LETTING DATE 01/19/2028

RCB Culvert Replacement - Twin Box
BRF-078-1(029)--38-54

KEOKUK COUNTY

IOWA | DOT

REVISIONS

	TOTAL 33
PROJECT IDENTIFICATION NUMBER	
23-54-078-010	
PROJECT NUMBER	
BRF-078-1(029)--38-54	
R.O.W. PROJECT NUMBER	

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM
KEOKUK COUNTY

RCB Culvert Replacement - Twin Box

IA-78 Culvert Over Stream
3.9 Mi E of IA 149

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

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

IOWA ONE CALL
1-800-292-8989
www.iowaonecall.com
811 Know what's below. Call before you dig.

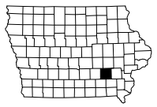
D5 PLAN - Date: 11/21/25
P9 PLAN - Date: 4/22/26

DESIGN DATA RURAL			
2028	AADT	1200	V.P.D.
2048	AADT	1400	V.P.D.
20	DHV		V.P.H.
TRUCKS		27	%
Total Design ESALs			

PRELIMINARY PLANS

Subject to change by final design.

D2/D3 PLAN - Date: 7/10/25



FILE NO.	ENGLISH	DESIGN TEAM Miller / O'Riley	KEOKUK COUNTY	PROJECT NUMBER BRF-078-1(029)--38-54	SHEET NUMBER A.1

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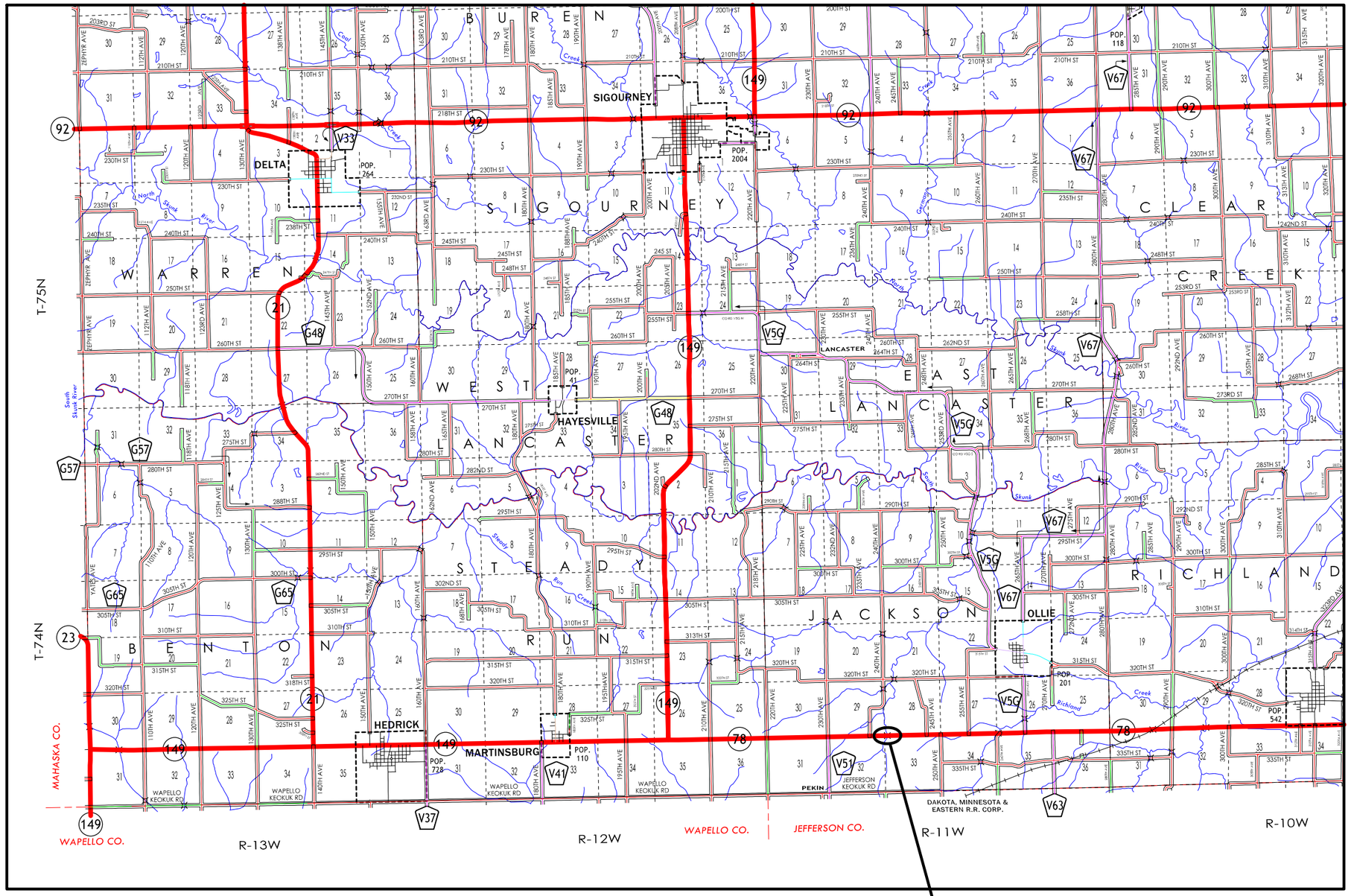
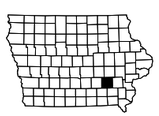
KEOKUK COUNTY





LOCATION MAP SCALE
0 1 2 3
Miles

FILE NO.	ENGLISH	DESIGN TEAM Miller / O'Riley	KEOKUK COUNTY	PROJECT NUMBER BRF-078-1(029)--38-54	SHEET NUMBER A.2

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IOWA DEPARTMENT OF TRANSPORTATION

TO OFFICE:	District 5	**DATE:**	Oct 7, 2024
ATTENTION:	Bob, Younie	**PROJECT:**	Keokuk County BRF-078-1(029)--38-54
FROM:	John E. Bartholomew		PIN: 23-54-078-010 Stream 3.9 mi E of IA 149
BUREAU:	Design		Maint. No. 5404.1S078 FHWA: 604370
SUBJECT:	Project Concept Statement; (Final, D0)		Design: 3737

This project involves the of the IA-78 bridge (Maint. No 5404.1S078) over Stream 3.9 mi E of IA 149. The project will extend approximately 25 Ft. beyond the culvert on both sides of the culvert.

A concept review was held on Aug 28, 2024. Those present included Bob Younie, Bonnie Clancy, Marv May from the District 5 Office; Christian Kennel from Bridge and Structures Bureau; Shawn Goetz, Jim Galliart, Deeann Newell, Jill Garton, Samuel Sturtz, Christy Vanbuskirk from Location and Environment Bureau; and John Bartholomew, Anthony Apland from the Design Bureau.

One alternative was considered:

1. Replacement of the 21ft. x 45 ft. concrete box culvert with a with a twin 10 Ft. x 12 Ft. x 102 Ft. reinforced concrete box. The estimated cost of this alternate is **$ 833,500.**

Additional right of way/right of entry will be required. Traffic will be maintained by an off-site detour.

The Draft Project Concept Statement was sent out for review and comment with concerns to be resolved by 10/3/2024. Comments received during the review period have been considered and resolved.

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

JEB: ARA
Attach.
cc:

C. Purcell	M. Kennerly	K. Nicholson
M. Dell	J. Nelson	M. Nop
M. Swenson	B. Younie	D. Sprengeler
S. Majors	A. Poole	K. Brink
D. Newell	B. Bradley	J. Laaser-webb
W. Sorenson	E. Wright	M. Ross
A. Welch	J. Harris	C. Poole
B. Hofer	G. Karssen	B. Azeltine
S. Anderson	D. Stokes	T. Jerman
K. Patel	R. Harris	M. Todsen
M. Van Dyke	T. Lovan	B. Dolan
N. Cuva	J. Bartholomew	S. McElmeel
N. Abuissa	B. Beavers	D. Bielser
B. Clancy	B. Lauderman	J. Woodcock
H. Torres-cacho	J. Phillips	P. Leanos
J. Garton	R. Porter	J. Ellis
S. Sersland	R. Meyer	M. Khoda
J. Hauber	K. Olson	S. Seivert
S. Neubauer	FHWA	

IOWA DEPARTMENT OF TRANSPORTATION

TO OFFICE:	District 5	**DATE:**	Oct 7, 2024
ATTENTION:	Bob, Younie	**PROJECT:**	Keokuk County BRF-078-1(029)--38-54 PIN: 23-54-078-010 Stream 3.9 mi E of IA 149 Maint. No. 5404.1S078 FHWA: 604370 Design: 3737
FROM:	John E. Bartholomew		
BUREAU:	Design		
SUBJECT:	Project Concept Statement; (Final, D0)		

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JEB: ARA
Attach.
cc:

FINAL PROJECT CONCEPT STATEMENT

IA-78 Culvert over Stream 3.9 mi E of IA 149.

Keokuk County
BRF-078-1(029)--38-54
PIN: 23-54-078-010
Maint. No. 5404.1S078
FHWA No. 604370

Highway Division
Design Bureau

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

Oct 10, 2024

I. STUDY AREA

A. Project Description

This project involves the replacement of the IA-78 Culvert (Maint. No 5404.1S078) over Stream 3.9 mi E of IA 149. The project will extend approximately 25 Ft. beyond the culvert on both sides of the culvert.

One alternative was considered:

1. Replacement of the 21ft. x 45 ft. concrete box culvert with a with a twin 10 Ft. x 12 Ft. x 102 Ft. reinforced concrete box. The estimated cost of this alternate is **$ 833,500**

B. Need for Project

This is a 21 ft. x 45 ft. concrete box culvert that was built in 1937 and reconstructed in 1988. The walls and bottom of the deck have several large hollows, spalled with severely rusted reinforcing. The wings have several cracks, heavy leaching, severe scaling, and hollow areas. The inlet and outlet have scour within 2 ft. length. Due to the condition, the culvert should be replaced.

IA-78 Westbound IA-78 Eastbound

C. Present Facility

The existing structure is a 21 ft. x 45 ft. , concrete box culvert bridge constructed in 1937. IA-78 in the project area is 24 ft. wide HMA pavement with 5 ft. wide gravel shoulders and 3:1 fore slopes, constructed in 1937. HMA resurfacing was accomplished in 2015.

D. Traffic Estimates

The 2028 construction year and 2048 design year average daily traffic estimates are 1200 ADT with 28% trucks and 1400 ADT with 27% trucks, respectively.

E. Sufficiency Ratings

IA-78 is classified as an Area Development route and is a maintenance service level C roadway. The Bridge Condition Index is 40.6 and the Bridge Condition Rating is Poor.

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 2 crashes including, 2 personal property crashes. The PCR rating is “0.01”.

II. PROJECT CONCEPT

A. Alternative #1 - Replace with a culvert

The existing 21 Ft. x 45 Ft. culvert will be replaced with a twin 10 Ft. x 12 Ft. x 102 Ft. reinforced concrete box (RCB) placed at a 15-degree right ahead skew. The typical cross section will consist of a 24 Ft. roadway with 5 Ft. gravel shoulders.

The roadway will be reconstructed on the existing vertical and horizontal alignment. Due to the flatter fore slopes provided (6:1 on the left side and 9:1 on the right side) the existing guardrail will not be required and can be removed. The existing ditches will need to be relocated to meet the inlet and outlet flowlines of the new RCB. Class E revetment will be placed at the ends of the RCB. The flow line of the box will be buried 1 ft. below the existing flow line in the channel. This will allow the bottom of the box to silt in and provide a natural bottom for fish passage.

Apply erosion control and rural seeding and fertilizing to all disturbed areas.
Right of way appears to be required for this project.
Traffic will be maintained by an off-site detour.

Bridge Items	Estimated Costs
New Culvert	$ 405,000
Removal	9,600
Revetment	12,500
Mobilization - 10%	43,000
M & C - 15%	86,000
Bridge Costs	**$ 556,100**
Roadway Items	
Removal of Pavement	4,100
PCC Pavement	16,000
Modified Subbase	4,500
Granular Shoulder	800
Embankment in place, contractor furnished	140,000
Excavation Class 13 Waste	3,000
Guardrail Removal	7,100
Clearing and Grubbing	3,900
Seeding and Fertilizing	700
Right of Way	10,000
Traffic Control - 5%	12,900
Mobilization - 5%	12,900
M & C - 20%	51,500
Roadway Costs	**$ 277,400**
Project Total	**$ 833,500**

B. Detour Analysis

IA-78 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 will start at the junction of IA 78 and IA-149 heading North approximately 7.75 miles, then East at the intersections of IA-149 and Co. Rd. V5G approximately 11.2 miles, then South in the city of ollie at the intersection of Co. Rd. V5G and 1st St, ending at the intersection of Co. Rd. V5G and IA-78. Out of distance travel is 13.26 miles. The total distance user cost is anticipated to be $900,946. The cost for county road maintenance will be $60,049 as calculated by the Gas Tax Method. Detour signing costs will be $10,000.

C. Recommendations

It is recommended that the present structure be replacement, 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 IA-78; therefore, no ADA accommodations are planned in conjunction with this project.

F. Special Considerations

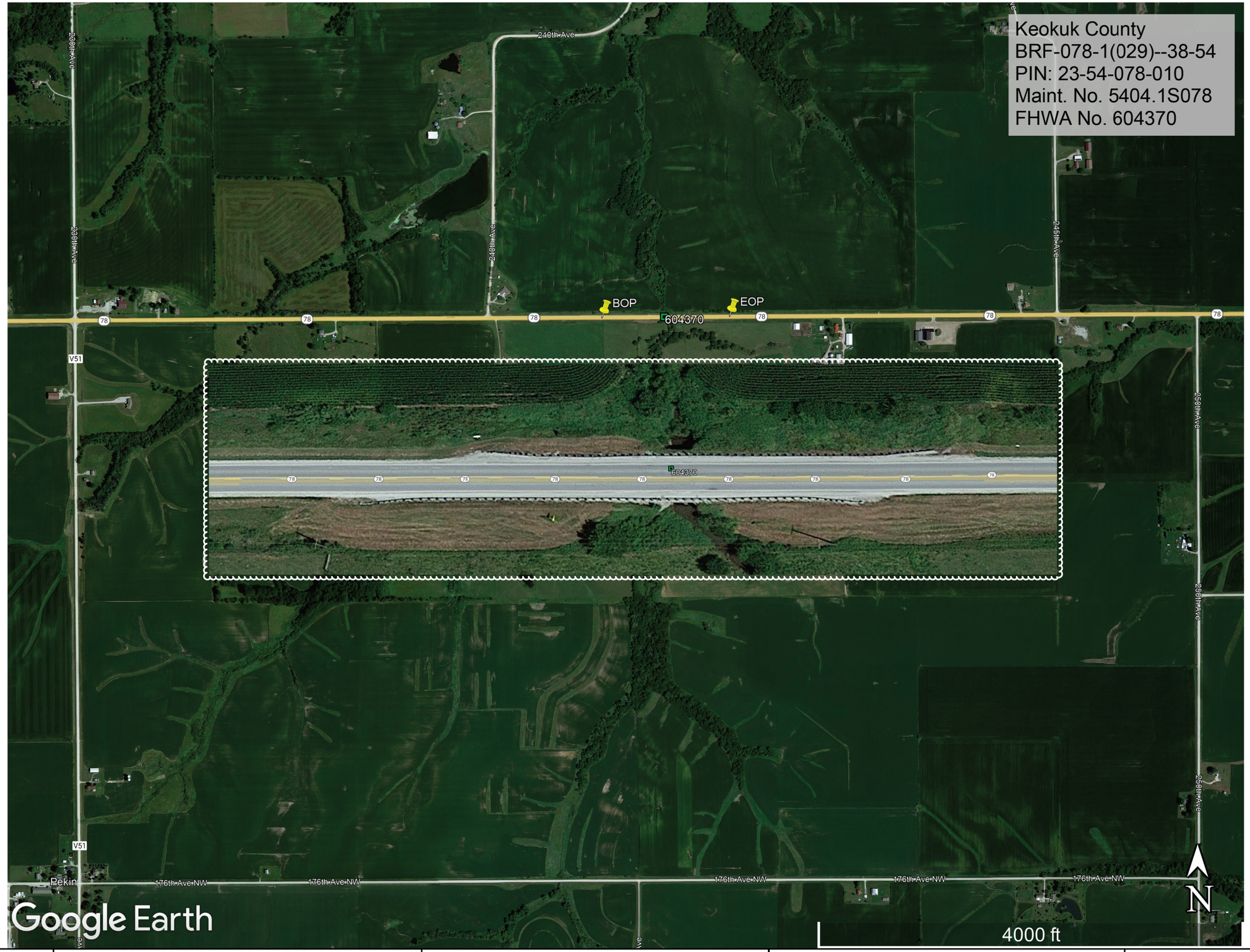
This will not be a traffic critical project.

The ABC Rating Score of 33 is less than the first stage filter threshold of 50, therefore this bridge will not be considered for accelerated bridge construction.

No bike path or sidewalk will be required as part of this project.
Waterway is not on a state water trail or paddling route.

Right of Way appears to be required for this project.

The Location and Environment Bureau has reviewed this project and has no concerns at this time.



FILE NO.	ENGLISH	DESIGN TEAM Miller / O'Riley	KEOKUK COUNTY	PROJECT NUMBER BRF-078-1(029)--38-54	SHEET NUMBER A.7

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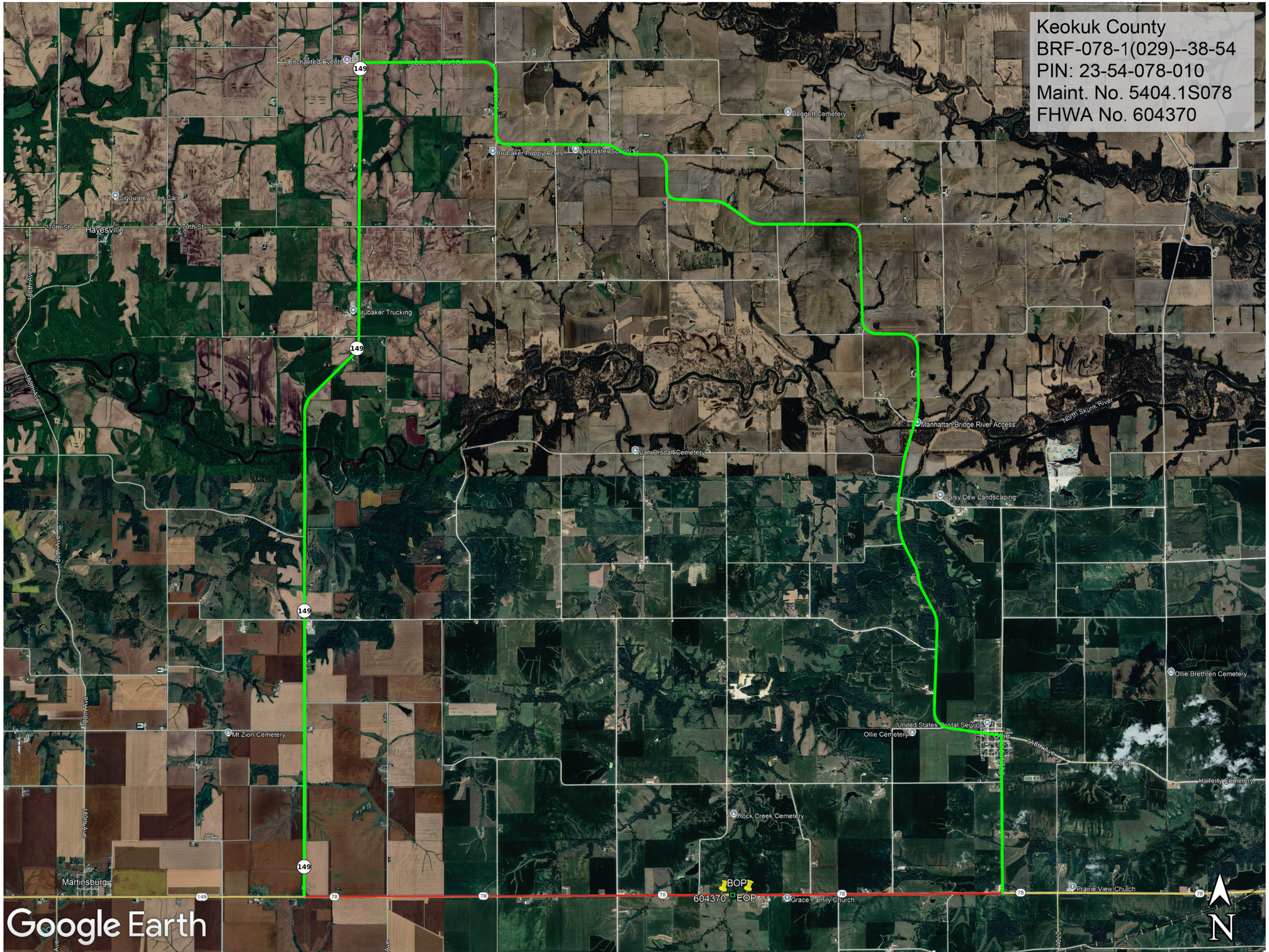

FILE NO.	ENGLISH	DESIGN TEAM Miller / O'Riley	KEOKUK COUNTY	PROJECT NUMBER BRF-078-1(029)--38-54	SHEET NUMBER A.8

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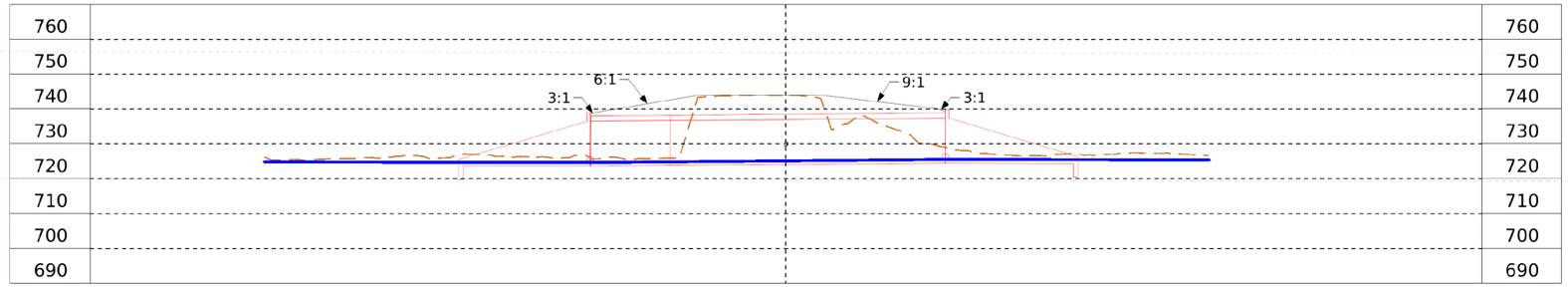
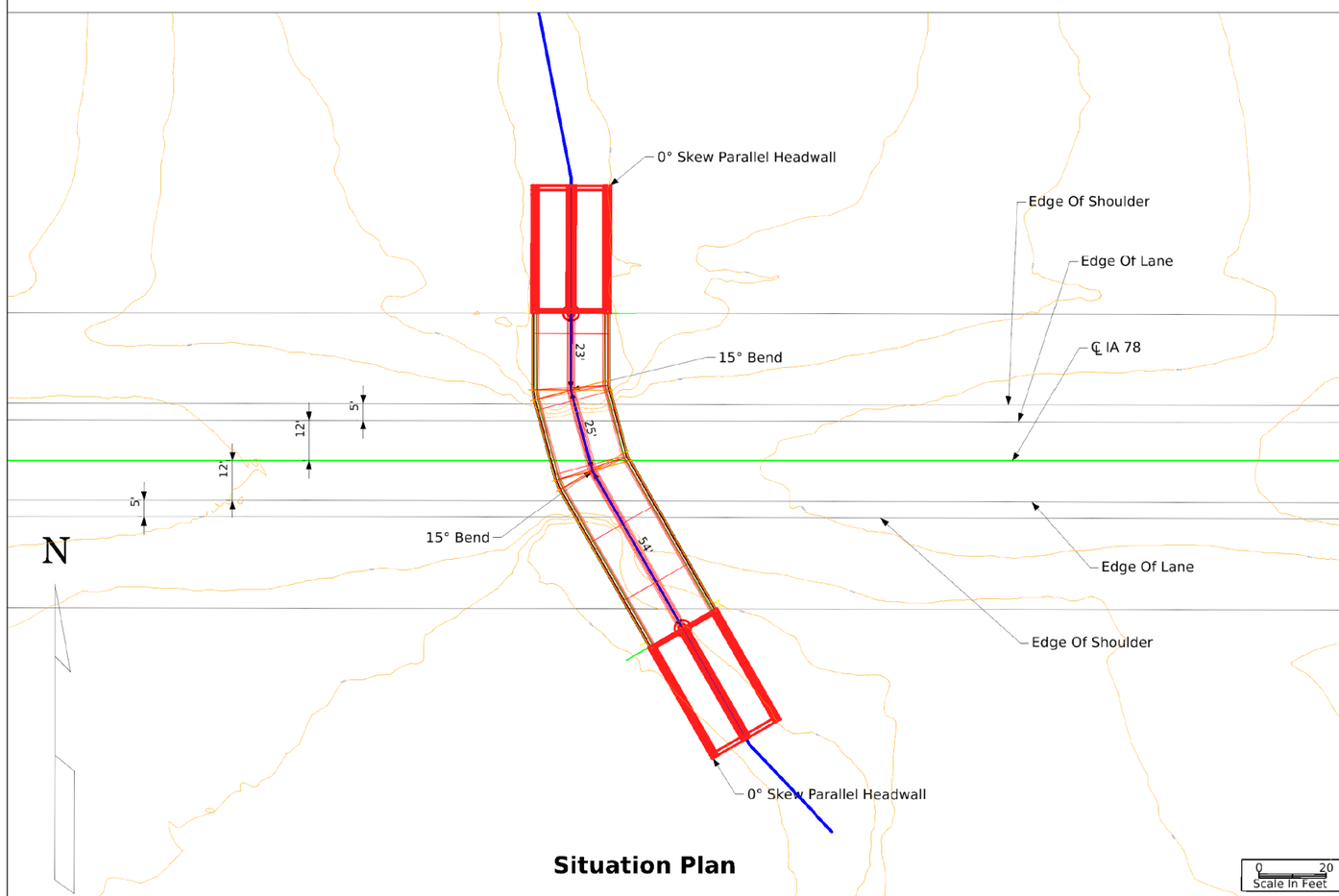




Situation Plan

Traffic Estimate

2028 AADT	1231 V.P.D.
2048 AADT	1369 V.P.D.
2048 DHV	141 V.P.H.
TRUCKS	28 %
Total Design ESALs	???

Hydraulic Data

Drainage Area = 2.23 SQ.MI.
Stream Slope = 20.5 Ft./Mi.
Q_{50} = 1,787 cfs
HW Elev. = 736.89

Location

On IA 78 over Rock Creek
T-74N R-11W
Section 28
Keokuk County
Latitude 41.177319°
Longitude -92.139013°

Design For 15 Degree Skew

Twin 10' x 12' x 102'
Cast-In-Place Concrete Culvert

Situation Plan

STA. 214+66.84

August 2024

KeokukCounty
IOWA DEPARTMENT OF TRANSPORTATION

Design No. TBD | Design Sheet No. 1 of 1 | FHWA/Asset TBD

FILE NO.	ENGLISH	DESIGN TEAM **Iowa DOT**	**Keokuk** COUNTY	PROJECT NUMBER **BRF-078-1(029)--38-54 / 23-54-078-010**	SHEET NUMBER V.1

SYSTEMTIME SYSTEMDATE USERNAME DGNSPEC

Local Utilities Near Project Location

Alliant Energy
Billie Reid
200 1st St. SE
Cedar Rapids, IA 52401
rerow@alliantenergy.com
319-786-8196

Kalona Cooperative Telephone Company (KCTC)
Jacob Slaubaugh
POL Box 1208
510 B Ave.
Kalona, IA 52247
319-656-3668
Jacob.slaubaugh@kctc.net

Wapello Rural Water Assoc.
Krista Huffman
PO Box 538
Ottumwa, IA 52501
641-382-8351
Kristah@wapelloruralwater.com

Windstream Communications ILEC
Dan Hogan
1614 230th St
Manchester, IA 52057
563-920-2428
Dan.Hogan@windstream.com

Windstream Communication CLEC
Stephen Kness
1450 N Center Point RD.
Hiawatha, IA 52233
319-791-7678
Stephen.kness@windstream.com

Roadway				
PIN Number	23-54-078-010		**Submittal Date**	
Project Number	BRF-078-1(029)--38-54			**Approval Date**
District	District 5	**Assistant District Engineer**		
County	KEOKUK		**or**	
Route	IA-78	**Office Director**		
Location	Stream 3.9 mi E of IA 149			
Work Type	Culvert Replacement			
Segment Manager				
Designer	Schrock / O'Riley			

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

Rural Two-Lane Highways (Rural Arterials)

Design Element		Preferred	Acceptable	Project Values
Design speed (mph)		60	50	60
Maximum superelevation rate (Refer to Section 2A-2)		6%	8%	-
Design lane width (ft)		12	12	12
Full depth paved width (ft)		12	12	12
Right turn lane (ft)		12	10	-
Climbing Lane (ft)		12	12	-
Left turn lane (ft)		12	10	-
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)		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 type (Refer to Section 3C-2)	Design speed = 50 or 55 mph	6-inch sloped	6-inch standard	-
	Design speed ≥ 60 mph	4-inch sloped	6-inch sloped	-
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
	Beyond standard ditch depth and design clear zone	3.5:1	3:1	3.5:1
	Curbed roadways	2%	not steeper than 3:1	-
Backslope (For cut areas greater than 25 feet, contact the Soils Design Section for assistance with backslope benches.)		3:1	2.5:1	3:1
Transverse Slopes	w/ drainage structures	8:1	6:1	6:1
	w/o drainage structures	10:1	6:1	
Ditches (Refer to Section 3G-1)	Outside ditch (depth x width) (ft)	5 x 10	--	5 x 10
Bridge width—new*	Bridge length ≤ 200 ft	design lane widths + effective shoulder widths	design lane widths + effective shoulder widths	-
	Bridge length > 200 ft	design lane widths + effective shoulder widths	design lane width + 4' right and left of the design lane widths	-
Bridge width—existing*		design lane widths + no less than 2 ft left and right	design lane widths + 2 ft. offset left and right	-
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		B	B	B

*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 = 1400

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*	5 Ft. Gravel
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:

Shoulder width and type to match existing.

Sag curve length and K value to match existing.

Roadway Design Speed (mph) = 60

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

Design Criteria for High Speed Roadways

Design Element			Preferred Criteria, Design Speed, mph: 50	55	60	65	70	75	Acceptable Criteria, Design Speed, mph: 50	55	60	65	70	75	Project Values
Stopping sight distance (ft) (Refer to Section 6D-1)			425	495	570	645	730	820	425	495	570	645	730	820	570
Minimum horizontal curve radius (ft) (Refer to Sections 2A-2 and 2A-3)	Method 5 superelevation and side friction distribution	e_{max} = 6%	833	1060	1330	1660	2040	2500	833	1060	1330	1660	2040	2500	-
		e_{max} = 8%	--	--	--	--	--	--	758	960	1200	1480	1810	2210	-
Minimum vertical curve length (ft) (Refer to Section 2B-1)			150	165	180	195	210	225	150	165	180	195	210	225	500
Minimum rate of vertical curvature (K) (Refer to Section 2B-1)	crest vertical curves		84	114	151	193	247	312	84	114	151	193	247	312	-
	sag vertical curves	roadways without fixed-source lighting	96	115	136	157	181	206	96	115	136	157	181	206	43.5
		roadways with fixed-source lighting	96	115	136	157	181	206	54	66	78	91	106	121	-
Minimum gradient (%)	(Refer to Section 2B-1)		0.5						0.3% with a curb, 0.0% without a curb						0.5
Maximum gradient (%)	(Refer to Section 2B-1)	Urban roadways	4		3				7	6	6	--	--	--	6
		Rural roadways							5	5	4	4	4	4	
		Interstates							5	5	4	4	4	4	
Clear zone			See "Preferred Clear Zone" table in Section 8A-2						See "Acceptable Clear Zone" table in Section 8A-2						24

design speed	design ADT	FORESLOPES: 6:1 or flatter	FORESLOPES: Steeper than 6:1, up to and including 4:1	FORESLOPES: Steeper than 4:1	BACKSLOPES: Steeper than 4:1*	BACKSLOPES: 4:1 or flatter, up to 6:1	BACKSLOPES: 6:1 or flatter
40 mph or less	ADT < 750	10	10	**	10	10	10
	750 ≤ ADT < 1500	12	14	**	12	12	12
	1500 ≤ ADT < 6000	14	16	**	14	14	14
	ADT ≥ 6000	16	18	**	16	16	16
45 – 50 mph	ADT < 750	12	14	**	10	10	12
	750 ≤ ADT < 1500	16	20	**	12	14	16
	1500 ≤ ADT < 6000	18	26	**	14	16	18
	ADT ≥ 6000	22	28	**	16	20	22
55 mph	ADT < 750	14	18	**	10	12	12
	750 ≤ ADT < 1500	18	24	**	12	16	18
	1500 ≤ ADT < 6000	22	30	**	16	18	22
	ADT ≥ 6000	24	32	**	18	22	24
60 mph	ADT < 750	18	24	**	12	14	16
	750 ≤ ADT < 1500	24	32	**	14	18	22
	1500 ≤ ADT < 6000	30	40	**	18	22	26
	ADT ≥ 6000	32	44	**	22	26	28
65 – 70 mph	ADT < 750	20	26	**	12	16	16
	750 ≤ ADT < 1500	26	36	**	16	20	22
	1500 ≤ ADT < 6000	32	42	**	20	24	28
	ADT ≥ 6000	34	46	**	24	30	30

Questions

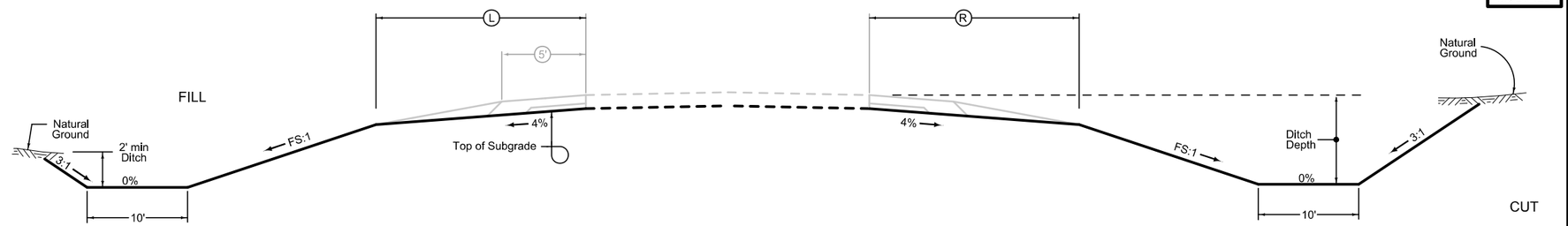
Do we need to DBL reinforce the pavement over the box culverts (see PR-120)?

Detour signing - By District or Contractor?

Do we need a safety edge due to small amount of pavement replaced?

G_2_Grade
MODIFIED

LOCATION			DIMENSIONS			
ROAD IDENTIFICATION	STATION TO STATION		(L) Feet	(R) Feet	(X) Inches	FS
IA-78						
	311+99.24	313+50.16		15'-11'		3:1
	312+66.19	313+23.67	13'-11'			3:1
	316+05.11	316+81.45	13'-16'			3:1
	316+18.81	316+38.81		7'		3:1

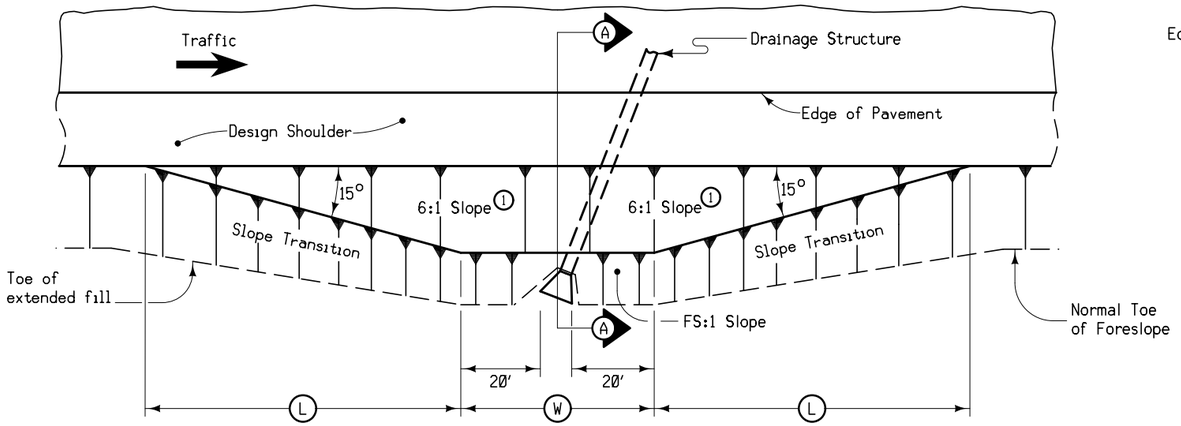


Normal section shown may be modified appropriately in areas of superelevated curves or other locations specifically designated by the Engineer.

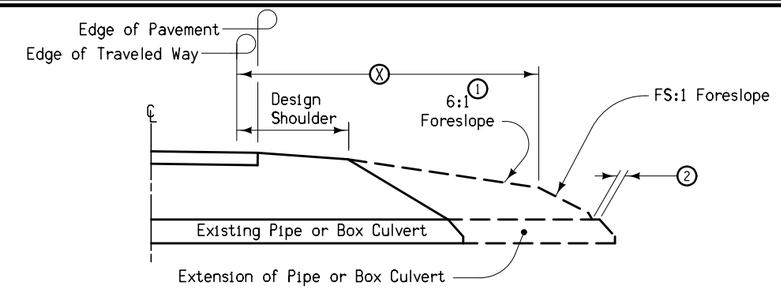
See plan & profile sheets and cross sections for additional details of ditches and backslopes.

2 LANE GRADING

4312
MODIFIED



PLAN VIEW



SECTION A-A

STRUCTURE LOCATION		(W)	(L)	(X)	(FS)
STATION (3)	SIDE	Feet	Feet	Feet	
314+65.69	LT	63.25'	>71'	34.24'	3:1
314+98.72	RT	40.39'	>71'	30.80'	3:1

At locations where an extended or newly constructed drainage structure extends beyond the normal foreslope cover, flatten as indicated so as to cover the structure. Minimum earth cover is 6 inches.

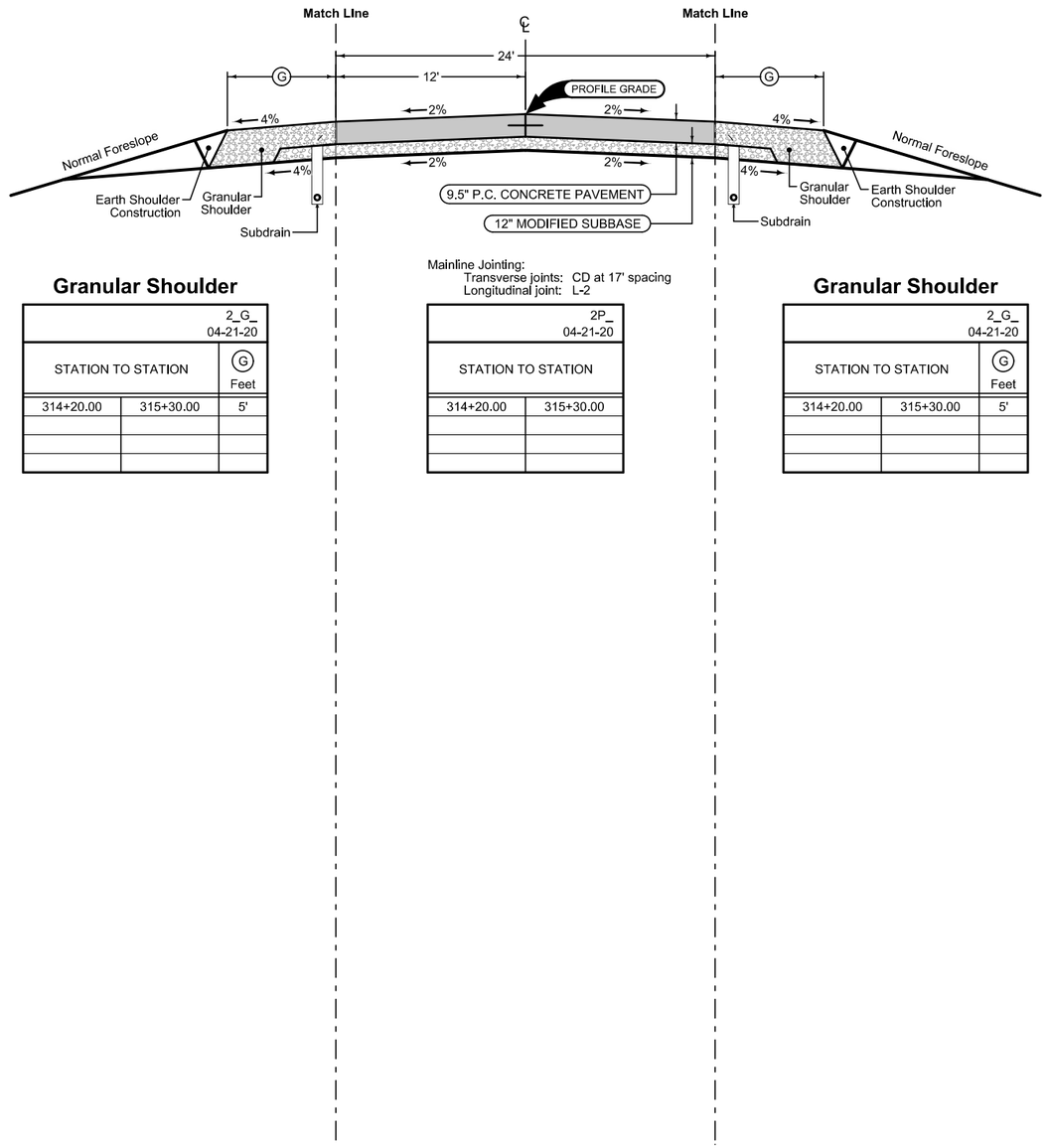
(1) Slope may be flatter than 6:1.

(2) 6 inch minimum for pipe installations or to top of headwall on RCB.

(3) At ℄ of roadway.

(W) = Pipe or RCB opening width plus 20 feet each side.

BARNROOF FORESLOPE AT SKEWED DRAINAGE STRUCTURE



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

Granular Shoulder

2_G_ 04-21-20		
STATION TO STATION		G Feet
314+20.00	315+30.00	5'

2P_ 04-21-20	
STATION TO STATION	
314+20.00	315+30.00

Granular Shoulder

2_G_ 04-21-20		
STATION TO STATION		G Feet
314+20.00	315+30.00	5'

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

- FO — *FO1D, Windstream - Quality D*
- *PPA, Alliant Energy*
- T1 — *TL1D, Windstream - Quality D*
- T2 — *TL2D, Kalona Cooperative - Quality D*
- W — *WL1D, Wapello Rural Water - Quality D*

WINDSTREAM COMMUNICATIONS
Design Contact: Locate Desk
Phone: 800-289-1901
Email: locate.desk@windstream.com

ALLIANT ENERGY
Design Contact: Alliant Energy Field Engineer
Phone: 800-255-4268
Email: locate_ipl@alliantenergy.com

KALONA COOPERATIVE TELEPHONE
Design Contact: On Call
Phone: 319-656-2769
Email: backoffice@kctc.net

WAPELLO RURAL WATER ASSOCIATION
Design Contact: Kathy Alex or Donnie Johnston
Phone: 641-6828351
Email: onecall@wrh2o.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

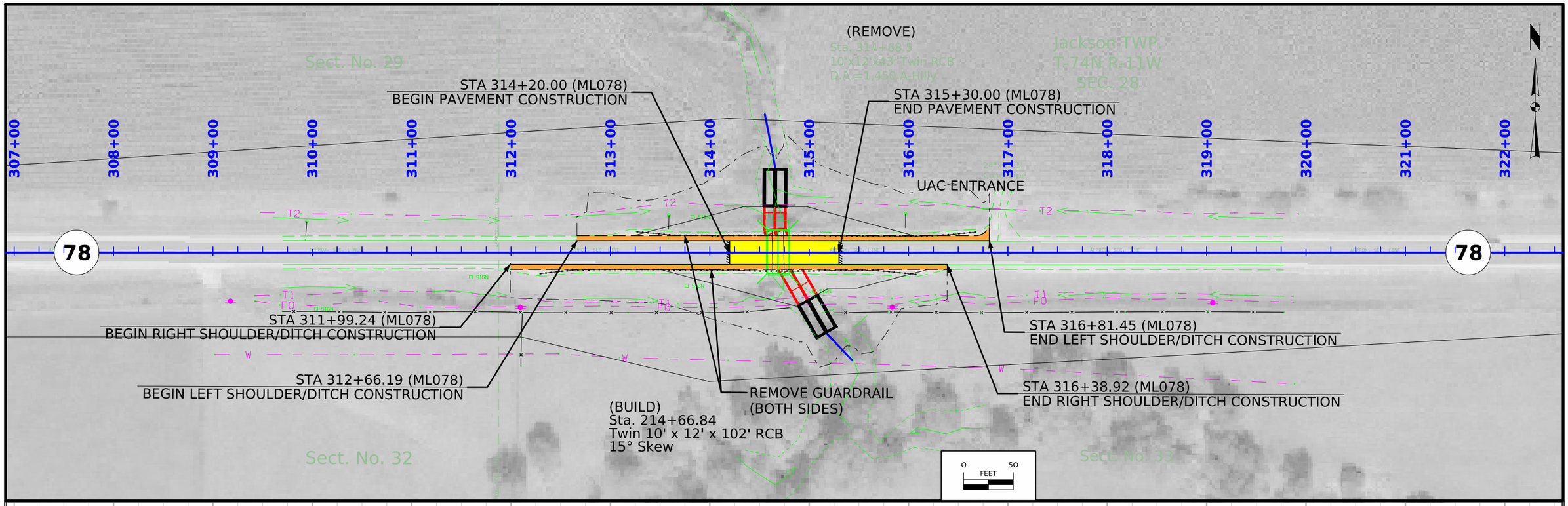
- Reference Point — Station — Survey Line
- Section Corner
- Ground Line Intercept
- Saw Cut
- Guardrail
- Trench Drain
- HighTension Cable Guardrail
- Sheet Pile
- Pavement Removal
- Clearing & Grubbing Area

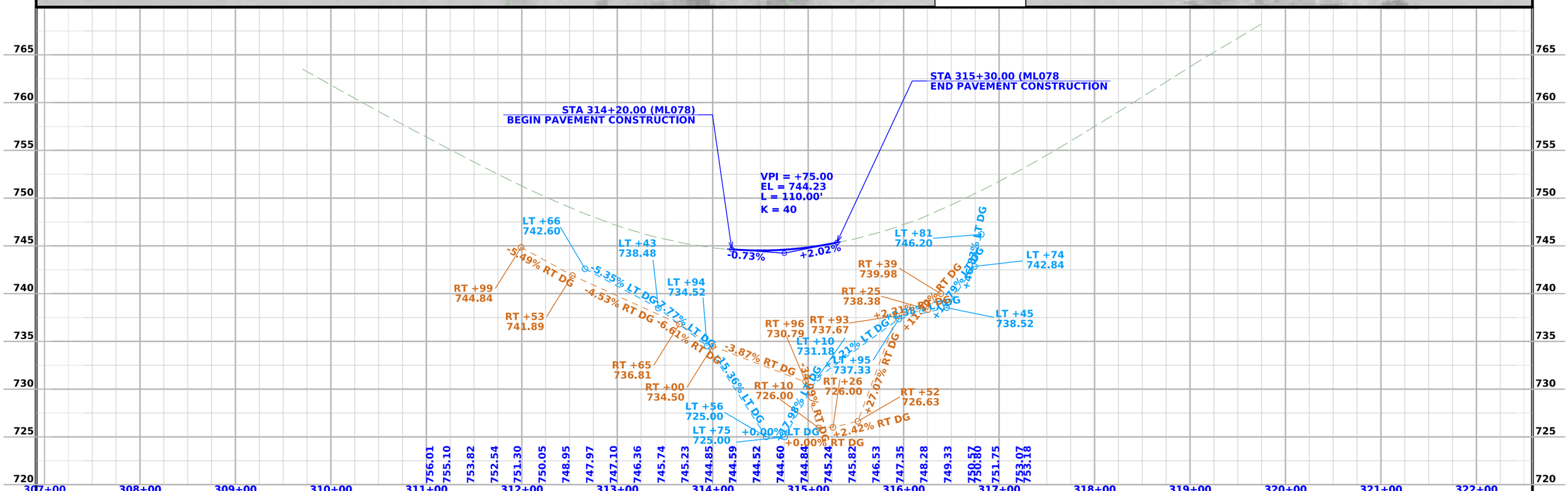
RIGHT-OF-WAY LEGEND

- 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 Miller / O'Riley	KEOKUK COUNTY	PROJECT NUMBER BRF-078-1(029)--38-54	SHEET NUMBER D.2

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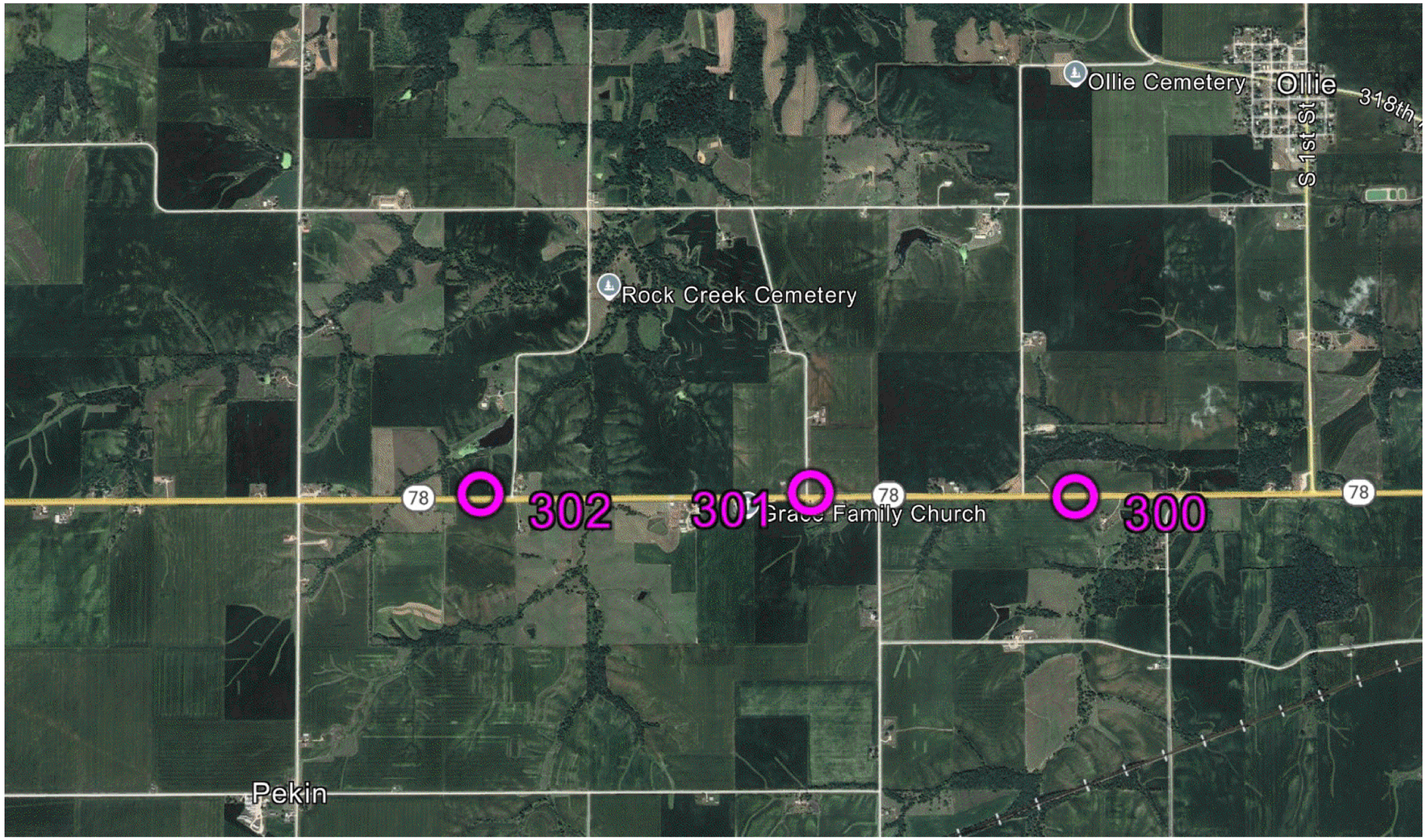
CONTROL POINT VICINITY MAP

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 13 (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.

SURVEY INDEX

County: Keokuk
Project Code: 23-54-078-010
Phase Number: BRF-078-1(029)--38-54
Location: Stream 3.9 mi E of IA 149
Type of Work: Culvert-Unspecified
Project Directory: 5407801023

Survey Personnel

Samuel Schilb – Assistant Survey Party Chief
Myron Fox – Party Chief

Date(s) of Survey

Begin Date	07/25/2024
End Date	10/16/2024

General Information

This survey is for Hwy 78 3.9 miles East of the Hwy 149 and 78 intersection. This survey request was for the Hwy 78 corridor only. 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 Prelim Survey project directory.

Project Control

Coordinates were determined for primary project control points by conducting concurrent six-hour static observations. Post processing is constrained to nearby Iowa Real Time Network reference stations. 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 13 (U.S. SURVEY FOOT)
VERTICAL DATUM: NAVD88
GEOID MODEL: 2018u3

Alignment Information

The horizontal alignment for Hwy 78 was provided by the District 5 Right of Way Department in Fairfield, IA.

HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING
HORIZ. DATUM: NAD83(2011) for EPOCH 2010.00 (IaRTN 2019 Adjustment)
Ia. Regional Coordinate System Zone 13 (U.S. Survey Foot)
VERT. DATUM: NAVD88
Geoid Model: 2018u3

Point Name	Northing	Easting	Elevation	Code Description
300	6737919.09	23447351.35	783.38	CP FND FENO MONUMENT 4" BELOW SURFACE IN GOOD CONDITION
301	6737994.91	23442521.14	794.24	CP SET 5/8"x42" REBAR 4" BELOW SURFACE
302	6737988.45	23436527.83	798.05	CP SET 5/8"x42" REBAR 4" BELOW SURFACE

108_23A
8/15/22

TRAFFIC CONTROL PLAN

Traffic on IA 78 will be maintained at all times via an off-site detour.

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

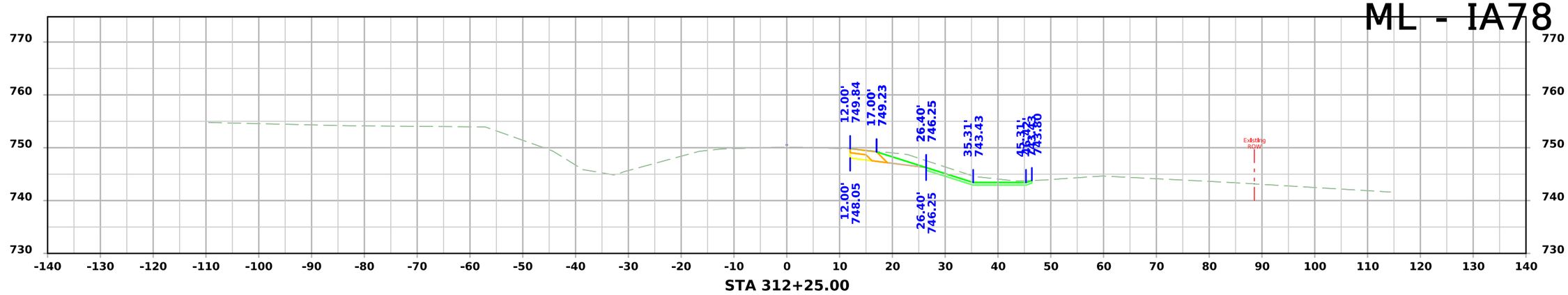
NOTES:

Text

CROSS SECTIONS
LEGEND AND INFORMATION SHEET

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

ML - IA78



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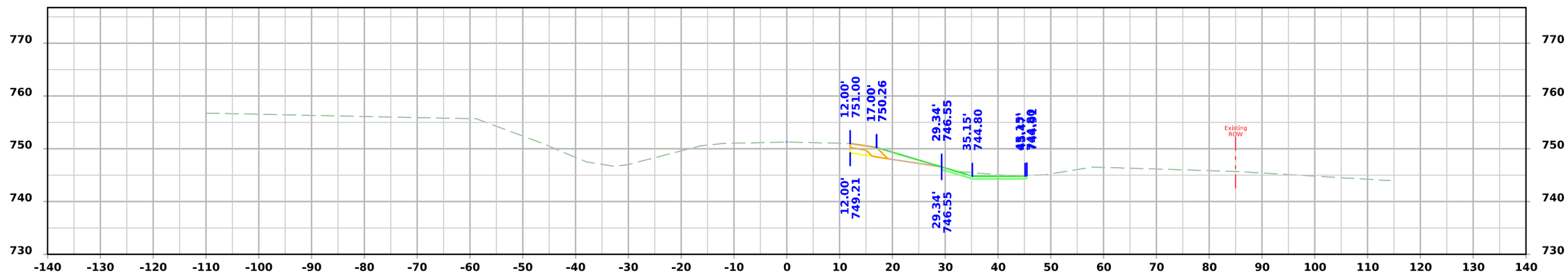

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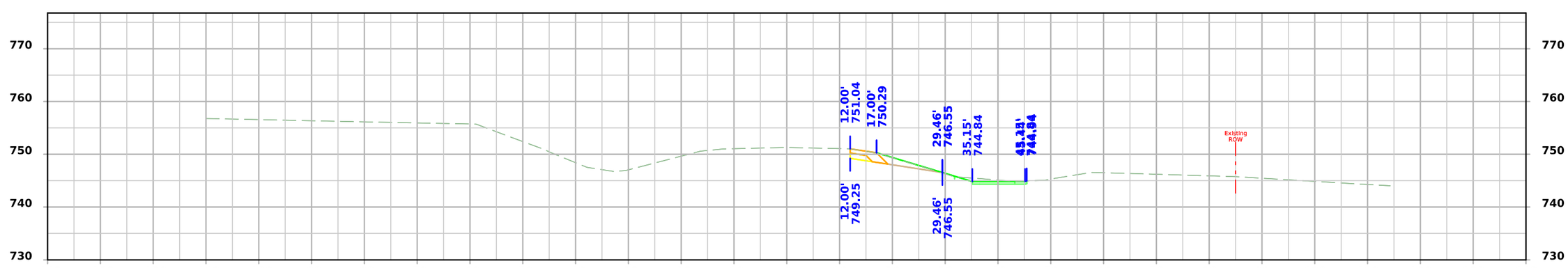

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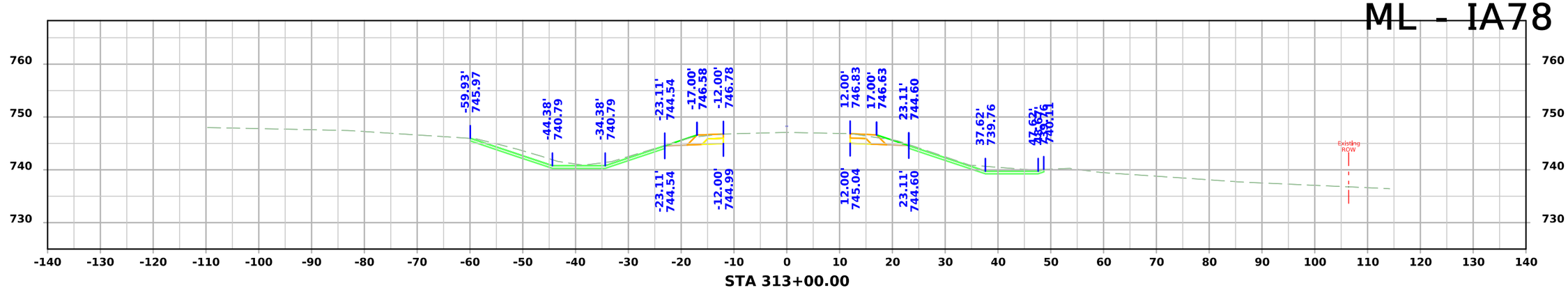

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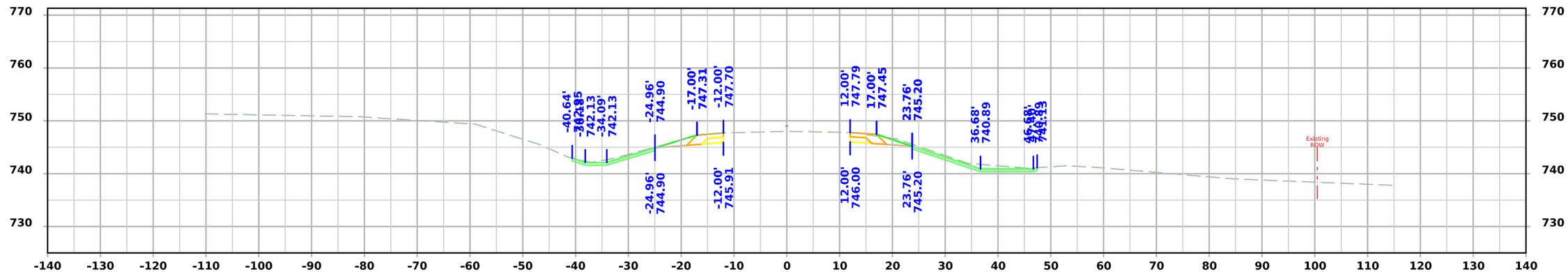

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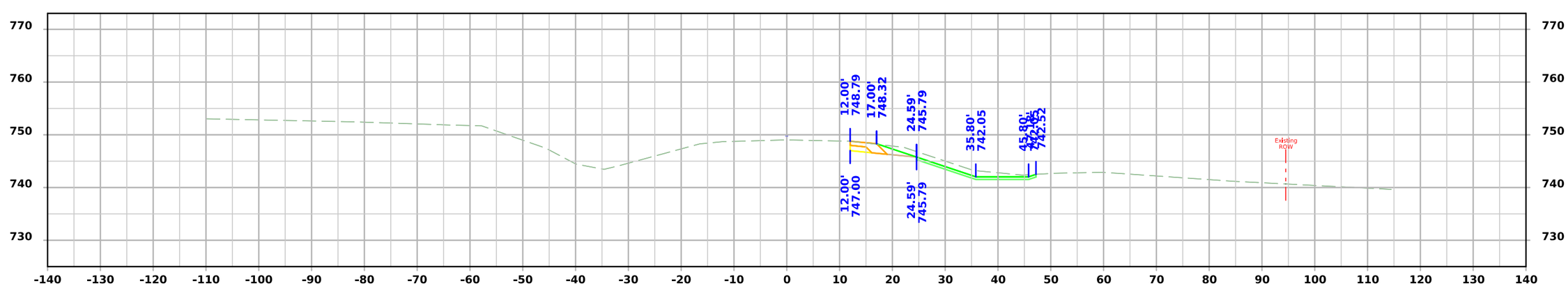

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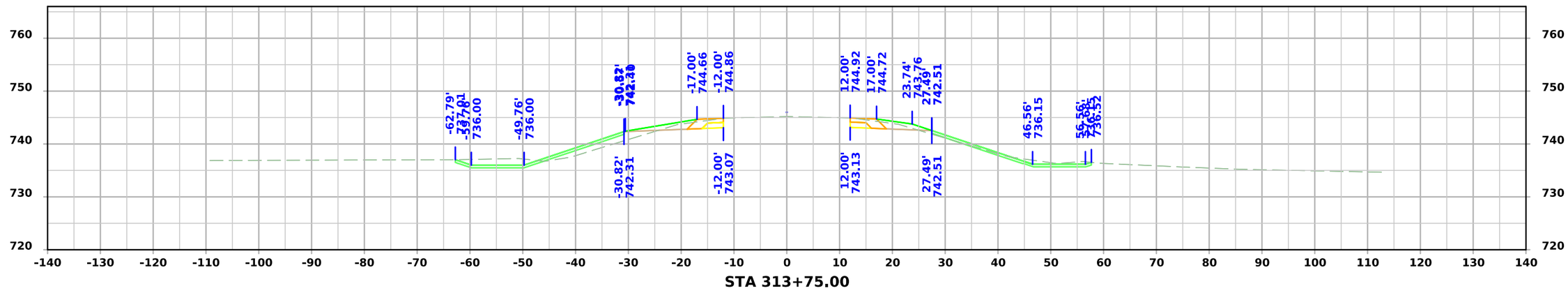
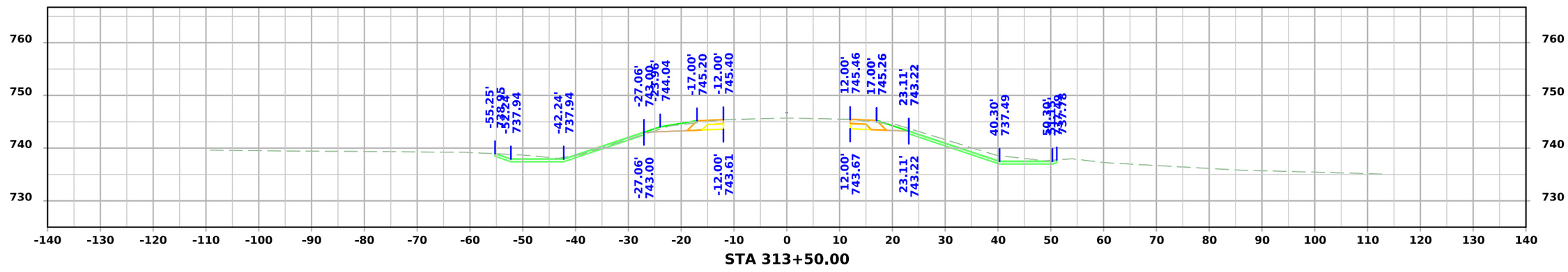
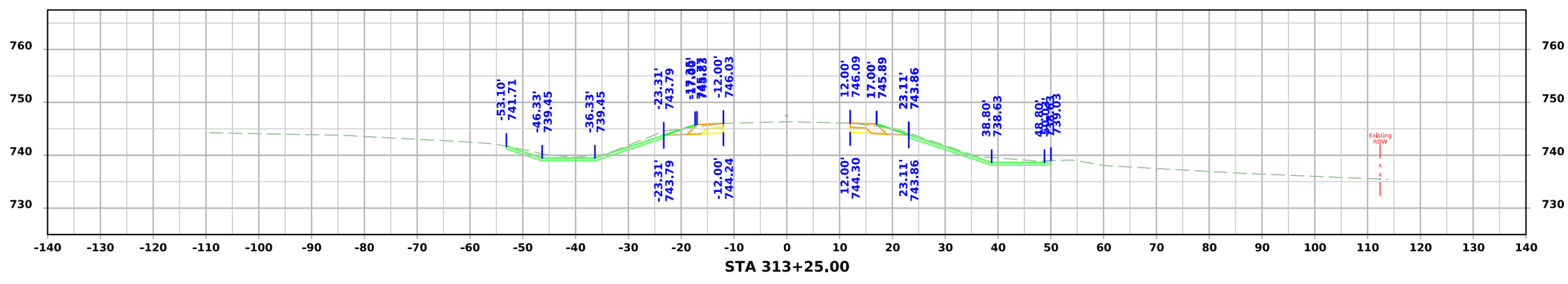
ML - IA78







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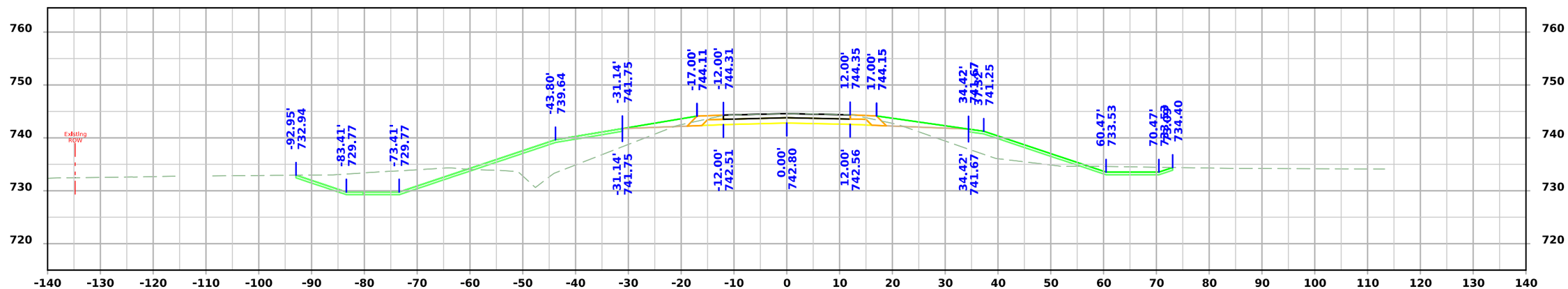

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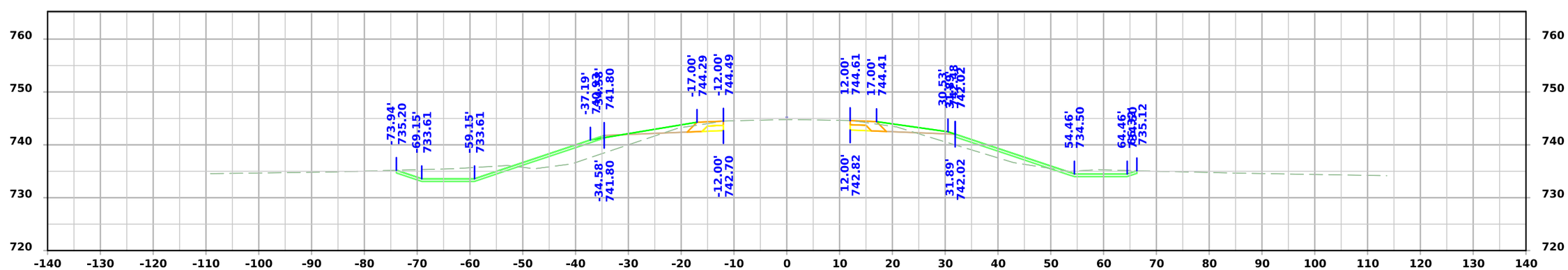

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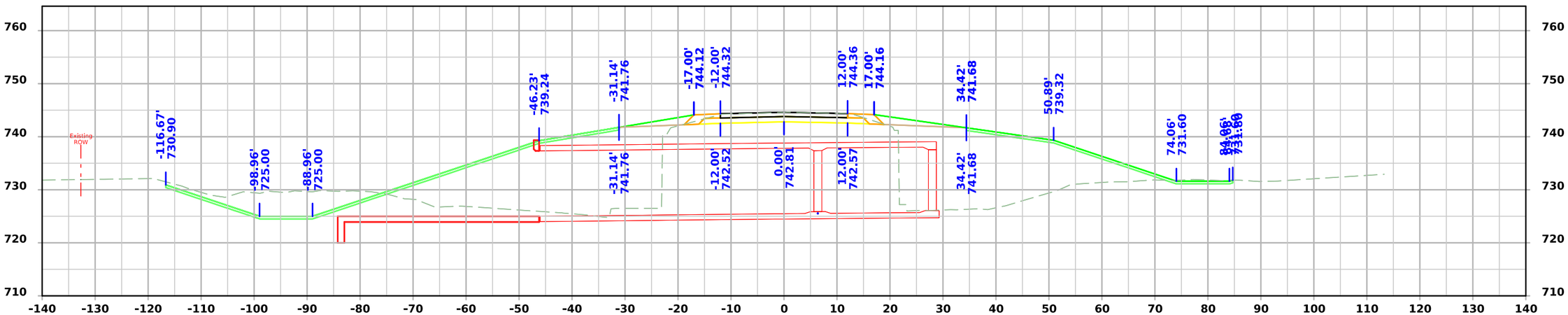

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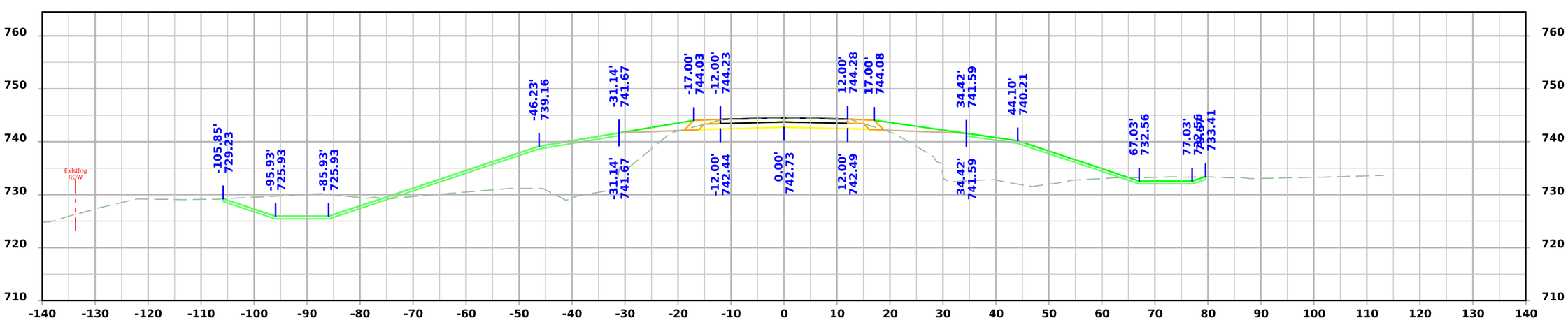

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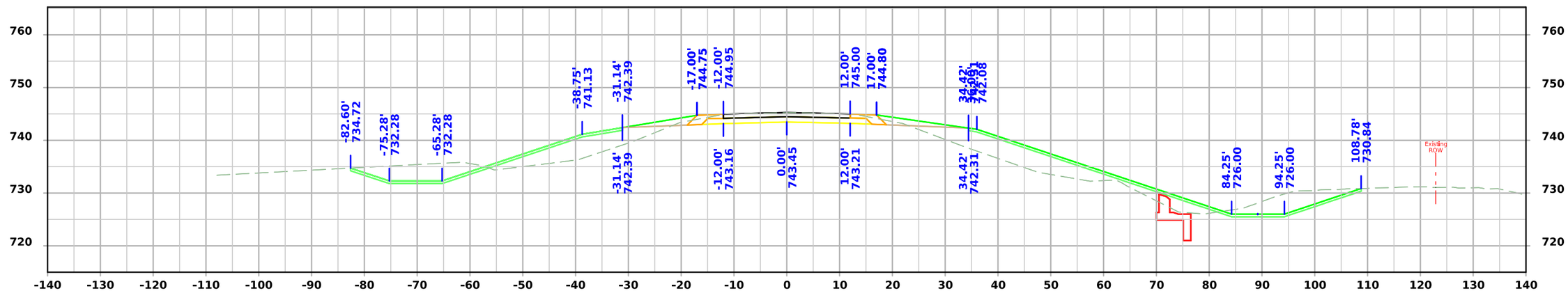

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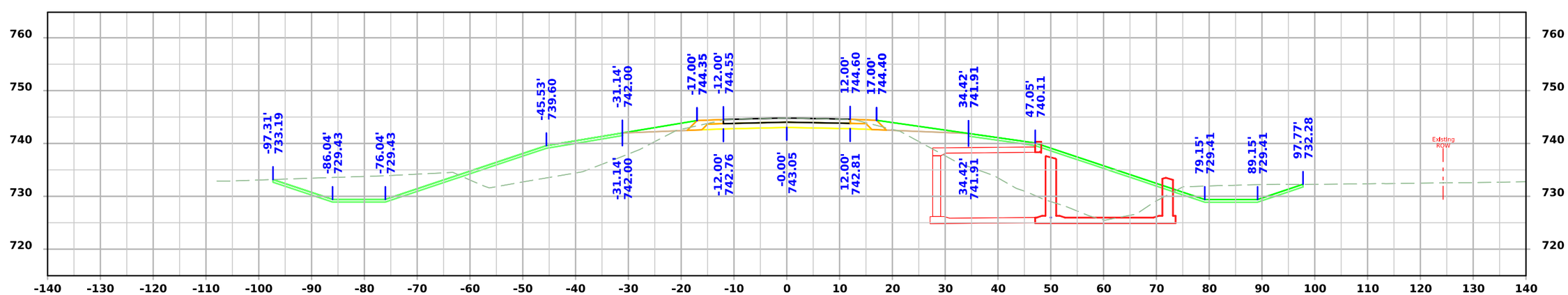

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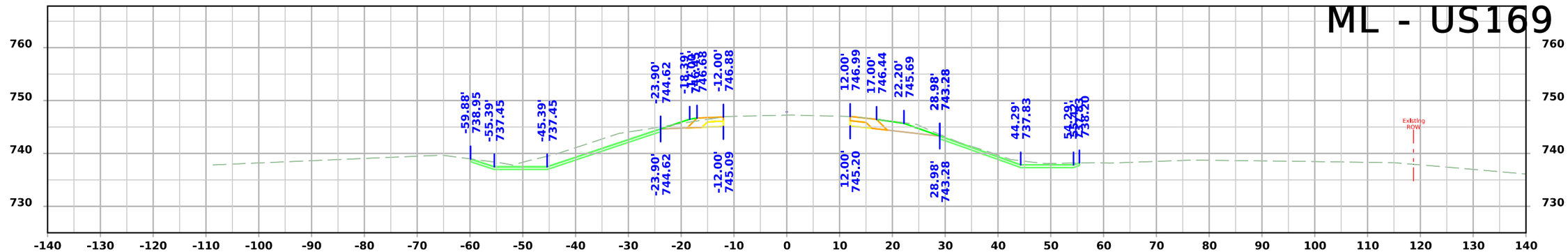

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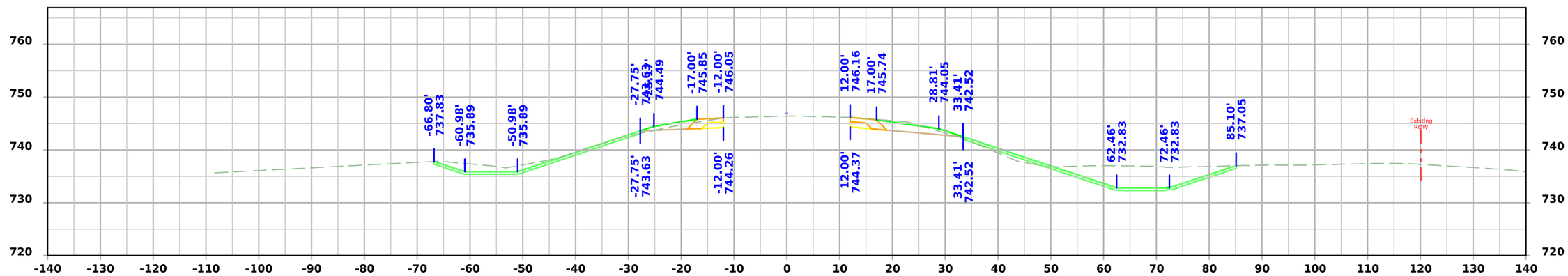

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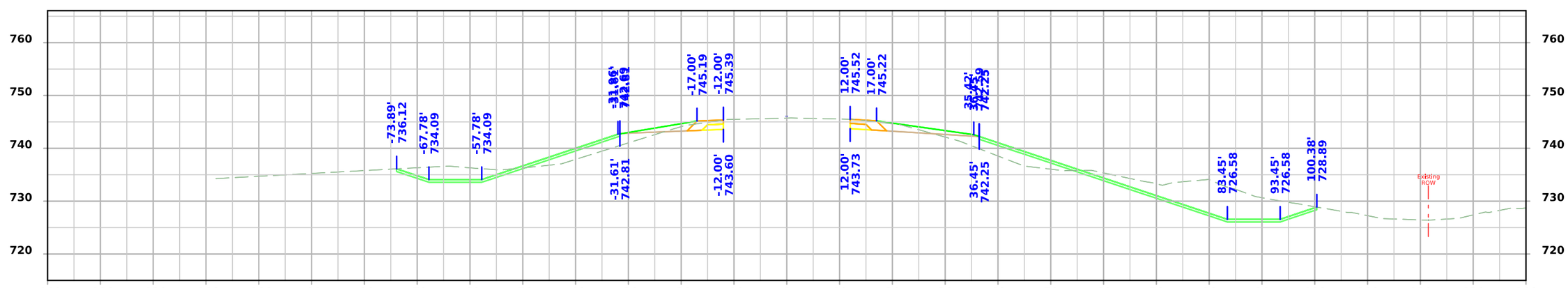

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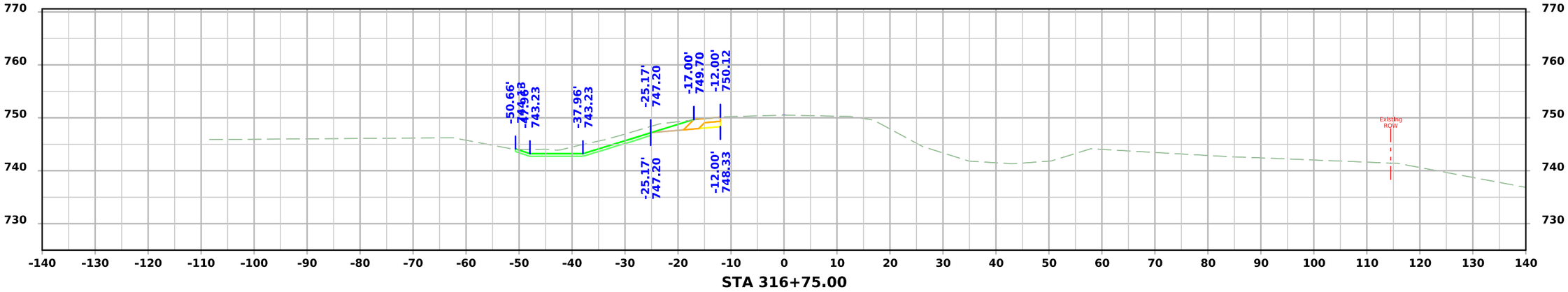

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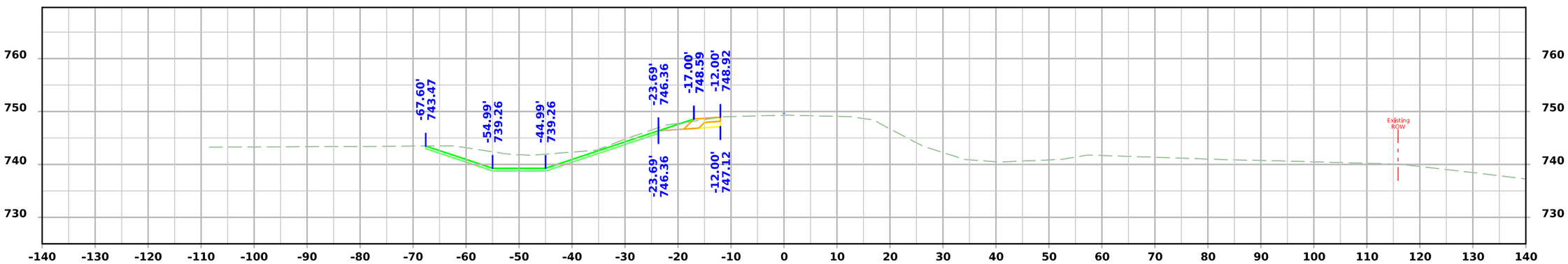

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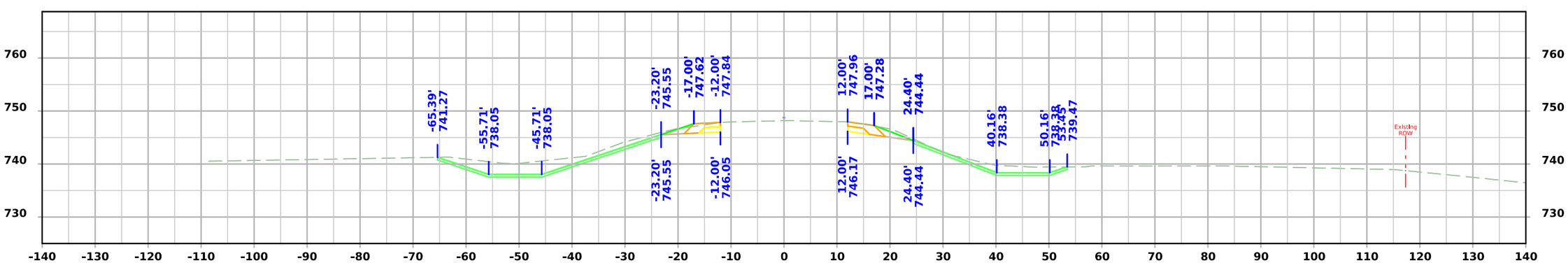

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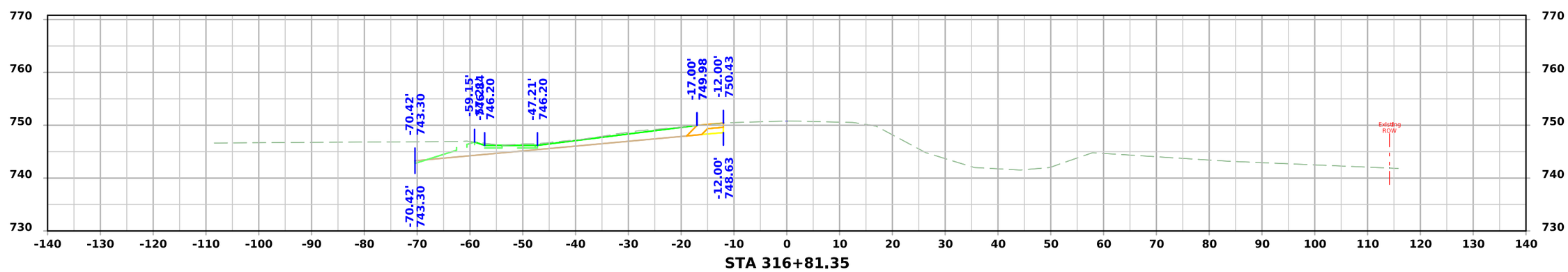

STA 316+81.35

FILE NO.	ENGLISH	DESIGN TEAM	COUNTY	PROJECT NUMBER	SHEET NUMBER 316+81.35

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