

PLANS OF PROPOSED IMPROVEMENT ON THE
PRIMARY ROAD SYSTEM
POTTAWATTAMIE COUNTY
BRIDGE REPLACEMENT
US 59 BRIDGE
Over Unnamed Stream
0.6 mi N of S Jct Co Rd G30
SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

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



H Sheet -->

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

REVISIONS

TOTAL

PROJECT IDENTIFICATION NUMBER

24-78-059-040

PROJECT NUMBER

BRF-059-3(060)--38-78

R.O.W. PROJECT NUMBER

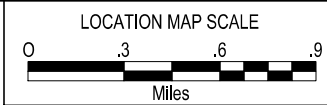
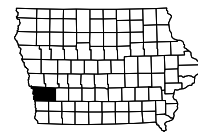
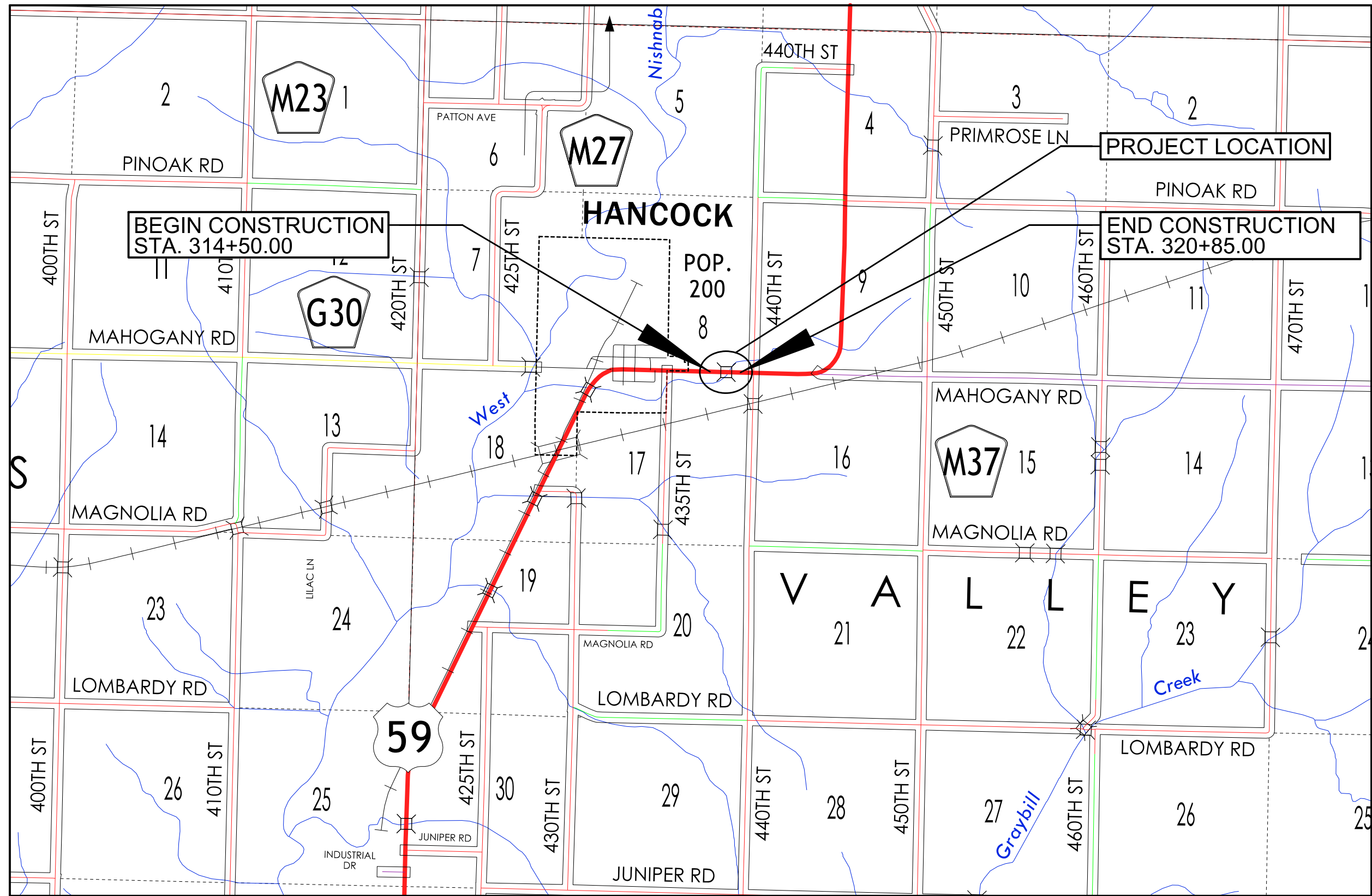
Index of Sheets

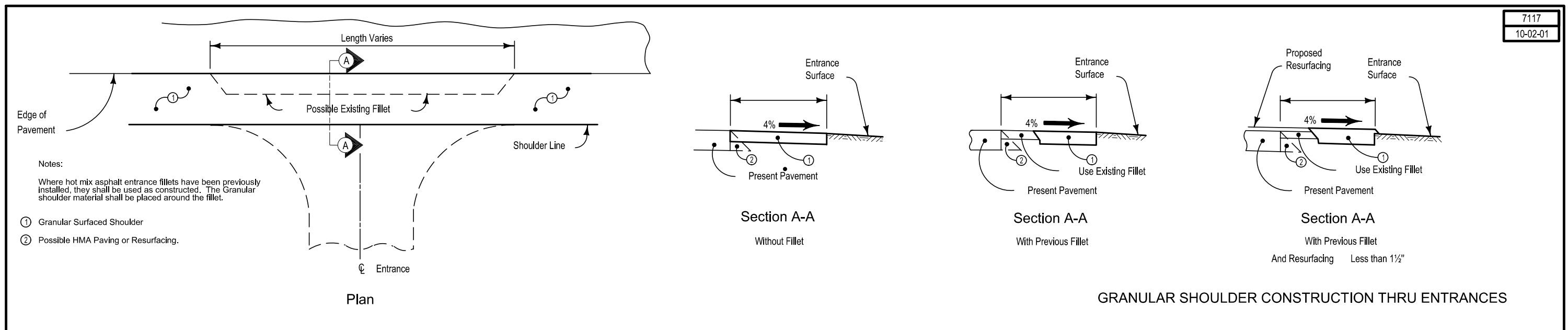
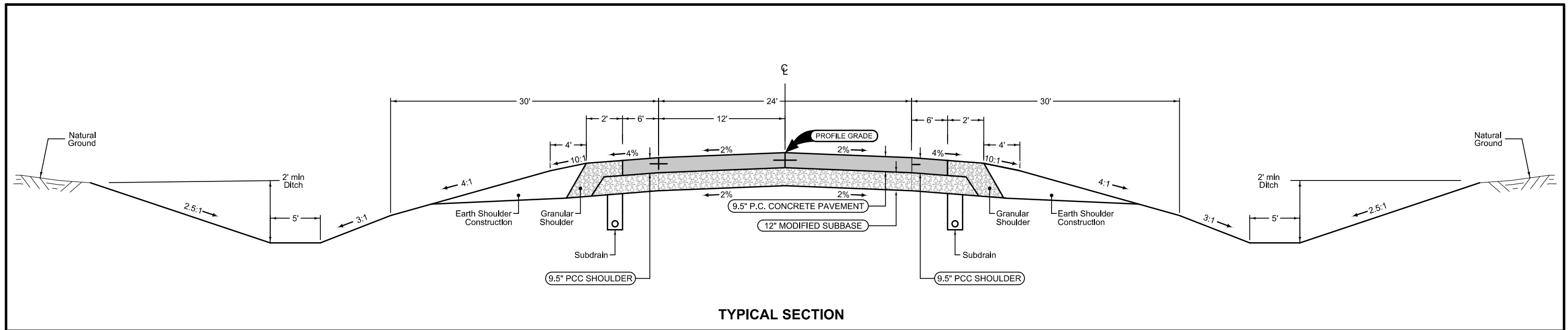
No.	Description
A Sheets	Title Sheets
*A.1	Title Sheet
*A.2	Location Map Sheet
B Sheets	Typical Cross Sections and Details
B.1 - B.2	Typical Section and Details
B.3	8212 - Temporary Concrete Barrier Layout for One-Way Traffic
D Sheets	Mainline Plan and Profile Sheets
*D.1	Plan & Profile Legend & Symbol Information Sheet
*D.2	US 59 Plan and Profile
G Sheets	Survey Sheets
G.1	Survey Information
*G.2	Control Point Vicinity Map
G.3	Horizontal and Vertical Project Control Coordinate Listing
J Sheets	Traffic Control and Staging Sheets
J.1	Traffic Control Plan
J.2	511 Travel Restriction
J.3	Staging Notes
*J.4	Traffic Control and Staging Legend and Symbol Information Sheet
*J.5 - J.6	Stage 1 Lane Closure with Signals and TBR
*J.7 - J.8	Stage 2 Lane Closure with Signals and TBR
*J.9	Typical Cross Section Staging
V Sheets	Bridge and Culvert Situation Plans
*V.1	Bridge Situation Plan
*V.2	Bridge Situation Plan - Site
*V.3	Bridge Construction Staging & Notes
V.4	Bridge TSL Development Report
W Sheets	Mainline Cross Sections
W.1 - W.11	Mainline Cross Sections
* Color Plan Sheets	

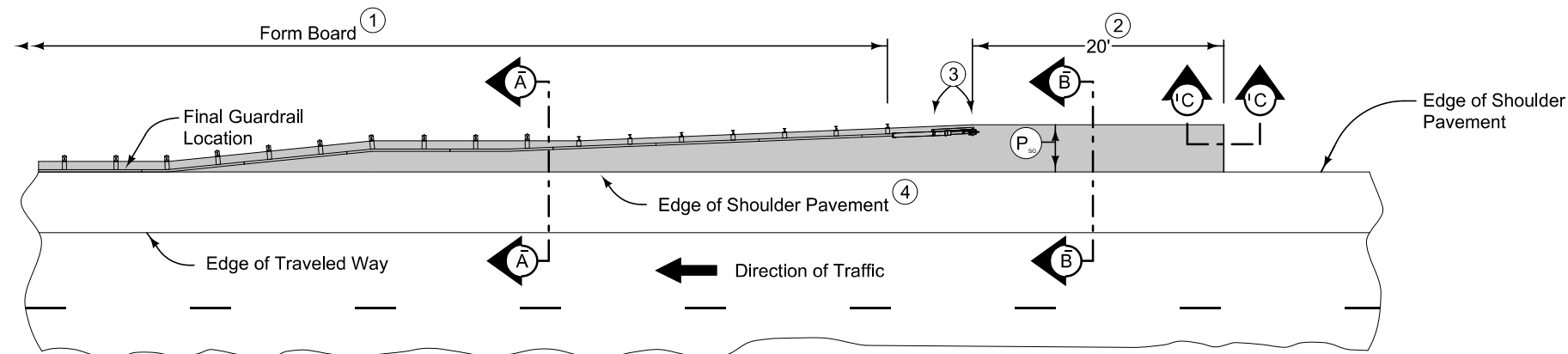
PRELIMINARY PLANS

Subject to change by final design.

D5 PLAN - Date: November 14, 2025







PLAN VIEW

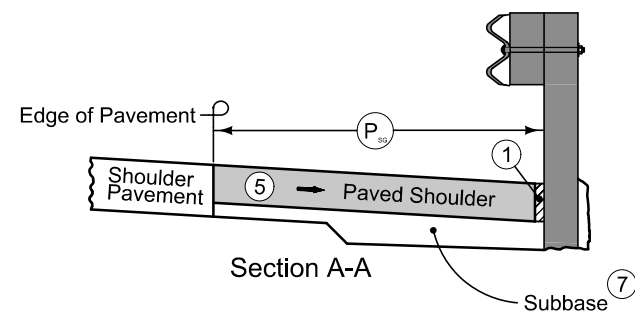
9" HMA Paved Shoulder at guardrail. 8" PCC may be substituted with the following jointing layout:

Match mainline pavement joint spacing. When mainline pavement is 8" or greater in thickness, place additional transverse 'C' joints in shoulder at mid-panel of the mainline pavement. Place longitudinal 'C' joint at P/2 from edge of mainline pavement when P is greater than 10' wide. Terminate longitudinal joint at transverse joint less than 10' in length.

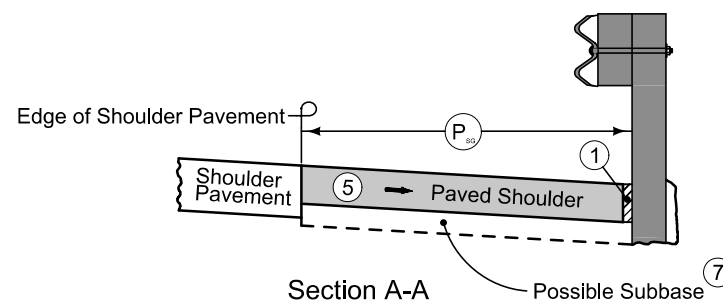
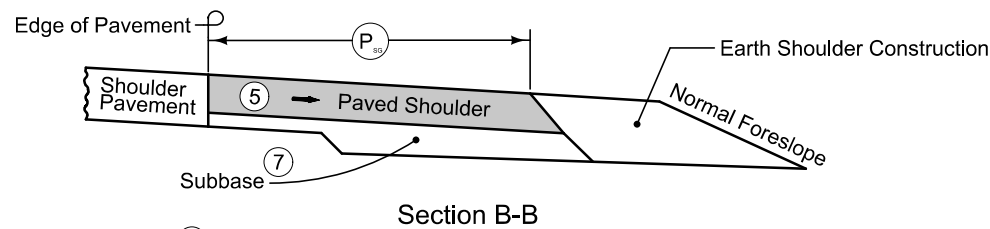
Compaction of HMA is required to face of guardrail post. Hand compaction will be allowed under guardrail. Removal and reinstallation of guardrail will be allowed with no additional payment.

Refer to Tabulation 112-9 for shoulder quantities.

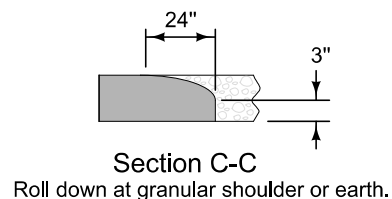
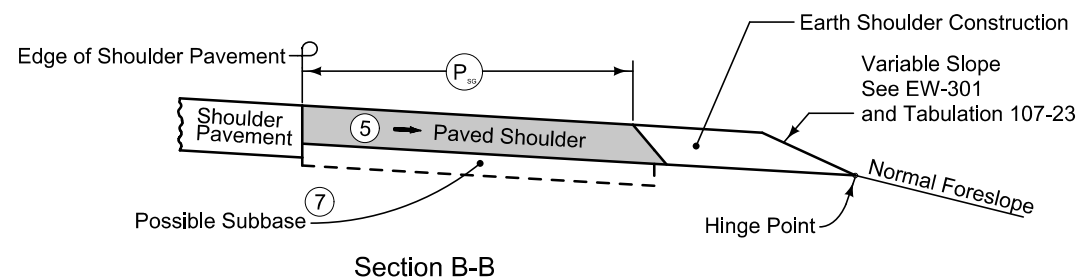
- ① PCC option only: When guardrail posts are installed prior to construction of PCC paved shoulder, fasten form board to the face of guardrail posts for the length shown.
- ② Continue paved shoulder 20 feet beyond the center of the first post.
- ③ Shoulder may be notched for first 2 posts or post sleeves may be installed through pavement. Do not drive posts through pavement.
- ④ '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.

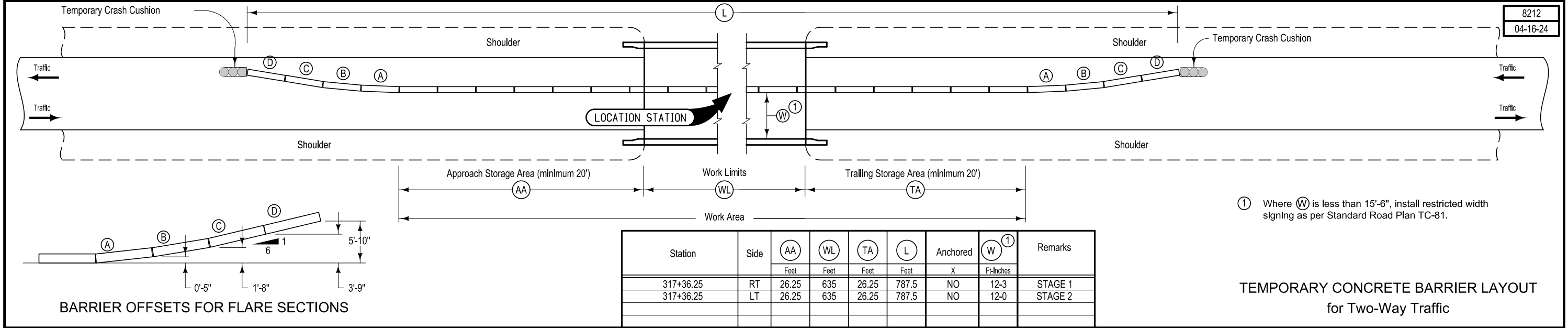


NEW CONSTRUCTION



EXISTING SHOULDER

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



	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
	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

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%

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

Station	Proposed Right-of-Way Symbol
Section Corner	Proposed Right-of-Way Line
Ground Line Intercept	Existing Right of Way
Saw Cut	Existing and Proposed Right-of-Way
Guardrail	Easement and Existing Right-of-Way
Trench Drain	Easement (Temporary) Symbol
High Tension Cable Guardrail	Easement (Temporary) Line
Sheet Pile	Easement
Pavement Removal	C/A Access Control
Clearing & Grubbing Area	Property Line Symbol
	Property Line

(COVERS SHEET SERIES D)

Survey Information

SURVEY INDEX

County: Pottawattamie County
PIN: 24-78-059-040
Project Number: BRF-059-3(060)--38-78
Location: Stream 0.6 mi N of S Jct Co Rd G30
Type of Work: Bridge-Unspecified
Project Directory: 7805904024

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

Alignment Information

The horizontal alignment for U.S. Hwy 59 this survey is a retrace of As-built Plans No. P-615. Survey stationing was equated to the plan PI at Sta. 306+91.0 and carried back and ahead with equation throughout the survey.

Survey stationing relates to as built plan stationing as follows:

PT Sta. 285+27.1 As-built Plans Project No. P-615
Survey PT Sta. 285+27.10

PI Sta. 306+91.0 As-built Plans Project No. P-615
Survey PI Sta. 306+91.00

PI Sta. 325+70.8 As-built Plans Project No. P-615
Survey PI Sta. 325+73.34

POT Sta. 335+21.8 As-built Plans Project No. P-615
Survey POT Sta. 335+24.34
Station Equation 270+56.8 Ahead

PC Sta. 277+81.7 As-built Plans Project No. P-615
Survey PC Sta. 277+81.70

Survey Personnel

Wes Shimp – PLS
Nate Theis-Barnett – Survey Party Chief
Matt Svec – Survey Party Chief
Alexis Avila – Assistant Survey Party Chief

Date(s) of Survey

Begin Date 01/02/2025
End Date 03/14/2025

General Information

This survey is for a bridge project on US Hwy 59 located 0.6 mile North of S Jct County Road G30. 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 three new 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.

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

Point Name	Northing	Easting	Elevation	Code - Description
300	7015514.78	16605981.75	1172.89	FENO SET MONUMENT 721' East of bridge on South side of US59
301	7015555.90	16605293.56	1155.15	FENO SET MONUMENT South East corner of bridge in grass on South side of US59
302	7015530.81	16604510.57	1151.98	FENO SET MONUMENT 645' West of bridge on South side of US59

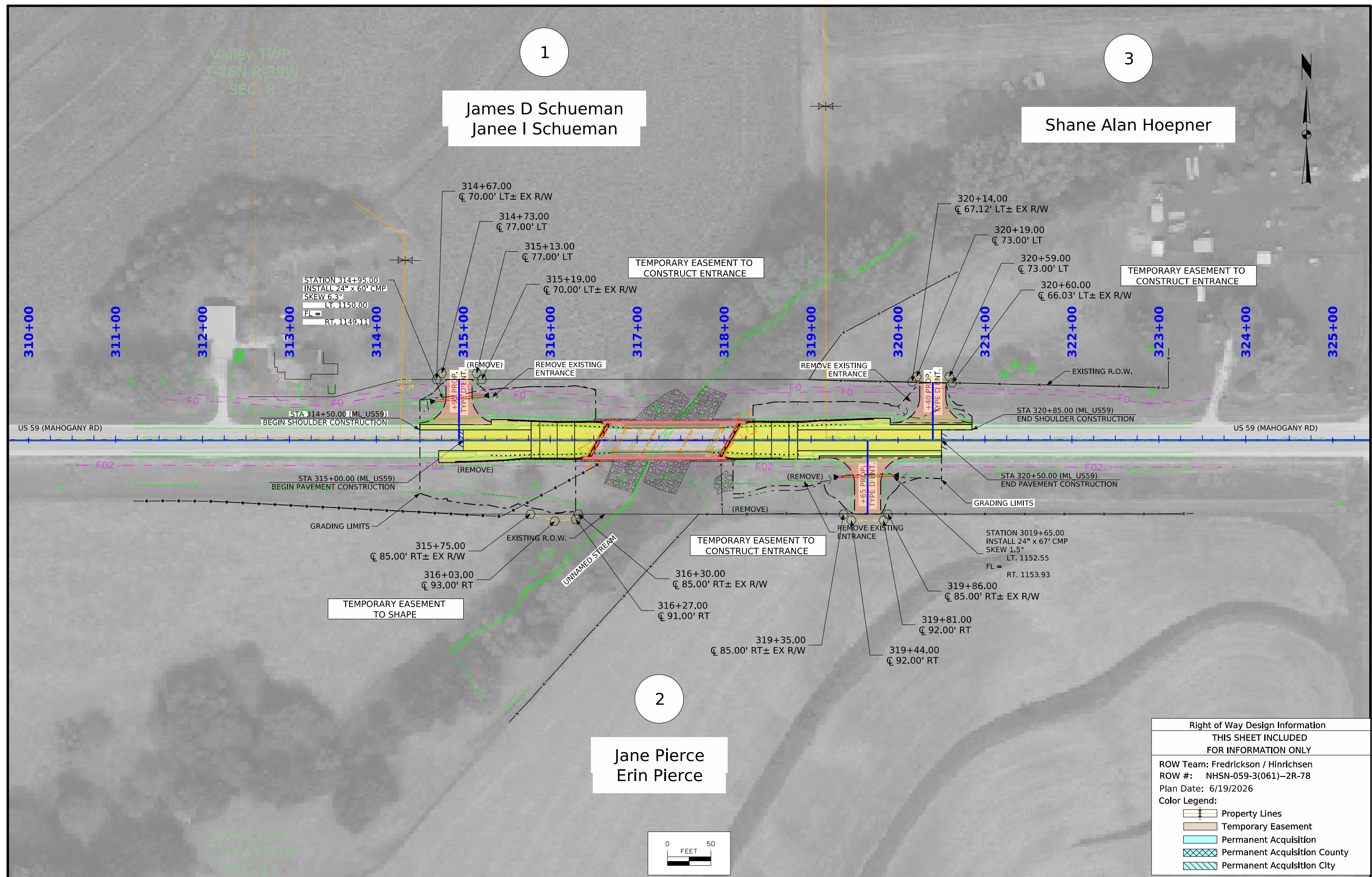
CONTROL LINE DATA - ML_US59											
POINT ID	BEARING	DISTANCE (FEET)	NORTHING (Y)	EASTING (X)							
					PC	PI	PT	DELTA	R	L	T
SURMLA059	S89°59'17"E	2163.90 '	7015583.07	16601999.90		285+27.10 R1					
SURMLA059	N89°53'24"E	1882.34 '	7015582.61	16604163.80		306+91.00 R1					
SURMLA059	N89°57'07"E	1675.90 '	7015586.22	16606046.14		325+73.34 R1					
SURMLA059			7015587.63	16607722.04		277+81.70 R2					

Pottawatta NGSN-059-3(061)--2R-78
mie
Stream 0.6 mi N of S Jct Co Rd G30
[7805904024](#)

Project Code 24-78-059-040
Route US 59

		State			County			City										
Parcel No	Owner Name	Fee	Hwy Ease	Other Ease	Fee	Hwy Ease	Other Ease	Fee	Hwy Ease	Other Ease	Excess	Temp Ease	Mitigation	Utility Ease	Relocation	TE Only	A/C Only	Total Acq
1	James D. Schueman											0.01 AC						
2	Erin Pierce											0.02 AC						
3	Shane Alan Hoepner.											0.01 AC						

3 Parcels



FILE NO.	ENGLISH	DESIGN TEAM	Foth	Pottawattamie COUNTY	PROJECT NUMBER	BRF-059-3(060)--38-78	SHEET NUMBER	H.1
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TRAFFIC CONTROL PLAN Traffic on US 59 will remain open for the duration of the project. US 59 will be reduced down to one lane using temporary traffic signals and barriers. Stage 1 will involve shoulder strengthening along the north edge of US 59. Stage 1 will provide a 12' - 0" traffic lane as well as Stage 2 A full 8-foot paved shoulder is required for Stage 2, and additional shoulder paving beyond the tie-ins should also be expected during this stage.				108_23A 8/15/22			
FILE NO.	ENGLISH	DESIGN TEAM	FOTH	POTTAWATTAMIE COUNTY	PROJECT NUMBER	BRF-059-3(060)--38-78	SHEET NUMBER J.1

511 TRAVEL RESTRICTIONS

Route	Direction	County	Location Description	Feature Crossed	Object Type	Maint. Bridge No. or Structure ID or FHWA No.	Type of Restriction	Existing Measurement	Construction Measurement	Construction Measurement as Signed	Projected As Built Measurement	Remarks
US 59	Both	Pottawattamie	US 59 over Unnamed Stream		Barrier	7857.5S059	Horizontal	N/A	12'	12'	N/A	TBR, per TC-217

108_26A 8/15/22 STAGING NOTES It is not the intent to confine the Contractor's activities to the areas of suggested stages alone. It is understood that some of the various steps may occur simultaneously. The Contractor may conduct several operations concurrently, provided that traffic is maintained and that these operations do not conflict with the staging indicated herein. It is recognized that as the various activities related to construction progress, certain situations may arise which will preclude adhering to the original construction sequence or which would readily lend themselves to more efficient staging operations. Should the Contractor desire to deviate from the original plan, a written alternative plan shall be submitted to the Project Engineer for approval a minimum of one (2) week prior to the proposed changes. Coordinate with all public and private projects in the area at all times. STAGE 1 Install temporary barrier rails (TBR) and traffic signals and shift traffic to one-lane operation on the south half per TC-217. See sheets J.5-J.6, and J.9 for additional information. Construct north half of bridge deck, bridge approach, and roadway. Construct granular driveway entrance at Sta. 314+95.00 and Sta. 320+40.00. Install new guardrail and construct paved shoulders at the NW and NE bridge approaches. Construct shoulder strengthening beyond reconstruction limits for Stage 2 traffic. STAGE 2 Move temporary barrier rails (TBR) and traffic signals and shift traffic to one-lane operation on the north half per TC-217. See sheets J.7-J.9 for additional information. Construct south half of bridge deck, bridge approach, and roadway. Construct granular driveway entrance at Sta. 319+65.00. Install new guardrail and construct paved shoulders at the SW and SE bridge approaches. STAGE 3 Remove temporary barrier rails (TBR) and signals. Install permanent pavement markings. Open US 59 to two-lane traffic.								
FILE NO.	ENGLISH	DESIGN TEAM	FOTH	POTTAWATTAMIE COUNTY	PROJECT NUMBER	BRF-059-3(060)--38-78	SHEET NUMBER	J.3

CROSS SECTION VIEW COLOR LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS		
SHADING	Design Color No.	
Green, Light	(225)	Existing Pavement Shading
Gray, Light	(48)	Previously Constructed Pavement Shading
Gray, Med	(80)	Previously Constructed Granular Surface Shading
Blue, Light	(230)	Proposed Pavement Shading
Lavender	(9)	Temporary Pavement Shading
Brown, Med	(237)	Future Proposed Pavement Shading

CROSS SECTION VIEW PATTERN AND SYMBOL LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS			
	Pavement Removal		Proposed Granular Shoulder
	Proposed Granular Subbase		Temporary Shoulder
	Proposed Special Backfill		Existing Shoulder Strengthening
	Temporary Barrier Rail		Permanent Barrier Rail
			Channelizing Device

PLAN VIEW COLOR LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS		
LINEWORK	Design Color No.	
Green	(2)	Existing Topographic Features and Labels
Magenta	(5)	Pavement Marking Call Outs
Blue	(1)	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Yellow	(4)	Pavement Markings, Yellow
Off White	(254)	Pavement Markings, White
Violet	(15)	Temporary barrier rail, Unpinned
Flush Orange	(228)	Temporary barrier rail, Pinned

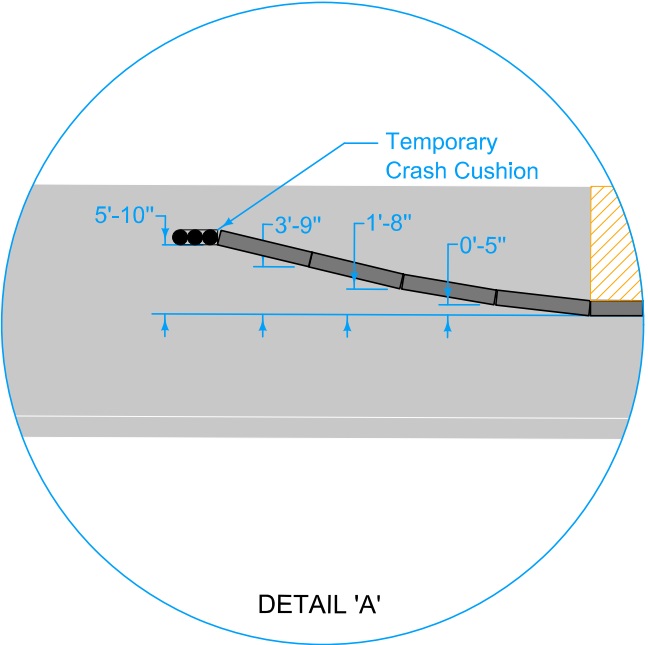
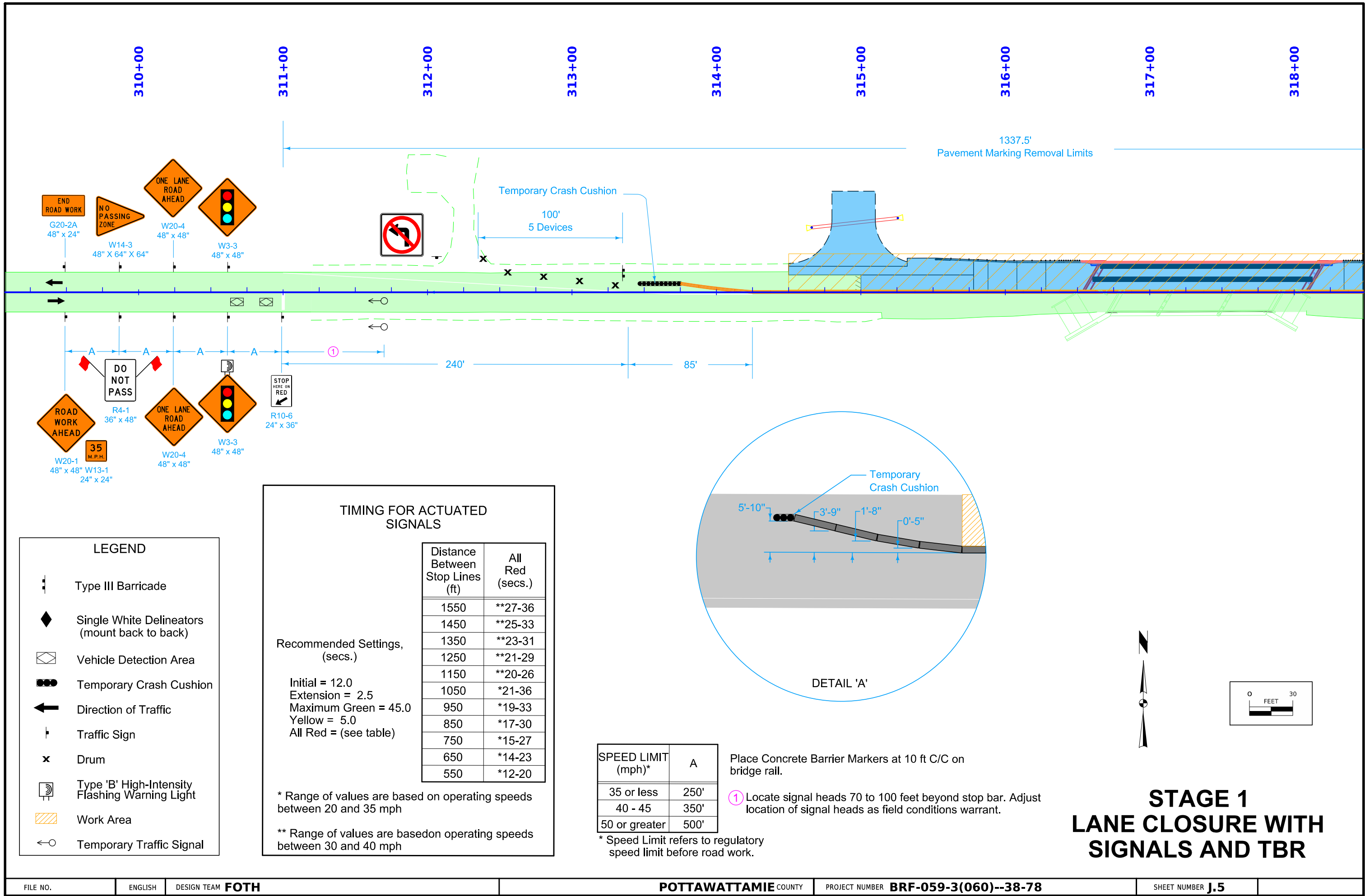
SHADING	Design Color No.	
Green, Light	(225)	Existing Pavement Shading
Gray, Light	(48)	Previously Constructed Pavement Shading
Orange	(6)	Proposed Granular Surface Shading
Gray, Med	(80)	Previously Constructed Granular Surface Shading
Blue, Light	(230)	Proposed Pavement Shading
Pink, Dark	(13)	Temporary Pavement Shading
Brown, Light	(236)	Proposed Grading Limits Shading
Cyan	(7)	Proposed MSE or CIP Wall Shading
Red	(3)	Proposed Bridge Shading and Sign Trusses
Black w/Gray, Light Fill	(0,48)	Previously Constructed Structure

PLAN VIEW PATTERN AND SYMBOL LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS			
	Channelizing Device		Crash Cushion (Temp or Perm)
	Drum		Traffic Signal
	Temporary Lane Separator		Flagger
	Tubular Marker		Temporary Floodlighting
	Channelizer Marker		Traffic Sign
	Concrete Barrier Marker		Type III Barricade
	Delineator		Type A Warning Light
	Temporary Barrier Rail		Direction of Traffic
	Pavement Removal		Safety Closure
	Sand Barrel Layout		Lane Identification

NOTE: Device spacing according to Standard Road Plans unless specifically dimensioned.

TRAFFIC CONTROL
AND
STAGING
LEGEND AND SYMBOL
INFORMATION SHEET

(COVERS SHEET SERIES J)



TIMING FOR ACTUATED SIGNALS	
Distance Between Stop Lines (ft)	All Red (secs.)
1550	**27-36
1450	**25-33
1350	**23-31
1250	**21-29
1150	**20-26
1050	*21-36
950	*19-33
850	*17-30
750	*15-27
650	*14-23
550	*12-20

Recommended Settings, (secs.)

Initial = 12.0
Extension = 2.5
Maximum Green = 45.0
Yellow = 5.0
All Red = (see table)

* Range of values are based on operating speeds between 20 and 35 mph

** Range of values are based on operating speeds between 30 and 40 mph

SPEED LIMIT (mph)*	A
35 or less	250'
40 - 45	350'
50 or greater	500'

* Speed Limit refers to regulatory speed limit before road work.

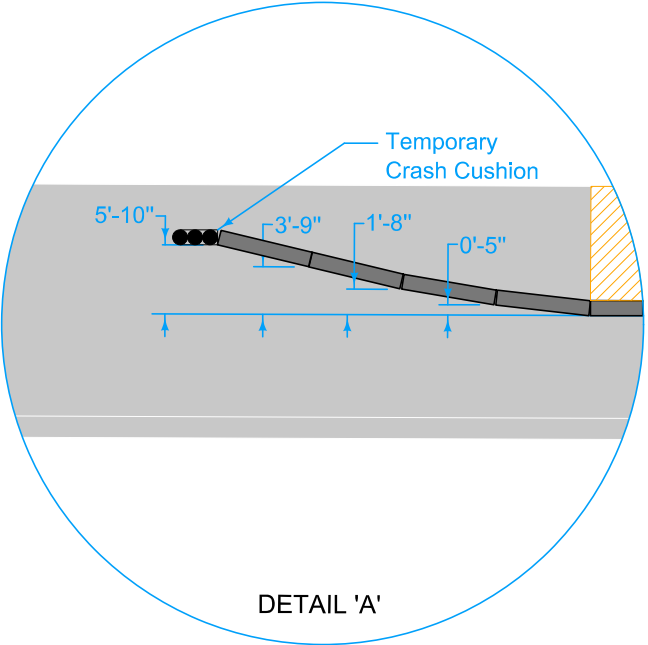
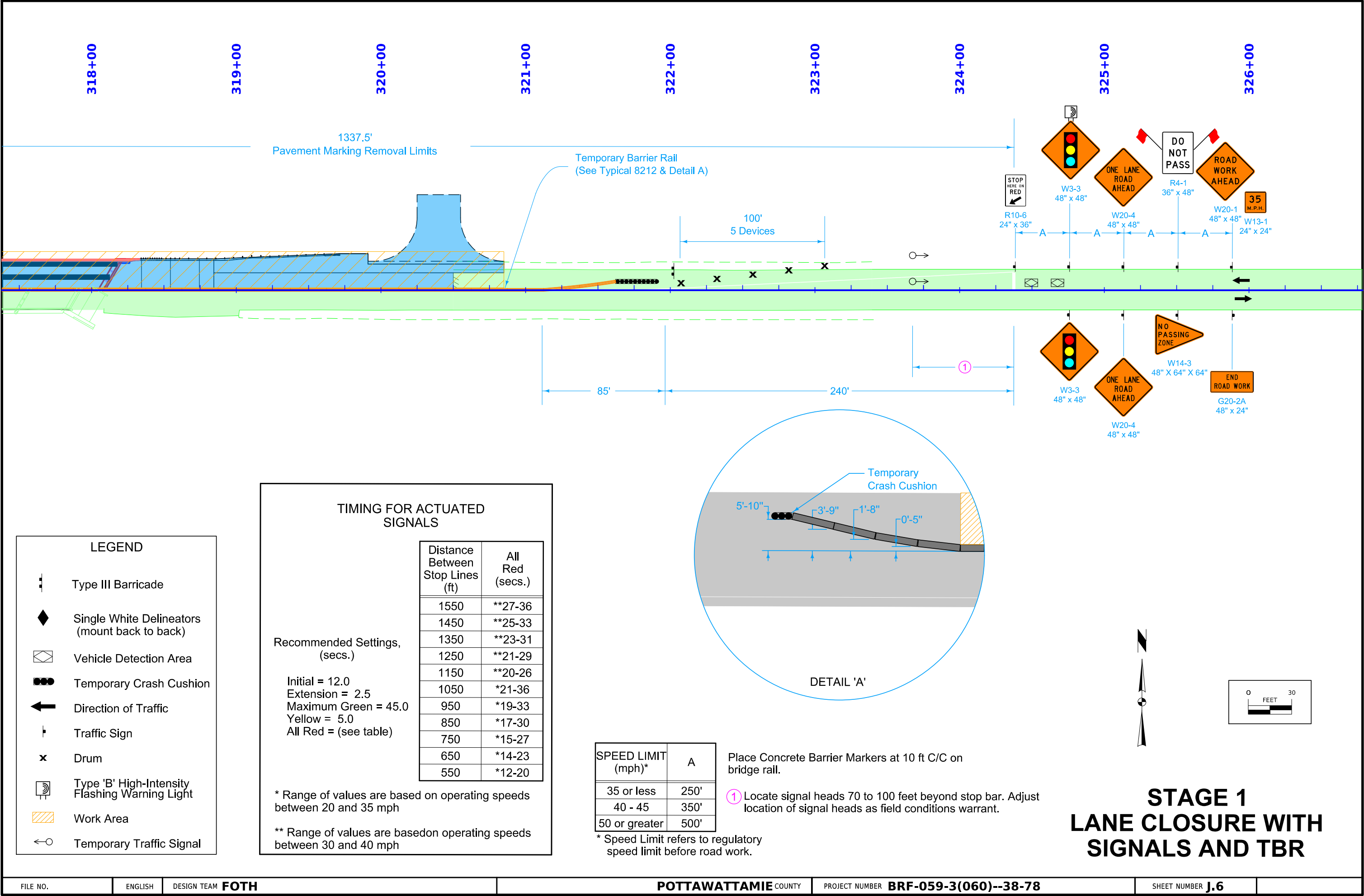
Place Concrete Barrier Markers at 10 ft C/C on bridge rail.

① Locate signal heads 70 to 100 feet beyond stop bar. Adjust location of signal heads as field conditions warrant.

LEGEND

- Type III Barricade
- Single White Delineators (mount back to back)
- Vehicle Detection Area
- Temporary Crash Cushion
- Direction of Traffic
- Traffic Sign
- Drum
- Type 'B' High-Intensity Flashing Warning Light
- Work Area
- Temporary Traffic Signal

STAGE 1 LANE CLOSURE WITH SIGNALS AND TBR



LEGEND

- Type III Barricade
- Single White Delineators (mount back to back)
- Vehicle Detection Area
- Temporary Crash Cushion
- Direction of Traffic
- Traffic Sign
- Drum
- Type 'B' High-Intensity Flashing Warning Light
- Work Area
- Temporary Traffic Signal

TIMING FOR ACTUATED SIGNALS

Distance Between Stop Lines (ft)	All Red (secs.)
1550	**27-36
1450	**25-33
1350	**23-31
1250	**21-29
1150	**20-26
1050	*21-36
950	*19-33
850	*17-30
750	*15-27
650	*14-23
550	*12-20

Recommended Settings, (secs.)

Initial = 12.0
Extension = 2.5
Maximum Green = 45.0
Yellow = 5.0
All Red = (see table)

* Range of values are based on operating speeds between 20 and 35 mph

** Range of values are based on operating speeds between 30 and 40 mph

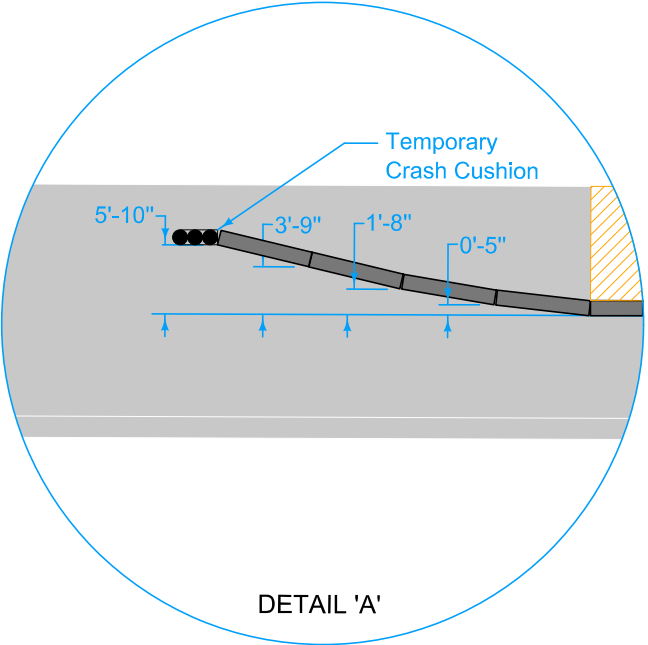
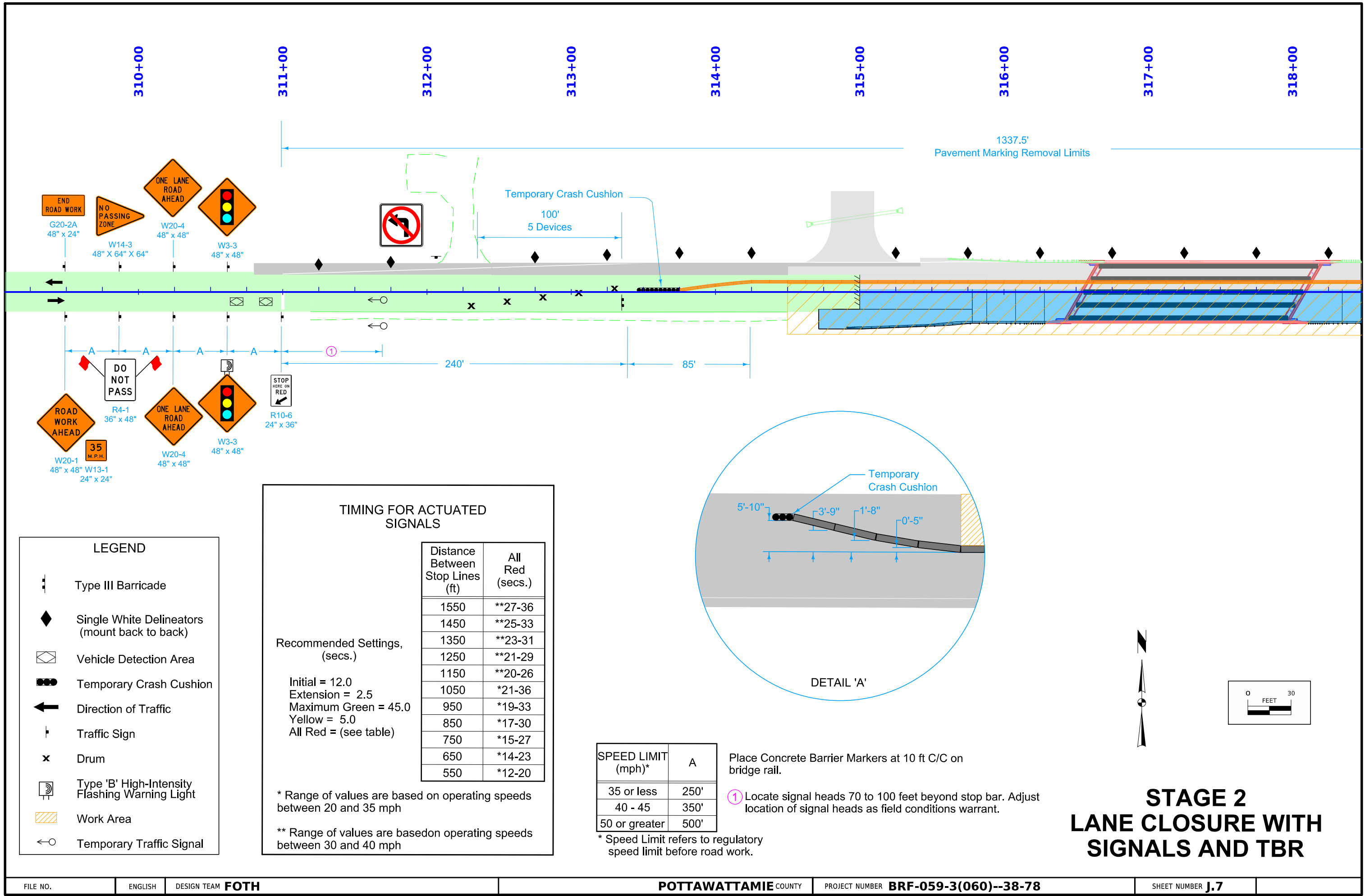
SPEED LIMIT (mph)*	A
35 or less	250'
40 - 45	350'
50 or greater	500'

* Speed Limit refers to regulatory speed limit before road work.

Place Concrete Barrier Markers at 10 ft C/C on bridge rail.

① Locate signal heads 70 to 100 feet beyond stop bar. Adjust location of signal heads as field conditions warrant.

STAGE 1
LANE CLOSURE WITH
SIGNALS AND TBR



TIMING FOR ACTUATED SIGNALS	
Distance Between Stop Lines (ft)	All Red (secs.)
1550	**27-36
1450	**25-33
1350	**23-31
1250	**21-29
1150	**20-26
1050	*21-36
950	*19-33
850	*17-30
750	*15-27
650	*14-23
550	*12-20

Recommended Settings, (secs.)

Initial = 12.0
Extension = 2.5
Maximum Green = 45.0
Yellow = 5.0
All Red = (see table)

* Range of values are based on operating speeds between 20 and 35 mph

** Range of values are based on operating speeds between 30 and 40 mph

SPEED LIMIT (mph)*	A
35 or less	250'
40 - 45	350'
50 or greater	500'

* Speed Limit refers to regulatory speed limit before road work.

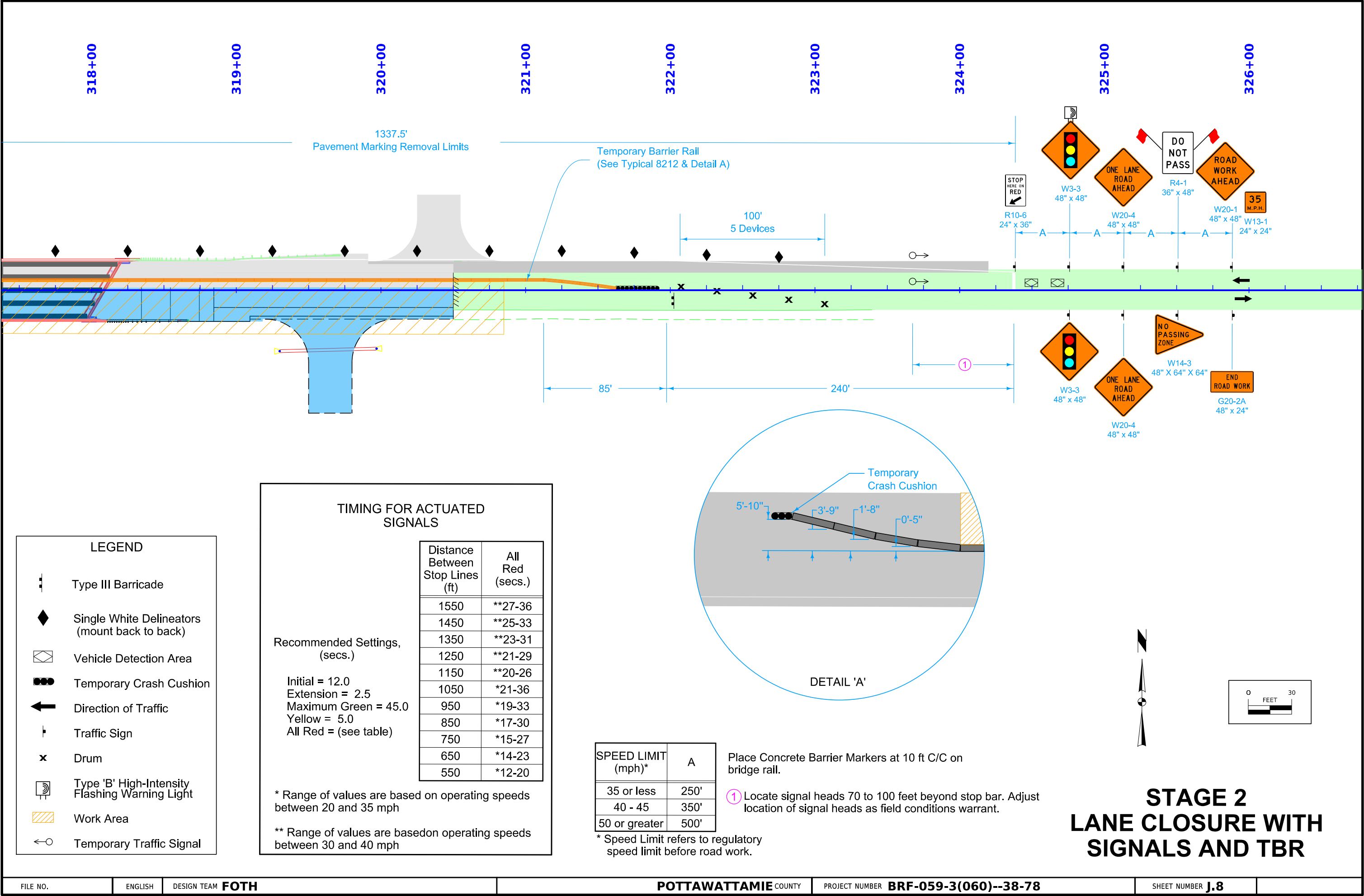
Place Concrete Barrier Markers at 10 ft C/C on bridge rail.

① Locate signal heads 70 to 100 feet beyond stop bar. Adjust location of signal heads as field conditions warrant.

LEGEND

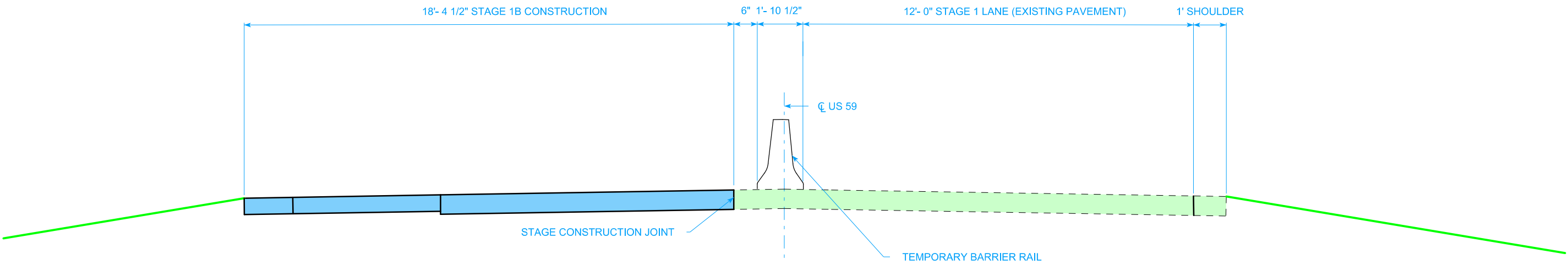
- Type III Barricade
- Single White Delineators (mount back to back)
- Vehicle Detection Area
- Temporary Crash Cushion
- Direction of Traffic
- Traffic Sign
- Drum
- Type 'B' High-Intensity Flashing Warning Light
- Work Area
- Temporary Traffic Signal

STAGE 2 LANE CLOSURE WITH SIGNALS AND TBR



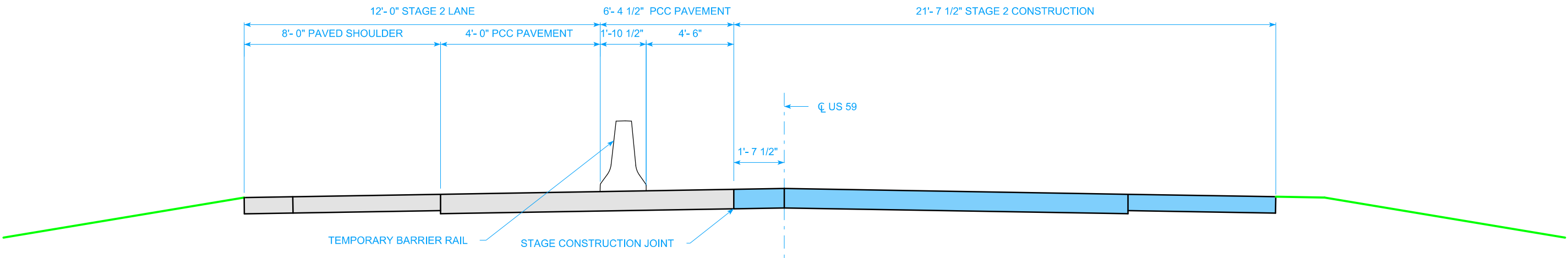
STAGE 1 TYPICAL ROADWAY CROSS SECTION

Looking East



STAGE 2 TYPICAL ROADWAY CROSS SECTION

Looking East



Not to Scale

Control Point 301: 7015555.90 N,16605293.56 E, FENO Set monument South East corner of bridge in grass on South side of US 59, Elev. 1155.15.

Hydraulic Data

RIDB: Not Applicable
Drainage Area = 1.76 Sq. Mi.
Stream Slope (HGL) = 30.57 Ft./Mi.
Avg. Low Water Stage = 1133.88

Channel and Operational
Low Beam = 1149.36

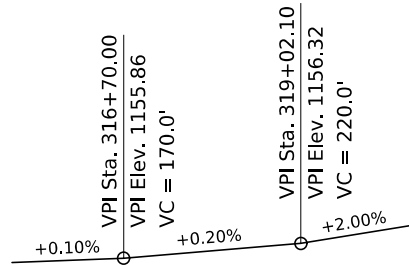
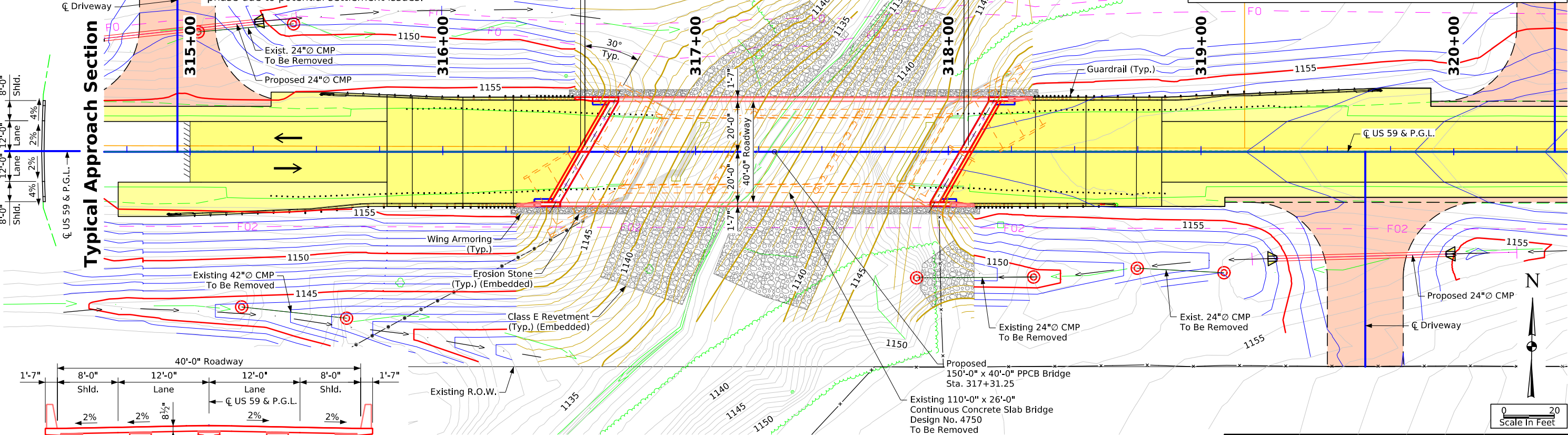
Q₅₀ = 1870 cfs
Stage = 1141.26
Operational Freeboard = 8.10 ft
Avg. Bridge Velocity = 3.96 fps

Q₁₀₀ = 2290 cfs
Stage = 1141.98
Operational Freeboard = 7.38 ft
Backwater = 0.00 Ft.
Avg. Bridge Velocity = 3.94 fps

Q₂₀₀ = 2730 cfs
Stage = 1142.68
Calculated Design Scour = 1130.18

Q₅₀₀ = 3320 cfs
Stage = 1143.54
Channel Freeboard = 5.82 ft
Avg. Bridge Velocity = 3.96 fps
Calculated Check Scour = 1130.18

Extreme HW Stage = Unknown
Date = Unknown



Proposed Profile
Grade US 59

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

BRG TSL Longitudinal Section Along C Approach Roadway

General Note:
1) This design is for the replacement of the existing 110' x 26' Continuous Concrete Slab Bridge, Pottawattamie Design No. 4750, FHWA No. 43430, Maint. No. 7857.55059.

Design Notes:
1) TSS TL-4 bridge railing proposed.
2) Final designer shall consider the need for temporary shoring to accommodate staging of bridge construction and include in the final plans as necessary. Note that the existing abutments have tie backs with concrete deadman anchors. Temporary support may be needed.
3) A RCB culvert option was dismissed during concept phase due to potential settlement issues.

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.

Signature: Timothy J. Sheets
Date: 12-12-2025
Printed or Typed Name: Timothy J. Sheets
My license renewal date is December 31, 2027

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

Situation Plan

Location

US 59 over Stream
T-76N R-39W
Section 8/17
Valley Township
Pottawattamie County
FHWA No. 43431
Bridge Maint. No. 7857.55059
Latitude 41.389974°
Longitude -95.349952°

Design For 30 Degree Skew LA
150'-0" x 40'-0" Prestressed
Prestressed Concrete Beam Bridge
150'-0" Single Span

Situation Plan

STA. 317+31.25 (C US 59)
Turn-in Date: Dec 2025
Pottawattamie County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 429
Design Sheet No. 1 of 3
FHWA No. 43431

General Utility Symbols:

FO - Fiber Optic Line
FO2 - Fiber Optic Line

Utilities Note:

Utilities shown on this sheet are for information only.
See Road Design sheets for utility information.

Traffic Estimate

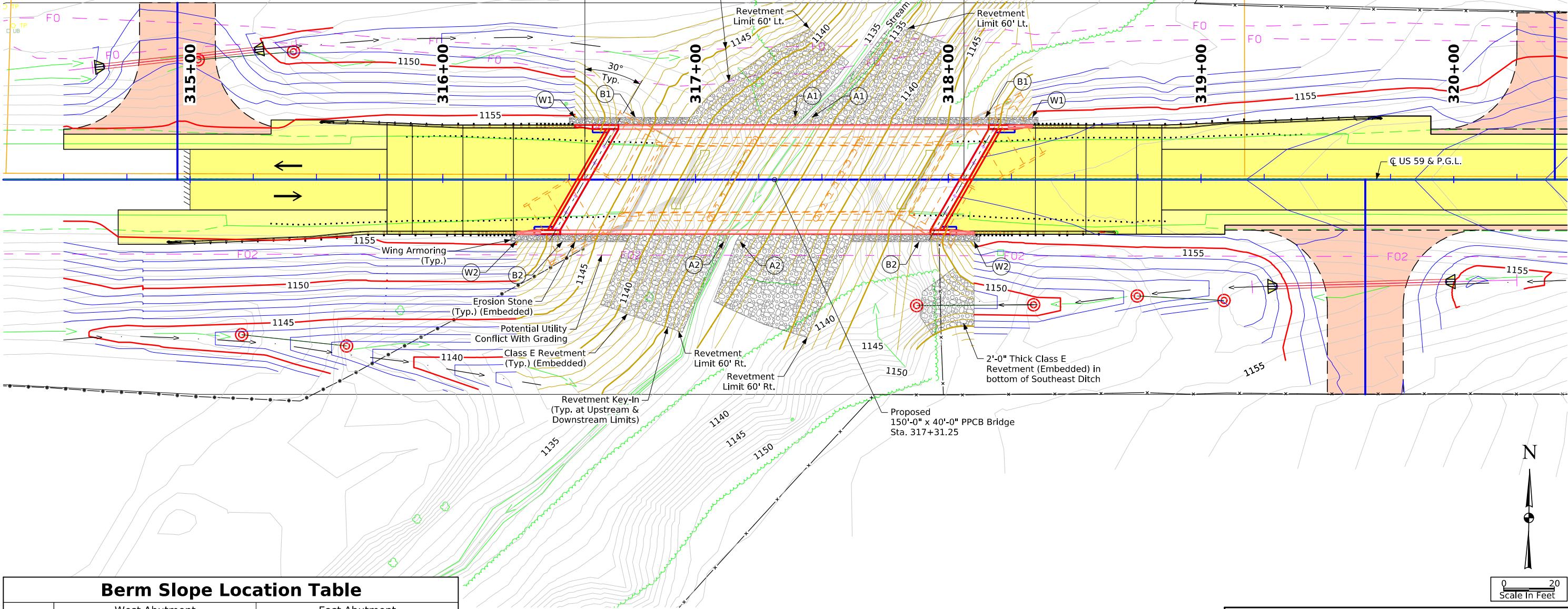
2029 AADT	2150 V.P.D.
2049 AADT	2620 V.P.D.
TRUCKS	21 %
Total Design ESALs	???

Control Point 301: 7015555.90 N,16605293.56 E, FENO Set monument South East corner of bridge in grass on South side of US 59, Elev. 1155.15.

Estimated Berm Armoring Quantities				
Location	Revetment CL. E (Ton)	Erosion Stone (Ton)	Engineering Fabric (SY)	CL. 10 Channel Excavation (CY)
Berm Lining - West	485	60	695	360
Berm Lining - East	545	65	775	405
Southeast Ditch Bottom	45	0	50	30
Totals	1075	125	1520	795

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. Erosion Stone quantity does not include typical Wing Armoring areas.

Revetment based on a density of 1.5 Ton/CY.
Erosion Stone based on a density of 1.6 Ton/CF.



Berm Slope Location Table						
Points	West Abutment			East Abutment		
	Station	Offset	Elev.	Station	Offset	Elev.
A1	317+39.32	24.58' Lt.	1132.88	317+45.91	24.58' Lt.	1132.88
A2	317+10.94	24.58' Rt.	1132.88	317+17.53	24.58' Rt.	1132.88
B1	316+75.61	24.58' Lt.	1147.61	318+15.07	24.58' Lt.	1147.87
B2	316+47.23	24.58' Rt.	1147.61	317+86.69	24.58' Rt.	1147.87
W1	316+52.30	24.58' Lt.	1155.31	318+33.30	24.58' Lt.	1155.70
W2	316+29.20	24.58' Rt.	1155.27	318+10.20	24.58' Rt.	1155.60

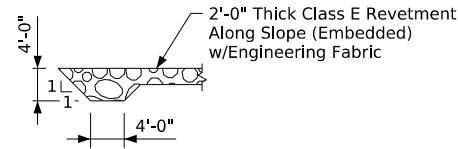
Berm slope elevations reflect the grading surface.

FILE NO. 32855	ENGLISH	DESIGN TEAM Foth	Pottawattamie COUNTY	PROJECT NUMBER BRF-059-3(060)--38-78	SHEET NUMBER V.2
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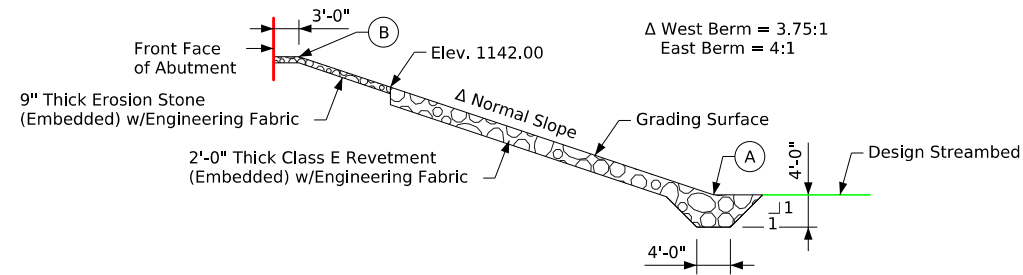
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Section Thru Embedded Revetment Key-In

(Upstream and Downstream Limits of Revetment)



Section Thru Embedded Revetment Berm



Site Plan

Design For 30 Degree Skew LA

150'-0" x 40'-0" Prestressed Concrete Beam Bridge

End Spans 150'-0" Single Span Interior Span

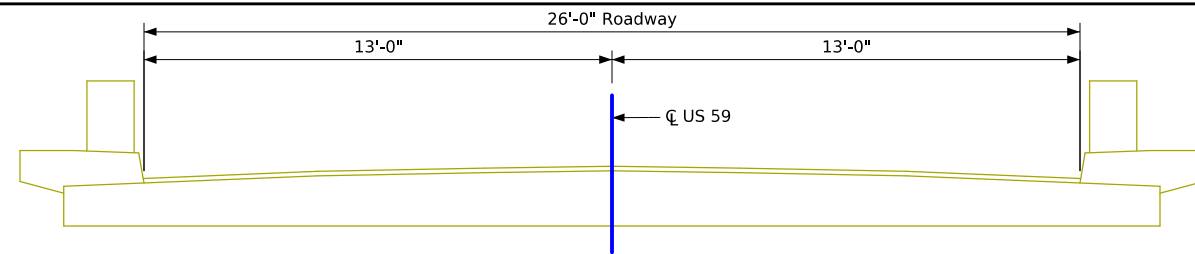
Situation Plan - Site

STA. 317+31.25 (Q US 59) Turn-in Date: Dec 2025

Pottawattamie County

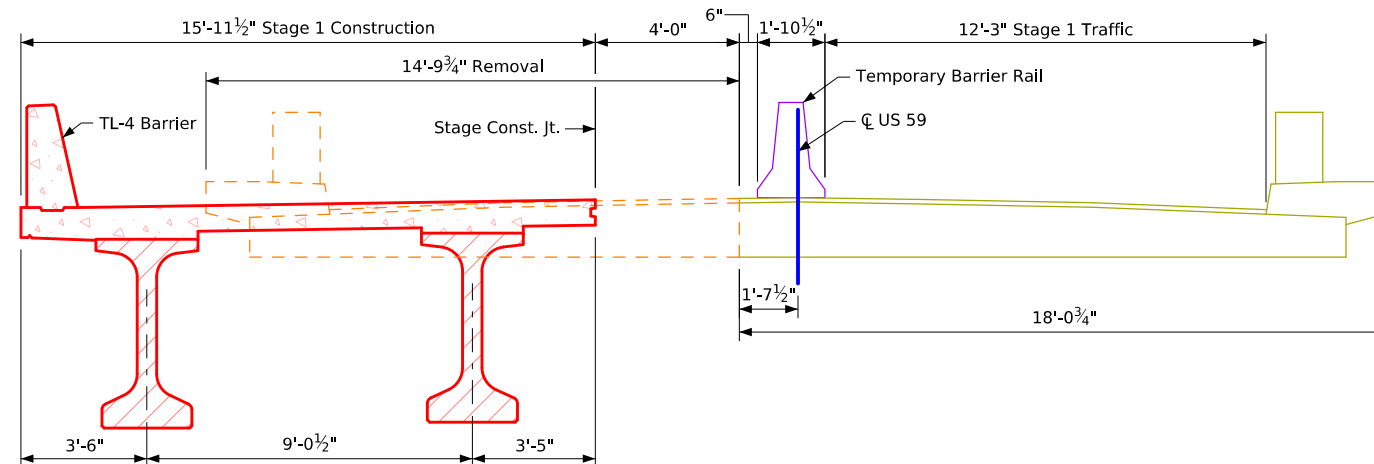
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 429 Design Sheet No. 2 of 3 FHWA No. 43431

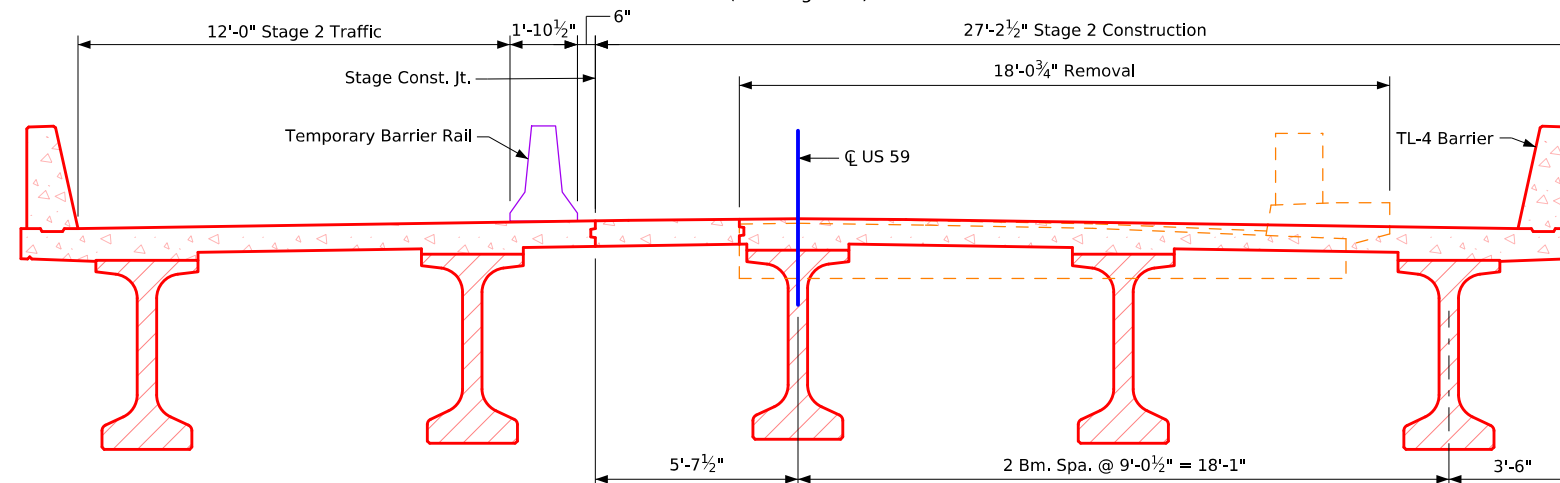


Existing Transverse Section
(Looking East)

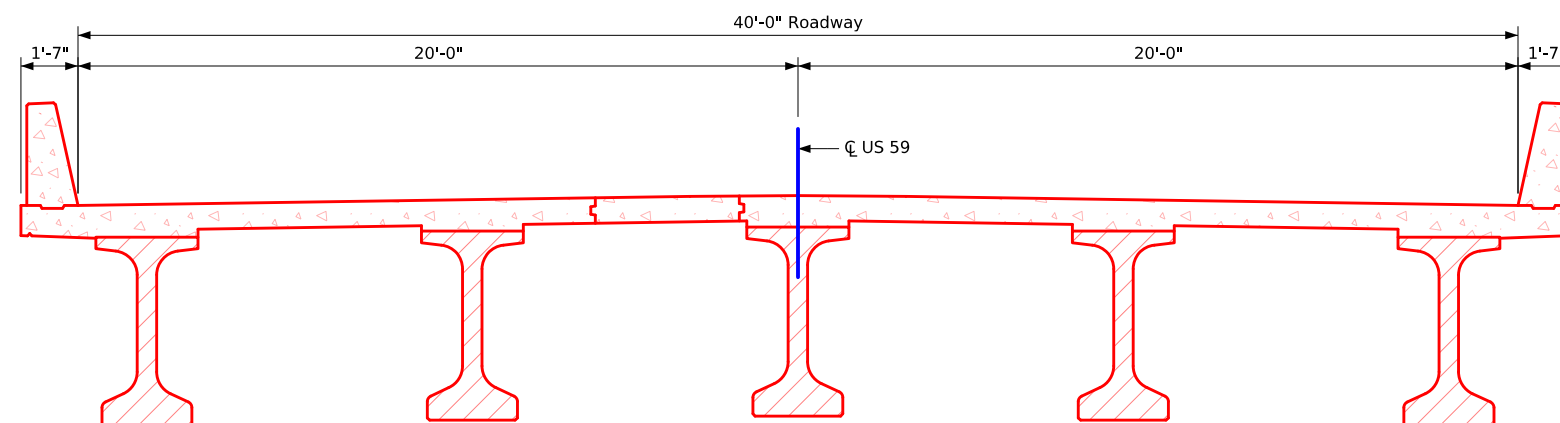
- Note:
1. The plans show a layout for TBR for both Stage 1 and Stage 2 construction. The temporary barrier rail sections adjacent to the work area for Stage 1 traffic are to remain in place until traffic is shifted to the Stage 2 traffic lane. The temporary barrier rail sections adjacent to the work area for Stage 2 traffic are to be in place prior to shifting traffic to the Stage 2 traffic lane.
 2. The Contractor shall exercise care during installation of the TBR anchors during Stage 1 and 2 to avoid interference with or damage to the deck reinforcing.



Transverse Section- Stage 1
(Looking East)



Transverse Section - Stage 2
(Looking East)



Proposed Transverse Section
(Looking East)

Design For 30 Degree Skew LA
**150'-0" x 40'-0" Prestensioned
Prestressed Concrete Beam Bridge**
150'-0" Single Span
Construction Staging & Notes
STA. 317+31.25 (CL US 59) Turn-in Date: Dec 2025
Pottawattamie County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. 429 Design Sheet No. 3 of 3 FHWA No. 43431

PRELIMINARY BRIDGE TSL DEVELOPMENT REPORT
US 59 over stream
Project No. BRF-059-3(060)--38-78
PIN: 24-78-059-040
File No. 32855
Pottawattamie County - Design No. 429
150'-0 x 40'-0 Pretensioned Prestressed Concrete Beam (PPCB) Bridge
Location: 0.6 mi. N of S Junction County Road G30
Station 317+31.25 (CL US 59)
Maintenance No. 7857.5S059
FHWA No. 43431
Work Description: Bridge Replacement - PPCB
Prepared for: Iowa DOT
Prepared by: Foth IE

TSL DEVELOPMENT DETAILS

1. BDM 3.2.2.4 - Freeboard
 - a. Q₅₀ design elevation is 1141.26 on the downstream edge of the proposed bridge.
 - b. Channel low beam at Sta. 316+68.42 and is 1149.36.
Freeboard for the proposed bridge is 8.09', which is greater than the DNR requirement of 3'. Calculation is below:

Low Step Elevation at W. Abut. = 1149.11
Bearing Device Height = 0.25'
Low Beam Elevation = 1149.36
Freeboard = 1149.36 - 1141.26 = 8.10'
2. BDM 3.2.2.7 - Scour
 - a. Design scour includes long-term degredation and contraction scour.
3. BDM 3.6.1.6 - Superstructures - PPCB
 - a. A 150' x 40' PPCB Bridge with an 8.5" deck thickness is proposed.
 - b. Estimated 2" haunches at both abutments.
 - c. BTE beams are proposed.
4. BDM 3.6.2.1 - Width - Highway
 - a. The width of the bridge was set by adding together the proposed lane widths and effective shoulder widths.
5. BDM 3.6.2.2 - Sidewalk, Shared Use Path, and Bicycle Lane
 - a. No pedestrian or bicycle facilities are included in the proposed bridge.
6. BDM 3.6.6 - Deck Drainage
 - a. The proposed bridge is located on a sag vertical curve. Deck drain locations to be determined during Final Design.
7. BDM 3.6.8 - Barrier Rails
 - a. TL-4 barrier rails conform with the BDM requirements for a mainline non-interstate bridge.
 - b. Barrier rails for this project will be the TSS TL-4 rails.
8. BDM 3.6.9 - Staging
 - a. Staged construction is proposed. Refer to Construction Staging sheet.
9. BDM 3.7.1 - Substructures - Skew
 - a. The bridge abutments will be placed at a 30 degree skew to match the channel flow direction.
10. BDM 3.7.2 - Abutments
 - a. Integral abutments will be used with 10'-0" prebored HP piling.
11. BDM 3.7.3.5 - Slope Protection
 - a. Embedded Class E revetment is proposed to an elevation equal to the Design Q₁₀₀ water surface elevation.
 - b. Embedded erosion stone is proposed above the Class E revetment to the face of the abutment.
12. BDM 3.7.6 - Foundation Conflicts
 - a. The bridge abutments will be placed behind the existing abutments.
 - b. There is a potential for conflict between proposed abutment piling and existing deadman and tiebacks. Adjust proposed pile spacing in final design to avoid existing piling.
13. Geotechnical Considerations
 - a. Multiple discussions were held between Foth, Terracon, and the Iowa DOT regarding the geotechnical investigation and global stability analysis. It was determind that 3:1 and 3.5:1 berm slopes did not provide an acceptable factor of safety for global stability. A 3.75:1 minimum berm slope is required to meet an acceptable factor of safety.

Design For 30 Degree Skew LA

150'-0" x 40'-0" Pretensioned
Prestressed Concrete Beam Bridge

150'-0" Single Span

TSL Development Report

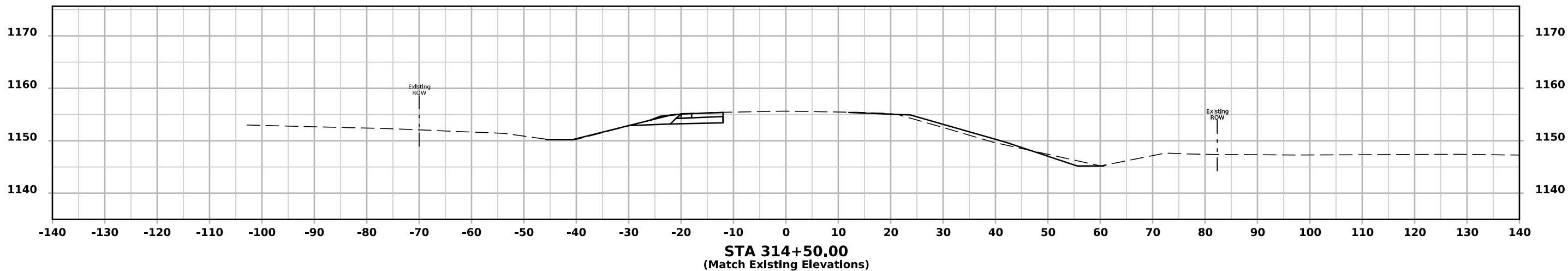
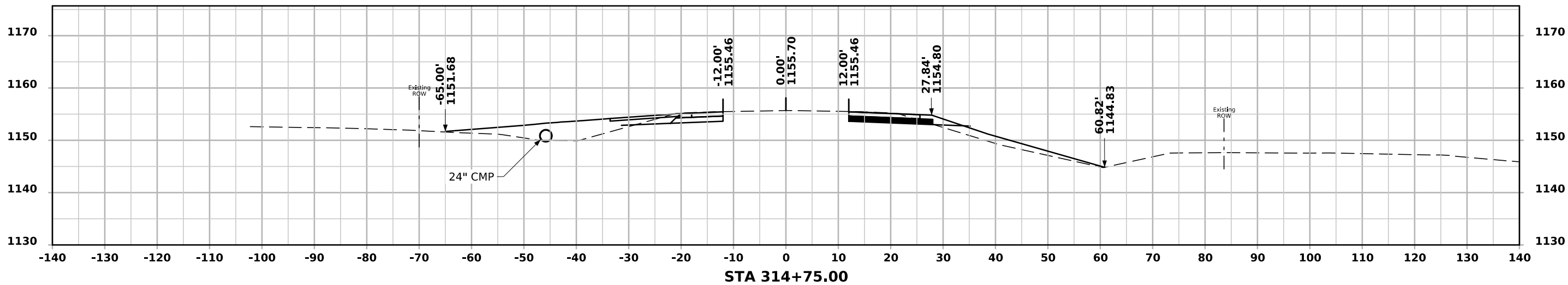
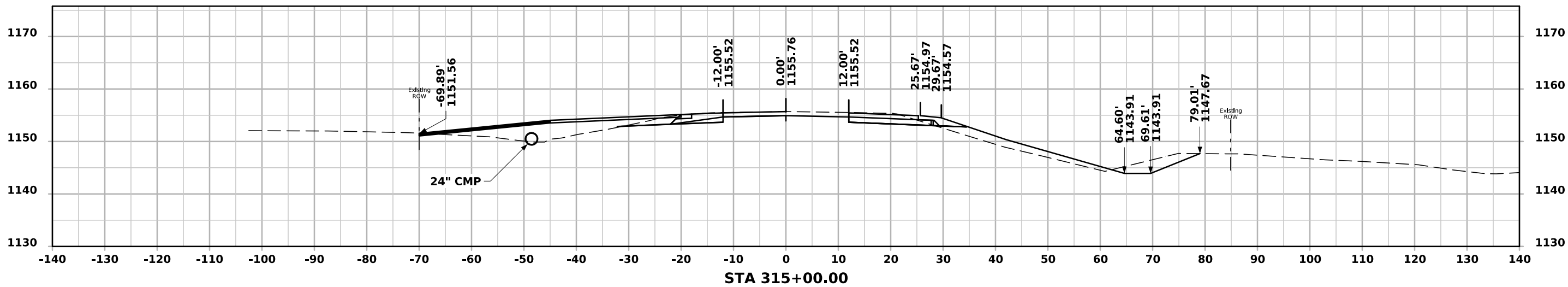
STA. 317+31.25 (CL US 59)Turn-in Date: Dec 2025

Pottawattamie County

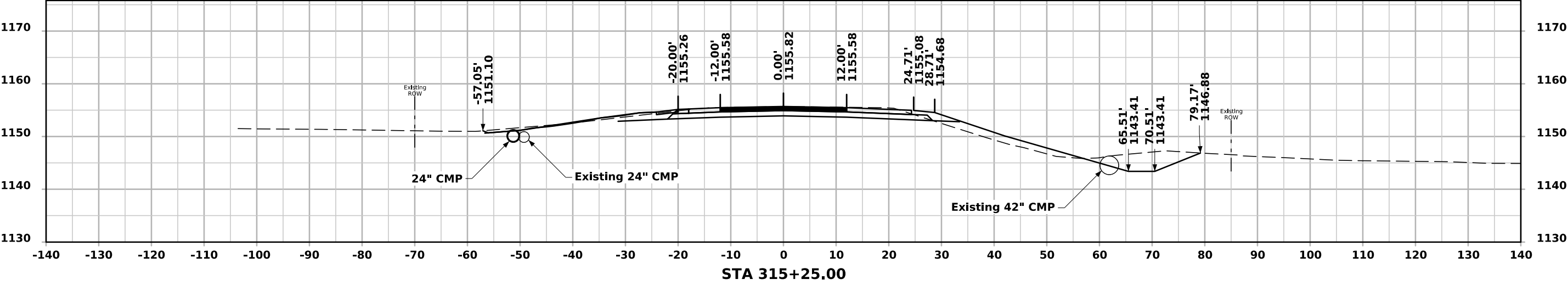
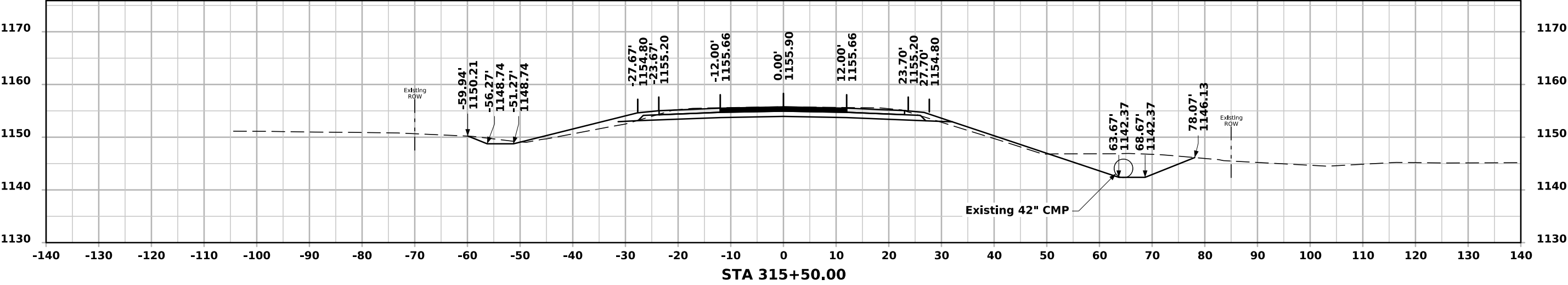
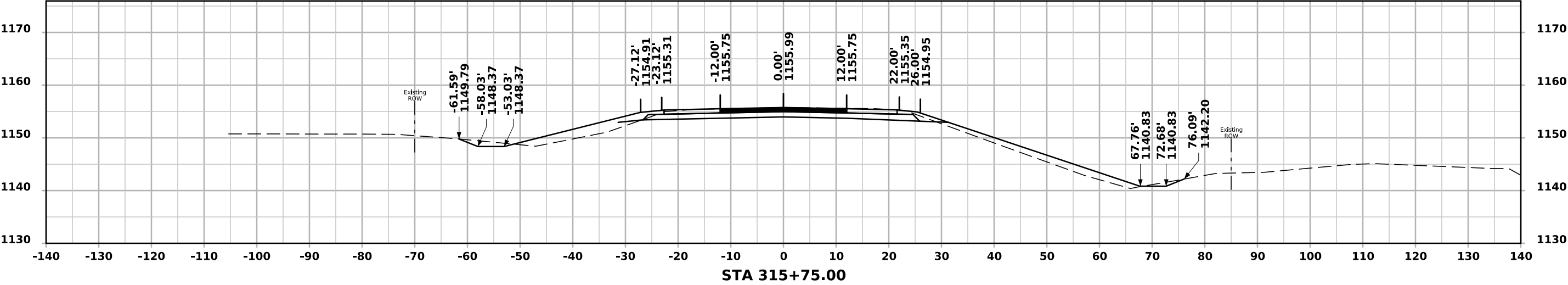
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 429Design Sheet No. ofFHWA No. 43431

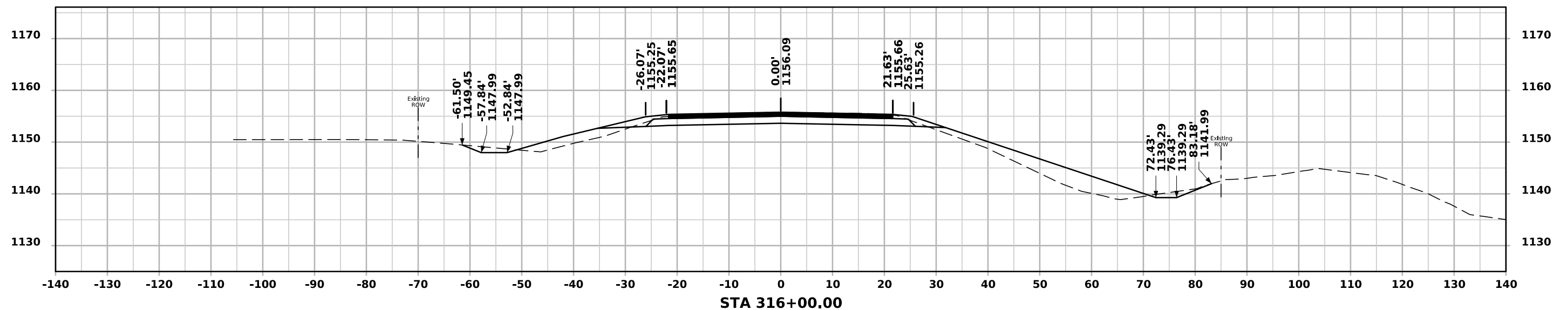
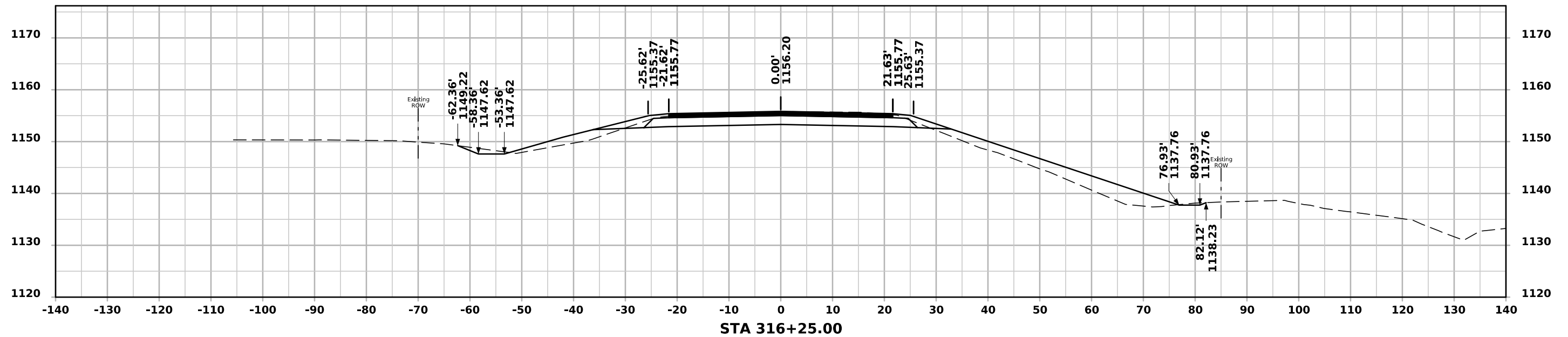
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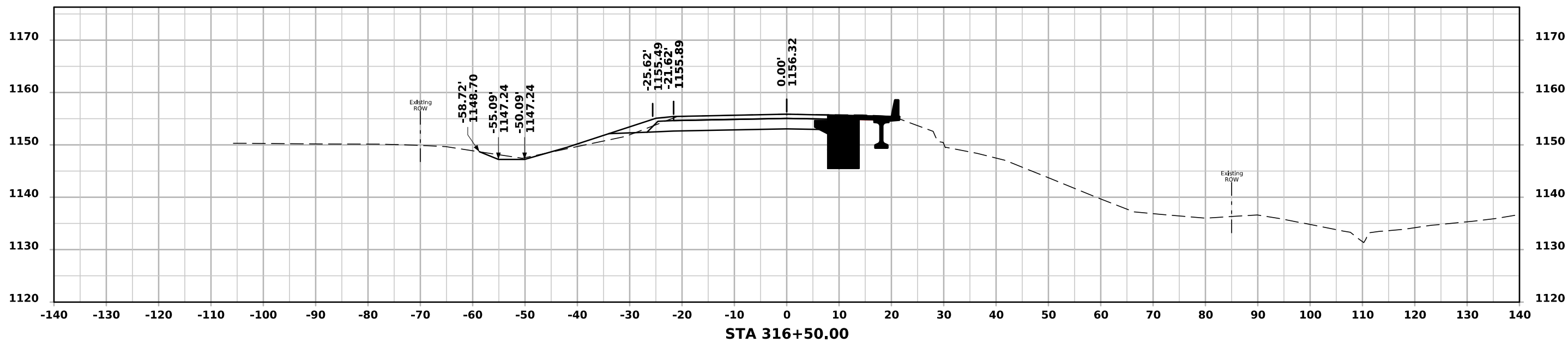
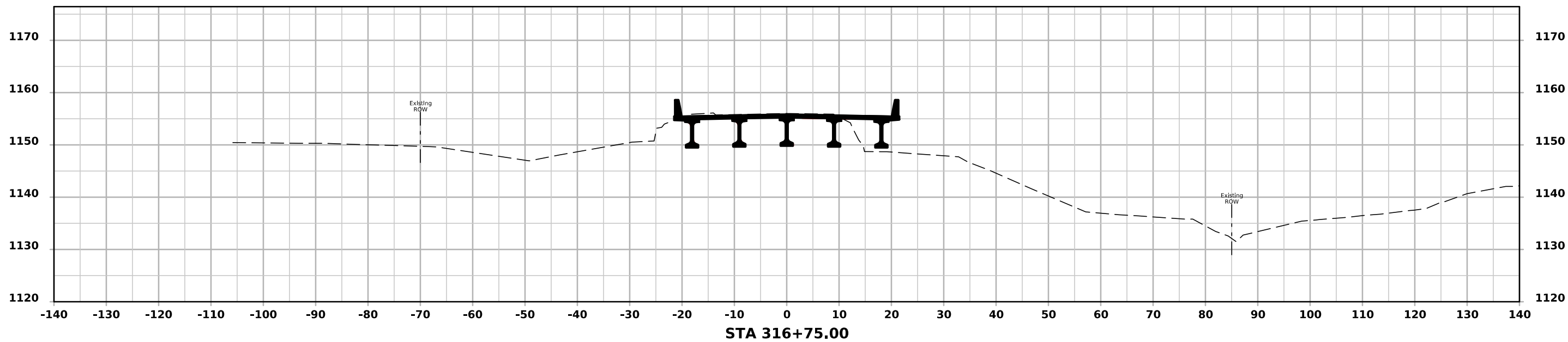
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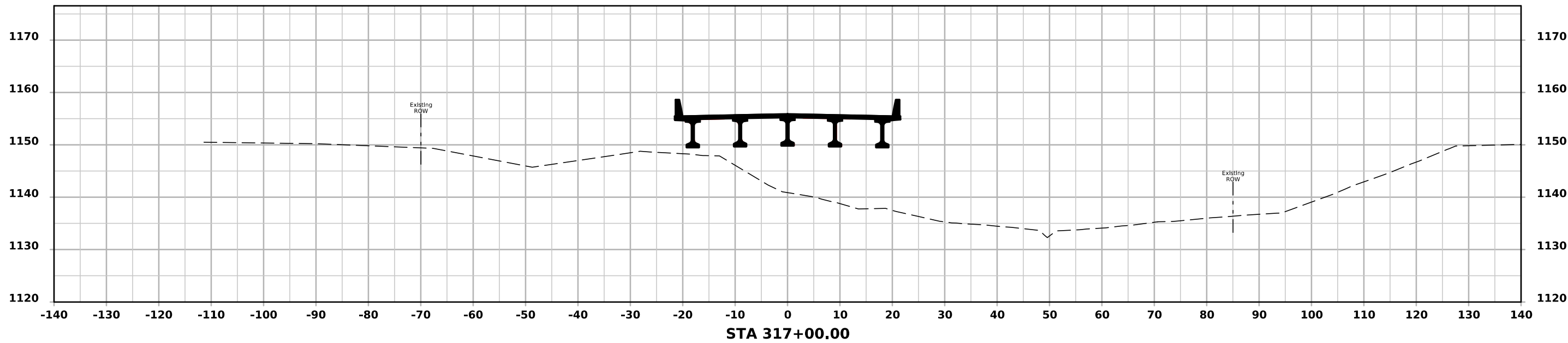
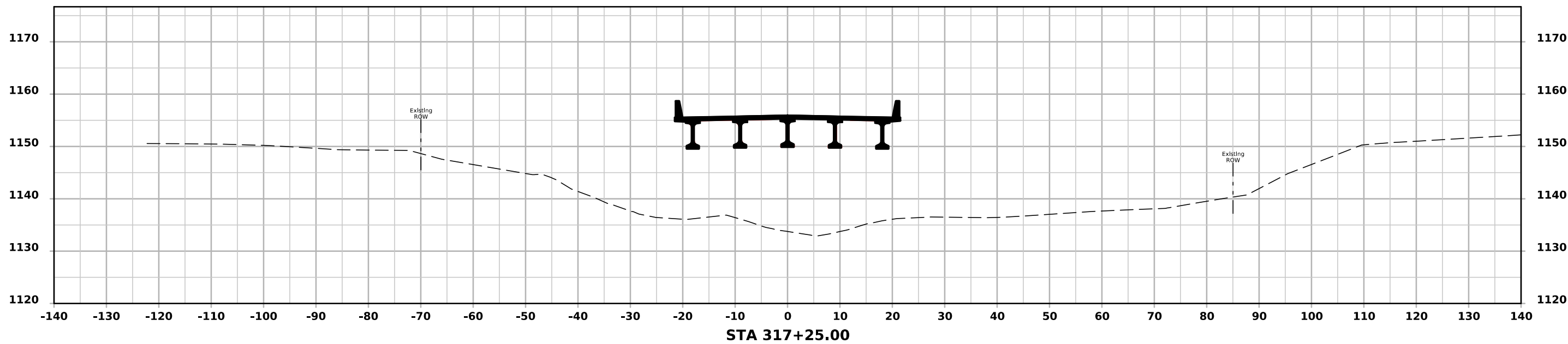
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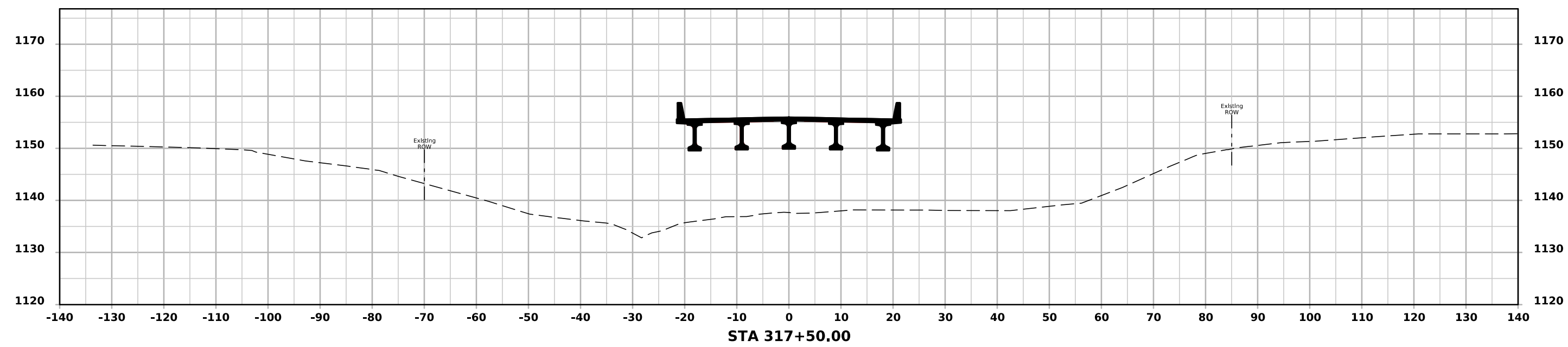
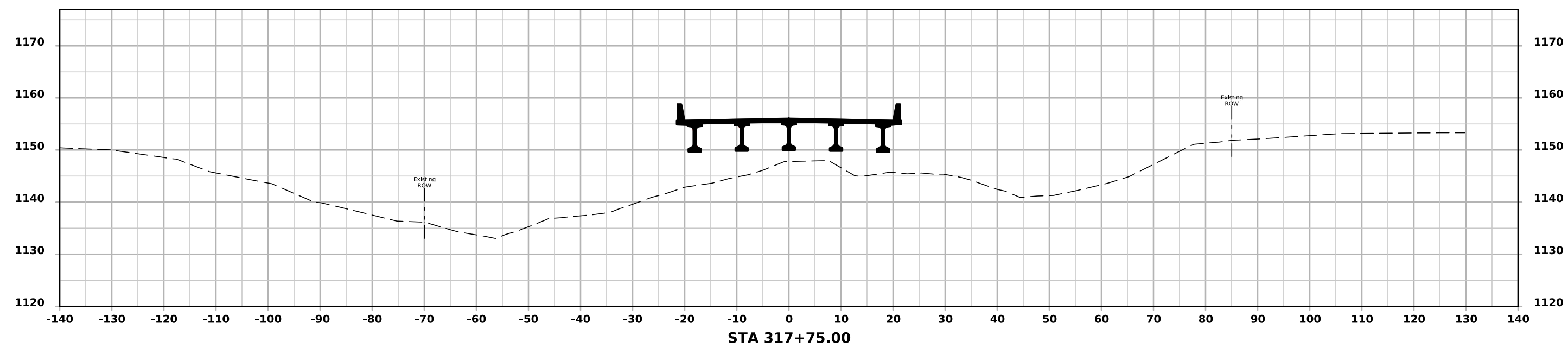
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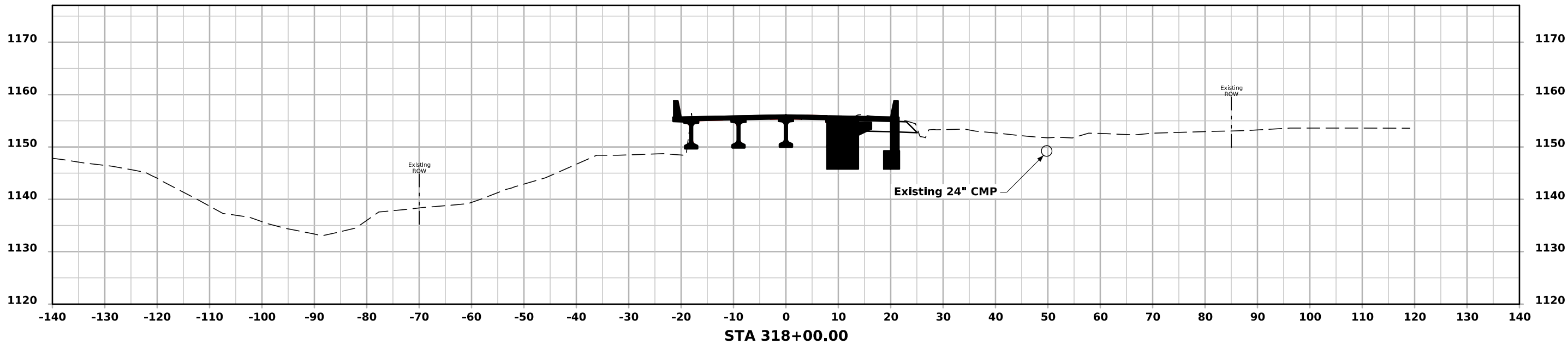
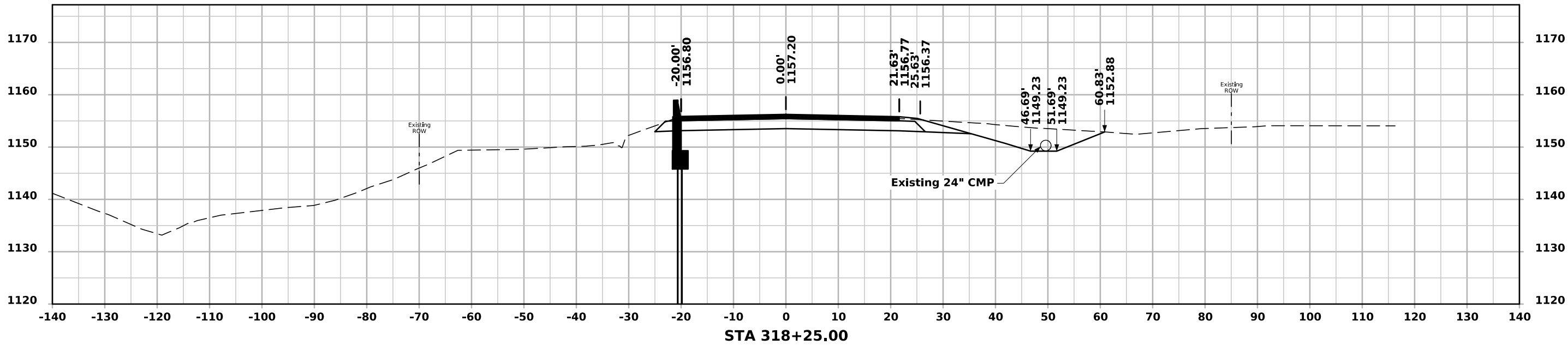
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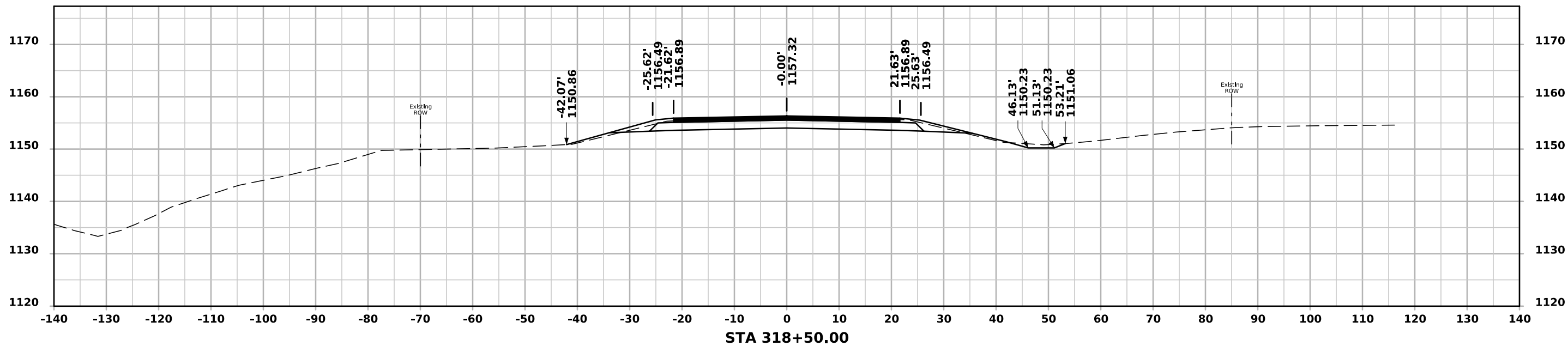
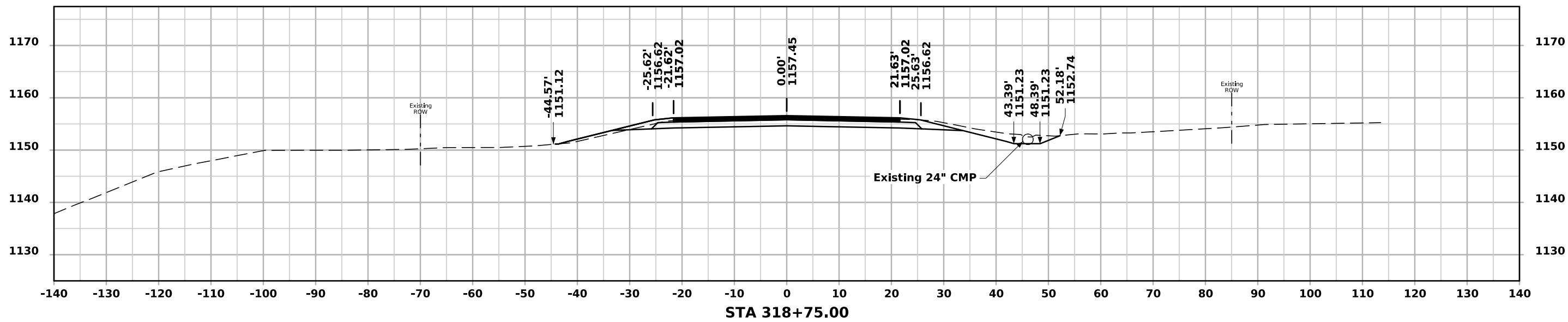
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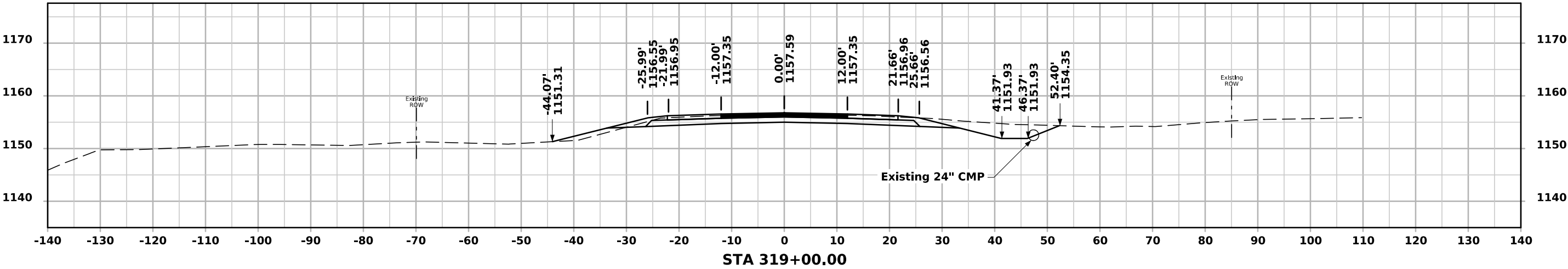
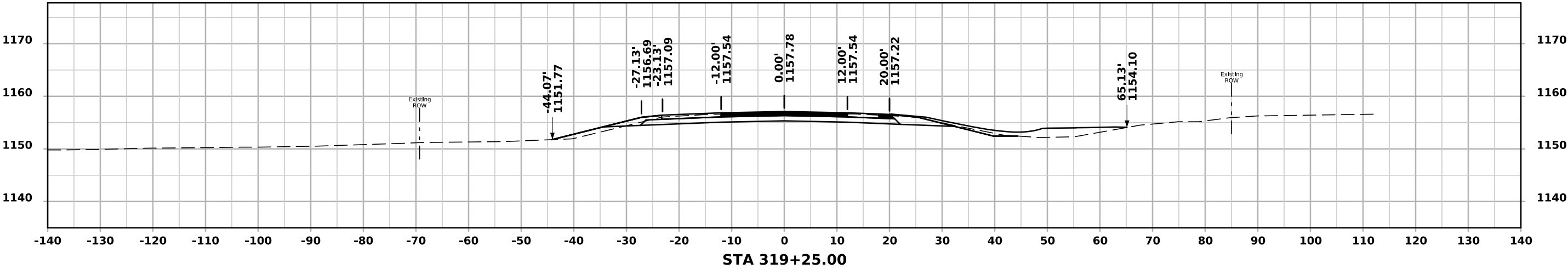
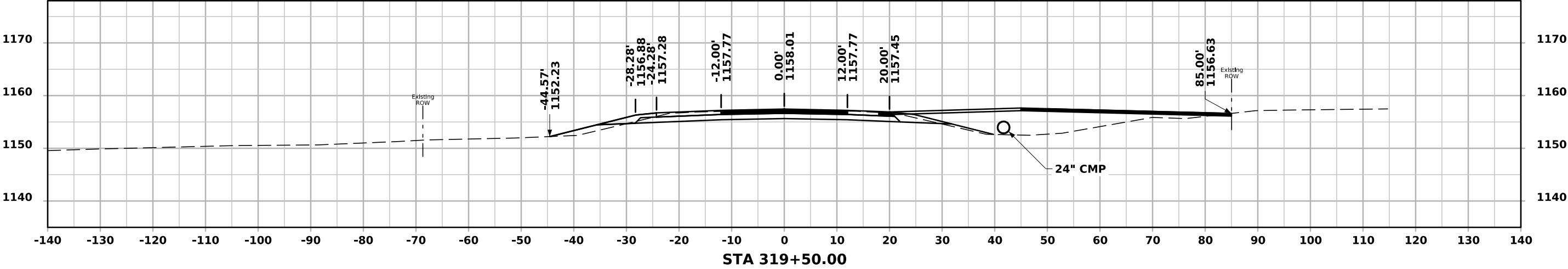
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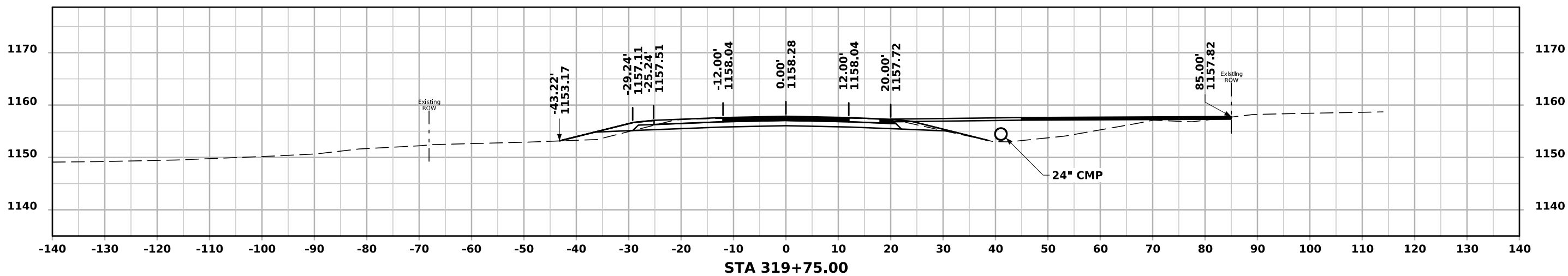
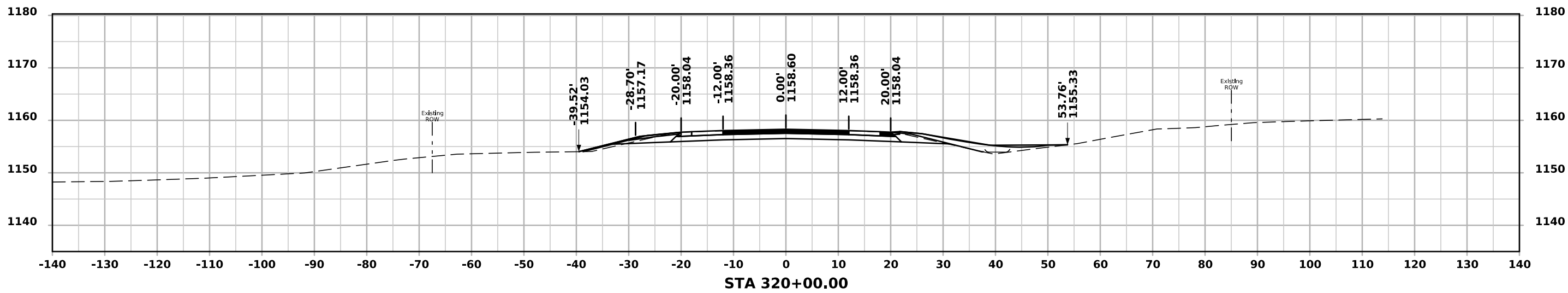
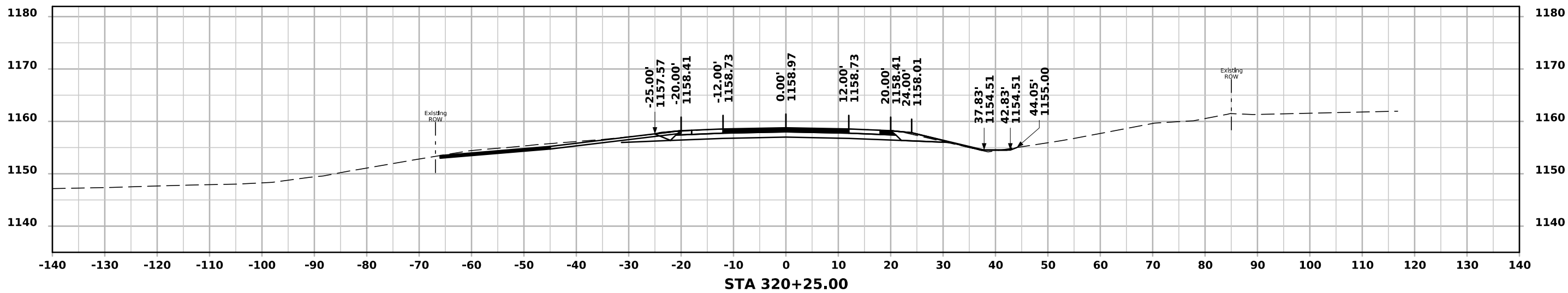
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