

INDEX OF SHEETS	
No.	DESCRIPTION
<b>A Sheets</b>	<b>Title Sheets</b>
A.1	Title Sheet
A.2	Location Map Sheet
<b>B Sheets</b>	<b>Typical Cross Sections and Details</b>
B.1 - 2	Typical Cross Sections and Details
<b>D Sheets</b>	<b>Mainline Plan and Profile Sheets</b>
D.1	Plan & Profile Legend & Symbol Information Sheet
D.2	ML I-80 Plan and Profile
<b>G Sheets</b>	<b>Survey Sheets</b>
G.1	Survey Index
G.2	Control Point Vacinity Map
G.3	Horizontal and Vertical Project Control Coordinates
<b>J Sheets</b>	<b>Traffic Control and Staging Sheets</b> <-- H Sheets
J.1	Traffic Control Plan
<b>V Sheets</b>	<b>Bridge and Culvert Situation Plans</b>
V.1	Bridge and Culvert Situation Plans
<b>W Sheets</b>	<b>Mainline Cross Sections</b>
W.1	Cross Sections Legend & Symbol Information Sheet
W.2 - 8	Mainline Cross Sections



PLANS OF PROPOSED IMPROVEMENT ON THE  
**INTERSTATE ROAD SYSTEM**  
**Pottawattamie COUNTY**  
**Culvert Extension**  
 Stream 1.6 mi E of Co Rd M47

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	
	19
PROJECT IDENTIFICATION NUMBER	
22-78-080-050	
PROJECT NUMBER	
IMX-080-1(546)48--02-78	
R.O.W. PROJECT NUMBER	
IMN-080-1(557)48--0E-78	

D4 PLAN - Date: 9-23-26

**PRELIMINARY PLANS**

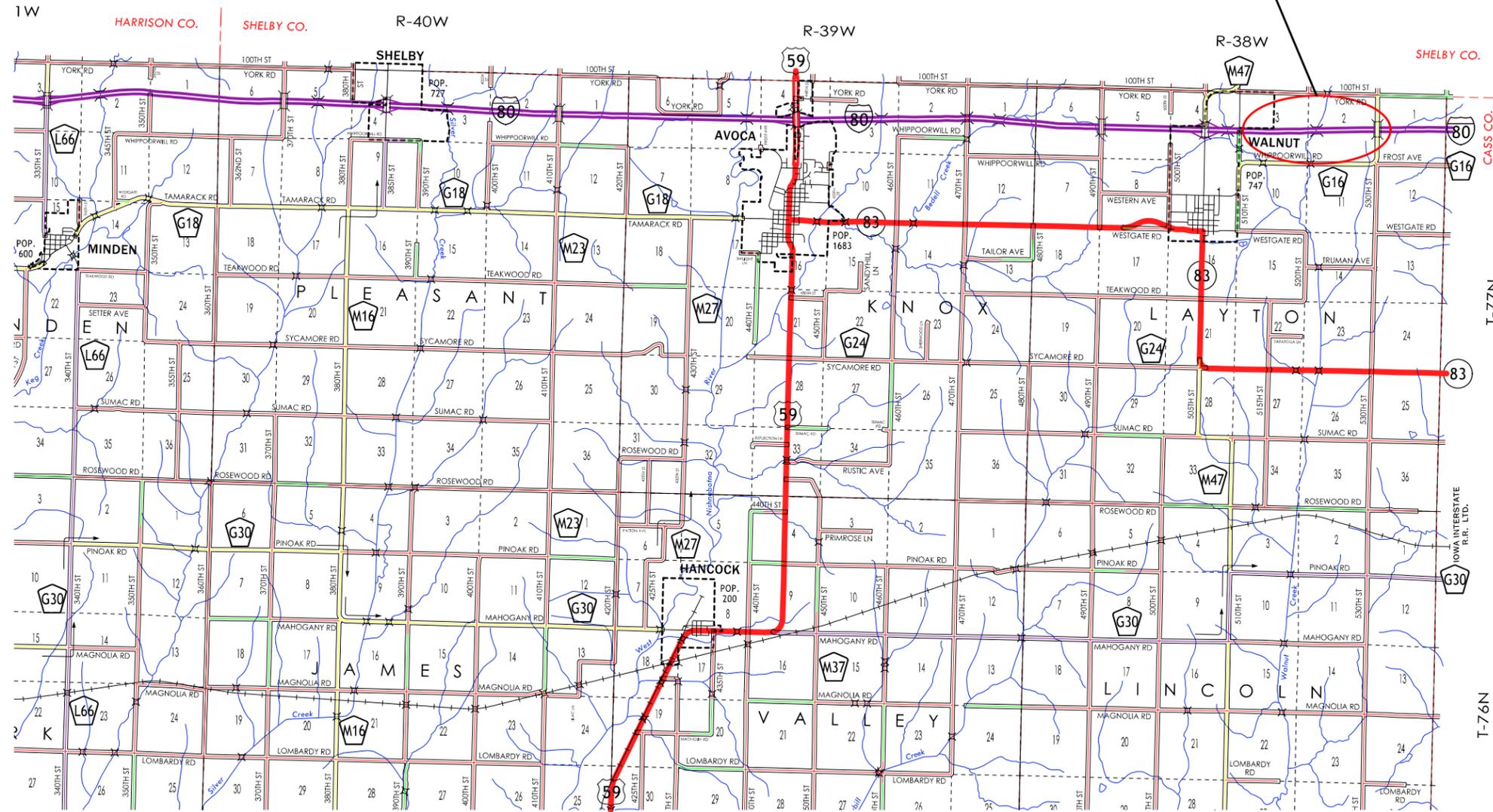
Subject to change by final design.

D5 PLAN - Date: 3-07-25

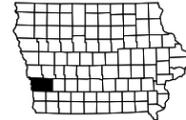
DESIGN DATA RURAL			
2022	AADT	23,600	V.P.D.
20 --	AADT	--	V.P.D.
20 --	DHV	--	V.P.H.
TRUCKS		41 %	
Total			
Design ESALs		--	

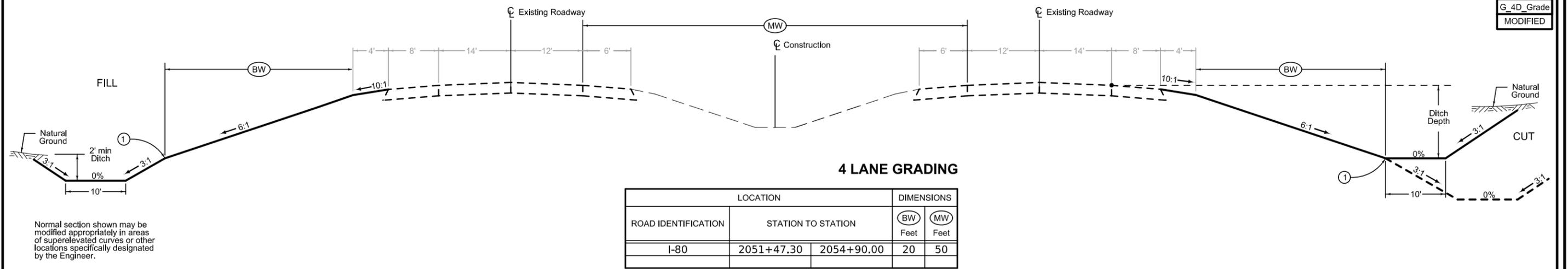
INDEX OF SEALS			
SHEET NO.	NAME	TYPE	BID QUANTITY SHEETS
A.1	X	Primary Signature Block	X
X	X	X	X

PROJECT LOCATION  
 STA. 2052+99.20  
 M.P. 47.83  
 FHWA No. 45650



7 1 24

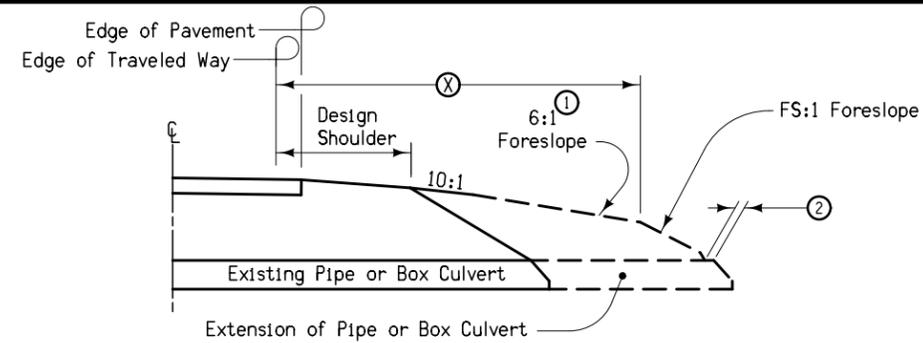
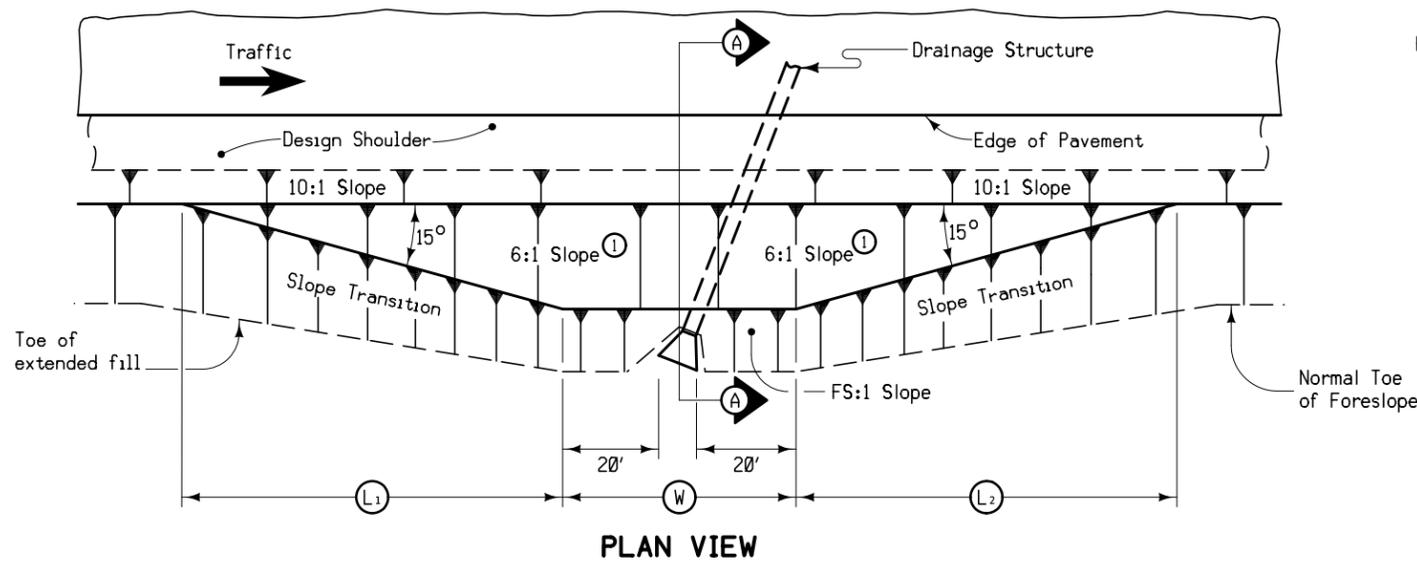




Normal section shown may be modified appropriately in areas of superelevated curves or other locations specifically designated by the Engineer.

See Plan & Profile sheets and cross sections for additional details of ditches and backslopes.

① Refer to project plan and cross sections for specific location of foreslope change.

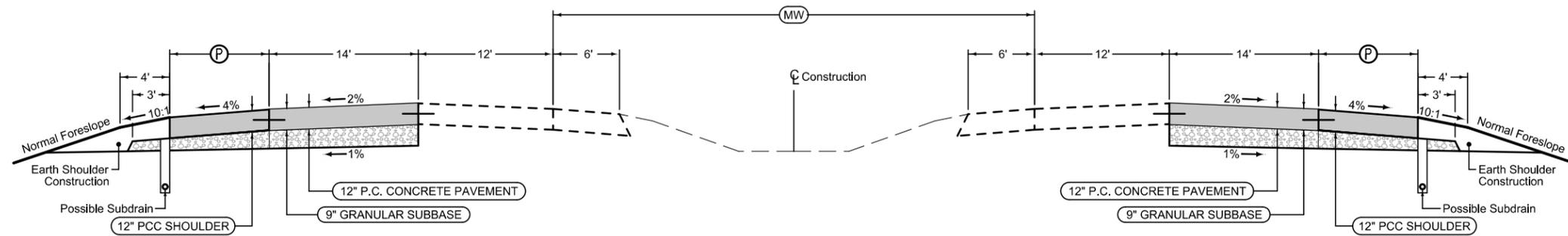


At locations where an extended or newly constructed drainage structure extends beyond the normal foreslope cover, flatten as indicated so as to cover the structure. Minimum earth cover is 6 inches.

- ① Slope may be flatter than 6:1.
- ② 6 inch minimum for pipe installations or to top of headwall on RCB.
- ③ At  $\phi$  of roadway.
- Ⓜ = Pipe or RCB opening width plus 20 feet each side.

STRUCTURE LOCATION		Ⓜ	L <sub>1</sub>	L <sub>2</sub>	X	FS
STATION ③	SIDE	Feet	Feet	Feet	Feet	
2052+99.20	RT	107.7	42.7	42.2	27.9	3:1
2052+99.20	LT	107.9	35.2	34.35	23.7	3:1

**BARNROOF FORESLOPE AT SKEWED DRAINAGE STRUCTURE**



**Full Depth PCC Shoulder**

Shoulder Jointing:  
 Longitudinal joint: BT-2, or L-2  
 Transverse joints: C at existing

4_P_FullPCC_04-15-25			
Direction of Travel	BEGIN STATION	END STATION	(P) Feet
WB	2053+00	2053+90	8

Section shown in the direction of traffic.

Mainline Jointing:  
 Transverse joints: CD at existing  
 Longitudinal joint: BT-3

4DP_04-21-20			
Direction of Travel	BEGIN STATION	END STATION	(MW) Feet
EB	2052+00	2052+90	50
WB	2053+00	2053+90	50

**Full Depth PCC Shoulder**

Shoulder Jointing:  
 Longitudinal joint: BT-2, or L-2  
 Transverse joints: C at existing

4_P_FullPCC_04-15-25			
Direction of Travel	BEGIN STATION	END STATION	(P) Feet
EB	2052+00	2052+90	10.5

**I-80 Paving**

### 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 Sign
- TCB Traffic Signal Control Box
- RRB Rail Road Signal Control Box
- TSB Telephone Switch Box
- EB Electric Box

### UTILITY LEGEND

- E1 **EL1D, Midamerican Energy**  
**Scott Behrens**  
**(402)-657-1059**  
**scott.behrens@midamerican.com**
- F0 **F0/F02, Iowa Communications Network**  
**David Augspurger**  
**(515)-229-2013**  
**david.augspurger@icn.state.ia.us**
- F02

### 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

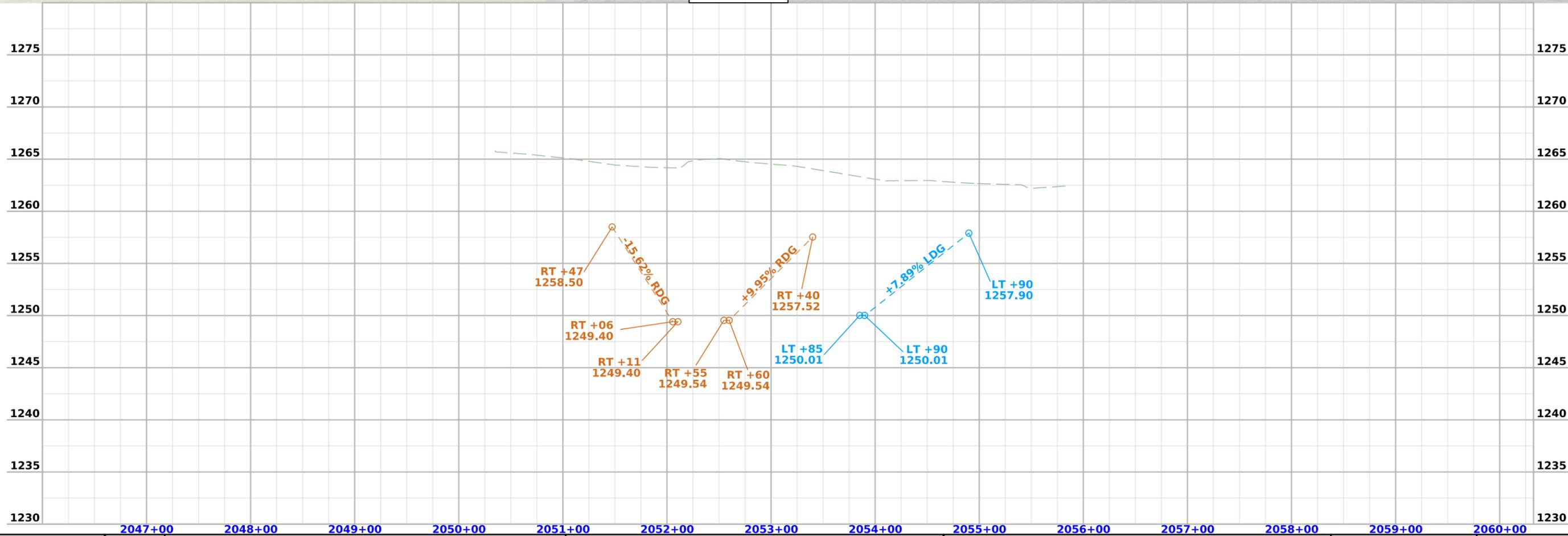
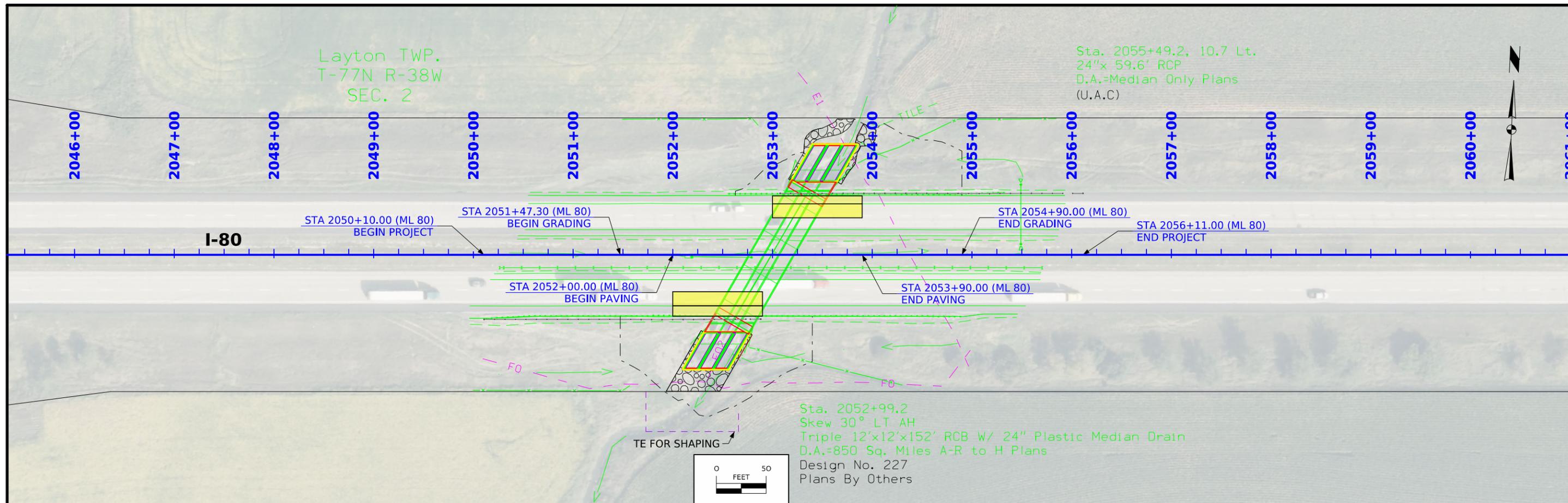
- Reference Point
- Station
- Survey Line
- Section Corner
- Ground Line Intercept
- Saw Cut
- Guardrail
- Trench Drain
- HighTension Cable Guardrail
- Sheet Pile
- Pavement Removal
- Clearing & Grubbing Area

### 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: 22-78-080-050**  
**Project Number: IMX-080-1(546)48--02-78**  
**Location: Stream 1.6 mi E of Co Rd M47**  
**Type of Work: Culvert Extension**  
**Project Directory: 7808005022**

### 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                 03/31/2024

### General Information

This survey is for I-80 culvert extension at location 1.6 mi E of Co Rd M47. 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>
78I80048	7055169.09	16649505.15	1266.92	CP SET FENO MONUMENT IN NORTH ROW I-80 APPROX 15 FT NORTH OF MILE MARKER 48 & 60 FT SOUTH OF ROW FENCE
78I800471	7054765.44	16645023.53	1331.60	CP SET FENO MONUMENT IN SOUTH ROW I-80 APPROX 20 FT NORTH OF ROW FENCE & 58 FT SOUTH OF EDGE AC SHOULDER
LAYTON	7055075.42	16652731.41	1343.92	CP NGS MONUMENT AS DESCRIBED IN GOOD CONDITION
Y149	7047265.73	16644620.36	1277.48	CP NGS MONUMENT AS DESCRIBED IN GOOD CONDITION

NO ACCESS RIGHTS ARE TO BE ACQUIRED ON THIS PROJECT.

ACCESS CONTROL PREVIOUSLY ACQUIRED.



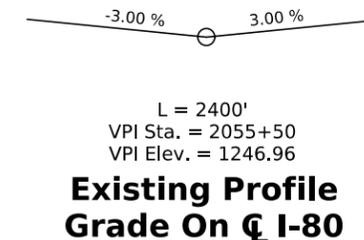
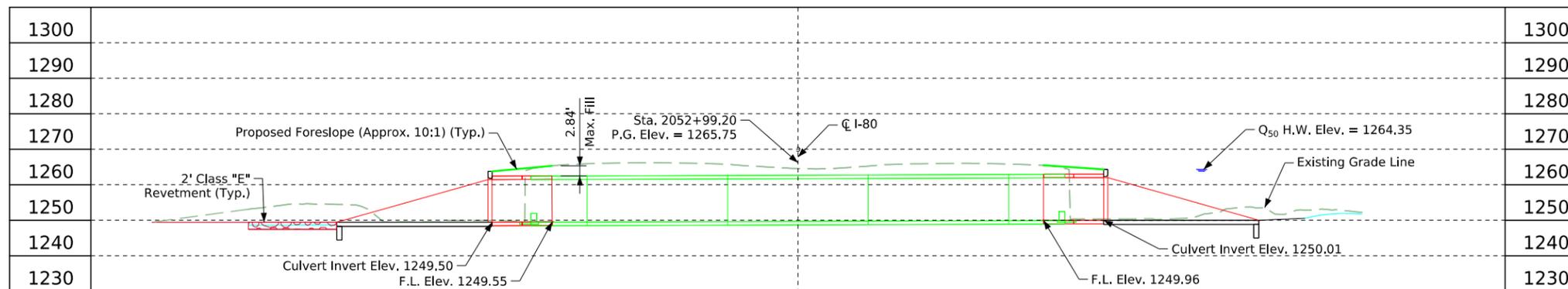
# TRAFFIC CONTROL PLAN

108\_23A  
8/15/22

This project is considered a Traffic Critical Project.

Two lanes of traffic in each direction on I-80 will be maintained at all times. Temporary widening to the median will be required.

Control Point: 78180048 CP SET FENO MONUMENT IN NORTH ROW I-80 APPROX 15 FT NORTH OF MILE MARKER 48 & 60 FT SOUTH OF ROW FENCE, N=7055169.087, E=16649505.145, EL.=1266.918  
 781800471 CP SET FENO MONUMENT IN SOUTH ROW I-80 APPROX 20 FT NORTH OF ROW FENCE & 58 FT SOUTH OF EDGE AC SHOULDER, N=7054765.442, E=16645023.525, EL.=1331.599



Longitudinal Section Along Centerline of Culvert

Design Fill = 3'-0"  
 Anticipated Settlement = Negligible

- 1 Perform concrete repairs to deterioration around the CMP culvert inlet and at construction joints.
- 2 Perform partial depth repair and installation of a waterstop along the slab and exterior wall construction joints. Drill new weep holes and install a maintainable drain filter, such as a jet filter type product.

**Hydraulic Data**

RIDB: Not Applicable  
 Drainage Area = 8.77 Sq. Mi.  
 Site Stream Slope = 0.11% (5.8 ft./mi.)

Per USGS Report 2015-5055, Discharges Are From USGS Report 2013-5086 Region 3 Single Variable Regression Equations

Q<sub>50</sub> (Design) = 3,960 cfs  
 Headwater (HW) El. = 1264.35  
 Exit Velocity = 8.9 Ft./s.

Edge of Low Shoulder  
 El. = 1264.53 (East of Culvert)

**Utilities Note:**

Utilities shown on this sheet are for information only. See Road Design sheets for utility information. Conflicts with existing utilities and need for potential relocations to be confirmed in Final Design.

**General Utility Symbols:**

E - Electric Line

**Plan Notes:**

- Headwalls shall be placed level.
- Limits of easements to be determined.
- Revetment is proposed at the culvert outlet per concept statement and due to the outlet velocity exceeding policy limits.
- Class E revetment stone is embedded.
- Faint lines indicate existing contours.

**General Notes:**

--This design is for the extension of the existing Triple 12'x12' Reinforced Concrete Box Culvert, Pottawattamie Design No. 563, FHWA No. 45650, Maint. No. 7847.8S080.

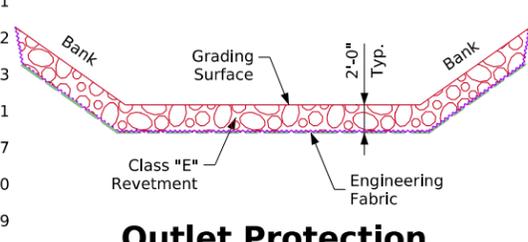
**Grading Control/Revetment Layout:**

- |  |   |
|--|---|
| (G1) Sta. 2052+04.12, 125.38' Rt., El. 1249.54 | (G8) Sta. 2053+32.80, 115.53' Lt., El. 1256.53  |
| (G2) Sta. 2051+90.41, 112.58' Rt., El. 1251.84 | (G9) Sta. 2053+40.77, 111.25' Lt., El. 1250.01  |
| (G3) Sta. 2051+74.32, 170.39' Rt., El. 1249.5  | (G10) Sta. 2053+65.35, 136.00' Lt., El. 1257.52 |
| (G4) Sta. 2052+42.15, 136.73' Rt., El. 1248.14 | (G11) Sta. 2053+82.50, 136.00' Lt., El. 1249.73 |
| (G5) Sta. 2052+22.82, 156.52' Rt., El. 1248.19 | (G12) Sta. 2053+83.25, 110.73' Lt., El. 1250.01 |
| (G6) Sta. 2052+35.94, 162.34' Rt., El. 1254.92 | (G13) Sta. 2053+91.84, 131.05' Lt., El. 1249.87 |
| (G7) Sta. 2052+55.98, 153.32' Rt., El. 1257.33 | (G14) Sta. 2054+04.29, 124.90' Lt., El. 1256.00 |
|  | (G15) Sta. 2053+98.97, 109.05' Lt., El. 1251.09 |

**Traffic Data**

2022 AADT TRUCKS 23,600 V.P.D. 41 %

**Situation Plan**



**Outlet Protection**

**Location:**

I-80 Over Drainage Ditch  
 T-77N R-38W  
 Section 2  
 Layton Township  
 Pottawattamie County  
 FHWA No. 45650  
 Maint. No. 7847.8S080  
 Latitude: 41.497481  
 Longitude: -95.190927

**Hydraulic Design**

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

*Brian J. Birkland* 1-27-2025  
 Signature Date  
 Brian J. Birkland  
 Printed or Typed Name  
 My license renewal date is December 31, 2026

Pages or sheets covered by this seal: V.1

**Estimated Revetment Quantities Included With Road Plans**

Location	Revetment Class "E" (Ton)	Engineering Fabric (SY)	CL. 10 Channel Excavation (CY)
Outlet	168.1	230.2	105.0
Inlet	163.7	232.5	102.3
Totals	331.7	462.5	207.3

Excavation quantity calculated from grading surface. Excavation quantity is for embedded revetment core out only, and does not include excavation to the grading surface. Excavation quantity to the grading surface is determined by Road Design and included in the Road Plans. Quantities shown for information only. See Road Sheets.

Preliminary  
 Design For 30 Degree LA  
**Triple 12'x12' Reinforced Concrete Box Culvert Extension**  
 Situation Plan  
 STA. 2052+99.20 (I-80) Turn-In Date: January, 2025  
**Pottawattamie County**  
 IOWA DEPARTMENT OF TRANSPORTATION  
 Design No. 227 Design Sheet No. 001 of 1 FHWA/Asset 45650

## CROSS SECTION VIEW COLOR LEGEND

Design Color No.	Feature	Design Color No.	Feature
<b>Aggregate</b>			
(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
(8)	Revetment Class A	<b>Substrata</b>	
(6)	Revetment Class B	(128)	Boulder
(62)	Revetment Class C	(209)	Boulder Removed
(188)	Revetment Class D	(48)	Broken Weathered
(28)	Revetment Class E	(210)	Broken Weathered Removed
(12)	Shoulder Special Backfill	(3)	Core Out
(12)	Special Backfill	(115)	Core Out Remove Only
(20)	Subbase	(195)	Core Out Remove and Replace
(20)	Subbase Lower	(203)	Existing Pavement
(20)	Subbase Upper	(184)	Existing Pavement Remove Only
(118)	Subgrade Treatment	(200)	Existing Pavement Remove and Replace
<b>Asphalt</b>			
(207)	HMA Base Course	(6)	Loam
(207)	HMA Interim Course	(211)	Loam Removed
(207)	HMA Surface Course	(80)	Rock
<b>Bridge</b>			
(0)	Bridge	(212)	Rock Removed
<b>Concrete</b>			
(0)	Barrier Concrete	(4)	Select Sand
(0)	Barrier Concrete Footing	(214)	Select Sand Removed
(0)	Curb Gutter	(3)	Shale
(48)	Flowable Mortar	(215)	Shale Removed
(0)	Median Concrete	(10)	Topsoil
(0)	PCC Pavement	(2)	Topsoil Remove Only
(0)	Sidewalk	(4)	Topsoil Remove and Replace
<b>Existing</b>			
(0)	Existing Pavement	<b>Unsuitable / Waste</b>	
<b>Shoulder</b>			
(209)	Shoulder HMA	(3)	Unsuitable Type A
(0)	Shoulder PCC	(216)	Unsuitable Type A Removed
(6)	Shoulder Granular	(13)	Unsuitable Type B
<b>Structural</b>			
(112)	Noise Wall	(217)	Unsuitable Type B Removed
(112)	Noise Wall Footing	(11)	Unsuitable Type C
(112)	Retaining Wall Back	(218)	Unsuitable Type C Removed
(112)	Retaining Wall Back Excavate	(3)	Waste
(112)	Retaining Wall Face	(219)	Waste Removed
(112)	Retaining Wall Front Excavate		
(112)	Retaining Wall Front Footing		
(112)	Retaining Wall MSE Gutter		
(112)	Retaining Wall Reinforced Earth		

NOTES:

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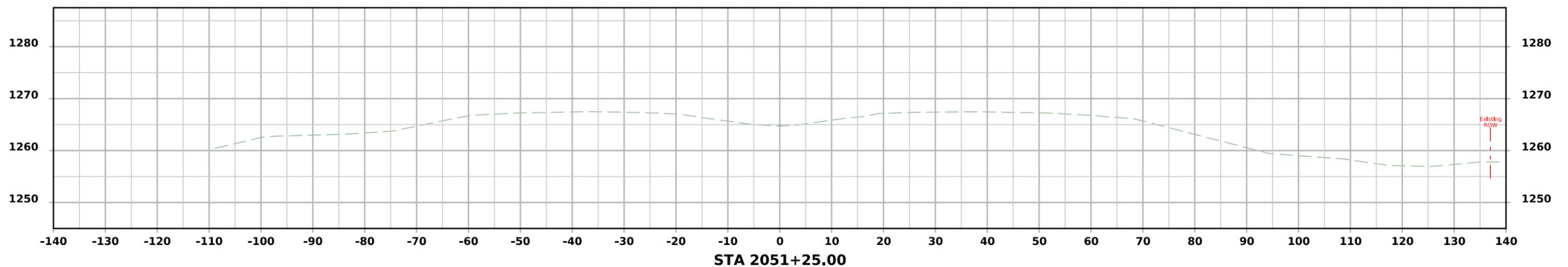
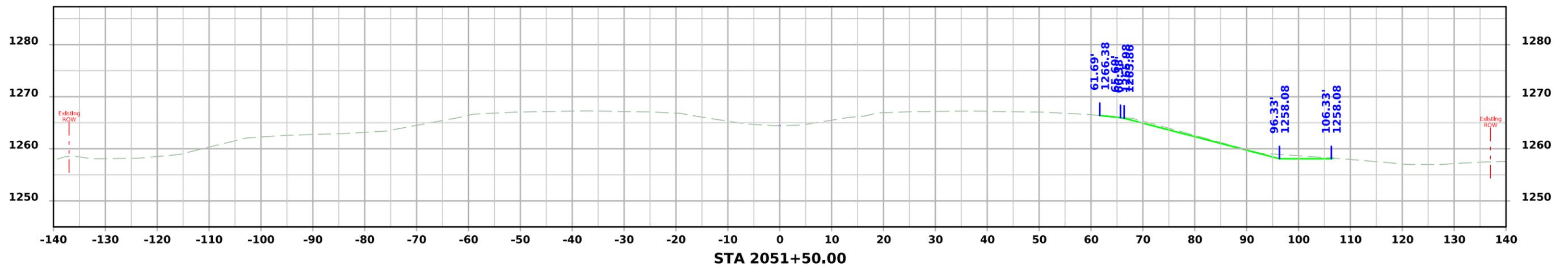
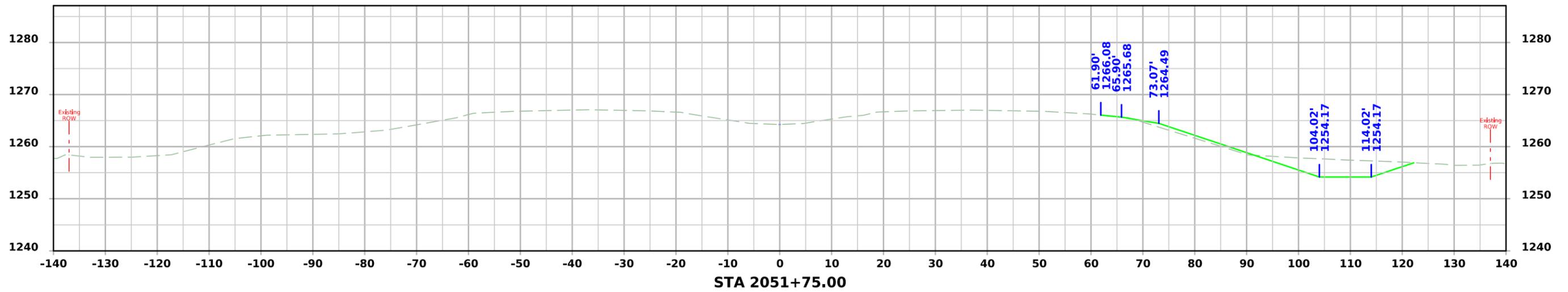
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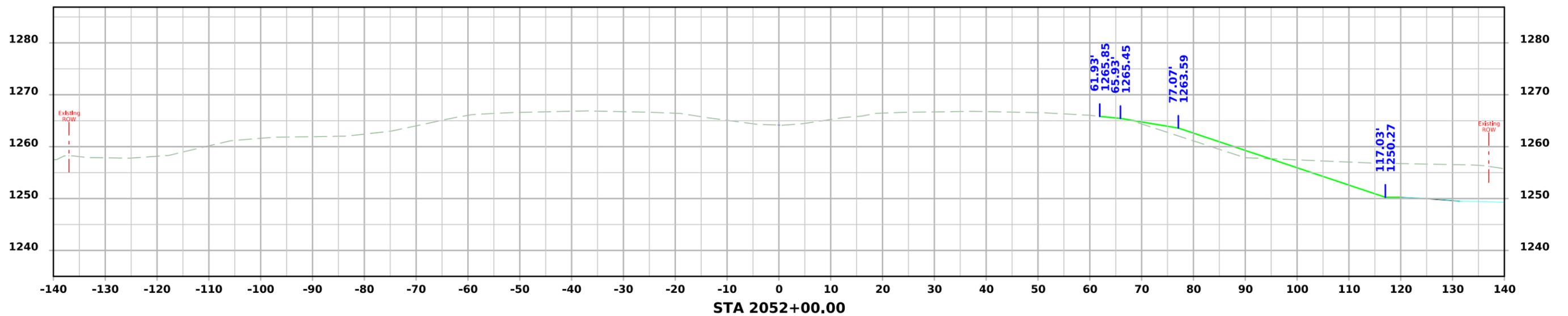
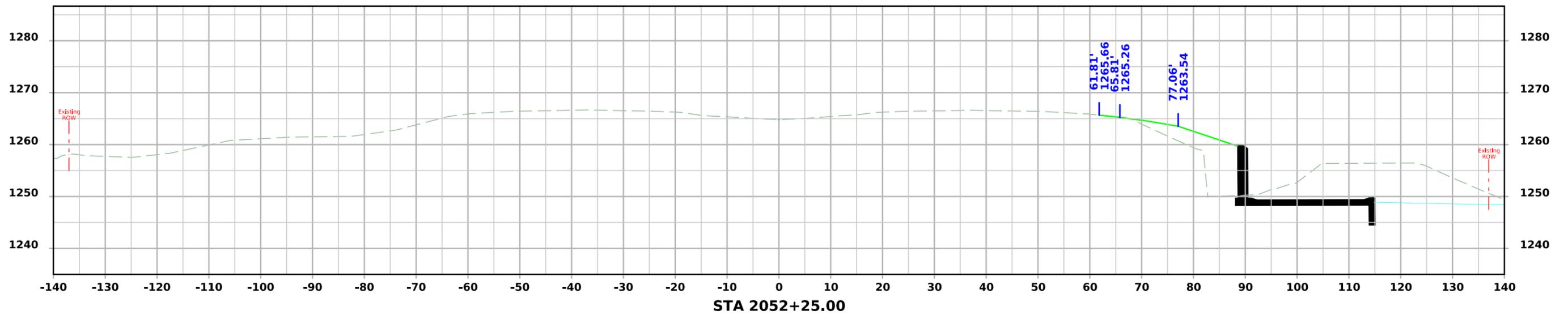
## CROSS SECTIONS LEGEND AND INFORMATION SHEET

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

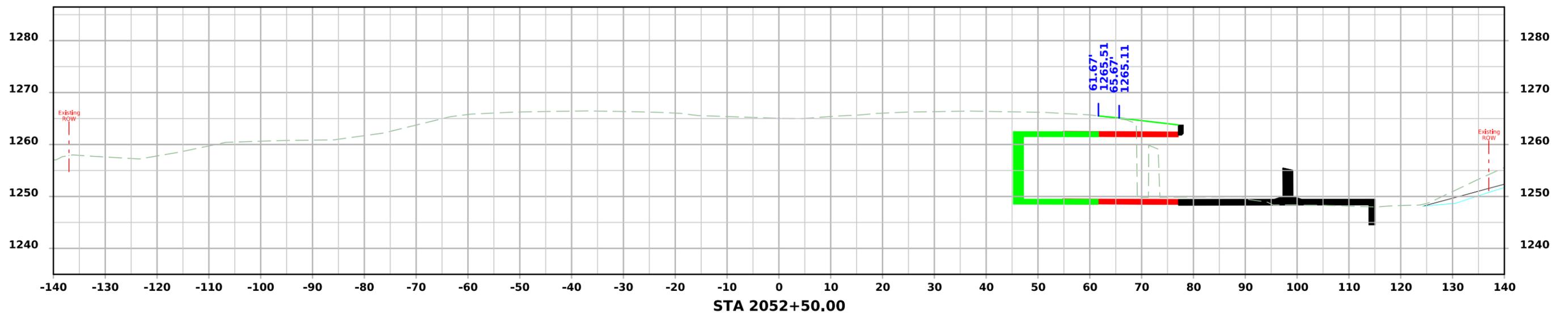
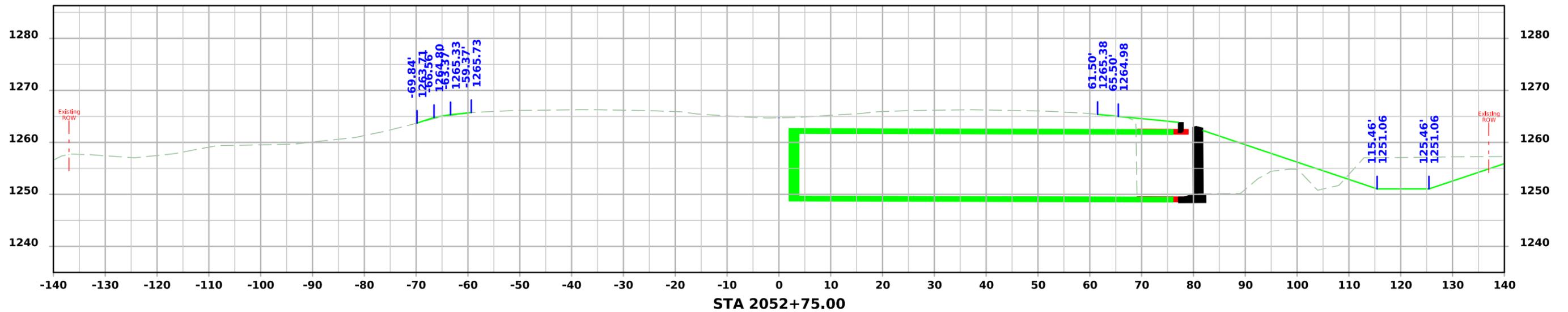
# ML - I-80



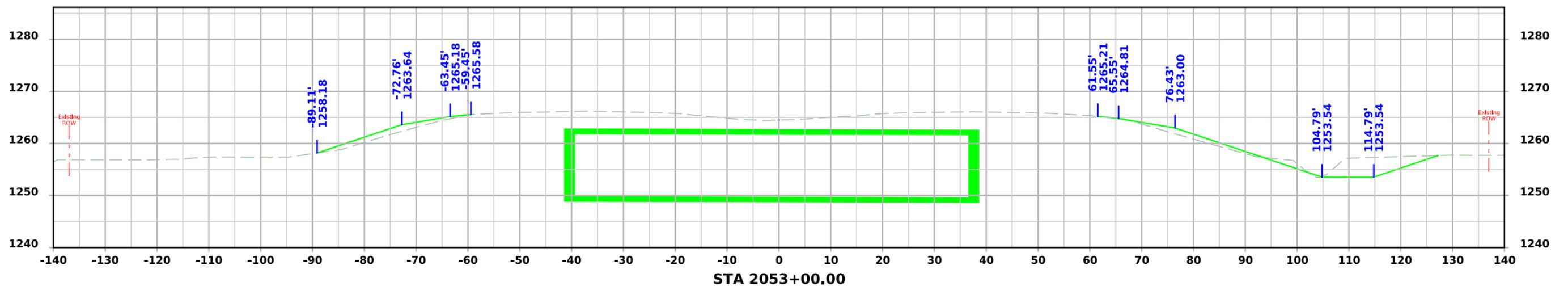
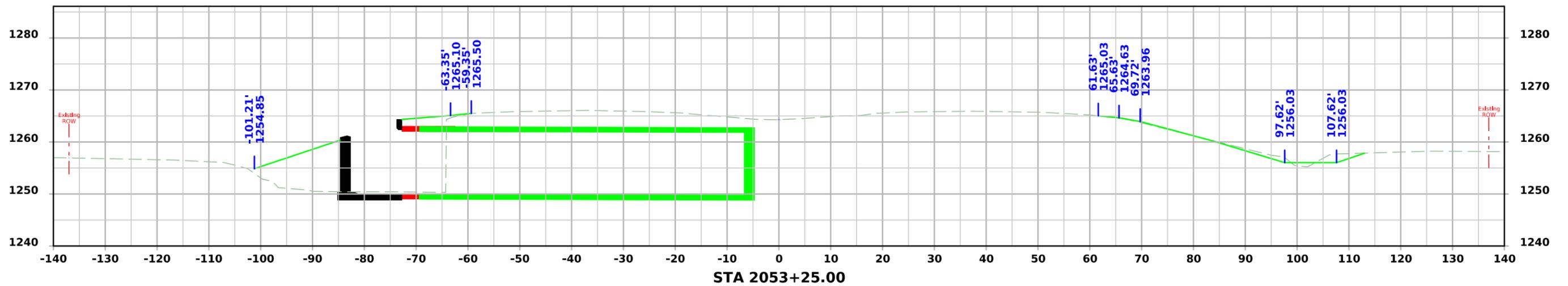
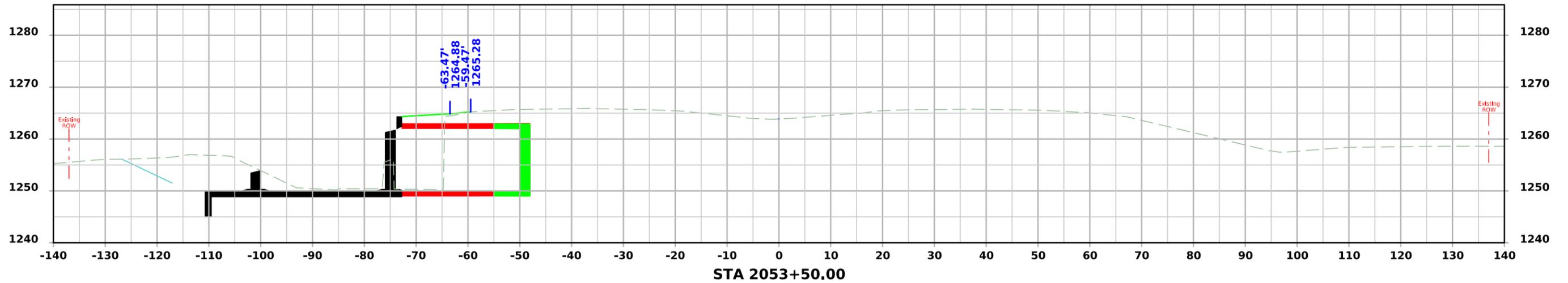
# ML - I-80



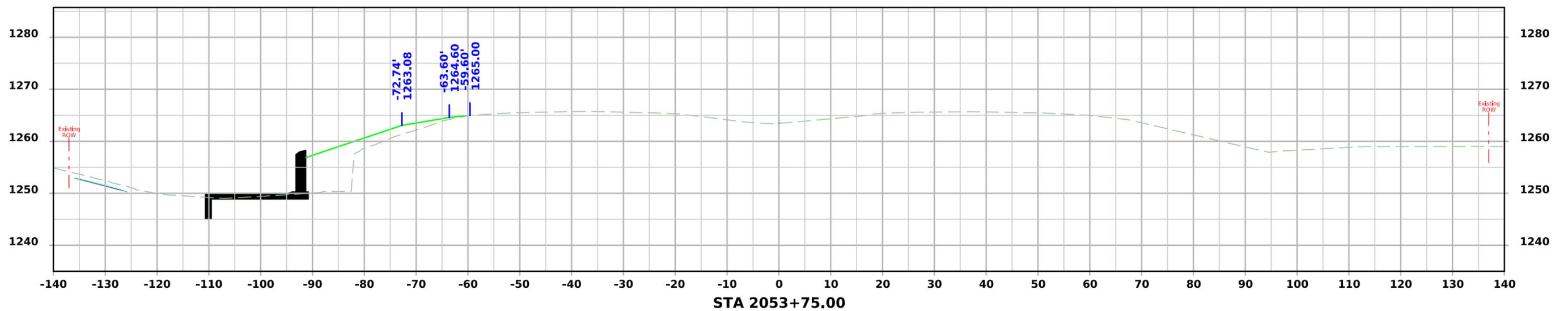
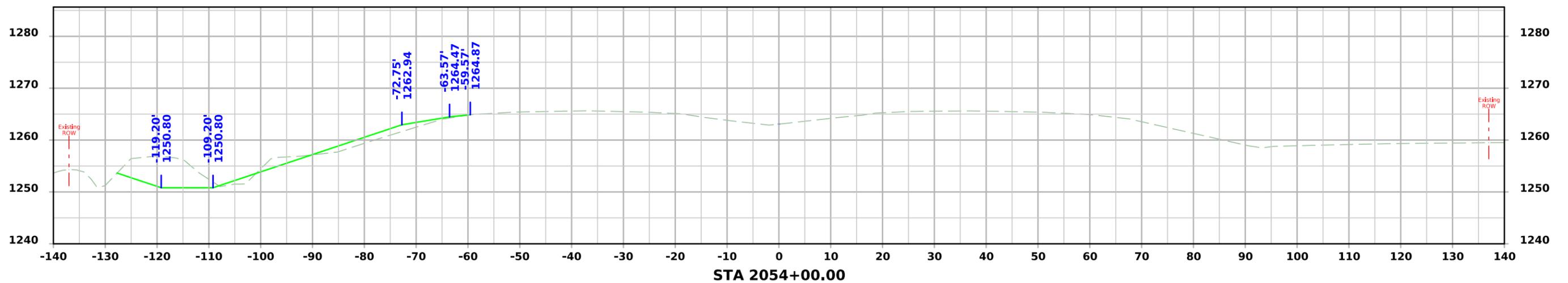
# ML - I-80



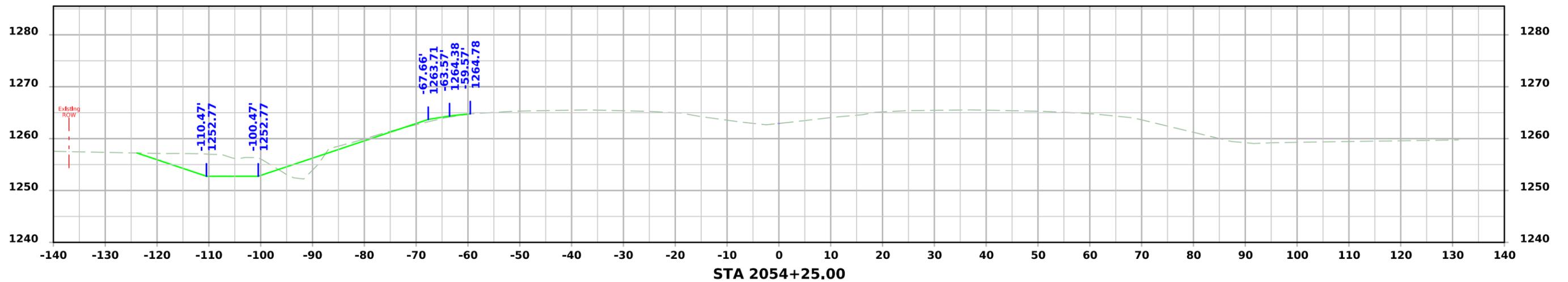
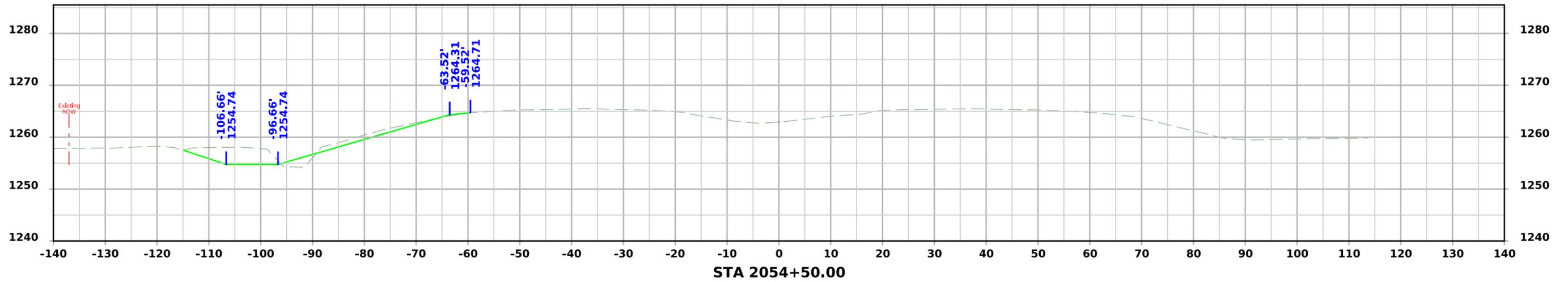
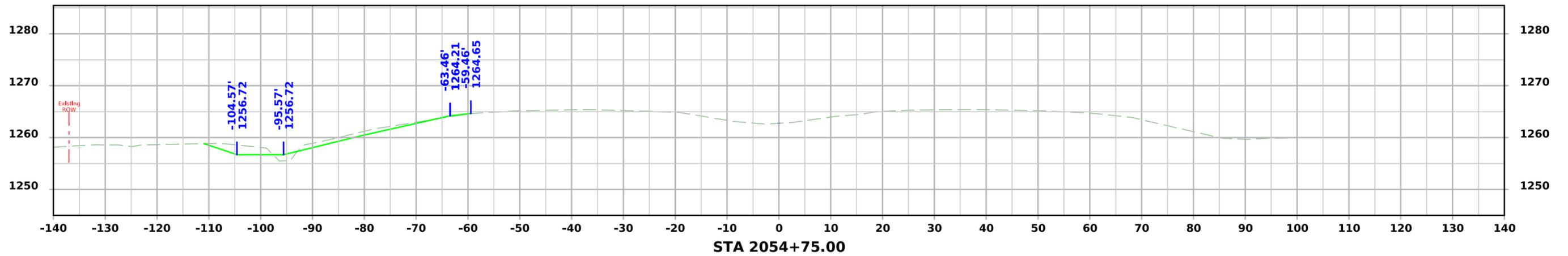
# ML - I-80



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