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PLANS OF PROPOSED IMPROVEMENT ON THE
PRIMARY ROAD SYSTEM
Pottawattamie COUNTY
Culvert Extension
 Drainage Ditch 0.3 mi W of
 Co Rd M16

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

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



REVISIONS

TOTAL

22

PROJECT IDENTIFICATION NUMBER

22-78-080-040

PROJECT NUMBER

IMX-080-1(545)34--02-78

R.O.W. PROJECT NUMBER

IMN-080-1(556)34--0E-78

B1 PLAN - Date: 1-17-25
 D5 PLAN - Date: 2-14-25
 D4 PLAN - Date: 9-23-26

PRELIMINARY PLANS

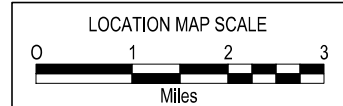
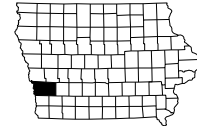
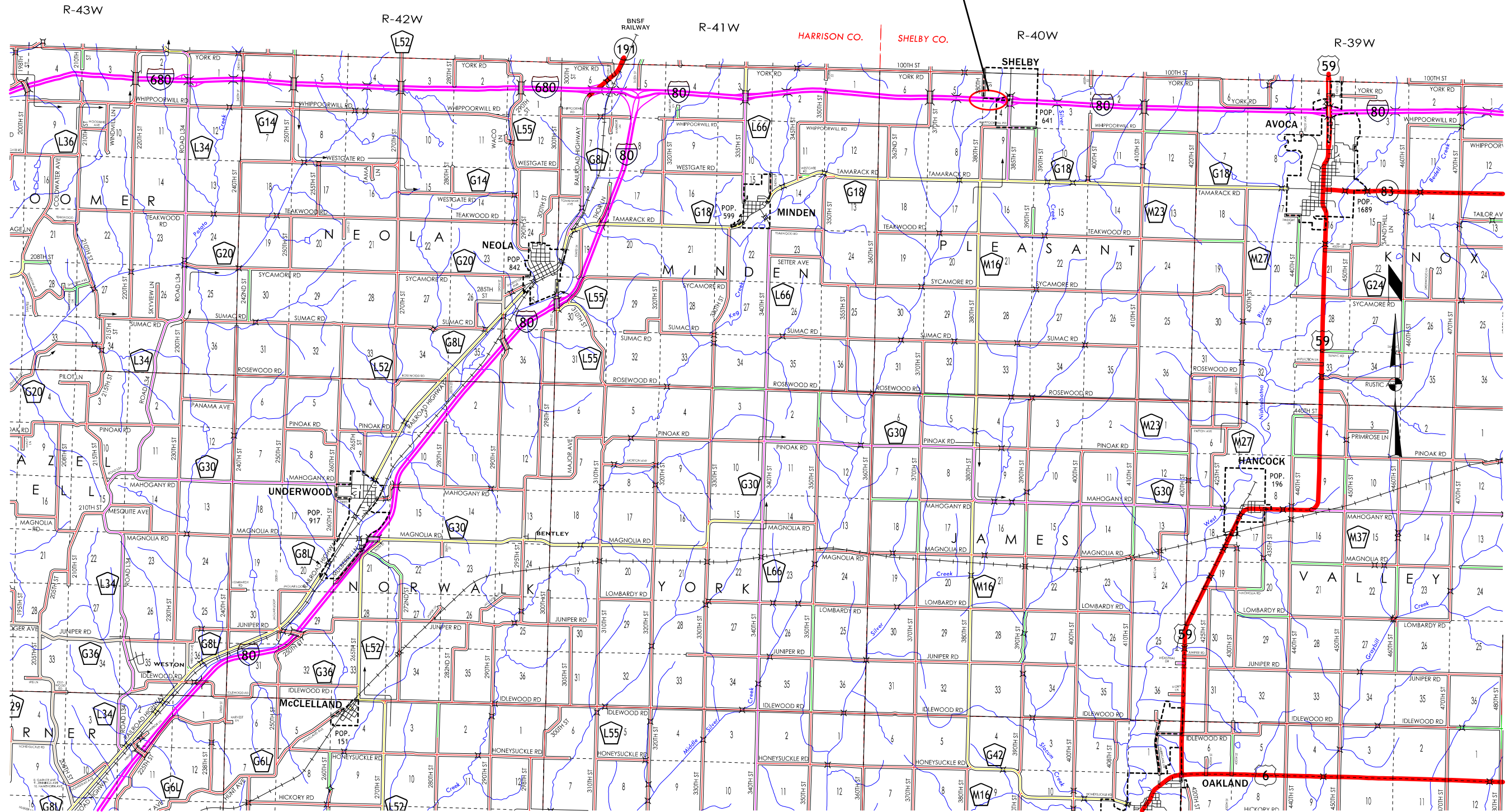
Subject to change by final design.

D2/D3 PLAN - Date: 10-31-24

DESIGN DATA RURAL			
2022	AADT	26,400	V.P.D.
20 --	AADT	--	V.P.D.
20 --	DHV	--	V.P.H.
TRUCKS		39 %	
Total			
Design ESALs		--	

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

PROJECT LOCATION
STA. 1324+36.62
M.P. 34.03
FHWA No. 45480



IOWA DEPARTMENT OF TRANSPORTATION

To Office District 4 Date September 6, 2023
Attention Wes Mayberry, Assistant District Engineer Ref No. Pottawattamie County
From Casey Faber & Lucas Fatka, WHKS & Co. IMX-080-1(545)34--02-78
Bureau Bridges and Structures Design No. 127
File No. 32386
FHWA No. 45480
Subject Final Concept for Culvert Extension of 10' x 8' x 177' Twin Reinforced Concrete Box
Culvert
Bridge Maintenance No. 7833.8S080

The culvert under I-80, 0.3 Mi. W of SR M-16, has been scheduled for an extension to be let on 1/20/2027. The current cost estimate is \$571,055 including inflation and a 20 percent contingency presuming a FY 2027 letting. The programmed amount is \$630,000. The culvert field exam on 7/12/2023 was attended by Brad Garside and Travis Malone of the District, as well as Casey Faber and Lucas Fatka of WHKS & Co.

The work type needs to be updated from culvert repair to culvert extension.

The culvert location map and asset information can be viewed in SIIMS using the following link:

https://iowadot-it.bentley.com/bridgedetail.aspx?type=0&as_id=69996

EXISTING CONDITIONS

The culvert was constructed in 1966, Design #1863. The culvert is on the NHS system.

There are leaching cracks in the walls and slab, primarily at the ends. Shallow bars exposed in the walls. There is evidence of leaking at the construction joints and there are leaching cracks and staining adjacent to them. Cracks with leaching and spalling around the storm sewer penetrations in each of the exterior walls. The west barrel has up to 3'-6" of silt built up.

The headwalls are in poor condition. There are numerous cracks with heavy leaching and large areas of delamination and spalling with reinforcing exposed primarily on the parapet. The northeast wing appears to be deflected out slightly.

The posted speed limit is 70 mph and 2022 AADT is 26,400 vehicles per day with 39% trucks (13,200 vpd eastbound and 13,200 vpd westbound).

The approach roadway in each direction is a 2-lane section with 26' PCC pavement and 8' asphalt outside shoulders and 6' asphalt inside shoulders. There are ramp lanes in each direction at the east side of the culvert.

The guardrail does not meet current design standards. Along the eastbound lanes, there is significant erosion exposing the guardrail posts and undermining the shoulder.

Pottawattamie 127 Final Concept
September 6, 2023
Page 2

RECOMMENDATIONS

It is recommended that the following repairs be made:

1. Perform concrete repairs to the deteriorated areas around the storm sewer penetrations and along the construction joints.
2. Remove and replace the headwalls extending the culvert 17' south and 14' north (14' min. beyond edge of shoulder).
3. Remove and replace barrels approximately 6' at each end to facilitate culvert extension.
4. Place engineering fabric and Class E revetment at each end.
5. Replace the guardrails with high tension cable rails.

Right-of-way is approximately 150' north and south of centerline I-80. Available ROW to the end of new headwalls appears to be at least 30', which should be confirmed in Final Design.

This project is considered a Traffic Critical Project. Traffic control will involve shoulder closure with temporary barrier rail and crash cushions in accordance with modified Standard Road Plan TC-402. Two lanes of traffic in each direction on I-80 and ramp traffic will be maintained at all times.

This project does not cross an Iowa DNR paddling route. No action required.

Location and Environment Bureau has reviewed and determined that this project requires a 404 permit. It is expected that the project will be authorized under a Nationwide Permit #3 or #14. Compensatory mitigation will be required if stream impacts exceed 0.03-acre.

The following utilities have been identified by One Call (811):

(FM6) FARMERS MUTUAL TELEPHONE
Contact Name : JASON BEST
Contact Phone: 7127443131
Contact Email: opsmgr@fmctc.com

(ICN) IOWA COMMUNICATIONS NETWORK
Contact Name : Shannon Marlow
Contact Phone: 8005723940
Contact Email: icnoutsideplantiowaonecall@iowa.gov

(NSH) NISHNABOTNA VALLEY REC
Contact Name : KERT BARNUM
Contact Phone: 7127552166
Contact Email: kbarnum@nvrec.com

(RGW) REGIONAL WATER, INC
Contact Name : Kerry Kiesel
Contact Phone: 7123432413
Contact Email: rwrwa@iowatelecom.net

(SM2) SHELBY MUNICIPAL UTILITIES
Contact Name : Chris Martin
Contact Phone: 7125442404
Contact Email: smu2@walnutel.net

(WNT) WALNUT TELEPHONE COMPANY, INC.
Contact Name : JIM
Contact Phone: 7127842211
Contact Email: wlocatesin@metcteam.com

No utilities were observed during the field exam.

Location and Environment Bureau has reviewed for potential NEPA impacts and identified Rock Island Old Stone Arch Trail and NRCS Easement as resources near the project area. The project will not impact these resources and access will be maintained throughout construction.

Estimated cost of repairs is as follows:

BRIDGE ESTIMATE:				
Item	Quantity	Unit	Rate	Amount
Removals, as per plan	1	LS	\$20,000	\$20,000
Structural Concrete (RCB Culvert)	186	CY	\$1,000	\$186,000
Concrete Repairs	8	SF	\$250	\$2,000
Class E Revetment	110	TON	\$75	\$8,250
Engineering Fabric	144	SY	\$5	\$720
Temporary Shoring (PE Req.)	1	LS	\$50,000	\$50,000
Temporary Stream Diversion	1	LS	\$10,000	\$10,000
Mobilization	1	LS	10.00%	\$27,697
	Base Cost:			\$304,667
	Contingency:		20%	\$60,933
	3 Years Inflation:		4.5%	\$51,610
	BRIDGE TOTAL:			\$417,211
ROADWAY ESTIMATE:				
Item	Quantity	Unit	Rate	Amount
Removal of Steel Beam Guardrail	545	LF	\$12	\$6,540
High Tension Cable Guardrail	500	LF	\$30	\$15,000
High Tension Cable Guardrail, End Anchor	4	Each	\$4,000	\$16,000
Temporary Barrier Rail, Concrete	1300	LF	\$25	\$32,500
Temp Crash Cushion	2	Each	\$1,500	\$3,000
Traffic Control	1	LS	\$20,000	\$20,000
Additional Roadway Items	1	LS	\$10,000	\$10,000

Mobilization	1	LS	10.00%	\$9,304
	Base Cost:			\$112,344
	Contingency:		20%	\$22,469
	3 Years Inflation:		4.5%	\$19,031
	ROADWAY TOTAL:			\$153,844
	PROJECT TOTAL:			\$571,055

CVF/LDF

Distributed to:
Scott Schram, District 4
Wes Mayberry, District 4
Jason Sallach, District 4
Dan Redmond, District 4
Brad Garside, District 4
Chris Haynes, District 4
Nathaniel Epperson, District 4
Todd Frank, District 4
Austin Yates, District 4 TSMO
Charlie Purcell, Transportation Development
Dave Lorenzen, Systems Operations
Michael Kennerly, Design
Kent Nicholson, Design
Stuart Nielson, Design
Dan Harness, Design
Dung Ta, Design
Shawn Majors, Program Management
Mark A Swenson, Project Scheduling
Jeremey Vortherms, Project Management
Brennan Dolan, Location and Environment
Jacob Woodcock, Location and Environment
Jill Garton, Location and Environment
Marc Solberg, Location and Environment
Claire Asberry, Location and Environment
DeeAnn Newell, Location and Environment
Chris Schwake, Location and Environment
Brad Azeltine, Location and Environment
Kenneth Brink, Location and Environment
Greg Cagle, Right of Way

James Nelson, Bridges and Structures
Mike Nop, Bridges and Structures
David Evans, Bridges and Structures
James Muetzel, Bridges and Structures
Steve Seivert, Bridges and Structures
Jim Ellis, Bridges and Structures
Scott Neubauer, Bridges and Structures
Joe Stanisz, Bridges and Structures
Ronald Meyer, Bridges and Structures
Steven Schroder, Bridges and Structures
Curtis Carter, Construction and Materials
Brian Worrel, Construction and Materials
Dan Sprengeler, Traffic and Safety
Willy Sorenson, Traffic and Safety

Appendix



South headwall

Northeast wing



North headwall

Storm sewer in east wall



Storm sewer in west wall

Typical construction joint



Shallow bars exposed in wall



Silt in west barrel



EB roadway looking W at S end of culvert



Erosion/undermining at shoulder behind south guardrail

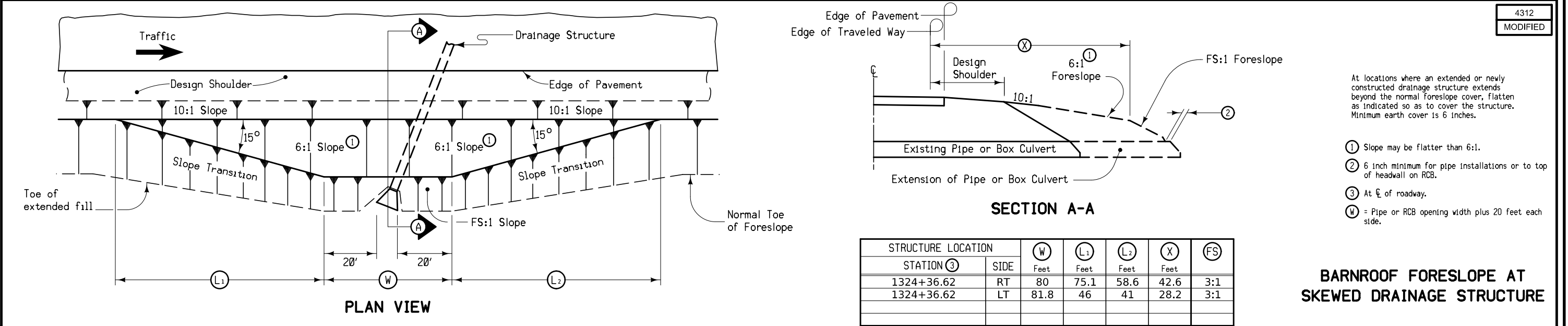
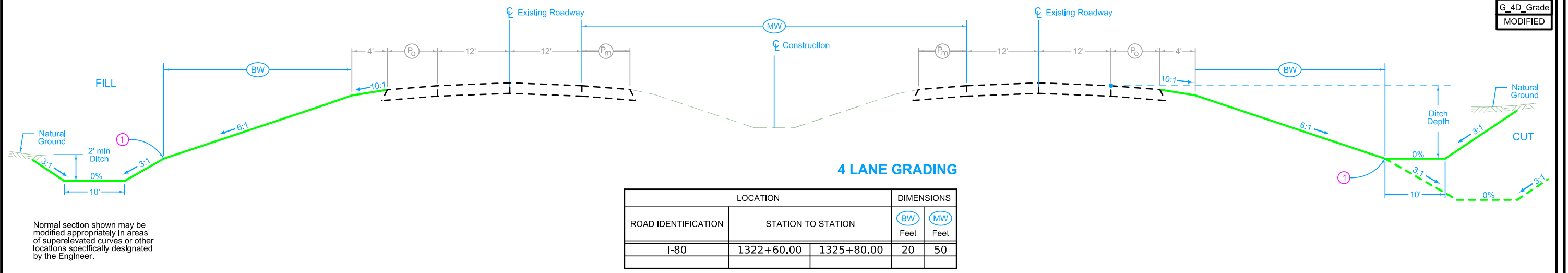


WB roadway looking E at N end of culvert

FIELD EXAM NOTES/QUESTIONS

Culvert wingwall outside of clearzone on RT side? Substantial clear zone from ML, ramp is close. Do we need cable on the RT side?

FIELD EXAM NOTES/QUESTIONS



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
- Water Hydrant (Rural)
- Septic Tank
- Cistern
- L.P. Gas Tank (No Footing)
- Underground Storage Tank
- Latrine
- Satellite TV Dish
- Water Hook Up
- Radio Tower
- Tower Anchor
- Guardrail (Beam or Cable)
- Guard Post (one or two)
- Guard Post (over two)
- Filler Pipe
- Gas Valve
- Water Valve
- Speed Limit Sign
- Mile Marker Post
- Sign
- Traffic Signal Control Box
- Rail Road Signal Control Box
- Telephone Switch Box
- Electric Box

UTILITY LEGEND

FO **FO1D, ICN - Quality D**

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

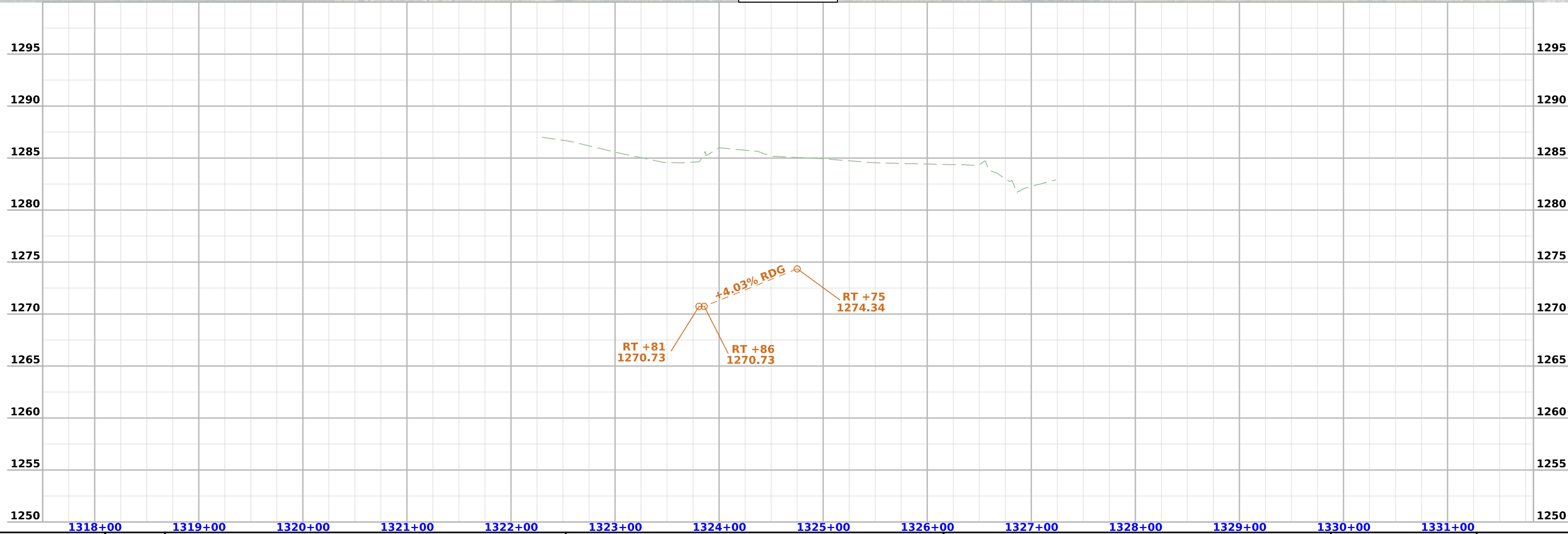
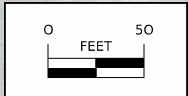
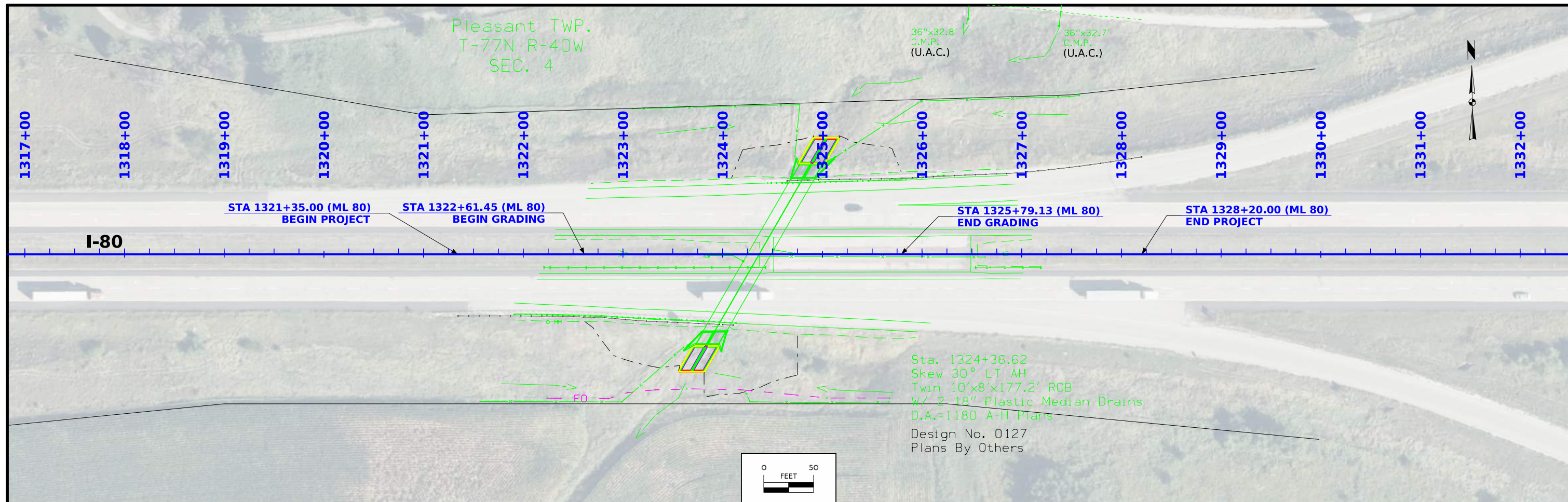
- Reference Point
- Station
- Survey Line
- Section Corner
- Ground Line Intercept
- Saw Cut
- Guardrail
- Trench Drain
- HighTension Cable Guardrail
- Sheet Pile
- Pavement Removal
- Clearing & Grubbing Area

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)



Survey Information

SURVEY INDEX

County: Pottawattamie
PIN: 22-78-080-040
Project Number: IMX-080-1(545)34--02-78
Location: Drainage Ditch 0.3 mi W of Co Rd M16
Type of Work: Culvert Extension
Project Directory: 7808004022

Alignment Information

The horizontal alignment for I80 this survey has been provided by the district 4 survey office.

Survey Personnel

Clayton Henningsen – Survey Party Chief
Jason Arn – Survey Party Chief

Date(s) of Survey

Begin Date 03/14/2024
End Date 04/02/2024

General Information

This survey is for I-80 culvert extension at location 0.3 mi W of Co Rd M16. This survey request was for the I-80 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 PrelimSurvey 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 06
(U.S. SURVEY FOOT)
VERTICAL DATUM: NAVD88
GEOID MODEL: 2018u3

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 06 (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 06 (U.S. Survey Foot)
 VERT. DATUM: NAVD88
 Geoid Model: 2018u3

<u>Point Name</u>	<u>Northing</u>	<u>Easting</u>	<u>Elevation</u>	<u>Feature Definition-Description</u>
78I800331	7055334.20	16571115.20	1313.07	CP SET FENO MONUMENT IN NORTH ROW OF I-80 APPROX 50 FT NORTH OF AC SHOULDER & APPROX 35 FT SOUTH OF ROW FENCELINE
78I800343	7055546.61	16577149.14	1321.18	CP SET FENO MONUMENT IN NW QUAD I-80 & CO RD M16 155 FT WEST OF CL M16 AND 45 FEET NORTH WESTBOUND ON RAMP
P146	7055039.02	16574729.31	1307.77	CP NGS DISK AS DESCRIBED IN GOOD CONDITION

TRAFFIC CONTROL PLAN

108_23A
8/15/22

This project is considered a Traffic Critical Project. Traffic control will involve shoulder closure with temporary barrier rail and crash cushions in accordance with modified Standard Road Plan TC-402.

Two lanes of traffic in each direction on I-80 and ramp traffic will be maintained at all times.

CROSS SECTION VIEW COLOR LEGEND

Design Color No.	Feature	Design Color No.	Feature
Aggregate			
(64)	Choke Stone	(8)	Behind Curb Cut
(42)	Engineering Fabric	(6)	Granular
(8)	Flooded Backfill	(13)	Granular Back Fill
(92)	Macadam Stone	(48)	Rock Undercut
(20)	Modified	(8)	Shoulder Earth Fill
(12)	Plowing Shaping	(2)	Side Slopes
(14)	Porous Backfill	(226)	Side Slopes Dressing
Grading			
(8)	Revetment Class A	(128)	Boulder
(6)	Revetment Class B	(209)	Boulder Removed
(62)	Revetment Class C	(48)	Broken Weathered
(188)	Revetment Class D	(210)	Broken Weathered Removed
(28)	Revetment Class E	(3)	Core Out
(12)	Shoulder Special Backfill	(115)	Core Out Remove Only
(12)	Special Backfill	(195)	Core Out Remove and Replace
(20)	Subbase	(203)	Existing Pavement
(20)	Subbase Lower	(184)	Existing Pavement Remove Only
(20)	Subbase Upper	(200)	Existing Pavement Remove and Replace
(118)	Subgrade Treatment	(6)	Loam
Substrata			
(207)	HMA Base Course	(211)	Loam Removed
(207)	HMA Interim Course	(80)	Rock
(207)	HMA Surface Course	(212)	Rock Removed
Asphalt			
(0)	Bridge	(4)	Select Sand
(0)	Barrier Concrete	(214)	Select Sand Removed
(0)	Barrier Concrete Footing	(3)	Shale
(0)	Curb Gutter	(215)	Shale Removed
(48)	Flowable Mortar	(10)	Topsoil
(0)	Median Concrete	(2)	Topsoil Remove Only
(0)	PCC Pavement	(4)	Topsoil Remove and Replace
(0)	Sidewalk	Unsuitable / Waste	
Concrete			
(0)	Existing Pavement	(3)	Unsuitable Type A
(209)	Shoulder HMA	(216)	Unsuitable Type A Removed
(0)	Shoulder PCC	(13)	Unsuitable Type B
(6)	Shoulder Granular	(217)	Unsuitable Type B Removed
Shoulder			
(0)	Existing Pavement	(11)	Unsuitable Type C
(209)	Shoulder HMA	(218)	Unsuitable Type C Removed
(0)	Shoulder PCC	(3)	Waste
(6)	Shoulder Granular	(219)	Waste Removed
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		

NOTES:

Text

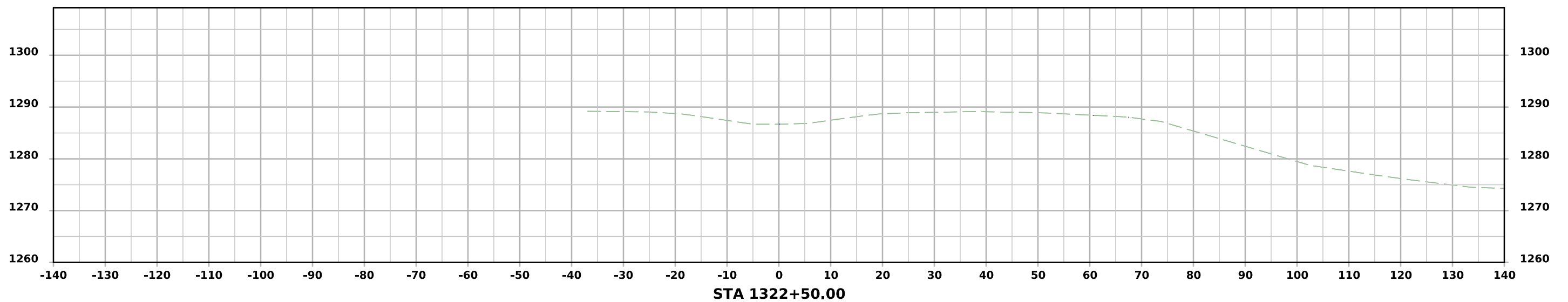
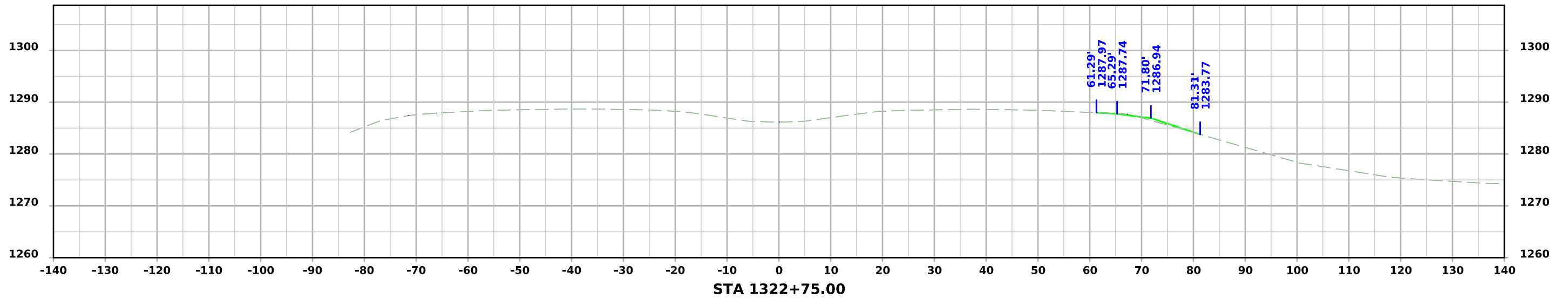
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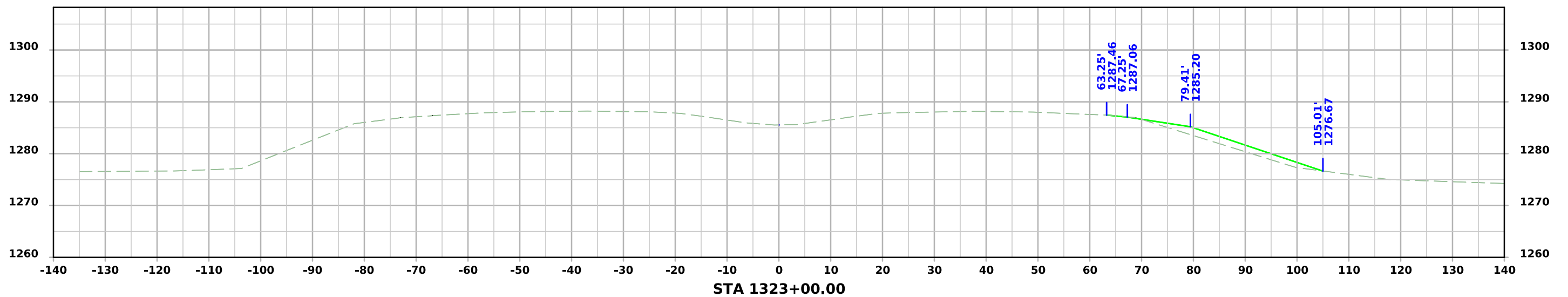
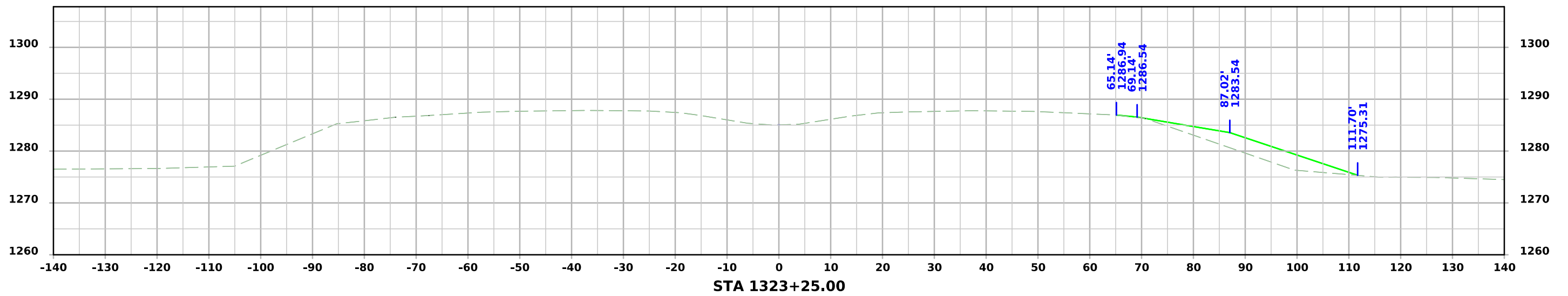
CROSS SECTIONS LEGEND AND INFORMATION SHEET

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

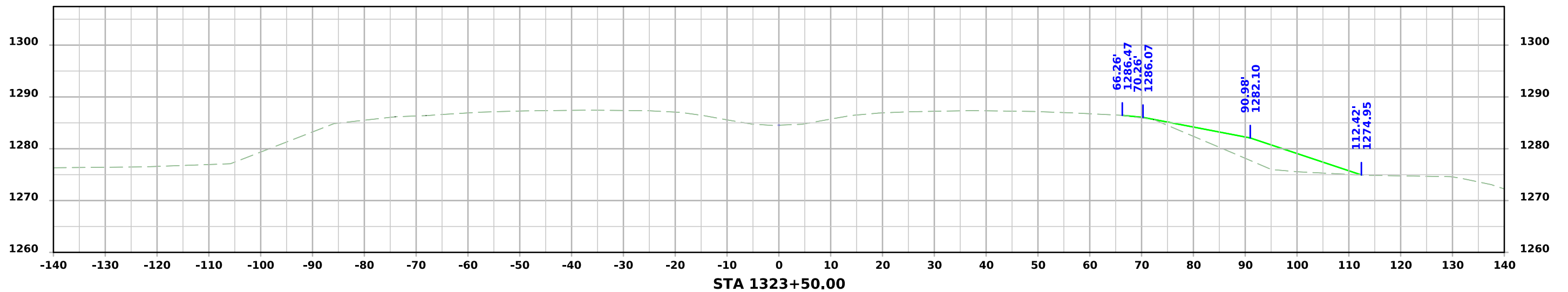
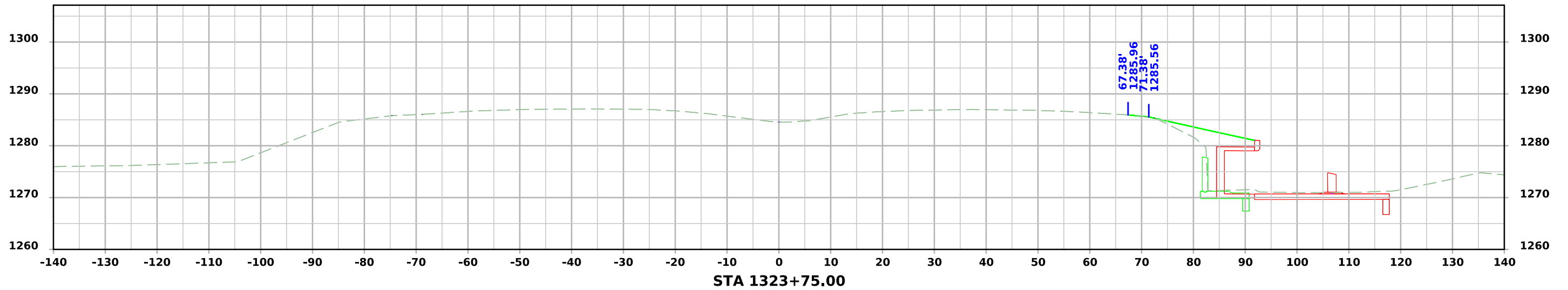
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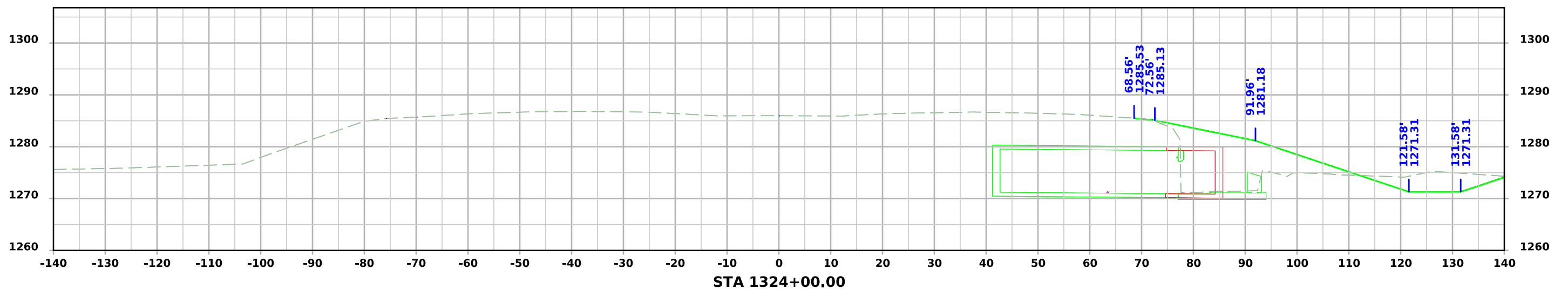
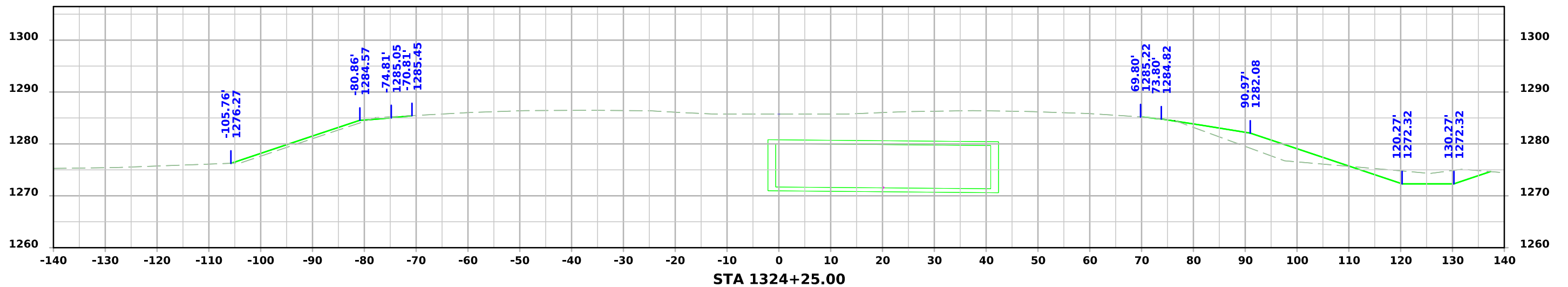
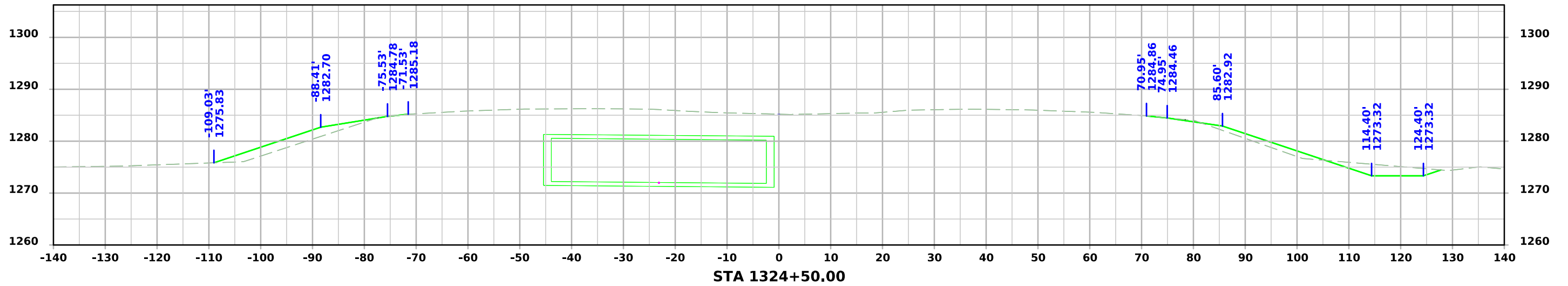
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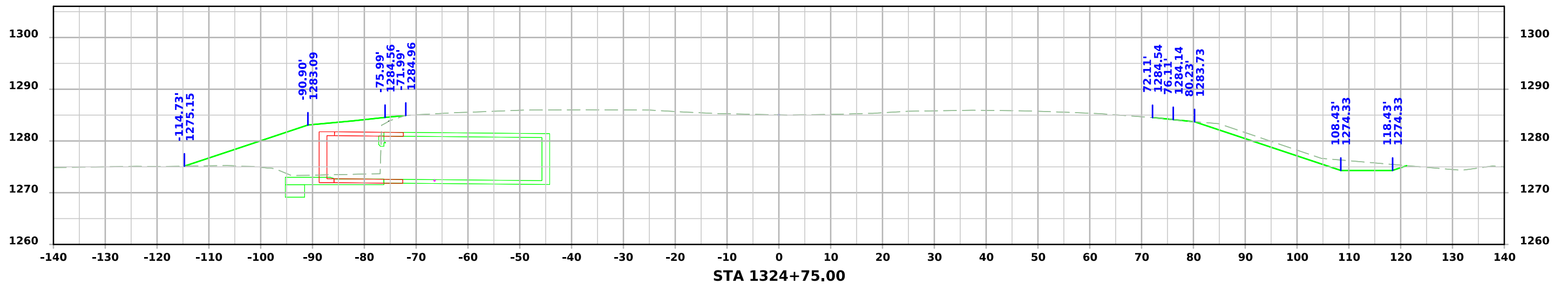
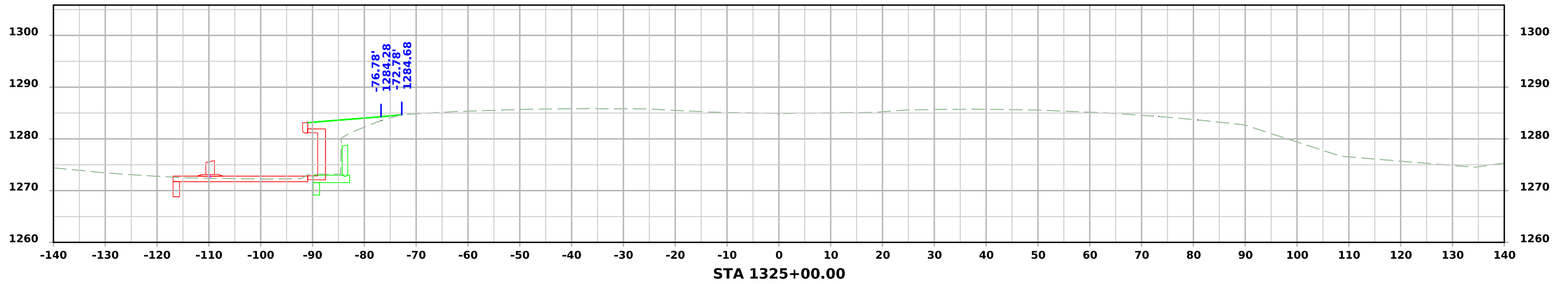
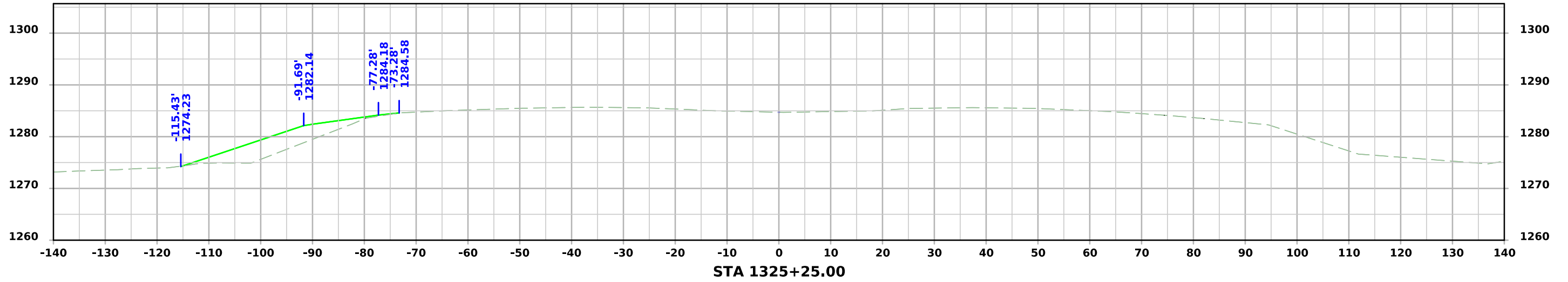
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