 * 35 * 8.29 = 426.5 feet
L(combination) = 1.47 * 35 * 11.79 = 606.6 feet

Passenger Vehicle Sight Distance



FILE NO.	ENGLISH	DESIGN TEAM Jia/Schoenrock/Evans	ADAIR COUNTY	PROJECT NUMBER IMX-080-2(275)76--02-01	SHEET NUMBER U.1

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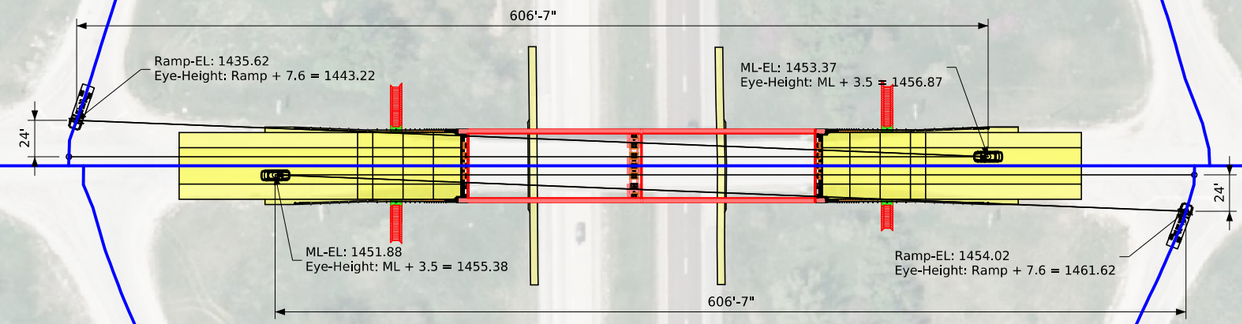


L = 1.47 * V * Tg

Time gap for left turn in passenger car = 8.0
Time gap for left turn in combination truck = 11.5

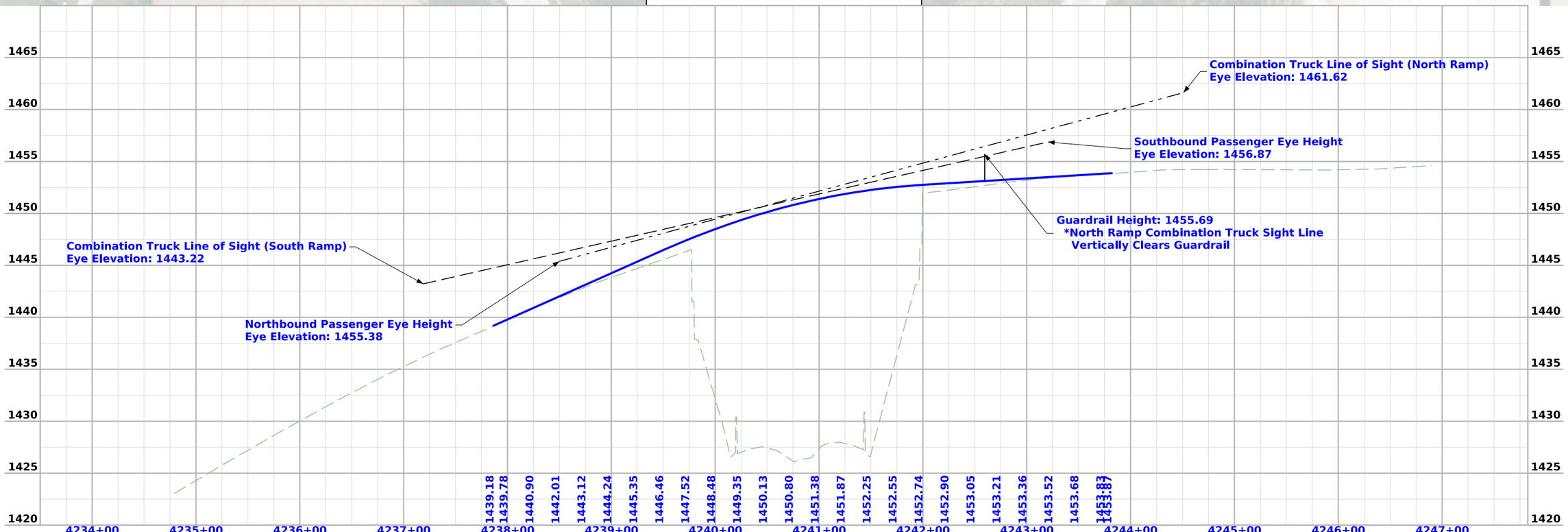
Adjustment for grade = 0.2 for each percent over 3% grade.
Actual grade assumption = 4.45%

Tg adjustment = 0.2 * 1.45 = +0.29 seconds

Time gap adjusted (passenger car) = 8.29 seconds
Time gap adjusted (combination truck) 11.79 seconds

L(passenger) = 1.47 * 35 * 8.29 = 426.5 feet
L(combination) = 1.47 * 35 * 11.79 = 606.6 feet

Combination Truck Sight Distance



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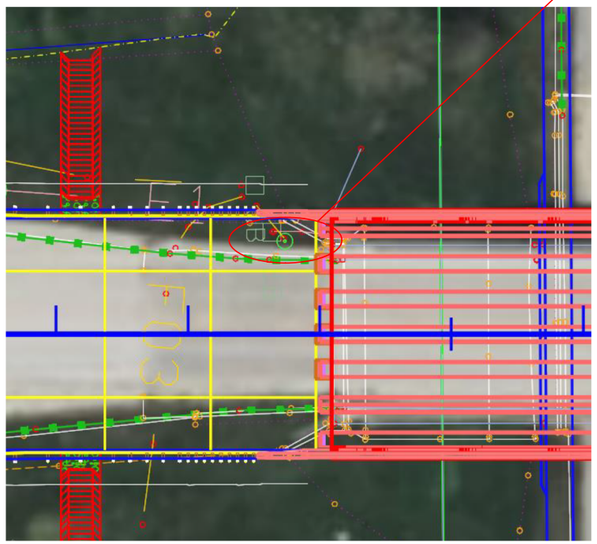

ITS Camera Location
STA. 4239+62.75 28' LT

The existing ITS pole and camera will be impacted with this project. Refer to C.1 for ITS coordination.

The footing is a power installed/screw-in foundation similar to the figure on the left.

The screw-in footing will remain in place and should be removed by the grading contractor.
After the bridge project is complete, the ITS maintenance contractor will reinstall the pole and camera.

ITS Pole Footing

FILE NO.	ENGLISH	DESIGN TEAM **Jia/Schoenrock/Evans**	**ADAIR** COUNTY	PROJECT NUMBER **IMX-080-2(275)76--02-01**	SHEET NUMBER **U.3**	

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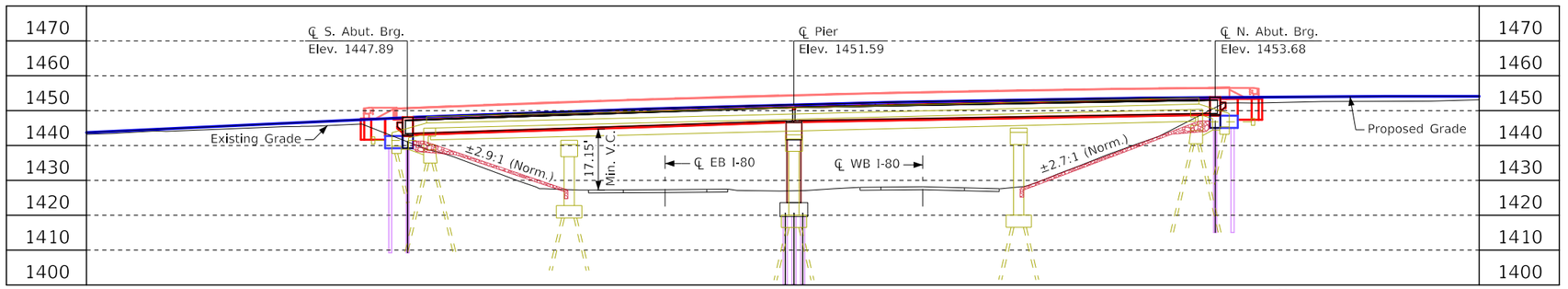
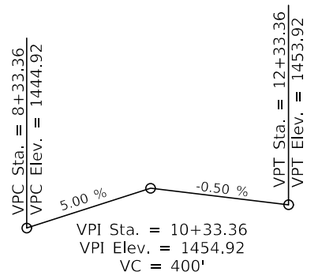


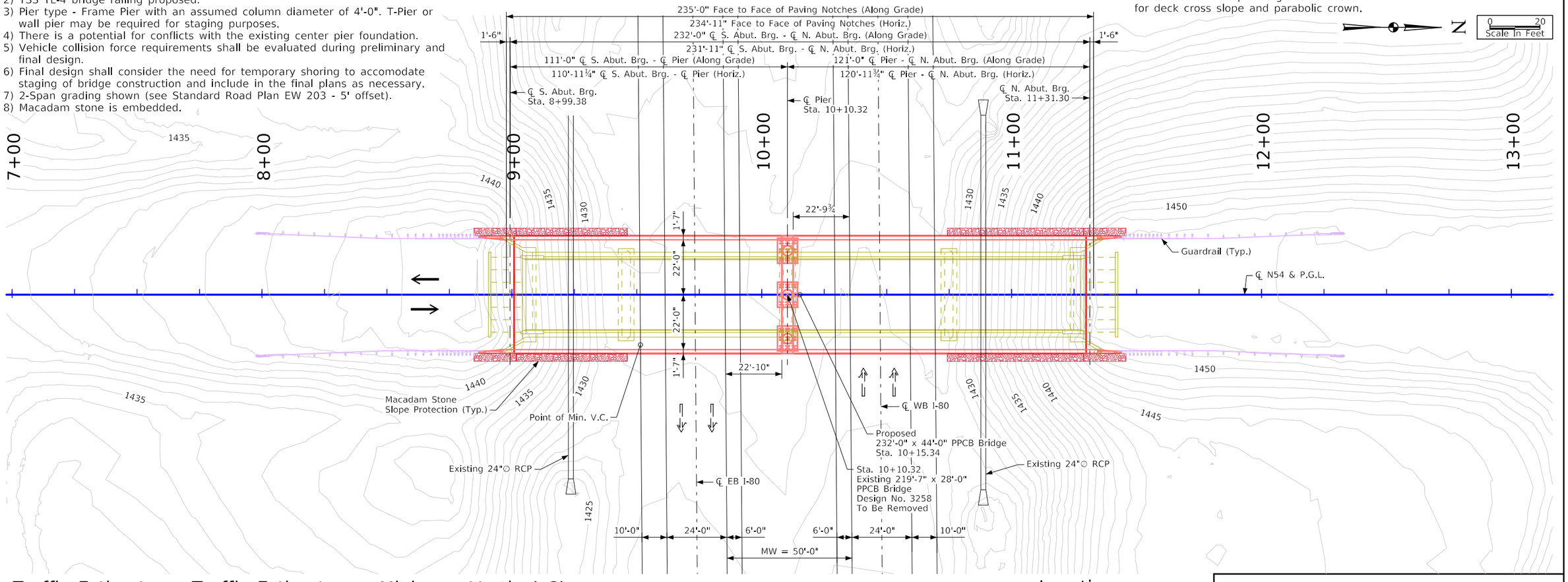


Proposed Profile Grade N54

Notes:
1) This design is for the replacement of the existing 219'-7" x 28' PPCB Bridge, Adair Bridge No. 3258, FHWA No. 13120, Maint. No. 0176.3O080.
2) TSS TL-4 bridge railing proposed.
3) Pier type - Frame Pier with an assumed column diameter of 4'-0". T-Pier or wall pier may be required for staging purposes.
4) There is a potential for conflicts with the existing center pier foundation.
5) Vehicle collision force requirements shall be evaluated during preliminary and final design.
6) Final design shall consider the need for temporary shoring to accomodate staging of bridge construction and include in the final plans as necessary.
7) 2-Span grading shown (see Standard Road Plan EW 203 - 5' offset).
8) Macadam stone is embedded.

BRG TSL Longitudinal Section Along ℄ Approach Roadway

Note:
Top of bridge deck at centerline roadway is 0.03' below the profile grade to account for deck cross slope and parabolic crown.



Traffic Estimate (N54)

2016 AADT	2290 V.P.D.
2048 AADT	3100 V.P.D.
20?? DHV	??? V.P.H.
TRUCKS	12 %
Total Design ESALs	???

Traffic Estimate (I-80)

2022 AADT	24,800 V.P.D.
20?? AADT	??? V.P.D.
20?? DHV	??? V.P.H.
TRUCKS	?? %
Total Design ESALs	???

Minimum Vertical Clearance

Overhead Station = 9+51.47, Offset 20.08' Rt.
Overhead Elevation = 1449.46
Depth of Superstructure = 4.63'
Underpass Station = ?, Offset 59.00' Rt.
Underpass Elevation = 1427.68
Minimum Vertical Clearance = 17.15'

Situation Plan

Location

Co. Rd. N54 over I-80
T-77N R-33W
Sections 3 & 4
Summit Township
Adair County
FHWA No. 13121
Bridge Maint. No. 0176.3O080
Latitude 41.492898°
Longitude -94.643491°

Design For 0 Degree
232'-0" x 44'-0" Pretensioned Prestressed Concrete Beam Bridge
111'-0" & 121'-0" End Spans

Situation Plan

STA. 10+15.34 (℄ N54)
Turn-in Date: Jan 2024

Adair County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. ??? Design Sheet No. 1 of 2 FHWA No. 13121

FILE NO. ???	ENGLISH	DESIGN TEAM Foth	Adair COUNTY	PROJECT NUMBER IMX-080-2(275)76--02-01	SHEET NUMBER V.1

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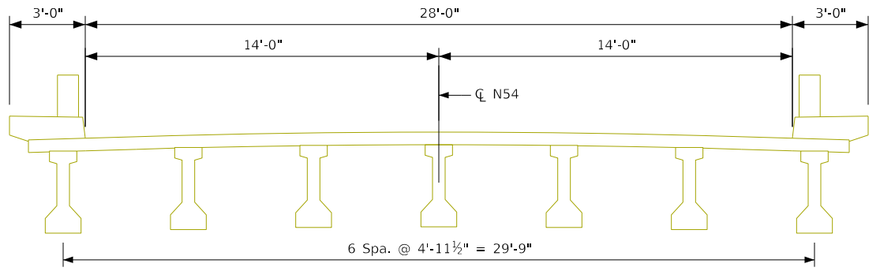
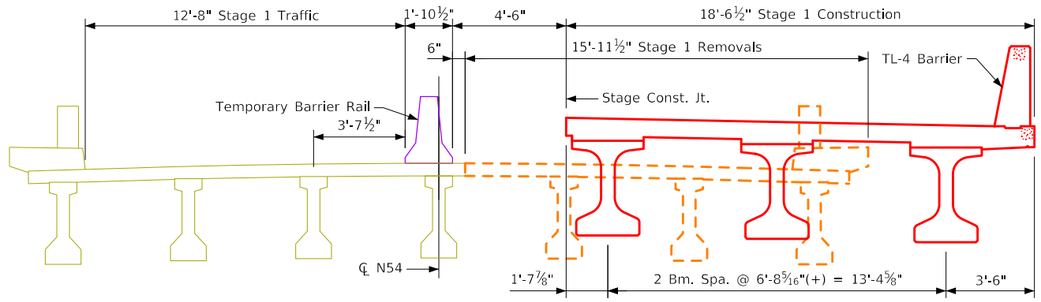
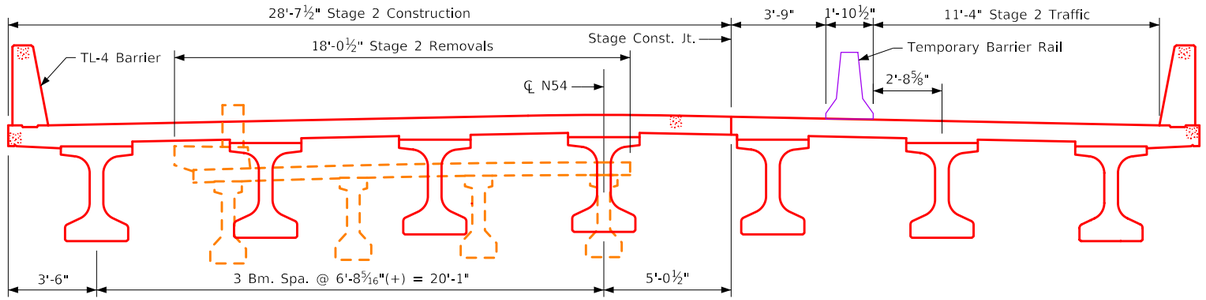


Existing Transverse Section
(Looking North)



Transverse Section - Stage 1
(Looking North)



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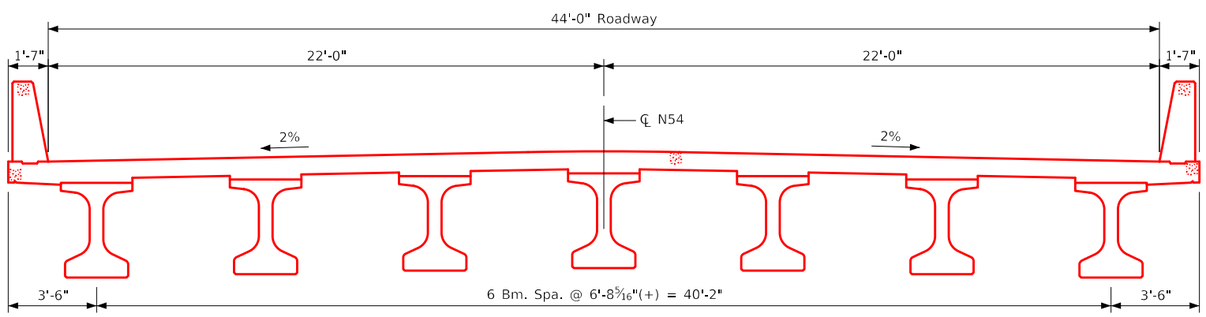

Proposed Transverse Section
(Looking North)

Design For 0 Degree

232'-0" x 44'-0" Pretensioned Prestressed Concrete Beam Bridge

111'-0" & 121'-0" End Spans — Interior Span

Construction Staging

STA. 10+15.34 (℄ N54) — Turn-in Date: Jan 2024

Adair County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. ??? — Design Sheet No. 2 of 2 — FHWA No. 13121

FILE NO. ???	ENGLISH	DESIGN TEAM Foth	Adair COUNTY	PROJECT NUMBER IMX-080-2(275)76--02-01	SHEET NUMBER V.2	

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CROSS SECTION VIEW COLOR LEGEND

Design Color No.	Feature
Aggregate	
(64)	Choke Stone
(42)	Engineering Fabric
(8)	Flooded Backfill
(92)	Macadam Stone
(20)	Modified
(12)	Plowing Shaping
(14)	Porous Backfill
(8)	Revetment Class A
(6)	Revetment Class B
(62)	Revetment Class C
(188)	Revetment Class D
(28)	Revetment Class E
(12)	Shoulder Special Backfill
(12)	Special Backfill
(20)	Subbase
(20)	Subbase Lower
(20)	Subbase Upper
(118)	Subgrade Treatment
Asphalt	
(207)	HMA Base Course
(207)	HMA Interim Course
(207)	HMA Surface Course
Bridge	
(0)	Bridge
Concrete	
(0)	Barrier Concrete
(0)	Barrier Concrete Footing
(0)	Curb Gutter
(48)	Flowable Mortar
(0)	Median Concrete
(0)	PCC Pavement
(0)	Sidewalk
Existing	
(0)	Existing Pavement
Shoulder	
(209)	Shoulder HMA
(0)	Shoulder PCC
(6)	Shoulder Granular
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

Design Color No.	Feature
Grading	
(8)	Behind Curb Cut
(6)	Granular
(13)	Granular Back Fill
(48)	Rock Undercut
(8)	Shoulder Earth Fill
(2)	Side Slopes
(226)	Side Slopes Dressing
Substrata	
(128)	Boulder
(209)	Boulder Removed
(48)	Broken Weathered
(210)	Broken Weathered Removed
(3)	Core Out
(115)	Core Out Remove Only
(195)	Core Out Remove and Replace
(203)	Existing Pavement
(184)	Existing Pavement Remove Only
(200)	Existing Pavement Remove and Replace
(6)	Loam
(211)	Loam Removed
(80)	Rock
(212)	Rock Removed
(4)	Select Sand
(214)	Select Sand Removed
(3)	Shale
(215)	Shale Removed
(10)	Topsoil
(2)	Topsoil Remove Only
(4)	Topsoil Remove and Replace
Unsuitable / Waste	
(3)	Unsuitable Type A
(216)	Unsuitable Type A Removed
(13)	Unsuitable Type B
(217)	Unsuitable Type B Removed
(11)	Unsuitable Type C
(218)	Unsuitable Type C Removed
(3)	Waste
(219)	Waste Removed

NOTES:

Text

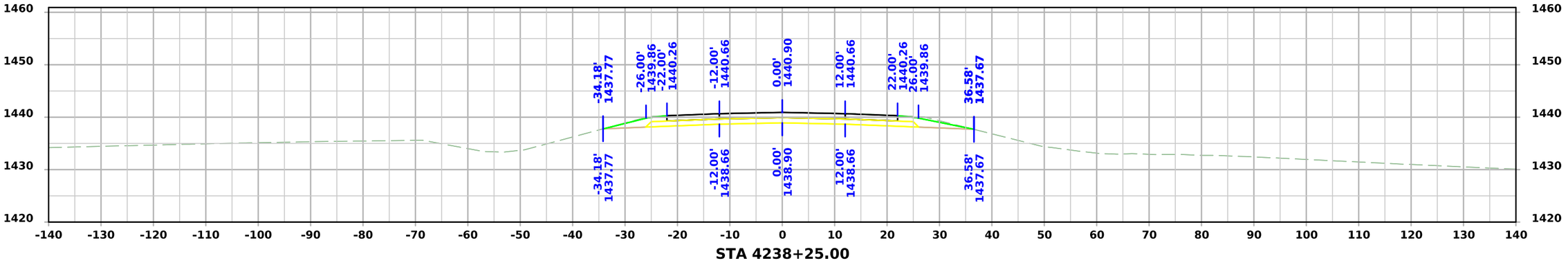
NOTES:

Text

CROSS SECTIONS
LEGEND AND INFORMATION SHEET

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

ML - Co Rd N54



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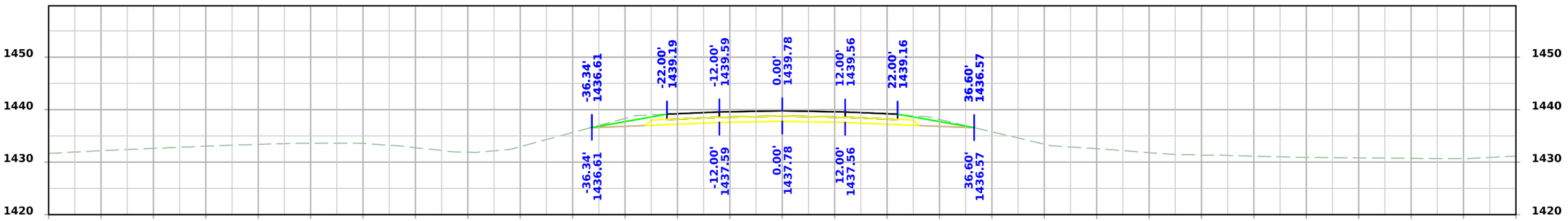

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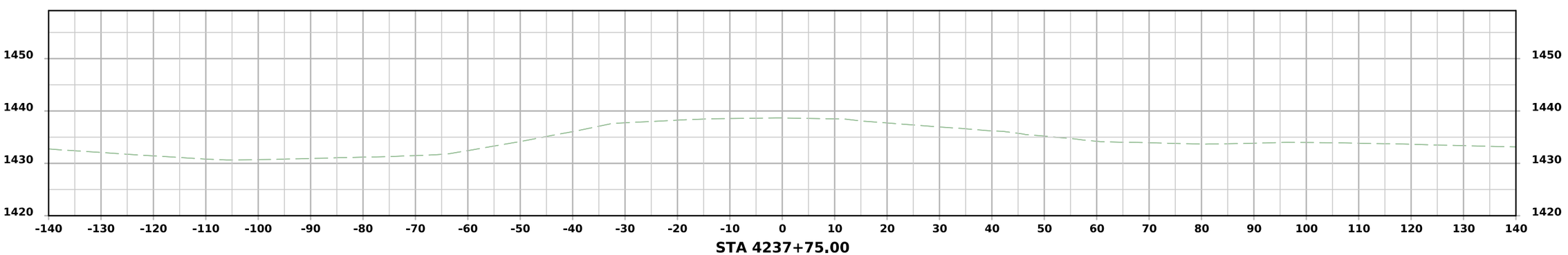

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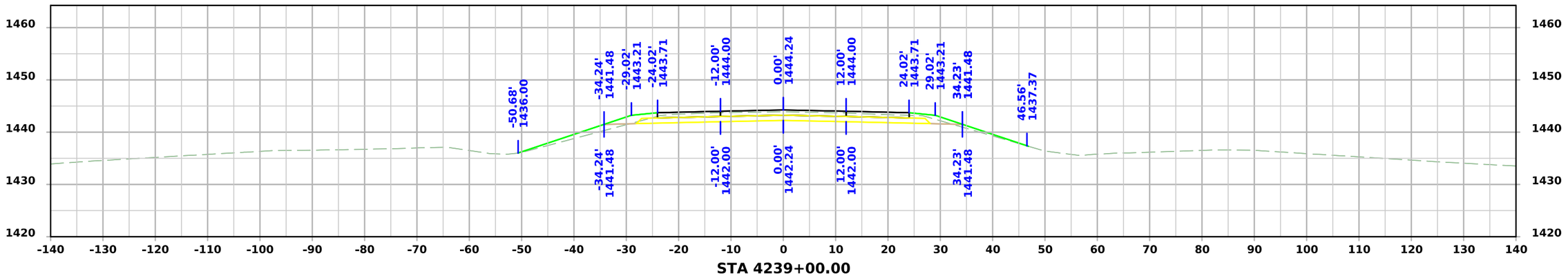

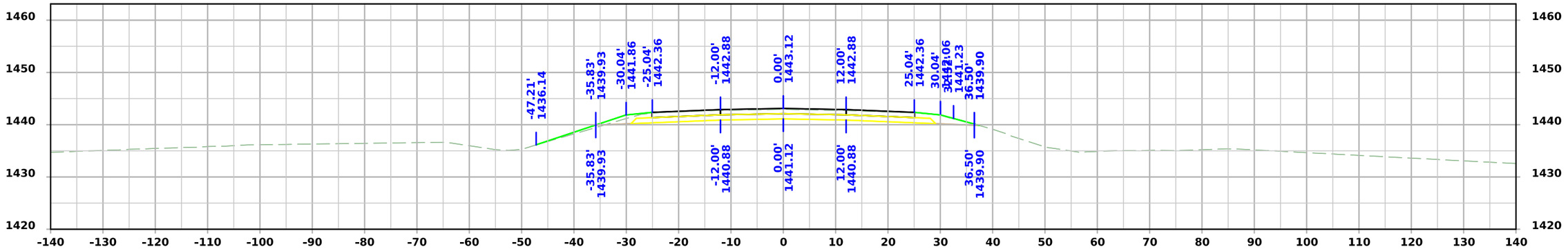

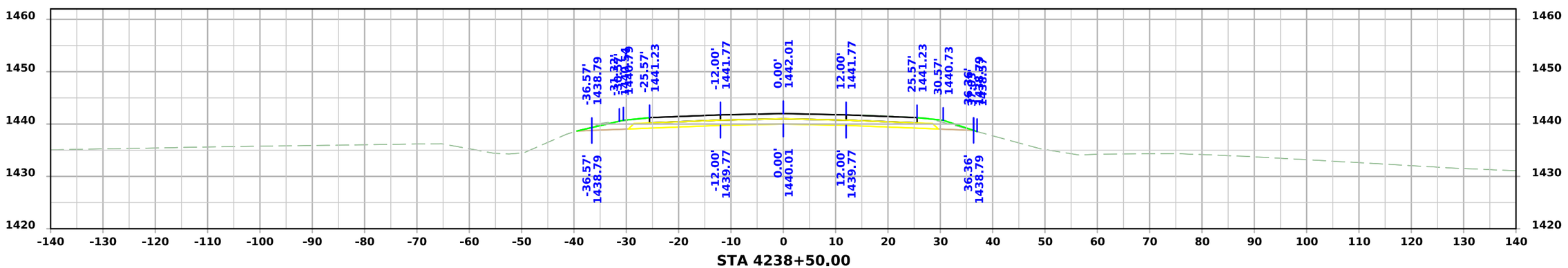

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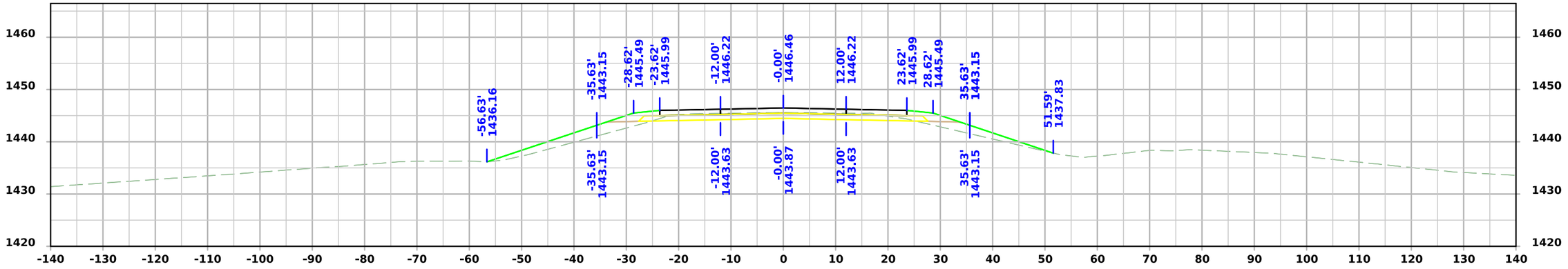

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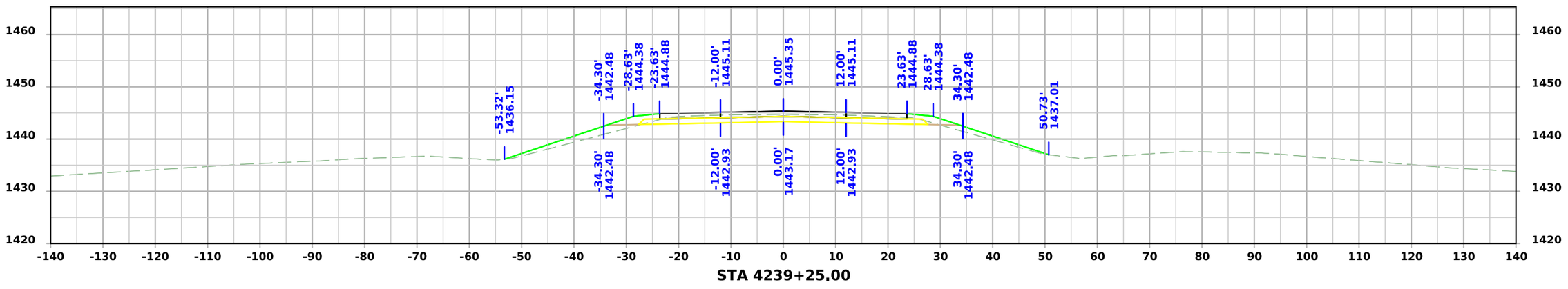

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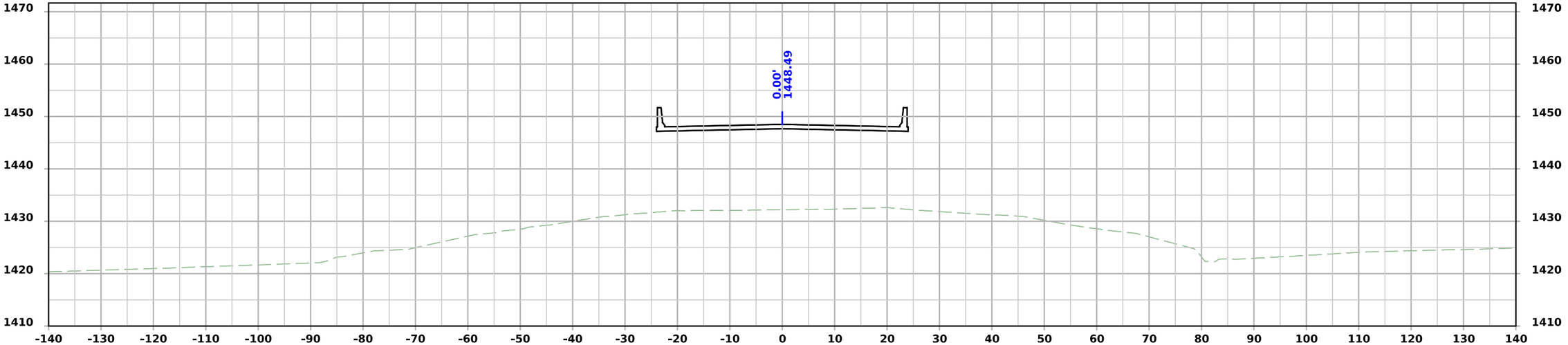

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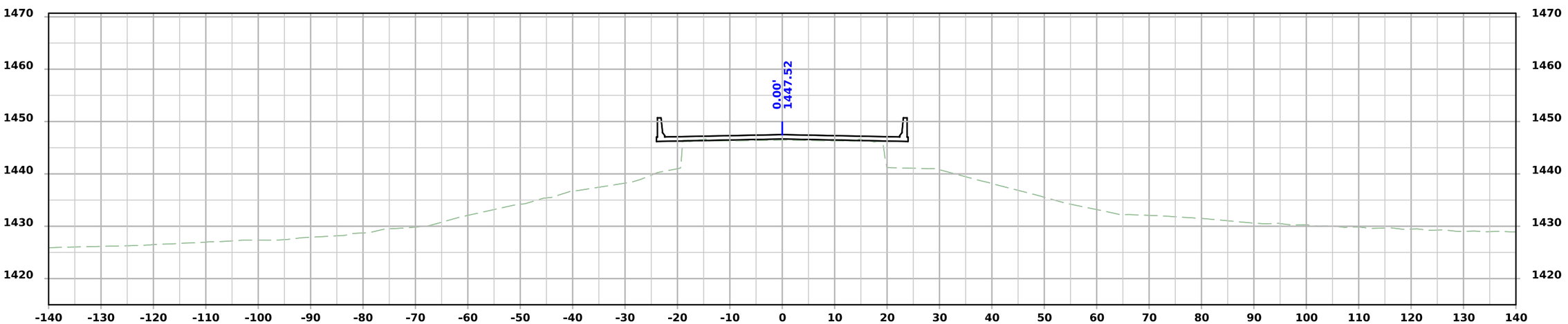

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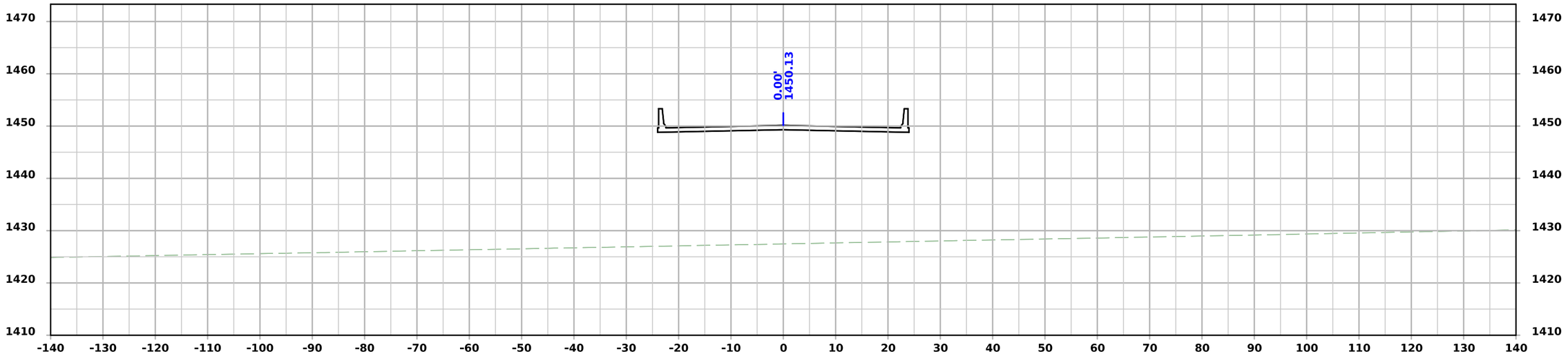

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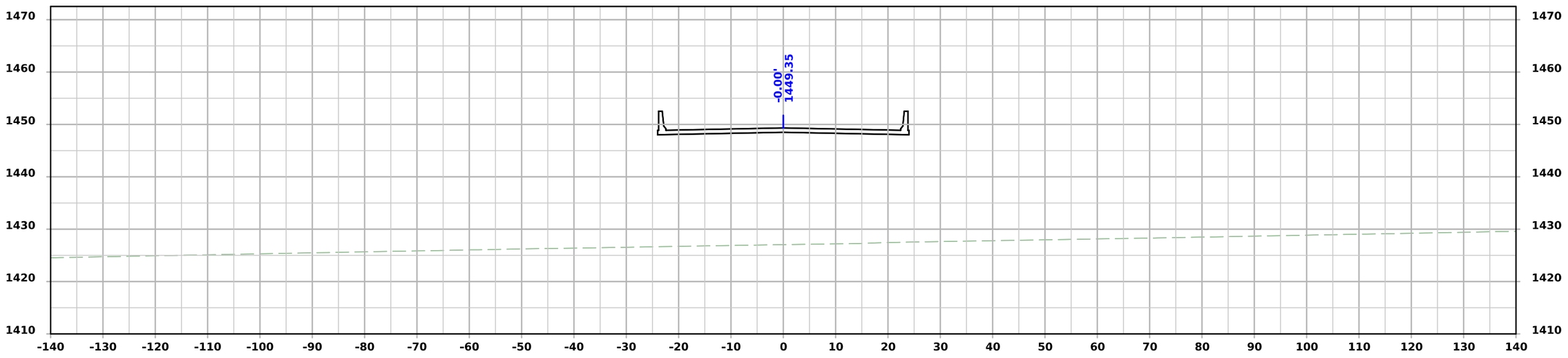

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ML - Co Rd N54

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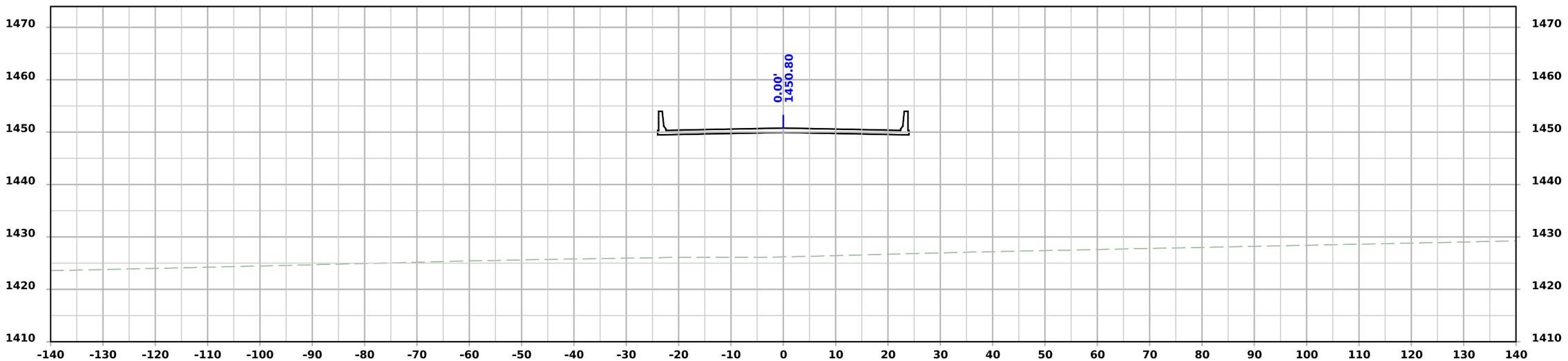

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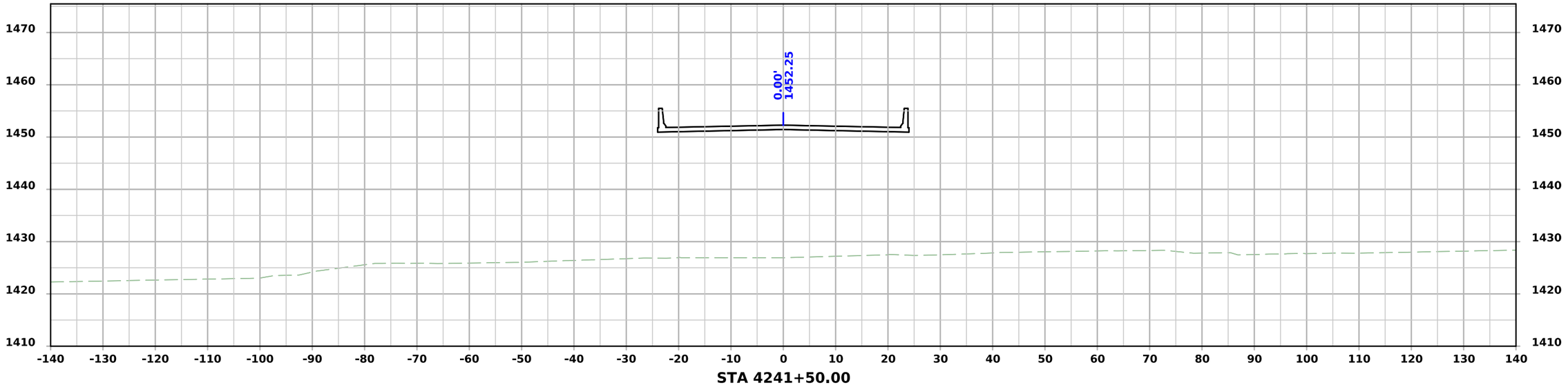

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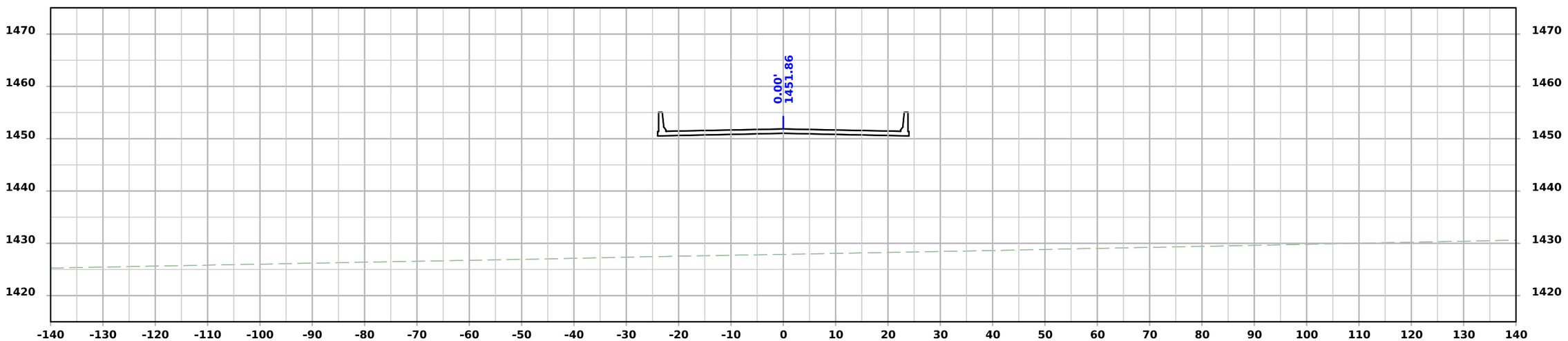

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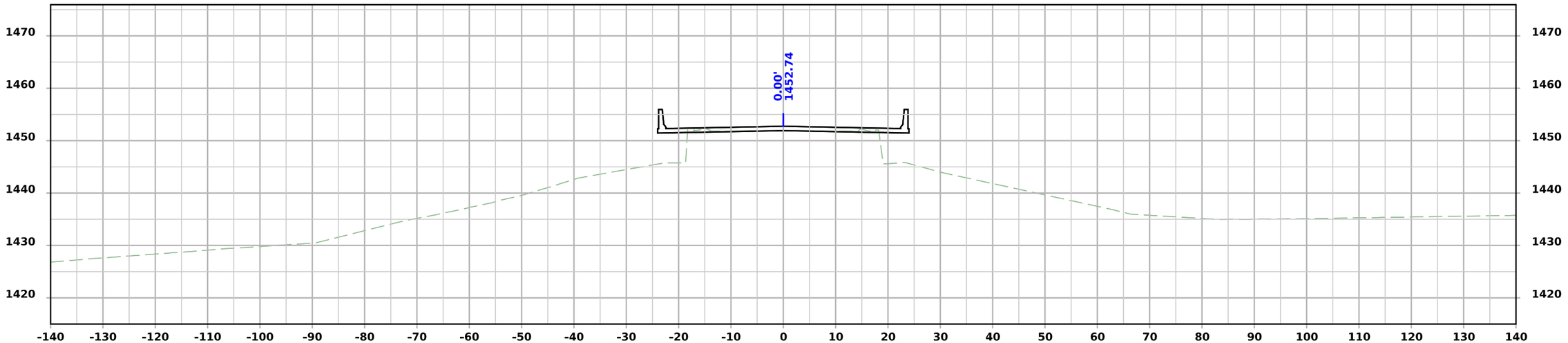

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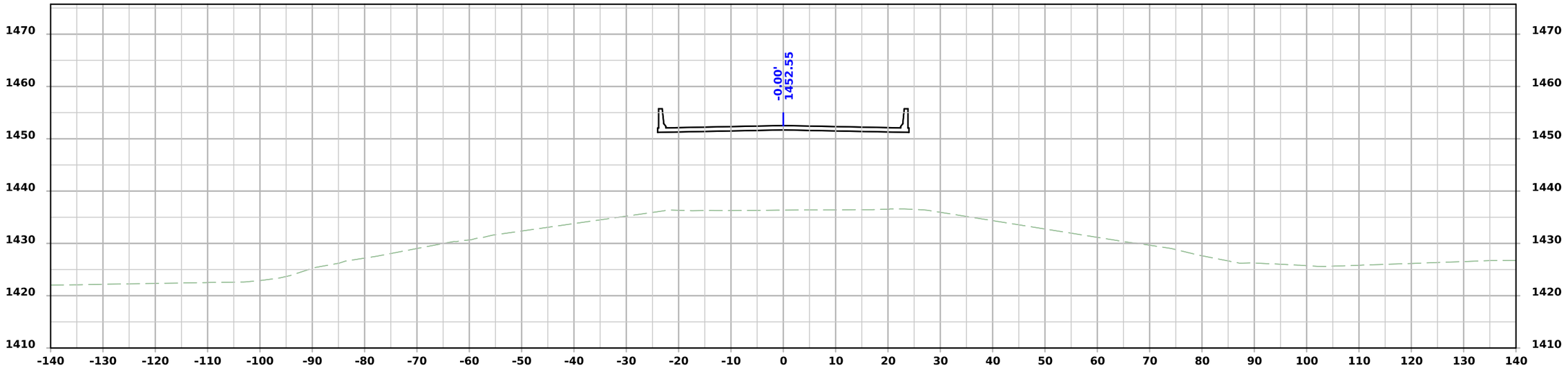

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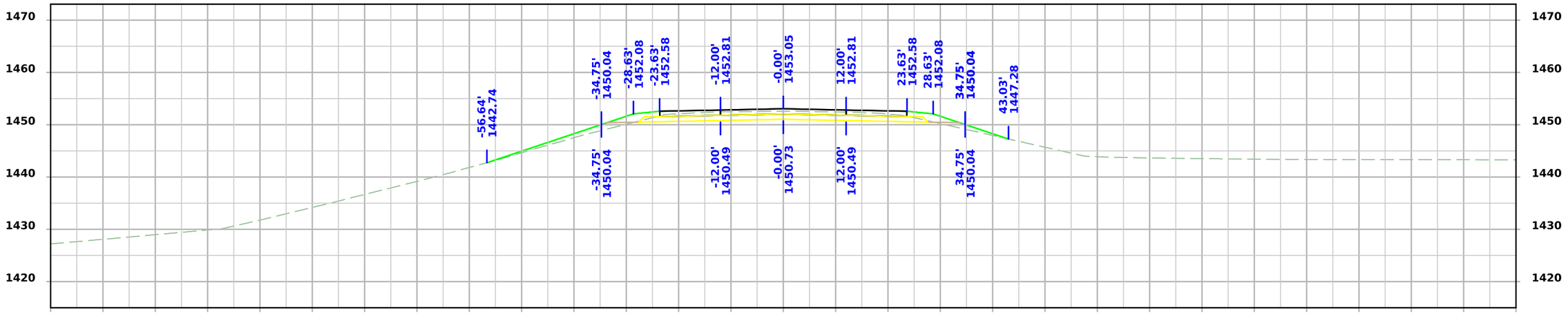

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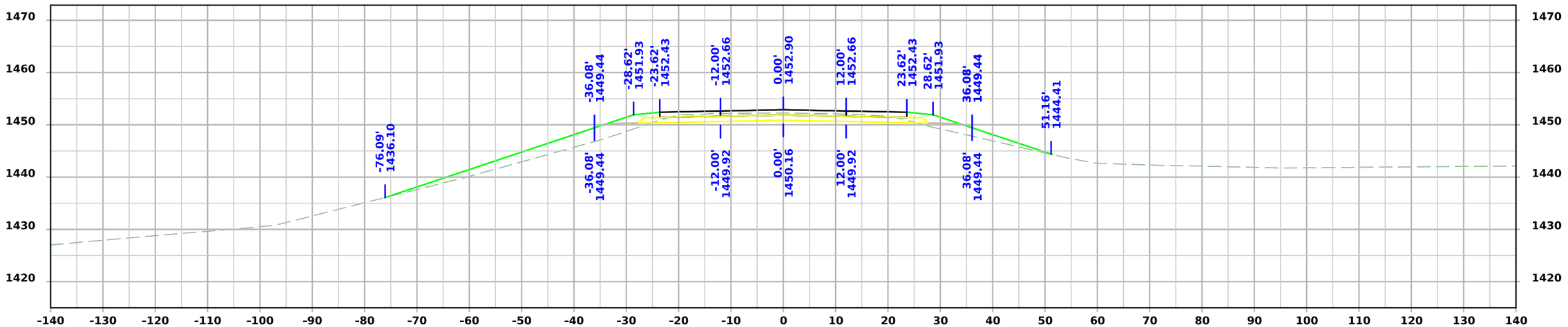

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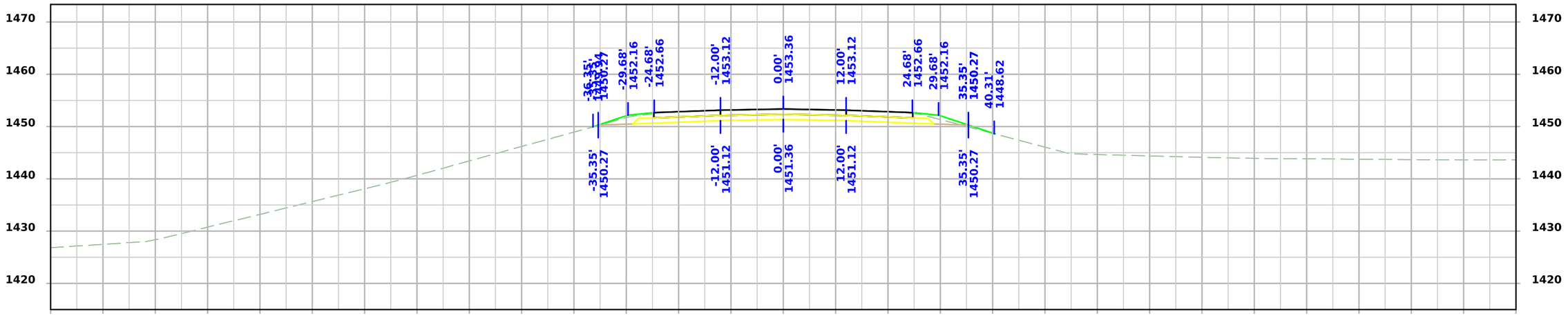
ML - Co Rd N54



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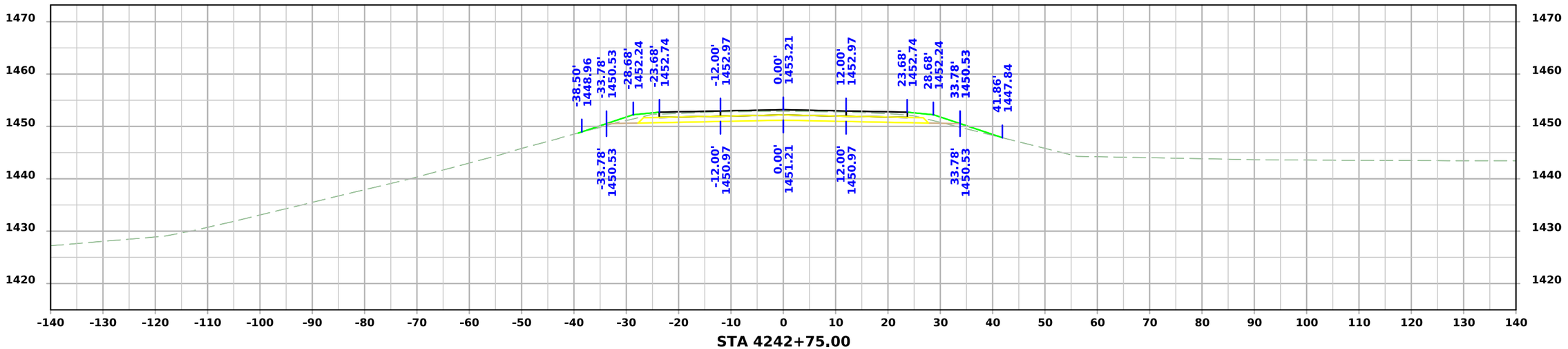

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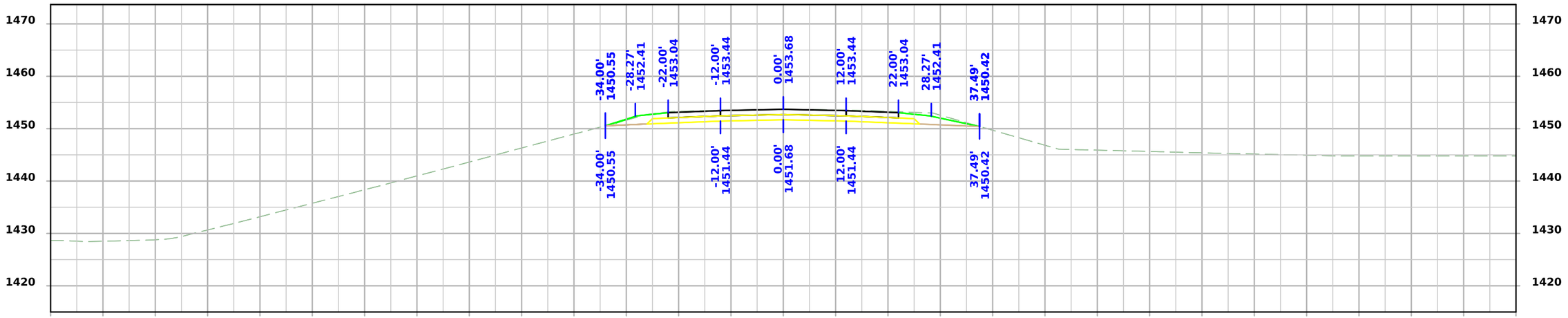
ML - Co Rd N54



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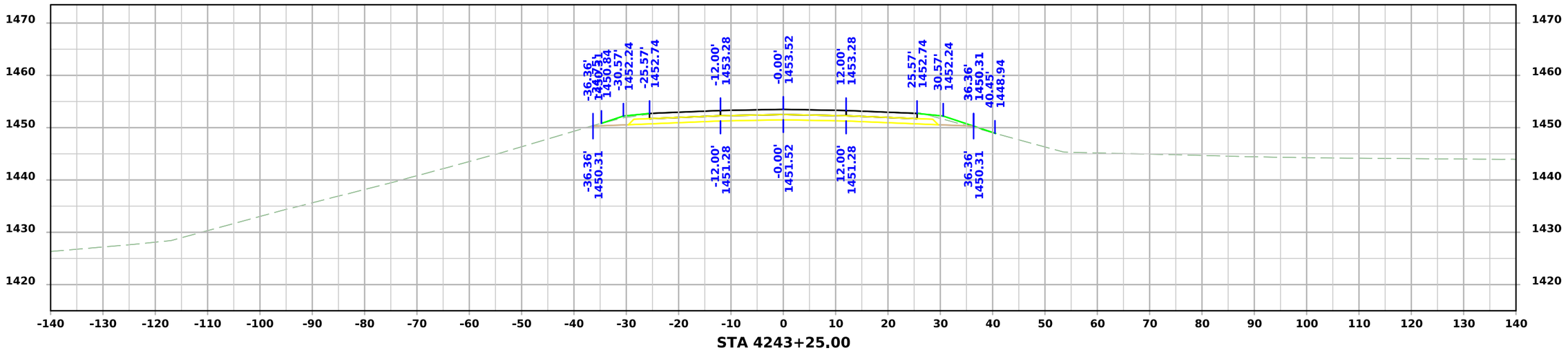

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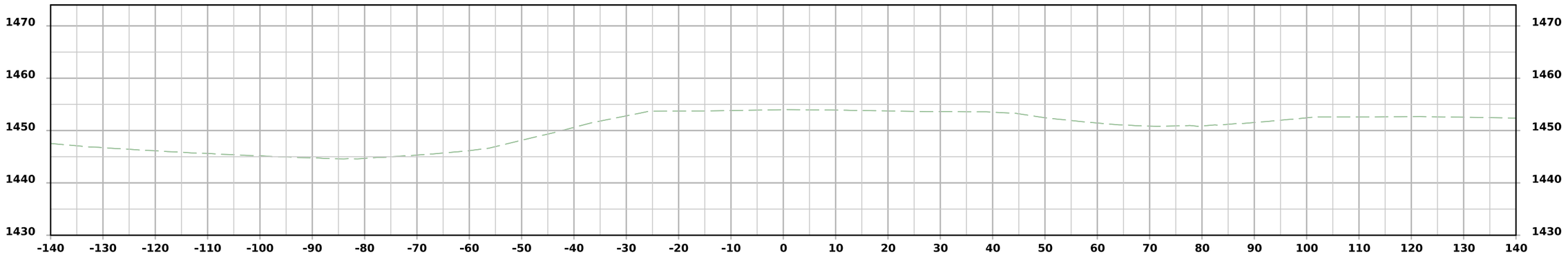
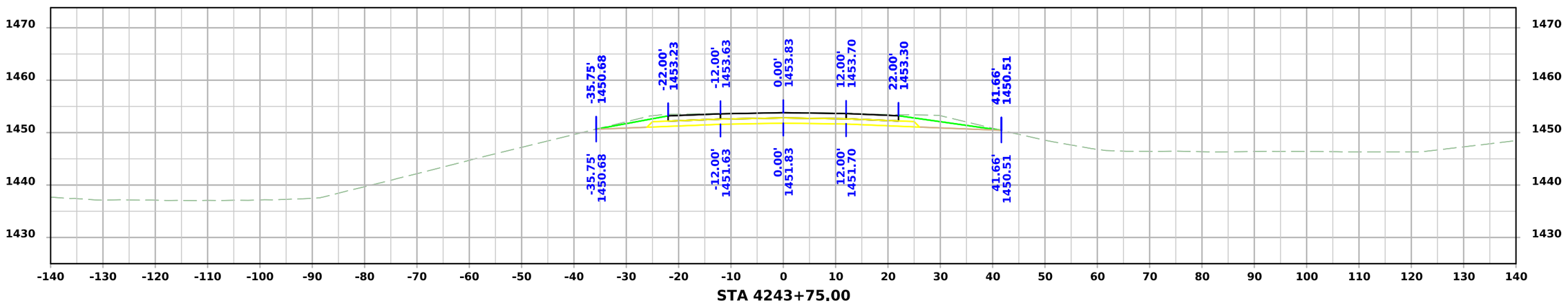


STA 4244+00.00



STA 4243+75.00

FILE NO.	ENGLISH	DESIGN TEAM Jia/Schoenrock/Evans	ADAIR COUNTY	PROJECT NUMBER IMX-080-2(275)76--02-01	SHEET NUMBER W.13

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