BRIDGE REPLACEMENT
BRF-141-1(047)--38-97

LETTING DATE
Nov. 21, 2028

WOODBURY COUNTY

IOWA DOT

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM
WOODBURY COUNTY
BRIDGE REPLACEMENT

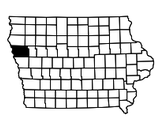
IA 141 BRIDGE
Over Smokey Hollow Creek
0.2 mi East of IA 31

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



REVISIONS	TOTAL ..
	PROJECT IDENTIFICATION NUMBER
	24-97-141-020
	PROJECT NUMBER
	BRF-141-1(047)--38-97
	R.O.W. PROJECT NUMBER

Index of Sheets

* Color Plan Sheets

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

PRELIMINARY PLANS

Subject to change by final design.

D5 PLAN - DATE: DECEMBER 12, 2025

FILE NO.	ENGLISH	DESIGN TEAM **FOTH**	**WOODBURY** COUNTY	PROJECT NUMBER **BRF-141-1(047)--38-97**	SHEET NUMBER **A.1**

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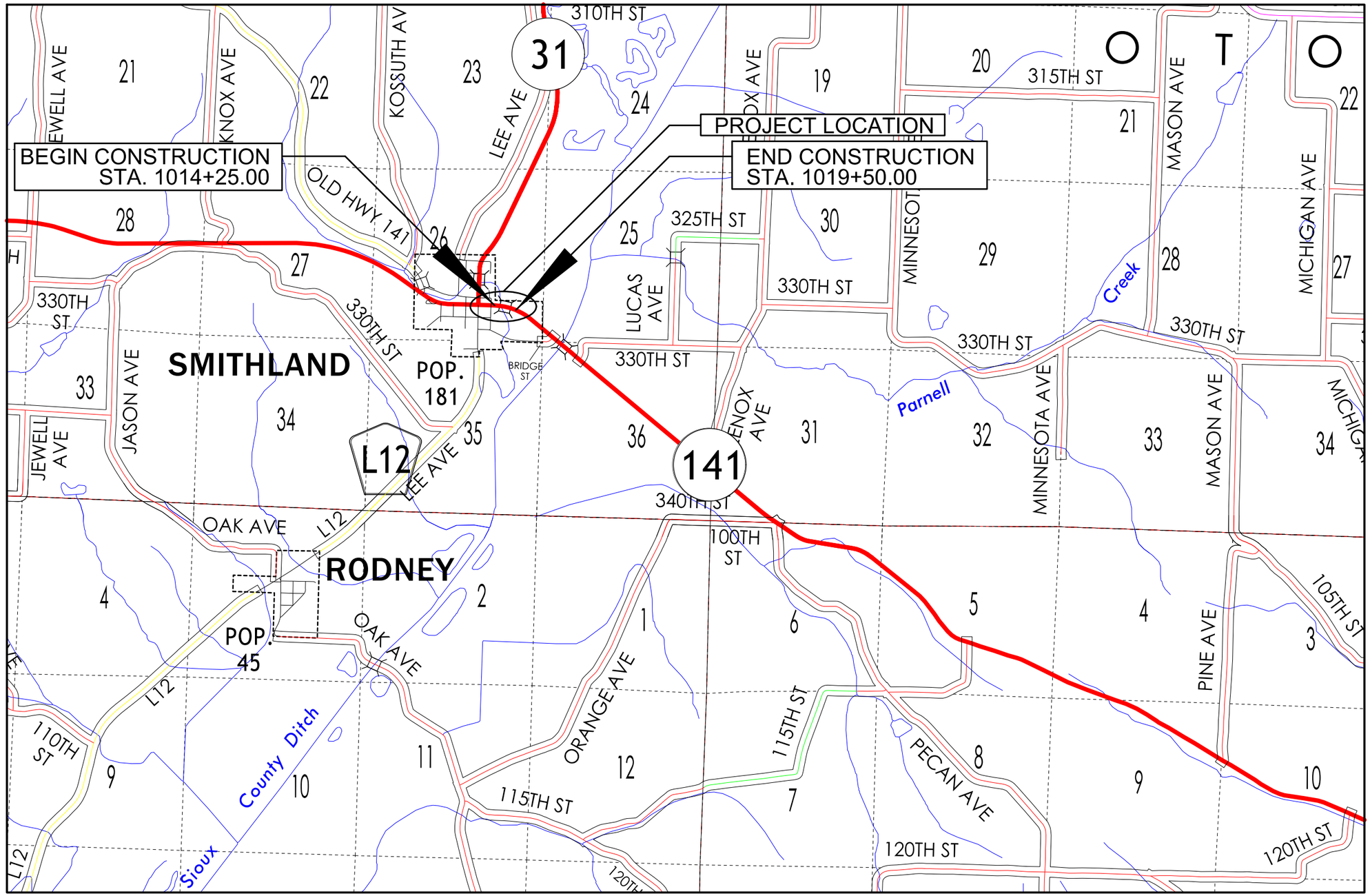

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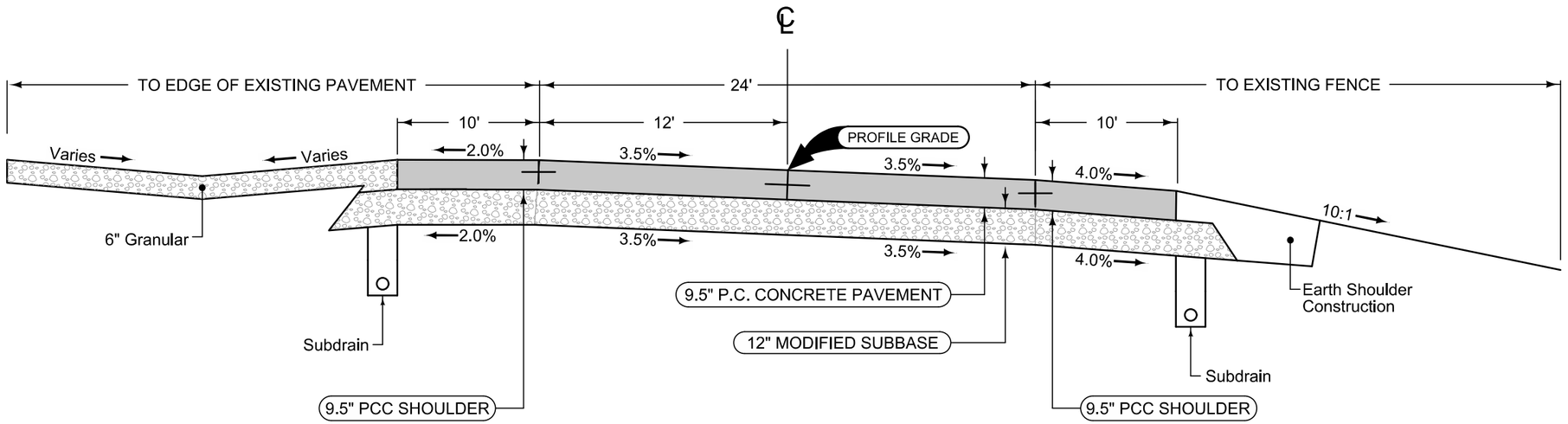
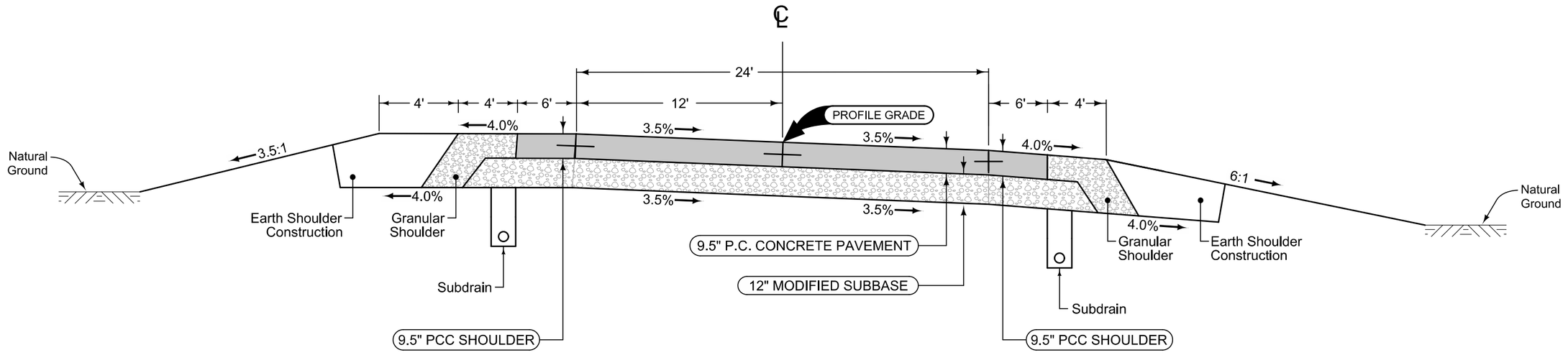


WEST OF BRIDGE TYPICAL SECTION



EAST OF BRIDGE TYPICAL SECTION

FILE NO.	ENGLISH	DESIGN TEAM **FOTH**	**WOODBURY** COUNTY	PROJECT NUMBER **BRF-141-1(047)--38-97**	SHEET NUMBER **B.1**

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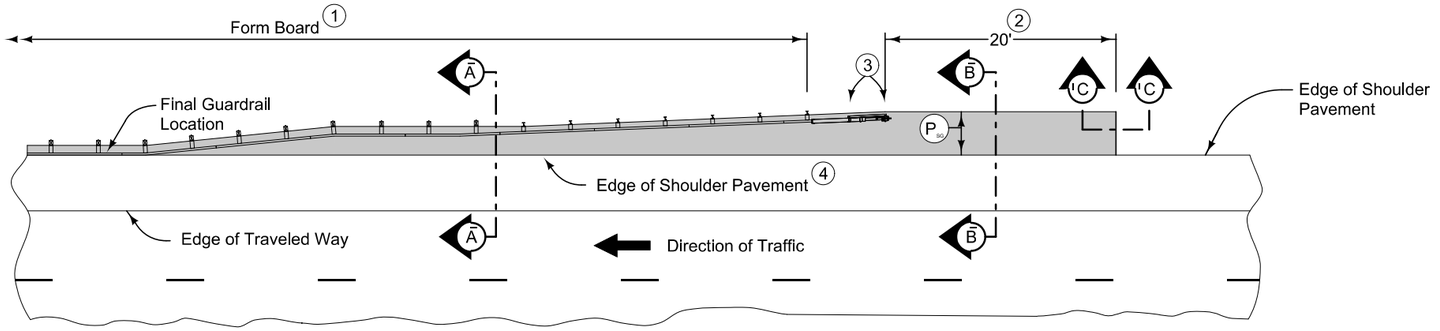
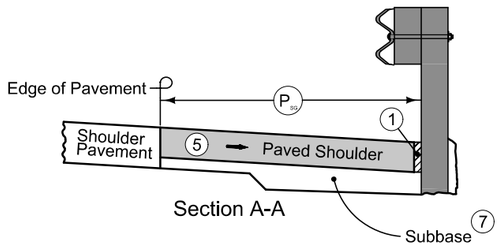
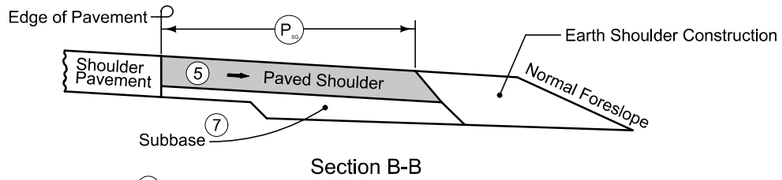
10-21-25



PLAN VIEW

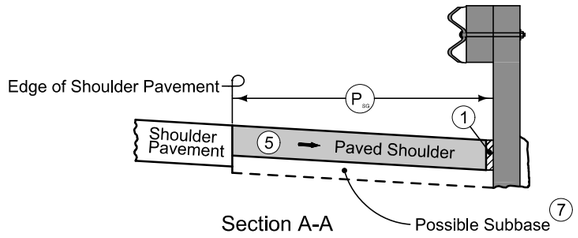


Section A-A

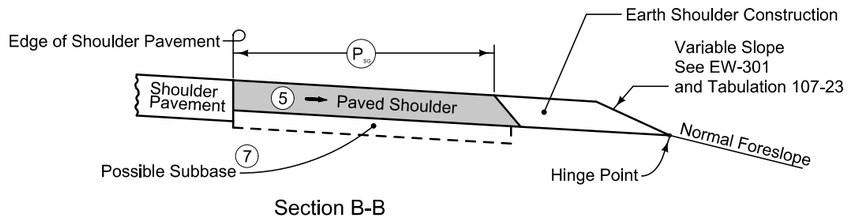


Section B-B

NEW CONSTRUCTION 6



Section A-A



Section B-B

EXISTING SHOULDER

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.

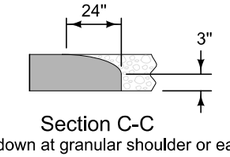
(3) Shoulder may be notched for first 2 posts or post sleeves may be installed through pavement. Do not drive posts through pavement.

(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.



Section C-C
Roll down at granular shoulder or earth.

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

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)
- 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

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.**	
Lavender	(9)	Temporary Pavement Shading
Yellow	(4)	Proposed Pavement Shading
Orange	(6)	Proposed Granular Shading
Orange	(70)	Proposed Shoulder Granular Shading
Yellow	(68)	Proposed Shoulder Paved Full Depth Shading
Yellow	(132)	Proposed Shoulder Paved Partial Depth Shading
Gray, Dark	(112)	Proposed Grade and Pave Shading "In conjunction with a paving project"
Brown, Light	(236)	Grading Shading
Orange, Light	(134)	Proposed Granular Entrance Shading
Yellow	(220)	Proposed Paved Entrance Shading
Tan	(8)	Proposed Sidewalk Shading
Blue, Light	(230)	Proposed Sidewalk Landing Shading
Pink	(11)	Proposed Sidewalk Ramp Shading
Green, Light	(225)	Existing Pavement Shading
Red	(3)	Proposed Structure Shading
Red	(3)	Delineates Restricted Areas

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

PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

(COVERS SHEET SERIES D)

FILE NO.	ENGLISH	DESIGN TEAM **FOTH**	**WOODBURY** COUNTY	PROJECT NUMBER **BRF-141-1(047)--38-97**	SHEET NUMBER **D.1**

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REMOVE & SALVAGE SIGN
REMOVE & REINSTALL SIGN
GRADING LIMIT
EXISTING R.O.W.
BROADWAY STREET
STA 1014+25.00 (ML IA141)
BEGIN CONSTRUCTION
IA 141 (MAIN ST E)
24"x300' C.M.P. (U.A.C)
(U.A.C)
15"x24' Conc. Pipe
(U.A.C)
15"x36' Conc. Pipe
BROADWAY STREET
EXISTING R.O.W.
INSTALL DR-402
REMOVE & SALVAGE SIGN
(REMOVE) 18"x26' C.M.P.
EXISTING R.O.W.
SMOKEY HOLLOW CREEK
REMOVE & REINSTALL SIGN
15' WIDE LEVEE ACCESS STA 1018+31.88
PROTECT SIGN
GRADING LIMIT
EXISTING R.O.W.
STA 1019+50.00 (ML IA141)
END CONSTRUCTION
IA 141 (MAIN ST E)
EXISTING R.O.W.
O FEET 30

1013+00 1014+00 1015+00 1016+00 1017+00 1018+00 1019+00 1020+00 1021+00

STA. 1014+25.00
ELEV. 1078.95
LT +25
1079.50
-0.10% LT Swale Grade
+0.50%
+0.80%
PROPOSED GRADE
VPI = +95.00
EL = 1079.31
L = 120.00'
K = 400
LT +73
1079.36
VPI = +77.00
EL = 1080.76
L = 120.00'
K = 66
+0.80%
-1.02%
VPI = +55.00
EL = 1078.95
L = 150.00'
K = 288
-1.02%
-0.50%
STA. 1019+50.00
ELEV. 1078.47
EXISTING GRADE
DESIGN SPEED = 40 MPH

1085 1080 1075 1070 1065 1060

1078.96 1079.08 1079.23 1079.38 1079.56 1079.75 1079.95 1080.15 1080.34 1080.46 1080.49 1080.42 1080.26 1080.02 1079.76 1079.51 1079.29 1079.08 1078.90 1078.74 1078.60 1078.47

1013+00 1014+00 1015+00 1016+00 1017+00 1018+00 1019+00 1020+00 1021+00

FILE NO.	ENGLISH	DESIGN TEAM **FOTH**	**WOODBURY** COUNTY	PROJECT NUMBER **BRF-141-1(047)--38-97**	SHEET NUMBER **D.2**

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SURVEY INDEX

County: Woodbury
PIN: 24-97-141-020
Project Number: BRF-141-1(047)--38-97, STPN-141-1(049)--2J-97
Location: Smokey Hollow Creek 0.2 mi E of IA 31
Type of Work: Topographic Survey
Project Directory: 9714102024

Survey Personnel

Dave Overman - Survey Party Chief
Jimmy Michaels - Survey Party Chief
Eric Green - Survey Party Chief
Ronaldo Polanco - Survey Party Chief
Jason Flaherty - Survey Party Chief
Matthew Schneider - Assistant Survey Party Chief

Date(s) of Survey

Begin Date	01/01/2025
End Date	05/23/2025

General Information

This survey is for IA 141 and Smokey Hollow Creek Bridge 0.2 mi E of IA 31. This survey request was for the IA 141 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

Nearby Iowa Real Time Network reference stations were utilized to obtain horizontal and vertical control on primary project control points. Three five-minute observations were taken with a minimum two-hour time span between and used in a weighted average to obtain final coordinate values. For additional details of the control survey, contact the Preliminary Survey department.

PROJECT DATUM: NAD83(2011) for EPOCH 2010.00 (IaRTN 2019 ADJUSTMENT)
COORDINATE SYSTEM: IOWA REGIONAL COORDINATE SYSTEM ZONE 4 (U.S. SURVEY FOOT)
VERTICAL DATUM: NAVD88
GEOID MODEL: 2018u3

Alignment Information

The horizontal alignment for U.S. Hwy 18 this survey is a retrace of As-built Plans 1962 No. F.N. 2B. Survey stationing was equated to the plan PI at Sta. 1019+81.4 and carried back and ahead with/without equation throughout the survey.

Survey stationing relates to as built plan stationing as follows:

POT Sta. 1008+57.3 As-built Plans 1962 No. F.N. 2B
Survey POT Sta. 1008+57.35

TS Sta. 1012+42.8 As-built Plans 1962 No. F.N. 2B
Survey TS Sta. 1012+42.85

SC Sta. 1013+92.8 As-built Plans 1962 No. F.N. 2B
Survey SC Sta. 1013+92.86

PI Sta. 1019+81.4 As-built Plans 1962 No. F.N. 2B
Survey SC Sta. 1019+81.4

CS Sta. 1025+19.7 As-built Plans 1962 No. F.N. 2B
Survey CS Sta. 1025+19.76

ST Sta. 1026+69.7 As-built Plans 1962 No. F.N. 2B
Survey ST Sta. 1026+69.77

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 04 (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 04 (U.S. Survey Foot)
VERT. DATUM: NAVD88
Geoid Model: 2018u3

Point Name	Northing	Easting	Elevation	Code - Description
200	8490427.69	14204486.47	1072.14	FENO SETMON SOUTHEAST INTERSECTION OF IA 141 AND CITY PARK ENTRANCE
201	8490945.60	14203651.56	1080.06	FENO SETMON NORTHEAST OF SMOKEY HOLLOW BRIDGE SOUTH OF ACCESS ROAD
202	8489930.69	14203679.55	1074.64	FENO SETMON SOUTHEAST OF BRIDGE NEAR SMOKEY HOLLOW AND BRIDGE STREET

CONTROL LINE DATA - ML_IA141

POINT ID	BEARING	DISTANCE (FEET)	NORTHING (Y)	EASTING (X)							
					PC	PI	PT	DELTA	R	L	T
START	S89°07'23"E	385.50 '	8490965.64	14202778.15		1008+57.35 R1					
HPI	S53°05'48"E	'	8490923.85	14203892.55	1013+92.86 R1	1019+72.73 R1	1025+18.82 R1	33°46'34"	1910.00 '	1125.95 '	579.87 '

NO ACCESS RIGHTS ARE TO BE ACQUIRED ON THIS PROJECT.

FILE NO.	ENGLISH	DESIGN TEAM	IOWA DOT * OFFICE OF ROW	COUNTY	PROJECT NUMBER	SHEET NUMBER	

Little Sioux TWP.
T-86N R-44W
SEC. 26

Smokey Hollow Creek

2D

Smithland
Drainage District

TEMPORARY EASEMENT TO SHAPE

1

J.M. Hall LLC
CP: KM Shattuck LLC

STA: 1015+37.98
OFF: 62.06' LT

STA: 1016+16.52
OFF: 65.42' LT

1015+00

1020+00

1010+00

N Broadway St

S Broadway St

141

141

Smokey Hollow Creek

0 50
FEET

Right of Way Design Information
THIS SHEET INCLUDED
FOR INFORMATION ONLY

ROW Team: CRYSTAL / CUVA
ROW #: STPN-141-1(049)--2J-97
Plan Date: 2/13/2026
Color Legend:
- Property Lines
- Temporary Easement
- Permanent Acquisition
- Permanent Acquisition County
- Permanent Acquisition City

FILE NO.	ENGLISH	DESIGN TEAM FOTH	WOODBURY COUNTY	PROJECT NUMBER BRF-141-1(047)--38-97	SHEET NUMBER H.1	

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108_25
3/28/24

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
			NO TRAVEL RESTRICTION EXPECTED				None					

108_23A
8/15/22

TRAFFIC CONTROL PLAN

Construction activity in this area will disrupt traffic on IA 141 between IA 31 and IA 175.
IA 141 will remain closed for the duration of the project, with traffic maintained via a designated detour route. Road Closures shall be in accordance with Standard Road Plan TC-252.
Information regarding the detour route is provided on Sheet J.3.

Traffic control on this project shall be in accordance with the Standard Road Plans. For additional complementary information, refer to Part 6 of the Manual on Uniform Traffic Control Devices and the current Standard Specifications.

Contractor shall install and maintain all road closures and detour signs. Coordinate closures with Engineer.

There are no existing pedestrian facilities within this project area.

108_26A
8/15/22

STAGING NOTES

Contractor shall be responsible to establish and maintain detour route.

Contractor shall maintain access to properties at all times.

Stage 1
Close IA 141 to traffic. Coordinate road closures with Engineer.
Remove existing bridge and roadway pavement.

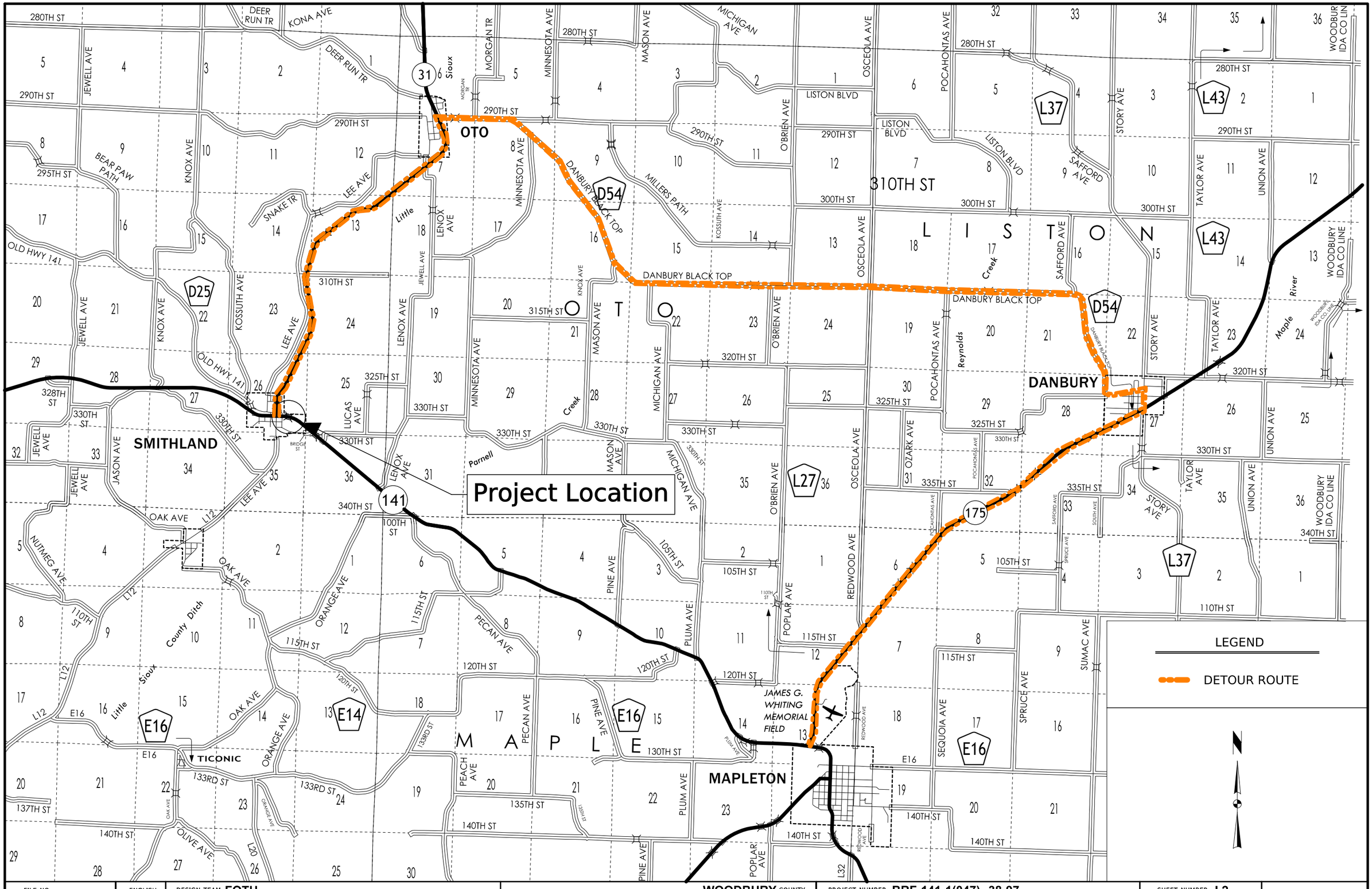
Stage 2
Complete construction of continuous concrete slab bridge and roadway reconstruction.
Coordinate the opening of IA 141 with Engineer.

108_13A
3/27/25

SAFETY CLOSURES

Refer to Section 2528 of the Standard Specifications

Station	Road Closure Qty.	Hazard Closure Qty.	Remarks
1012+75.00	1		
1014+25.00		1	
1019+50.00		1	
1026+20.00	1		



FILE NO.	ENGLISH	DESIGN TEAM FOTH	WOODBURY COUNTY	PROJECT NUMBER BRF-141-1(047)--38-97	SHEET NUMBER J.2

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Control Point 201: 8490945.60 N, 14203651.56 E, FENO set mon northeast of Smokey Hollow bridge south of Access road, Elev. 1080.06.

Hydraulic Data

RIDB: Not Applicable
Drainage Area = 2.85 Sq. Mi.
Stream Slope (HGL) = 22.65 Ft./Mi.
Avg. Low Water Stage = 1068.79

Operational Low Beam = 1077.84

Q_{50} = 995 cfs
Stage = 1074.78
Operational Freeboard = 3.04 Ft.
Avg. Bridge Velocity = 4.87 fps

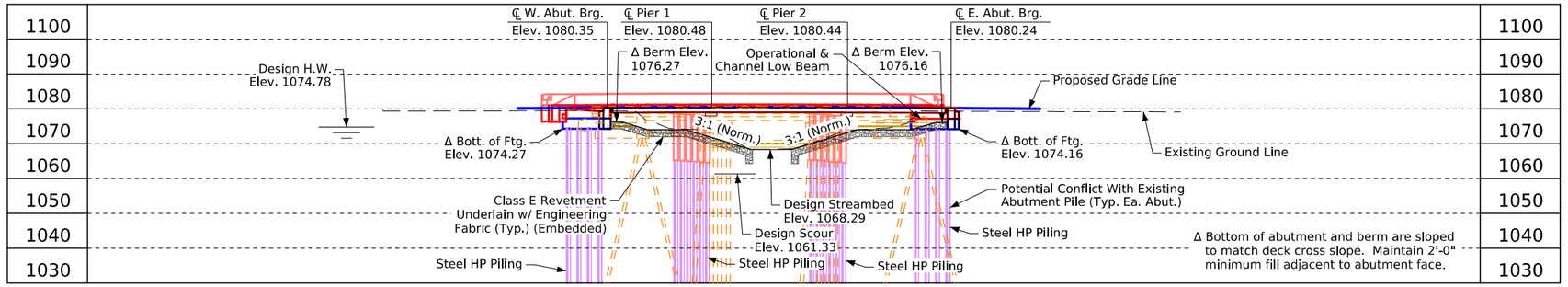
Q_{100} = 1125 cfs
Stage = 1075.09
Operational Freeboard = 2.63 Ft.
Backwater = 0.29 Ft.
Avg. Bridge Velocity = 5.08 fps

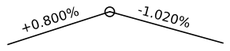
Q_{200} = 1450 cfs
Stage = 1076.11
Calculated Design Scour = 1061.33

Q_{500} = 1810 cfs
Stage = 1076.55
Channel Freeboard = 1.27 Ft.
Avg. Bridge Velocity = 5.92 fps
Calculated Check Scour = 1060.95

Extreme HW Stage = Unknown
Date = Unknown

Discharge rates and design highwater elevations are controlled by upstream NRCS (SCS) structures and adjacent levee.





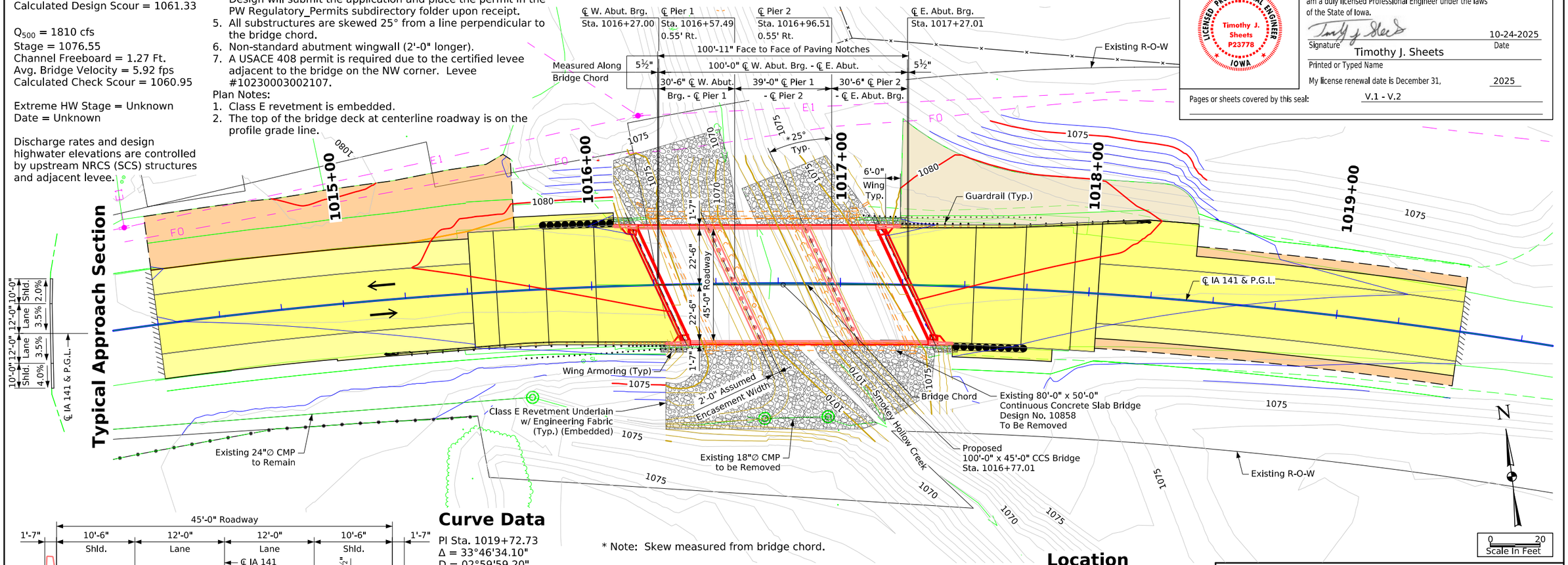
VPI Sta. 1016+77.00
VPI Elev. 1080.76
VC = 120'

Proposed Profile Grade IA 141

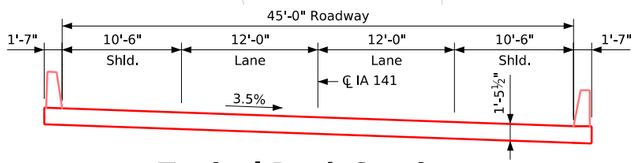
Design Notes:
1. TSS TL-4 bridge railing proposed.
2. Pier type - fully encased pile bent (P10L).
3. Standard Bridge Index No. J44 (Mod.)
4. An Iowa DNR Flood Plain Permit is required. Preliminary Design will submit the application and place the permit in the PW Regulatory_Permits subdirectory folder upon receipt.
5. All substructures are skewed 25° from a line perpendicular to the bridge chord.
6. Non-standard abutment wingwall (2'-0" longer).
7. A USACE 408 permit is required due to the certified levee adjacent to the bridge on the NW corner. Levee #10230003002107.

Plan Notes:
1. Class E revetment is embedded.
2. The top of the bridge deck at centerline roadway is on the profile grade line.

BRG TSL Longitudinal Section Along ℄ Approach Roadway



Typical Approach Section



Typical Deck Section

Curve Data

PI Sta. 1019+72.73
Δ = 33°46'34.10"
D = 02°59'59.20"
T = 579.87'
L = 1125.95'
E = 86.08'
R = 1910.00'
e = 3.5%
SC Sta. 1013+92.86
PT Sta. 1025+18.82

* Note: Skew measured from bridge chord.

Situation Plan

Traffic Estimate

2029 AADT	1930 V.P.D.
2049 AADT	2350 V.P.D.
TRUCKS	11 %
Total Design ESALs	???

General Note:
This design is for the replacement of the existing 80' x 50' Continuous Concrete Slab Bridge, Woodbury Design No. 10858, FHWA No. 53320, Maint. No. 9716.7S141.

Location

IA 141 over
Smokey Hollow Creek
T-86N R-44W
Section 26
Little Sioux Township
Woodbury County
City of Smithland
FHWA No. 53321
Bridge Maint. No. 9716.7S141
Latitude 42.228804°
Longitude -95.927840°

Hydraulic Design

LICENSED PROFESSIONAL ENGINEER
Timothy J. Sheets
P23778
IOWA

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 — 10-24-2025 Date

Timothy J. Sheets
Printed or Typed Name

My license renewal date is December 31, 2025

Pages or sheets covered by this seal: V.1 - V.2

General Utility Symbols:

E1 - Mid-American Electric Co.
FO - Iowa Communications Network
- Power Poles - Mid-American Electric Co.

Utilities Note:

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

Design For 25 Degree Skew RA

100'-0" x 45'-0" Continuous Concrete Slab Bridge

30'-6" End Spans — Radius = 1910' — 39'-0" Interior Span

Situation Plan

STA. 1016+77.01 (IA 141) — Turn-in Date: Oct 2025

Woodbury County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. xxx — Design Sheet No. 1 of 2 — FHWA No. 53321

FILE NO. xxxx	ENGLISH	DESIGN TEAM Foth	Woodbury COUNTY	PROJECT NUMBER BRF-141-1(047)--38-97	SHEET NUMBER V.1

1:44:41 PM 10/27/2025 tjs6 pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\9714102024\Bridge\(047)_Bridge-Unspecified\SHT_97141047_FOTH_DSN#_53320_Z04.dgn

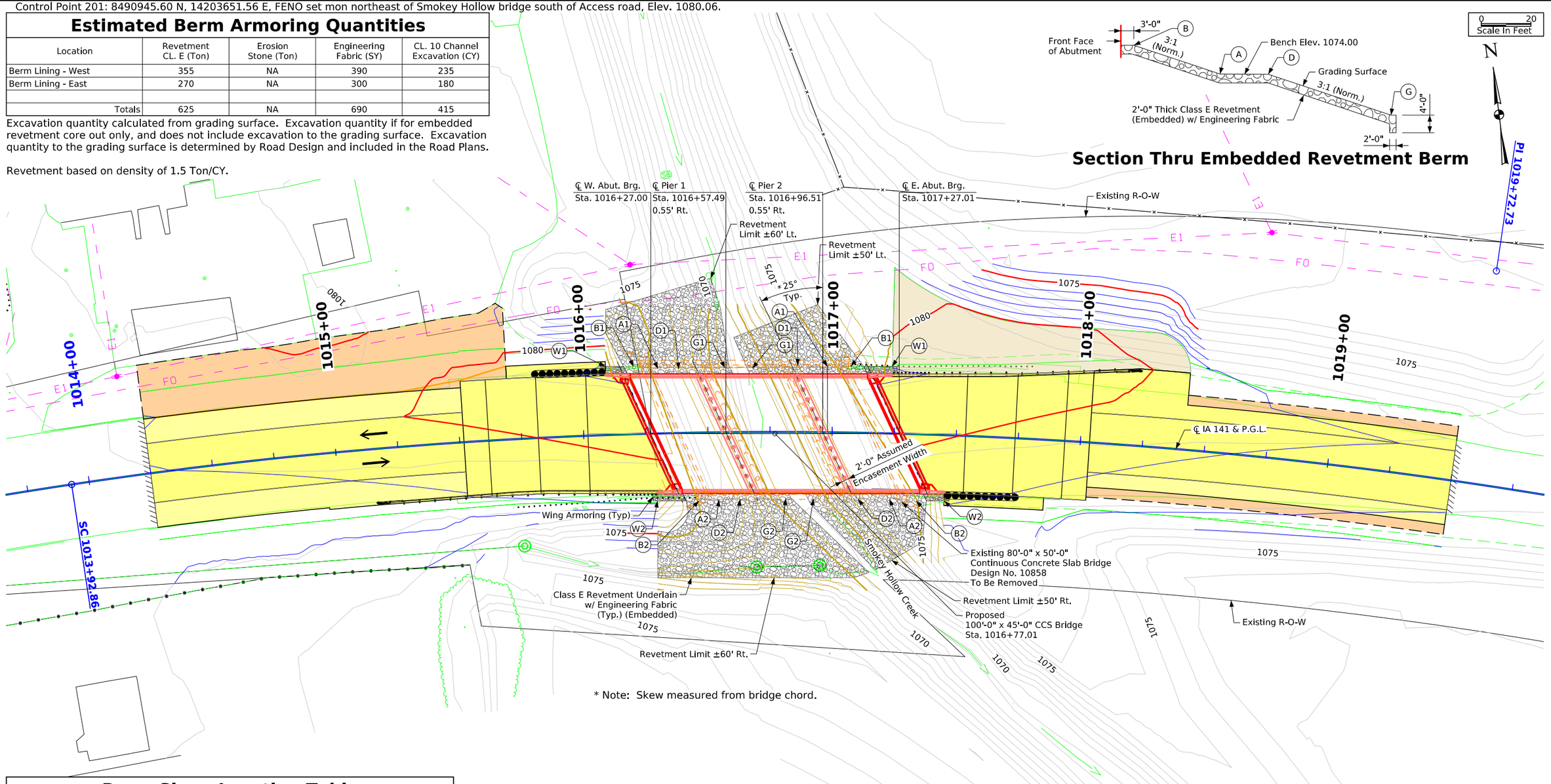
Control Point 201: 8490945.60 N, 14203651.56 E, FENO set mon northeast of Smokey Hollow bridge south of Access road, Elev. 1080.06.

Estimated Berm Armoring Quantities

Location	Revetment CL. E (Ton)	Erosion Stone (Ton)	Engineering Fabric (SY)	CL. 10 Channel Excavation (CY)
Berm Lining - West	355	NA	390	235
Berm Lining - East	270	NA	300	180
Totals	625	NA	690	415

Excavation quantity calculated from grading surface. Excavation quantity if 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.

Revetment based on density of 1.5 Ton/CY.



Section Thru Embedded Revetment Berm

* Note: Skew measured from bridge chord.

Site Plan

Berm Slope Location Table

Points	West Abutment			East Abutment		
	Station	Offset	Elev.	Station	Offset	Elev.
A1	1016+29.94	27.02' Lt.	1074.00	1016+97.95	26.55' Lt.	1074.00
A2	1016+48.62	27.53' Rt.	1074.00	1017+31.64	26.97' Rt.	1074.00
B1	1016+20.14	27.29' Lt.	1077.13	1017+08.96	26.70' Lt.	1077.21
B2	1016+44.12	27.46' Rt.	1075.39	1017+35.49	26.85' Rt.	1075.09
D1	1016+38.10	26.83' Lt.	1074.00	1016+86.35	26.45' Lt.	1074.00
D2	1016+62.61	27.68' Rt.	1074.00	1017+12.24	27.42' Rt.	1074.00
G1	1016+56.74	26.54' Lt.	1068.29	1016+67.71	26.45' Lt.	1068.29
G2	1016+81.79	27.73' Rt.	1068.29	1016+93.07	27.67' Rt.	1068.29
W1	1016+09.81	27.63' Lt.	1080.86	1017+23.51	27.00' Lt.	1080.91
W2	1016+29.15	27.15' Rt.	1079.43	1017+46.12	26.50' Rt.	1079.12

Berm slope elevations reflect the grading surface.

Design For 25 Degree Skew RA

100'-0" x 45'-0" Continuous Concrete Slab Bridge

30'-6" End Spans — 39'-0" Interior Span

Situation Plan - Site

STA. 1016+77.01 (IA 141) — Turn-in Date: Oct 2025

Woodbury County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. xxx — Design Sheet No. 2 of 2 — FHWA No. 53321

FILE NO. xxxx	ENGLISH	DESIGN TEAM Foth	Woodbury COUNTY	PROJECT NUMBER BRF-141-1(047)--38-97	SHEET NUMBER V.2

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PRELIMINARY BRIDGE TSL DEVELOPMENT REPORT October 24, 2025
IA 141 over Smokey Hollow Creek
Project No. BRF-141-1(047)--38-97
PIN: 24-97-141-020
File No. ???
Woodbury County - Design No. ???
100'-0 x 45'-0 Continuous Concrete Slab (CCS) Bridge
Location: 0.2 mi. E of IA 31
Station 1016+77.01 (CL IA 141)
Maintenance No. 9716.7S141
FHWA No. 53321
Work Description: Bridge Replacement - CCS
Prepared for: Iowa DOT
Prepared by: Foth IE

TSL DEVELOPMENT DETAILS

1. BDM 3.2.2.4 - Freeboard
   a. Q_{50} design elevation is 1074.78 on the downstream edge of the proposed bridge.
   b. Channel and operational low beam at Sta. 1017+36.59 and is 1077.85.
      Freeboard for the proposed bridge is 3.07', which is greater than the DNR requirement of 3'. Calculation is below:
      Profile grade at Sta. 1017+36.59: 1080.15
      Ordinate from PGL to edge of deck: (24.0833')(0.035) = 0.843'
      Deck Edge thickness: 1'-5½" = 1.458'
      Low Superstructure Elevation = 1077.85
      Freeboard = 1077.85 - 1074.78 = 3.07'
2. BDM 3.2.2.7 - Scour
   a. Design scour does extend below the proposed bottom of encased piers.
3. BDM 3.6.1.1 - Superstructures - Continuos Concrete Slab
   a. A 100' x 45' CCS Bridge with a 1'-5½" deck thickness is proposed.
4. BDM 3.6.2.1 - Width - Highway
   a. The minimum width of the bridge was set by adding together the proposed lane widths and effective shoulder widths.
   b. The deck was widened by 1'-0" to meet minimum shoulder widths along the roadway curve.
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. 3.6.3 - Horizontal Curve
   a. The roadway alignment includes a horizontal curve through the bridge.
   b. The distance between the bridge chord and the arc (M) is less than 1'-0". Therefore, according to BDM Table 3.6.3-2 the deck has been widened to provide fill shoulder width at all locations.
   c. Deck is built straight and parallel to the bridge chord.
7. BDM 3.6.5 - Bridge Deck Cross Slopes
   a. Bridge deck cross slope shall match superelevation of 3.5% and will be held through the entire bridge length.
8. BDM 3.6.6 - Deck Drainage
   a. The proposed bridge is located on a crest vertical curve and is superelevated. Deck drains locations to be determined during final design.
9. 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.
10. BDM 3.7.1 - Substructures - Skew
    a. The bridge abutments and piers will be placed at a 25 degree skew to match the channel flow direction.
11. BDM 3.7.2 - Abutments
    a. Integral abutments with HP piling are proposed.
12. BDM 3.7.3.5 - Slope Protection
    a. Class E revetment will extend to the face of the abutment.
13. BDM 3.7.4 - Piers and Pier Footings
    a. Fully encased pile bents are proposed for the piers.
14. BDM 3.7.6 - Foundation Conflicts
    a. The bridge abutments and piers will be placed behind the existing abutments and piers. There is potential for the proposed abutment pile to conflict with the existing battered pile along the back face of the existing abutments.

Design For 25 Degree Skew RA
100'-0" x 45'-0" Continuous Concrete Slab Bridge
30'-6" End Spans 39'-0" Interior Span
TSL Development Report
STA. 1016+77.01 (IA 141) Turn-in Date: Oct 2025
Woodbury County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. xxx FHWA No. 53321

FILE NO. xxxx	ENGLISH	DESIGN TEAM Foth	Woodbury COUNTY	PROJECT NUMBER BRF-141-1(047)--38-97	SHEET NUMBER	

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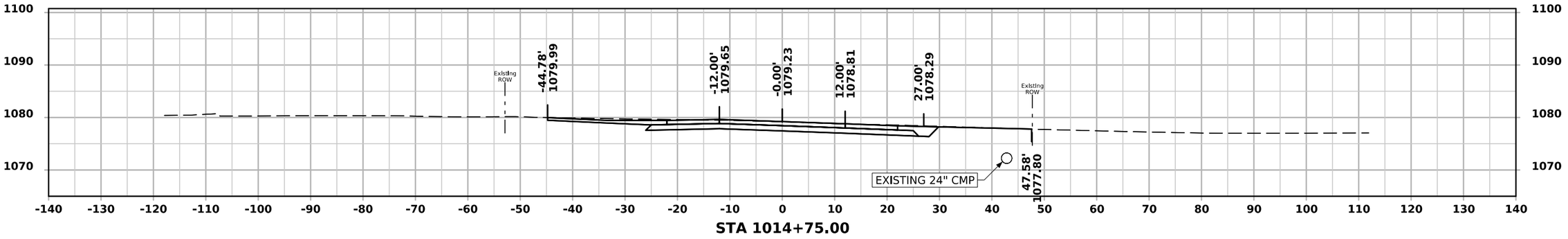
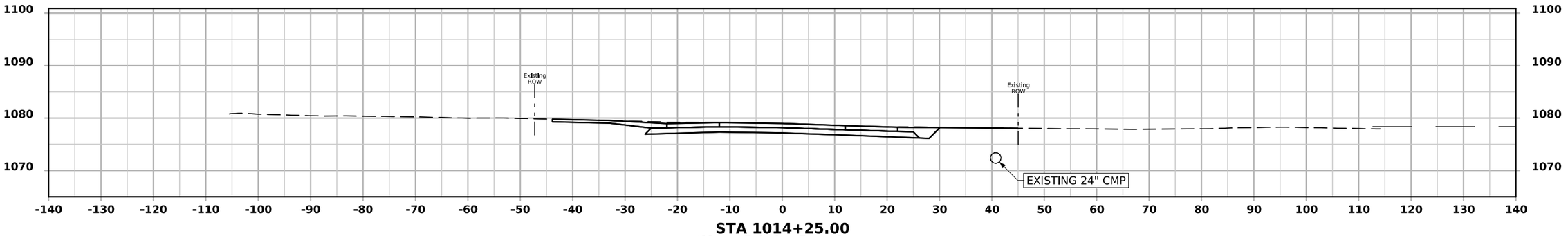
ML - IA141



STA 1014+75.00

STA 1014+50.00



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(Match Existing Elevations)

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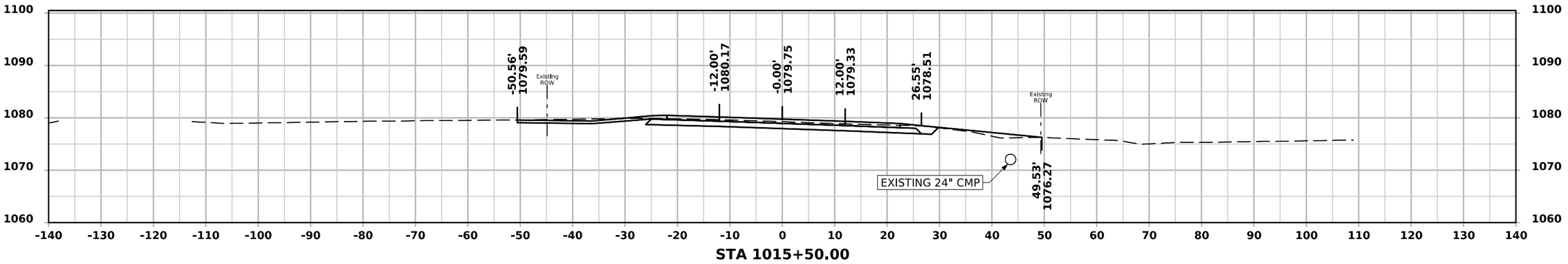
ML - IA141



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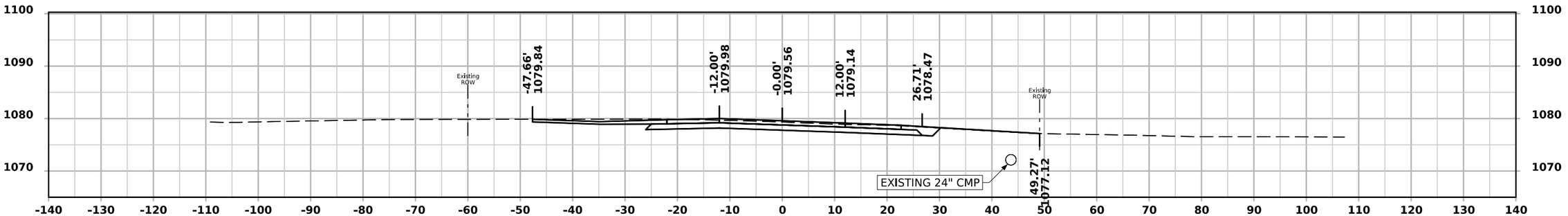

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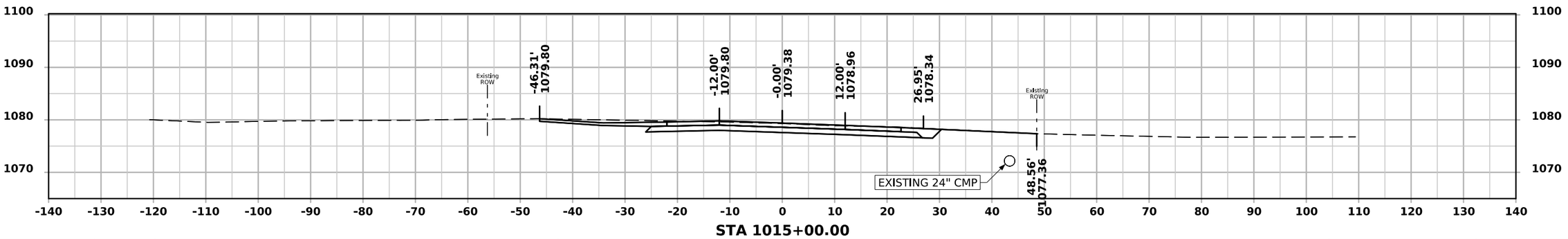

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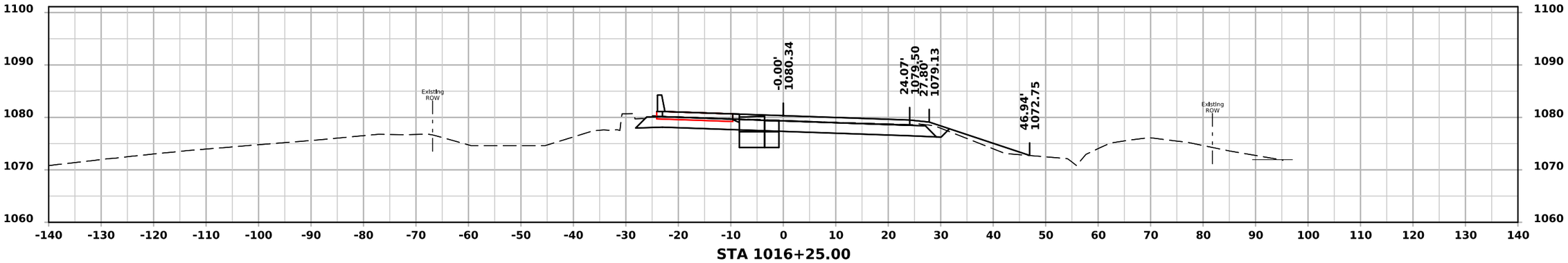
ML - IA141



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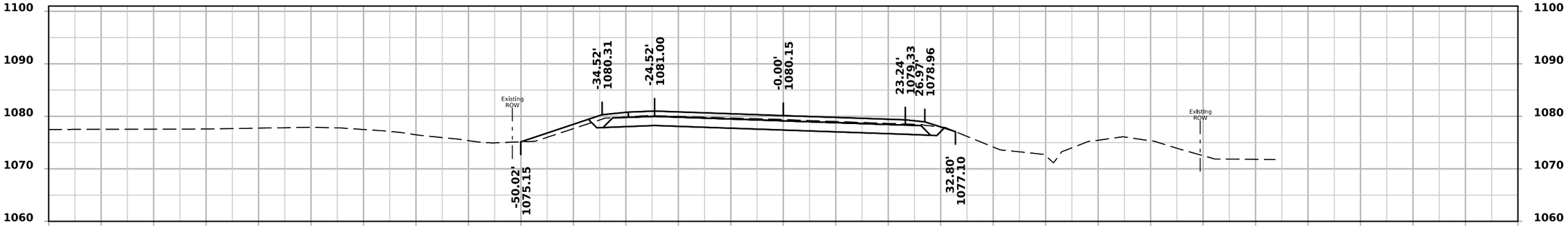

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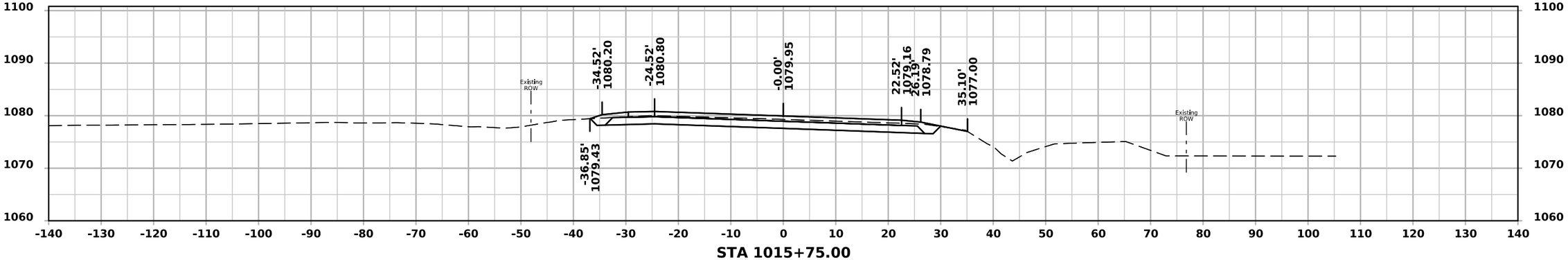

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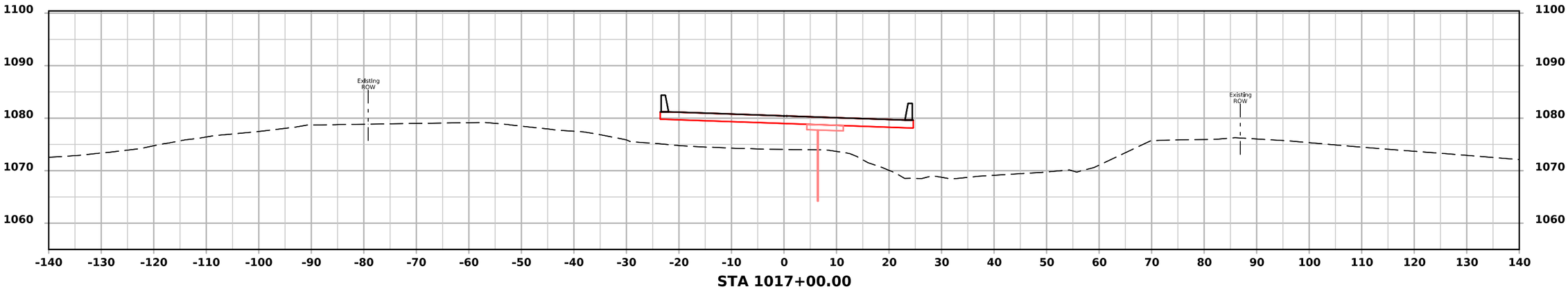
ML - IA141



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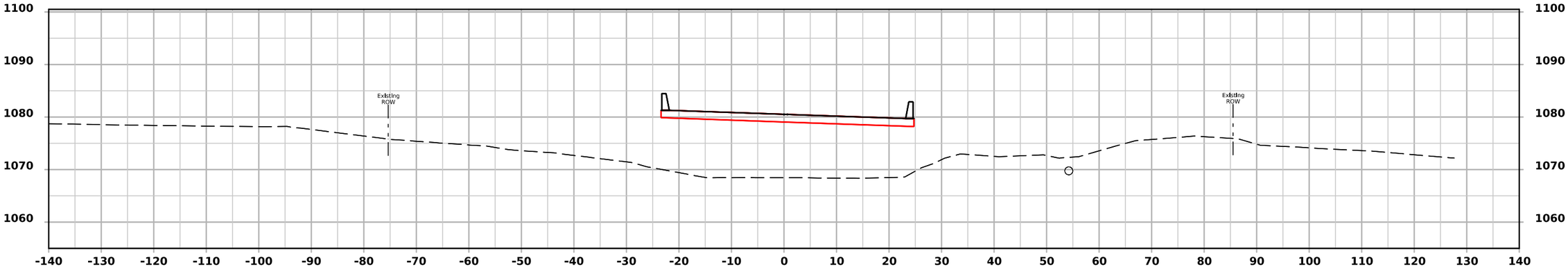

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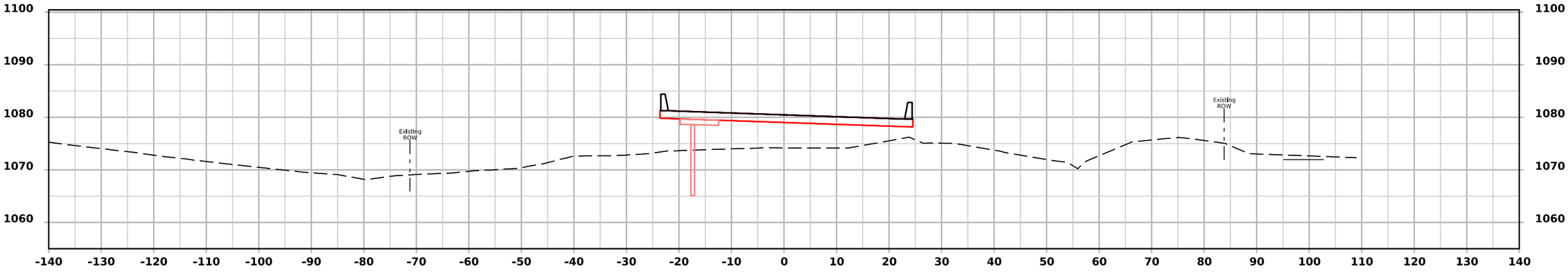

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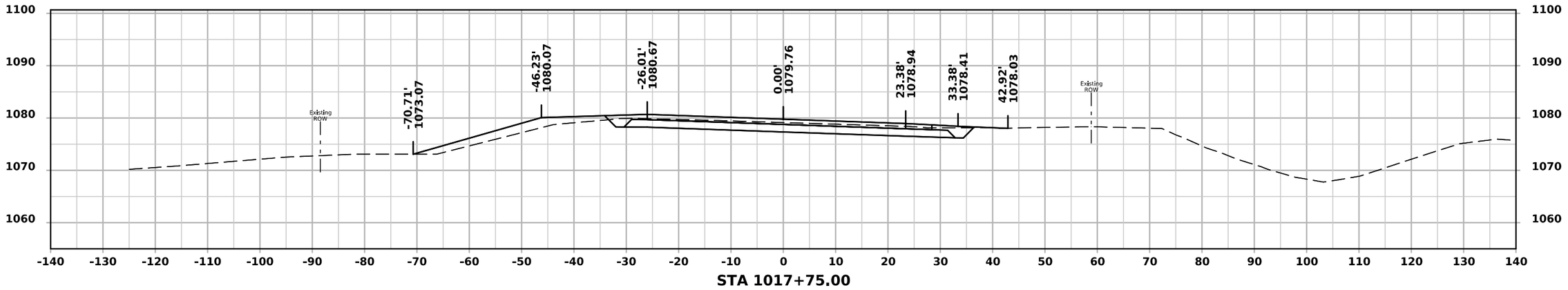

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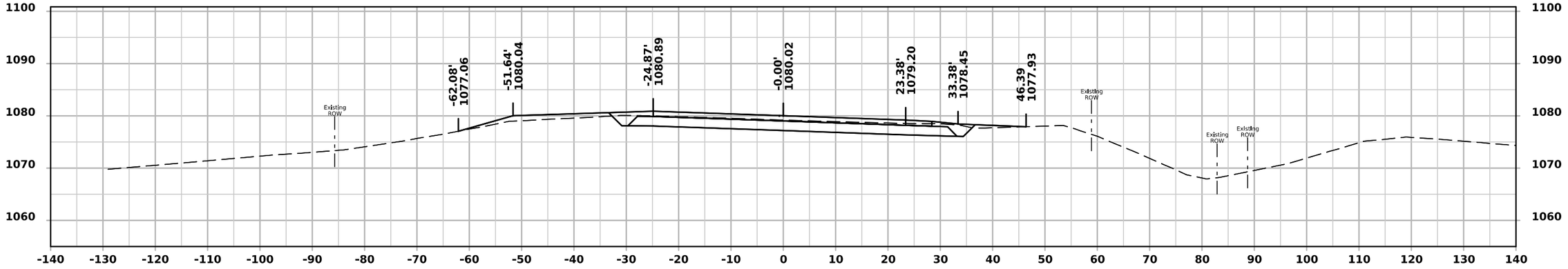

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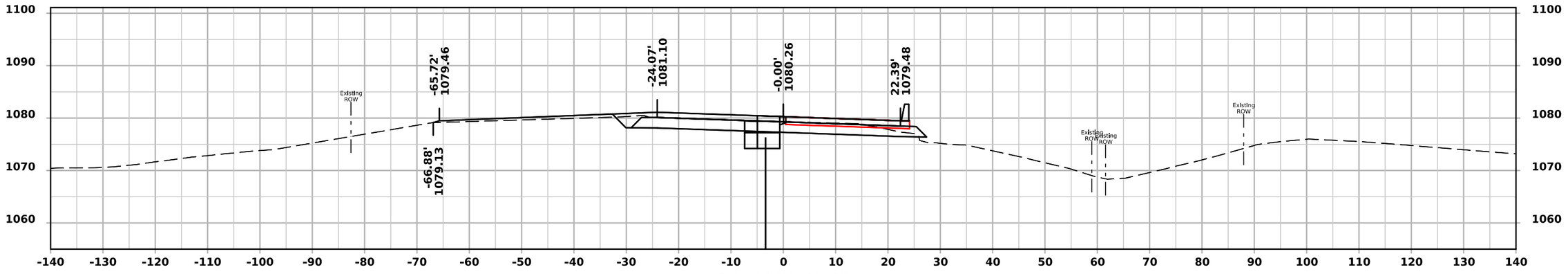

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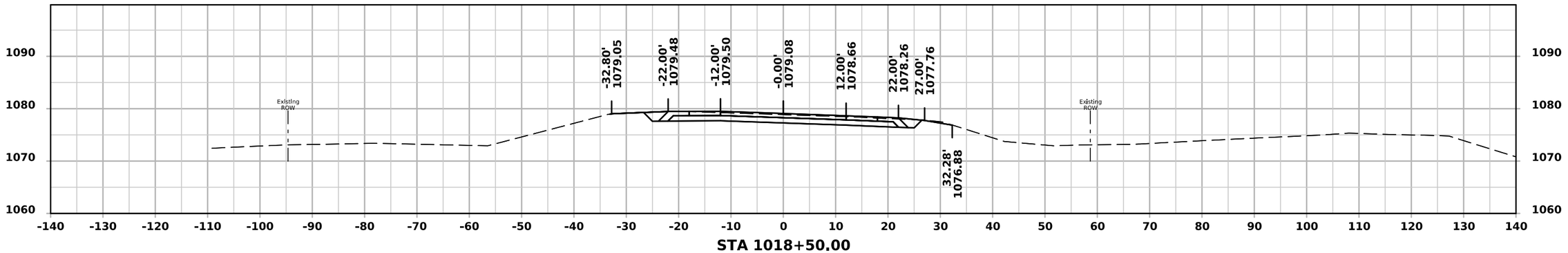
ML - IA141



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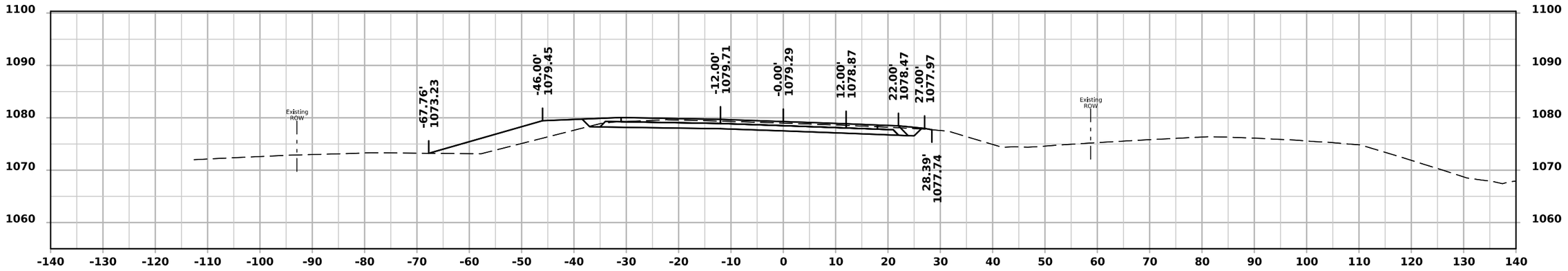

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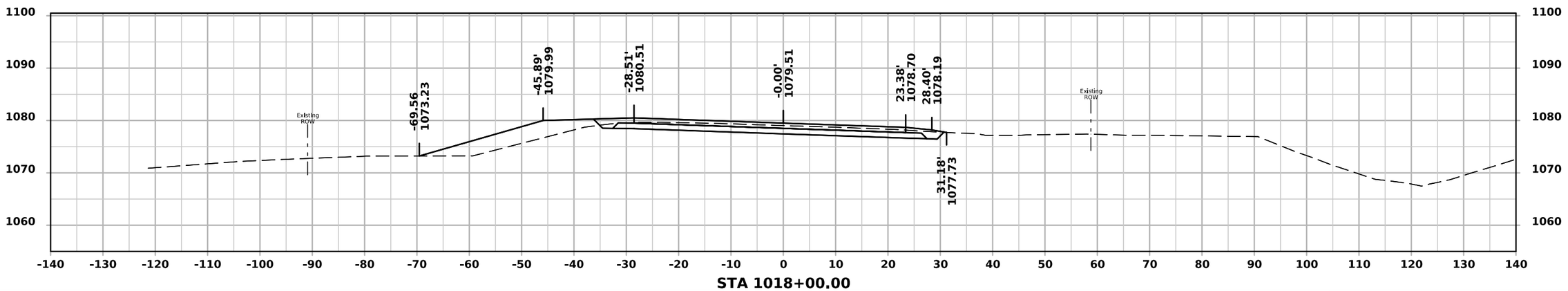

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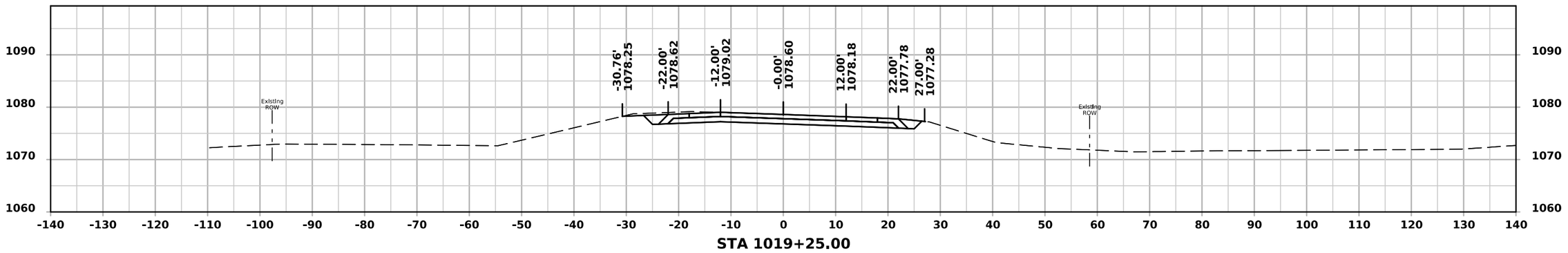
ML - IA141



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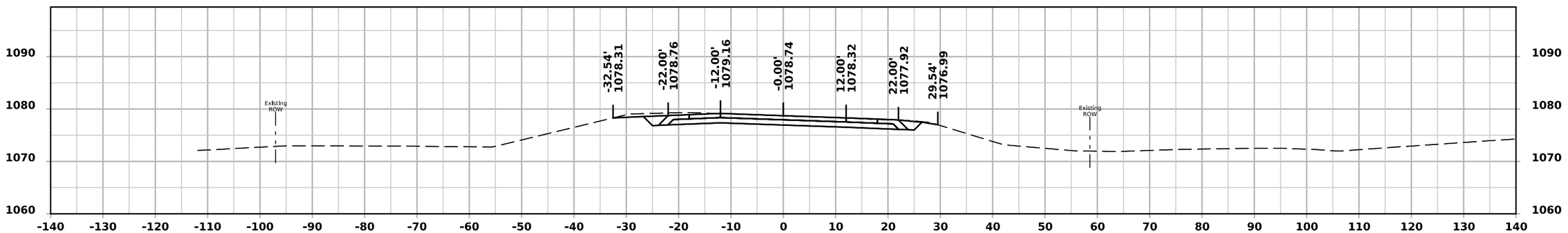

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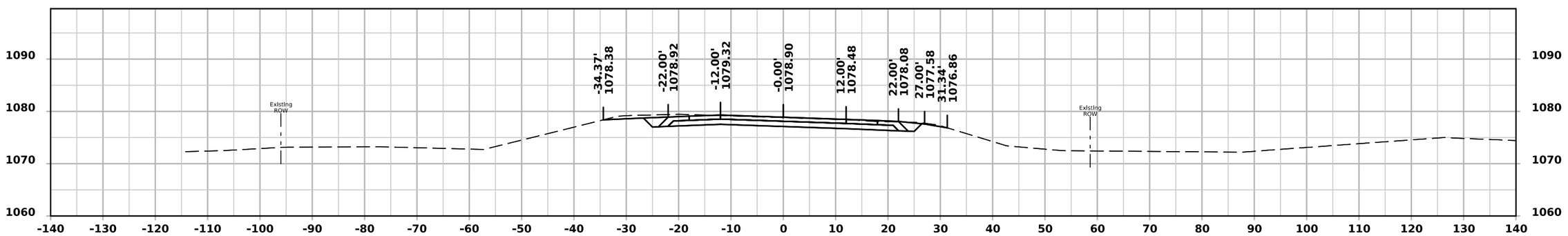

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FILE NO.	ENGLISH	DESIGN TEAM **FOTH**	**WOODBURY** COUNTY	PROJECT NUMBER **BRF-141-1(047)--38-97**	SHEET NUMBER **W.7**

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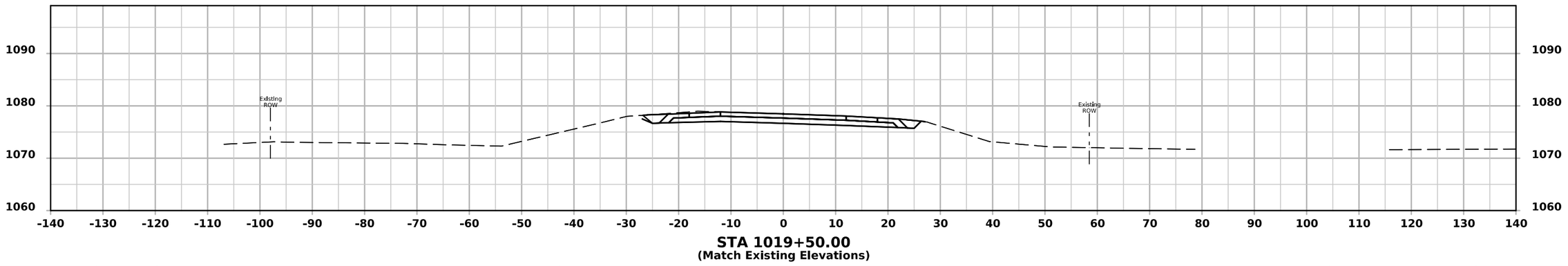
ML - IA141



STA 1019+50.00
(Match Existing Elevations)

FILE NO.	ENGLISH	DESIGN TEAM **FOTH**	**WOODBURY** COUNTY	PROJECT NUMBER **BRF-141-1(047)--38-97**	SHEET NUMBER **W.8**

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