CULVERT REPLACEMENT - TWIN BOX
BRFN-025-1(13)--39-80

LETTING DATE
Dec 19 2028

RINGGOLD COUNTY

INDEX OF SHEETS

IOWA DOT

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM
RINGGOLD COUNTY
CULVERT REPLACEMENT - TWIN BOX

IA 25
2.5 Miles North of the South Junction of J23

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

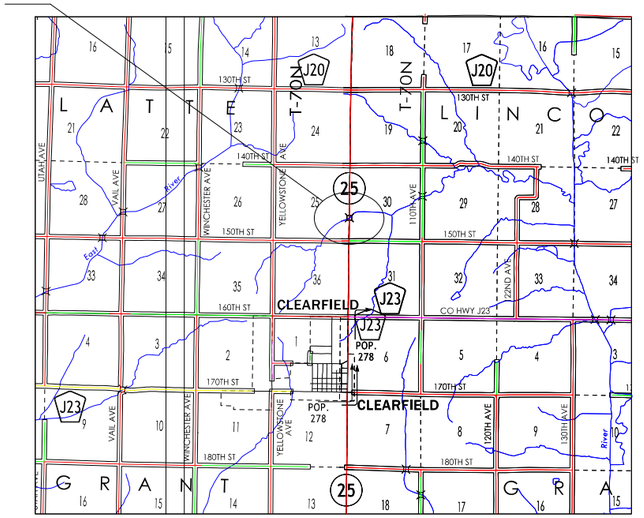
Value Engineering Saves. Refer to Article 1105.14 of the Specifications.

REVISIONS

TOTAL	22
PROJECT IDENTIFICATION NUMBER	24-80-025-010
PROJECT NUMBER	BRFN-025-1(13)--39-80
R.O.W. PROJECT NUMBER	STPN-025-1(14)12J-80
-	-

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

PROJECT LOCATION



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NOT TO SCALE

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

PRELIMINARY PLANS

Subject to change by final design.

D2 PLAN - Date: 9-24-25

FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	RINGGOLD COUNTY	PROJECT NUMBER BRFN-025-1(13)--39-80	SHEET NUMBER A.1

10:50:56 AM 8/21/2025 mkjartanson pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\8002501024\Design\CADD_Files\Sheet_Files\SHT_80025013_A01.dgn

Roadway	Iowa 25		
PIN Number	24-080-025-010	**Submittal Date**	
Project Number	BRFN-025-1(13)--39-80		**Approval Date**
District	District 4	**Assistant District Engineer**	
County	RINGGOLD	**or**	
Route	Iowa 25	**Office Director**	
Location	2.3 miles N of J23		
Work Type	RCB Replacement - Single Box		
Segment Manager			
Designer	Cindy Spencer PE		

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

Rural Two-Lane Highways (Rural Arterials)

Design Element		Preferred	Acceptable	Project Values
Design speed (mph)		60	50	60
Maximum superelevation rate (Refer to Section 2A-2)		6%	8%	6%
Design lane width (ft)		12	12	12
Full depth paved width (ft)		12	12	12
Right turn lane (ft)		12	10	N/A
Climbing Lane (ft)		12	12	N/A
Left turn lane (ft)		12	10	N/A
Pavement cross-slope (on tangent sections)	Through lanes	2%	1.5% minimum, 2% maximum	2%
	Auxiliary and turn lanes	3%	3% maximum	3%
	Crown break at centerline	4%	4% maximum	4%
Shoulder cross-slope (on tangent sections)		4%	Shoulder cross-slope cannot be less than the adjacent lane, 6% max for paved or granular shoulders, 8% max for earth shoulders	4%
Curb type (Refer to Section 3C-2)	Design speed = 50 or 55 mph	6-inch sloped	6-inch standard	N/A
	Design speed ≥ 60 mph	4-inch sloped	6-inch sloped	N/A
Foreslope (For fill areas greater than 40 ft, contact the Soils Design Section for assistance)	Adjacent to shoulder	10:1 for 4' then 6:1	3:1	10:1 / 6:1
	Beyond standard ditch depth and design clear zone	3.5:1	3:1	3.5:1
	Curbed roadways	2%	not steeper than 3:1	N/A
Backslope (For cut areas greater than 25 feet, contact the Soils Design Section for assistance with backslope benches.)		3:1	2.5:1	3:1
Transverse Slopes	w/ drainage structures	8:1	6:1	8:1
	w/o drainage structures	10:1	6:1	10:1
Ditches (Refer to Section 3G-1)	Outside ditch (depth x width) (ft)	5 x 10	--	5' x 10'
Bridge width—new*	Bridge length ≤ 200 ft	design lane widths + effective shoulder widths	design lane widths + effective shoulder widths	N/A
	Bridge length > 200 ft	design lane widths + effective shoulder widths	design lane width + 4' right and left of the design lane widths	N/A
Bridge width—existing*		design lane widths + no less than 2 ft left and right	design lane widths + 2 ft. offset left and right	N/A
Vertical clearance (ft) (above lanes, shoulders and 25 feet left and right of the center of railroad tracks)	Over primary	16.5	16	N/A
	Over non-primary	16.5 at interchange locations, 15 at all other locations	14	N/A
	Over railroad	23.3	23.3	N/A
	Sign trusses and pedestrian bridges	17.5	17	N/A
Structural Capacity		Contact Office of Bridges and Structures	Contact Office of Bridges and Structures	
Level of Service		B	B	B

*FHWA notification via email is required if acceptable critera is not met on the NHS system (No formal design exeption is required)

Design year ADT = 1250 (2016)

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

Effective Shoulder Width and Type for Two-Lane Highways

Preferred (values shown in feet)			Acceptable (values shown in feet)			Project Values
	Rural Roadways	Urban Roadways		Rural Roadways	Urban Roadways	
Turn lanes with shoulders	6	6	Turn lanes with shoulders	6	0	N/A
Turn lanes with curbs	6	See Section 3C-2	Turn lanes with curbs	6	0	N/A
	Effective Shoulder Width	Paved Width		Effective Shoulder Width	Paved Width	
Climbing Lanes	6	4	Climbing Lanes	4	0	N/A
Two-Lane Highways	Effective Shoulder Width	Paved Width	Two-Lane Highways	Effective Shoulder Width	Paved Width	
Routes where bicycles are to be accommodated	10	10	Design year ADT > 2000 vpd	8	0*	8' (granular)
On roadways approaching urban areas (due to increased bike traffic)	10	10				
On all curves with a superelevation rate of 7.0% or greater	10	10				
On roadways with design year ADT > 5000	10	6	Design year ADT between 400 - 2000 vpd	6	0*	
On all other NHS	10	6				
On non-NHS routes with design year ADT > 3000	10	6	Design year ADT < 400 vpd	4	0*	
On non-NHS routes with design year ADT < 3000	8	0*				

*Requires safety edge-Refer to Section 3C-6

Curbs should be located beyond the outer edge of the effective shoulder width in rural areas

Refer to Section 3C-2 for curb offsets in urban areas

Notes: Existing roadway has full width granular shoulders

Roadway Design Speed (mph) = 60

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

Design Criteria for High Speed Roadways

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

PROJECT CONCEPT STATEMENT

RCB on Iowa 25 over Stream

Ringgold County
Project # BRFN-025-1(013)--39-80
PIN: 24-80-025-010
Maint. No. 8017.9S025
FHWA No. 046490

Prepared for:
Iowa Department of Transportation
District 4
Wes Mayberry, P.E.

Prepared by: Snyder & Associates, Inc. / Shuck-Britson Inc.

February 10, 2025

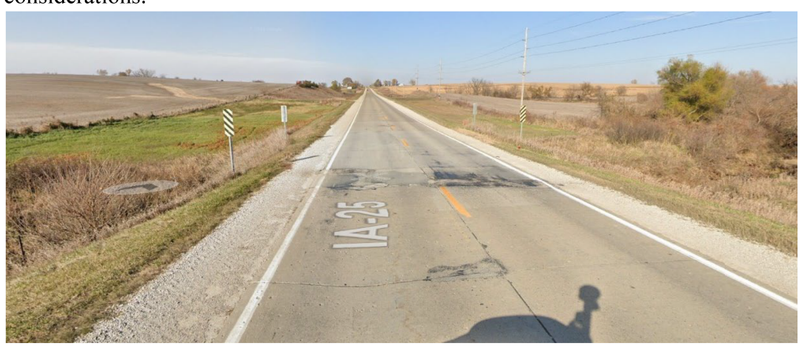
I. STUDY AREA

A. Project Description

This project involves replacement of a 10' x 10' twin RCB on Iowa 25 over stream (Maint. No. 8017.9S025), approximately 2.5 miles north of the south junction with J23 in Ringgold County.

B. Present Facility--Need for Project

The existing RCB is a 10' x 10' twin RCB, skewed 30 degrees RT ahead, constructed in 1934 (Design No. 1134). The roadway is 24 foot wide PCC with 8 foot wide granular shoulders. Roadway foreslopes are 3:1, and the roadway was built without clear zone considerations.



The culvert was last inspected in January, 2023 and has a culvert condition rating of 5, on a scale of 0 to 9. A condition rating of '5' is classified as "Fair". A rating of '4' or less for the culvert condition rating would make the culvert "Poor". There are no plans available that show that this culvert has been repaired since its original construction year 1934. It is likely the condition rating will drop below a '4' in the near future which would make the culvert classification "Poor".

For these reasons, the culvert is not a rehabilitation or extension candidate but should be held as a replacement candidate for a future letting. The culvert's expected replacement type and total project cost should be determined with this Project Concept phase.

There do not appear to be any accesses in the immediate vicinity of the box culvert. A field entrance is indicated in the as-built plans at Sta. 845+07 LT, approximately 300 feet north of the culvert.

C. Hydrology

The design discharge is 1,060 cfs (50-year) for the 2.2 square mile drainage area based on the "DOT Regional Equation Annual Exceedance – Probability Discharge" spreadsheet. The 1987 regression equations were used to compute the design flows as recommended in the United States Geological Survey (USGS) Report 2015-5055.

A twin 10' x 7' reinforced concrete box culvert is hydraulically capable of conveying the design flow. Replacing the existing twin 10' x 10' box culvert with a smaller structure is not desirable from the DOT's standpoint. The DOT prefers the proposed structure to match the existing structure at a minimum. For this case the proposed structure will be a twin 10' x 12' with a flowline buried 2 feet as per the recommendations of Section 4.2.2 of Chapter 4 of the Bridge Design Manual.

The structure is located in FEMA Zone A. A DNR floodplain permit will not be required for construction of the replacement structure.

The structure does not appear to be located within a drainage district.

D. Traffic Estimates

The 2016 traffic count was 1,250 vehicles per day (VPD), with trucks comprising approximately 16% of total traffic (approximately 200 trucks per day). Historical traffic counts from 2000-2016 vary between 840 VPD and 1,250 VPD.

No traffic forecasts were provided for this location.

E. Crash History

No crash history was provided at this location.

F. Bridge Condition Index (BCI)

The culvert has a current Bridge Condition Index (BCI) of 59.4.

G. Accelerated Bridge Construction Score

The Accelerated Bridge Construction (ABC) normalized score when using county roads is 33, which is below the threshold (50) that would qualify for further evaluation of ABC techniques. The contributing factors to the raw score are the out of distance travel (OODT) raw score of 30, average annual daily traffic (AADT) raw score of 10, a daily road user costs (DRUC) raw score of 10, and an economy of scale (EOS) raw score of 5.

H. Access Control

Access rights will not be acquired on this project.

II. PROJECT CONCEPT

A. Proposed Improvements

Two options were explored for replacement of the existing culvert: a precast and cast-in-place alternative for the proposed twin 10' x 12' RCB. Refer to attached sheets for additional information.

1. Alternative Number 1: Twin 10' x 12' x 84' Cast-in-place RCB Culvert

This alternative removes the existing RCB and installs a new box culvert in the same location and at the same skew (30 degrees), with the culvert flowlines buried two feet from the natural stream elevation. An estimated 80 feet of existing roadway pavement will be removed to allow for open trench construction, and replaced with 24 foot wide, 10 inch thick PCC pavement and 8 foot wide granular shoulders. A 6:1 / 3.5:1 barnroof section with a 24 foot clear zone will be utilized at the box culvert, per Standard Detail 4312.

The proposed structure will be a twin 10' x 12' x 84' RCB with 30 degree skew headwalls. Standard LRFD culvert details will be used in construction, and maximum fill over the culvert will be approximately 4 feet. Rip-rap will be installed at the outlet per Standard Detail 1092, with an estimated length of 10 feet.

The proposed detour route for this option requires 10 miles of out-of-distance travel for through traffic. While the detour route is the same for the cast-in-place and precast culvert options, it is estimated that the cast-in-place option will require a longer construction duration. Based on standard construction rates provided by the Office of Contracts, construction of the cast-in-place option is estimated to take 26 construction days. No rates are provided for installation of precast box culverts, although the installation rate for both round culvert pipe and storm sewer is estimated at 150 feet per day, which would mean installation at this location could be completed in 2 working days. We felt that actual rates for this work would be much slower due to the size of the culvert sections and other mitigating circumstances, and assumed approximately 18 days for installation of the precast box, a differential of 8 working days. The Federal Highway Administration provides a road user cost calculator that estimates the daily additional road used costs due to the additional detour travel length and time, based on traffic volumes and current labor, fuel, and maintenance costs. This calculator estimated a road user cost of

$16,291 per day due to the detour. Those costs have been included in the project cost estimate (below).

Estimated Construction Cost

Item	Estimated Cost
Embankment-in-Place	$ 25,740
Modified Subbase	$ 3,382
Granular Shoulders, Type B	$ 2,100
PCC Pavement, 10 Inch	$ 16,401
Removal of Existing Culvert	$ 18,500
Structural Concrete (RCB Culvert)	$342,040
Reinforcing Steel	$125,828
Temporary Stream Diversion	$ 10,000
Revetment, Class E	$ 3,861
Removal of Pavement	$ 2,130
Traffic Control (5%)	$ 27,500
Mobilization (5%)	$ 27,500
Base Cost	$604,982
Contingency (30%)	$181,495
Additional Road User Costs	$130,328
Project Total	**$916,805**
	$917,000

2. Alternative Number 2: Twin 10’ x 12’ x 100’ Precast RCB Culvert

Similar to Alternative 1, this option involves removal of the existing RCB and installation of a new box in the same location and at the same skew as the existing with the flowlines lowered two feet from the natural stream elevation, using open trench methods. Roadway geometry will be the same as Alternative 1.

The proposed structure is a twin 10’ x’ 12’ x 100’ precast RCB with Type 3 precast end sections, per standard LRFD Precast RCB details. Rip-rap will be placed at the culvert outlet per Standard Detail PEP 12-20, with an estimated length of 10 feet. Per standard culvert notes, the cost of the granular leveling material and porous backfill between barrels is included in the precast RCB item cost. Because this option is estimated to have a shorter construction duration, it will not include additional road user costs.

Estimated Construction Cost

Item	Estimated Cost
Embankment-in-place	$ 25,740
Modified Subbase	$ 3,382
Granular Shoulders, Type B	$ 2,100
PCC Pavement, 10 Inch	$ 16,401
Removal of Existing Culvert	$ 18,500
Precast Box Culvert, 10 Ft. x 12 Ft.	$400,000
Precast End Section, 10 Ft. x 12 Ft.	$148,000
Temporary Stream Diversion	$ 10,000
Revetment, Class E	$ 4,648
Removal of Pavement	$ 2,130
Traffic Control (5%)	$ 31,546
Mobilization (5%)	$ 31,546
Base Cost	$693,993
Contingency (30%)	$208,198
Project Total	**$902,191**
	$903,000

B. Recommendations

Road user costs and construction duration factor heavily into the price differential between the two alternatives. Typically RCB projects are bid to allow the Contractor to choose either precast or cast-in-place alternatives to achieve the best price, although assigned contract period typically does not differ between the two despite the obvious difference in construction rates. We recommend letting the project with bid alternates for precast and cast-in-place options, and adding the Developmental Specifications for Lane Rental (A+B Bidding with Incentive / Disincentive) if minimizing the roadway closure time and associated user costs is considered an important consideration.

C. Detour Analysis

Iowa 25 will be closed to traffic during construction. Through traffic will be detoured. U.S. 169 is 13 miles east of the project site and Iowa 148 is 14 miles west of the project site. To limit out-of-distance travel, use of paved county roads would be recommended. Our recommended detour route is J23, west to N64, then north to U.S. 34. Out-of-distance travel for this option is 10 miles. Refer to Sheet J.1 of the attached plans.

D. Special Considerations

Existing right-of-way width at this location is 130 feet left of centerline and 100 feet right of centerline, per as-builts, which should be adequate to accommodate the

proposed structure and associated grading. However, the GIS mapping from the County Assessor's office appears to indicate that the existing ROW was purchased in easement. If additional right-of-way were needed to accommodate the new structure, we would recommend clearing up right-of-way title as part of this project.

E. Construction Sequence

It is anticipated that all work will be awarded to one prime contractor. The Bridges and Structures Bureau will coordinate the plan preparation with Snyder & Associates, Inc. / Shuck-Britson.

F. Program Status

This project is listed in the 2025-2029 Iowa Transportation Improvement Program with $520,000 programmed for construction in FY 2029 and $10,000 programmed for right-of-way. The project is currently scheduled for a December 19, 2028 letting.

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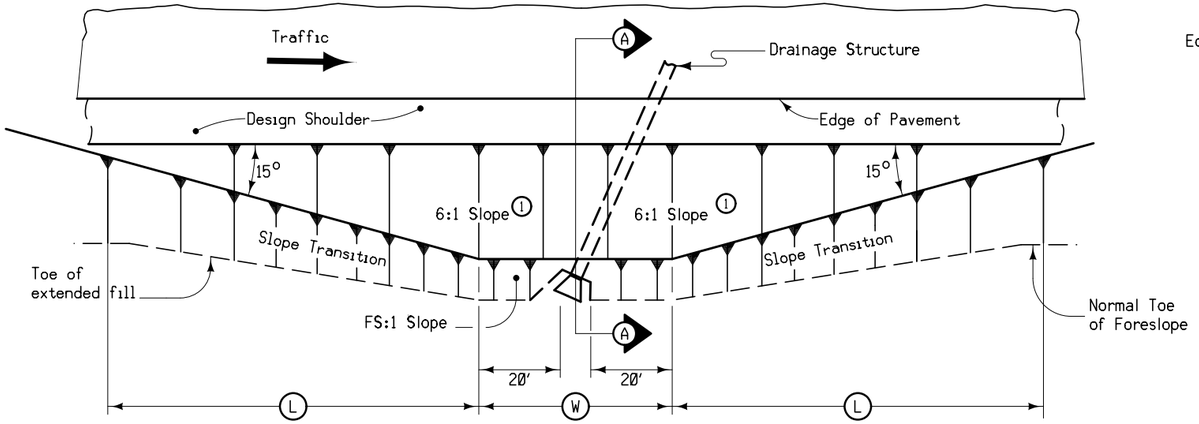
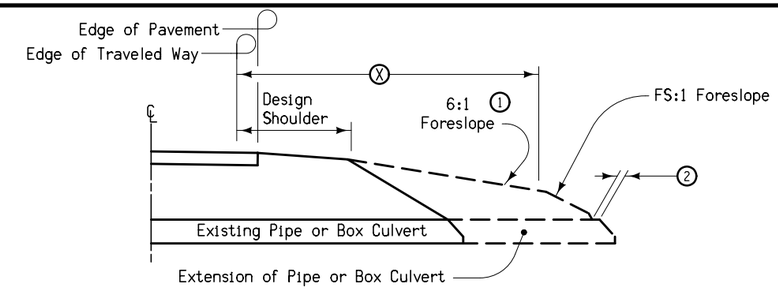
DESIGNER INFO

4312 MODIFIED



PLAN VIEW



SECTION A-A

STRUCTURE LOCATION		W	L	X	FS
STATION	SIDE	Feet	Feet	Feet	
841+90	LT / RT	64.7	89.6	24	3.5

Notes:

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

1. Slope may be flatter than 6:1.
2. 6" Minimum for pipe installations or to top of headwall on R.C.B.
3. At ℄ of roadway

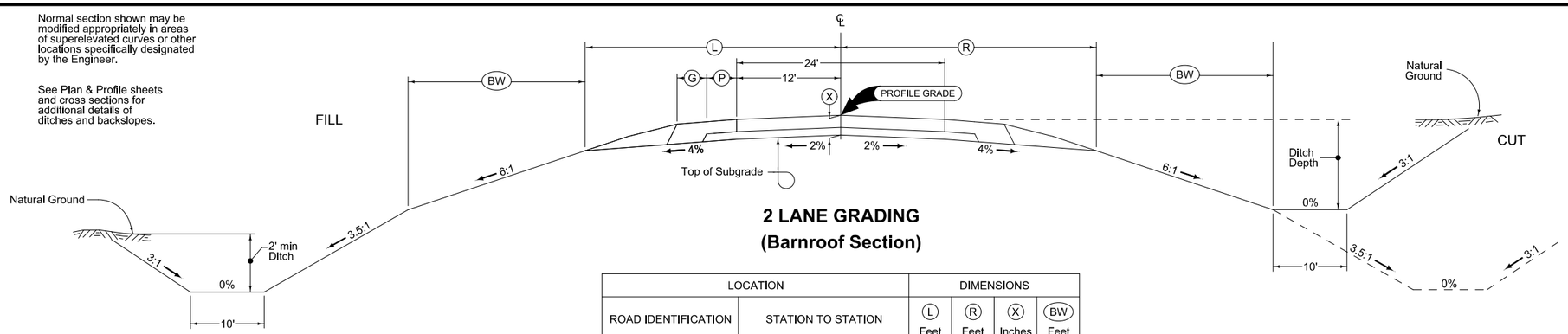
W = Pipe or R.C.B. opening width plus 20 feet each side.

BARNROOF FORESLOPE AT SKEWED DRAINAGE STRUCTURE

G_2_Grade_BR
04-21-20

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

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



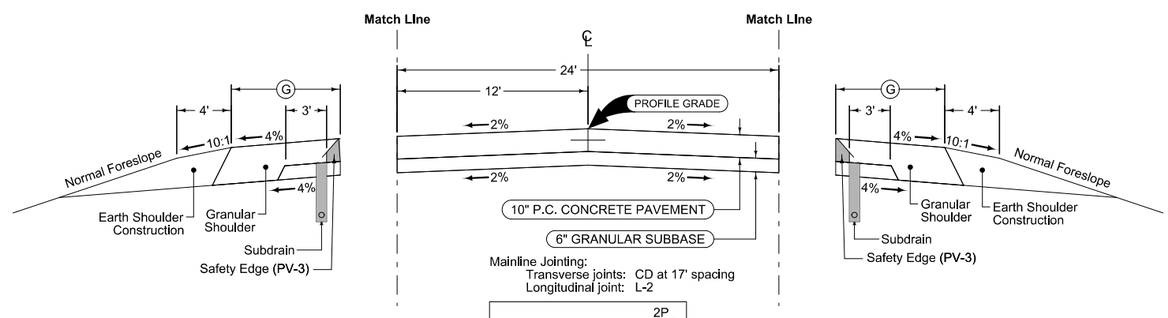
2 LANE GRADING (Barnroof Section)

LOCATION			DIMENSIONS			
ROAD IDENTIFICATION	STATION TO STATION		L Feet	R Feet	X Inches	BW Feet
IOWA 25	841+30.00	842+30	39.9	39.9	16	2.1

2P_
2G_

Granular Shoulder with Safety Edge

2_G_ 04-21-20		
STATION TO STATION		G Feet
841+30.00	842+30.00	8



2P_ MODIFIED	
STATION TO STATION	
841+30.00	842+30.00

Granular Shoulder with Safety Edge

2_G_ 04-21-20		
STATION TO STATION		G Feet
841+30.00	842+30.00	8

SURVEY SYMBOLS

- Interstate Highway Symbol
- U.S. Highway Symbol
- Iowa Highway Symbol
- County Road Highway Symbol
- Evergreen Tree
- Deciduous Tree
- Fruit Tree
- SB Shrub (Bushes)
- Timber
- Hedge
- Stump
- Swamp
- Rock Outcrop
- Broken Concrete
- Revetment (Rip Rap)
- Cemetery
- G Grave
- CV Cave
- SH Sink Hole
- Board Fence
- Chain Link or Security Fence
- Wire Fence
- Terrace
- Earth Dam or Dike (Existing)
- Tile Outlet
- Edge of Water
- Existing Drainage
- Right of Way Rail or Lot Corner
- Concrete Monument
- Well
- Windmill
- Beehive Intake
- Existing Intake
- Existing Utility Access (Manhole)
- Fire Hydrant
- WH Water Hydrant (Rural)
- ST Septic Tank
- C Cistern
- LP L.P. Gas Tank (No Footing)
- UST Underground Storage Tank
- Latrine
- Satellite TV Dish
- WHU Water Hook Up
- RT Radio Tower
- TA Tower Anchor
- Guardrail (Beam or Cable)
- GP Guard Post (one or two)
- Guard Post (over two)
- FP Filler Pipe
- GV Gas Valve
- WV Water Valve
- SL Speed Limit Sign
- MM Mile Marker Post
- SIGN Sign
- TCB Traffic Signal Control Box
- RRB Rail Road Signal Control Box
- TSB Telephone Switch Box
- EB Electric Box

UTILITY LEGEND

— W —
(SIRWA) SOUTHERN IOWA RURAL WATER
Contact Name: Chad Mahan
Contact Phone:
Contact Email: cmahan@sirwa.org

— FO3 —
WINDSTREAM
Contact Name: Lisa Zingula
Contact Phone:
Contact Email: Lisa.Zingula@windstream.com

PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.		
Green	(2)	Existing Topographic Features and Labels	
Blue	(1)	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation	
Magenta	(5)	Existing Utilities	
SHADING	**Design Color No.**		**Transparency**
Pink, Dark	(13)	Temporary Pavement Shading	50%
Yellow	(4)	Proposed Pavement Shading	50%
Orange	(6)	Proposed Granular Shading	50%
Orange	(70)	Proposed Shoulder Granular Shading	50%
Yellow	(68)	Proposed Shoulder Paved Full Depth Shading	50%
Yellow	(132)	Proposed Shoulder Paved Partial Depth Shading	50%
Brown, Light	(236)	Grading Shading	50%
Orange, Light	(134)	Proposed Granular Entrance Shading	50%
Yellow	(220)	Proposed Paved Entrance Shading	50%
Tan	(8)	Proposed Sidewalk Shading	50%
Blue, Light	(230)	Proposed Sidewalk Landing Shading	50%
Pink	(11)	Proposed Sidewalk Ramp Shading	50%
Red	(3)	Proposed Structure Shading	50%
Red	(3)	Delineates Restricted Areas	0%

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	
Green	(10)	Existing Ground Line Profile
Blue	(1)	Proposed Profile and Annotation
Magenta	(5)	Existing Utilities
Blue, Light	(230)	Proposed Ditch Grades, Left
Black	(0)	Proposed Ditch Grades, Median
Rust	(14)	Proposed Ditch Grades, Right

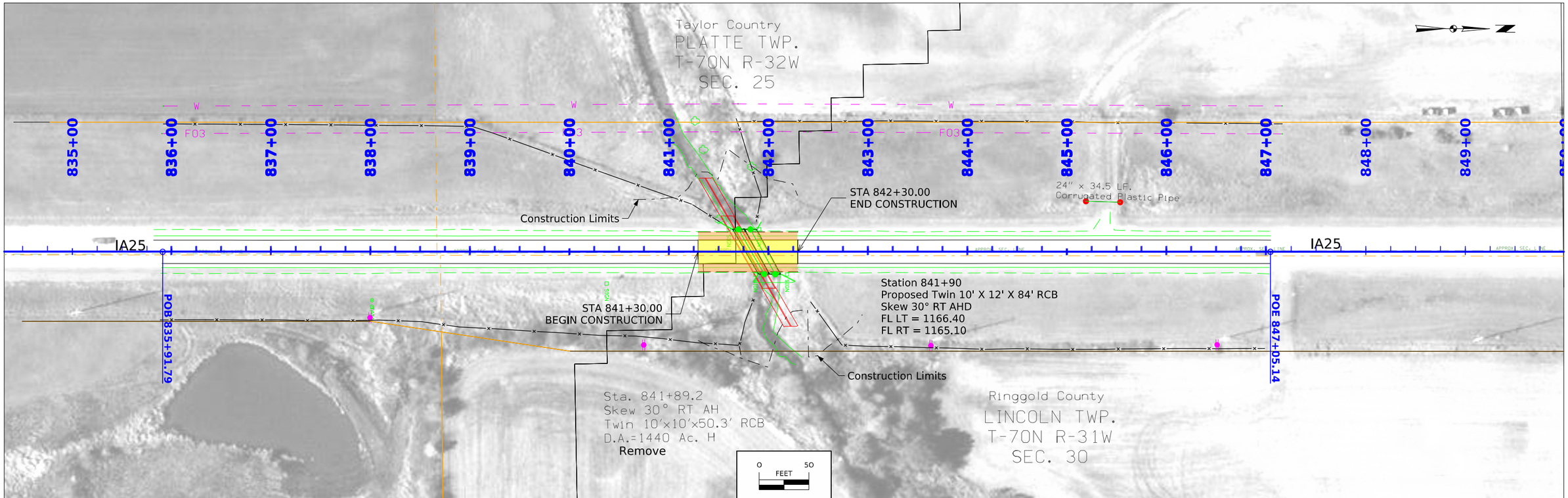
- Reference Point — Survey Line
- Station
- Section Corner
- Ground Line Intercept
- Saw Cut
- Guardrail
- Trench Drain
- HighTension Cable Guardrail
- Sheet Pile
- Pavement Removal
- Clearing & Grubbing Area

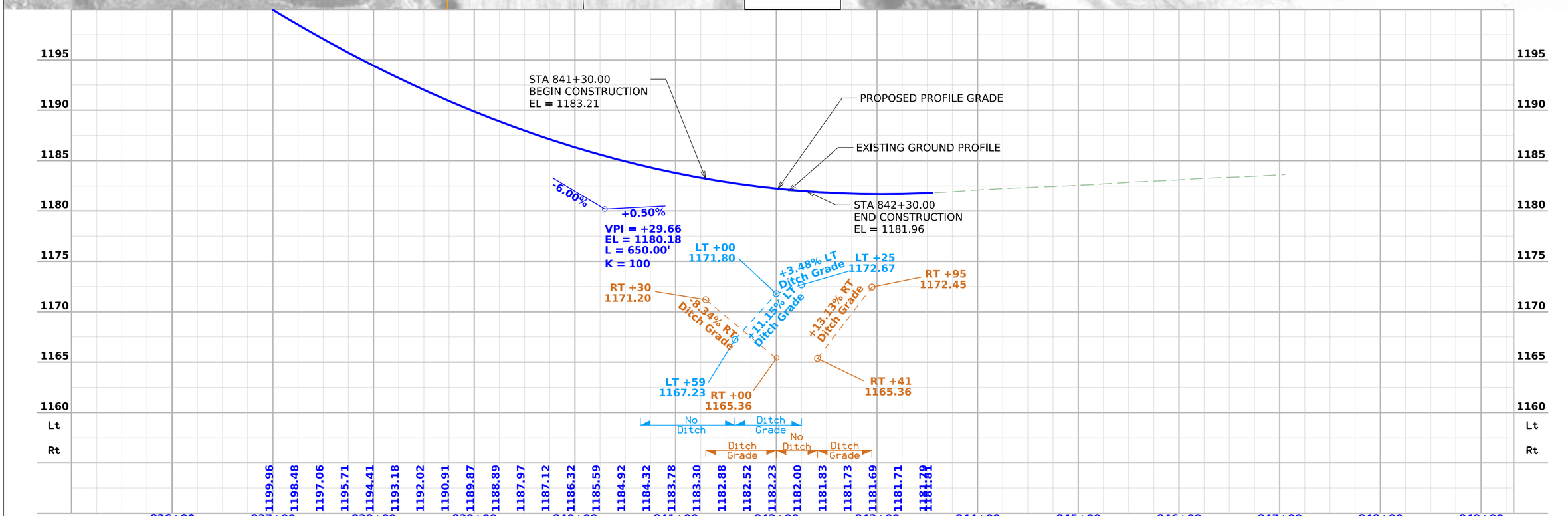
RIGHT-OF-WAY LEGEND

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

PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

(COVERS SHEET SERIES D, E, F, & K)





FILE NO.	ENGLISH	DESIGN TEAM SNYDER AND ASSOCIATES, INC.	RINGGOLD COUNTY	PROJECT NUMBER BRFN-025-1(13)--39-80	SHEET NUMBER D.2

11:12:34 AM 8/21/2025 mkjartanson pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\8002501024\Design\CADD_Files\Sheet_Files\SHT_80025013_D02.dgn

SURVEY INDEX

County: Ringgold
PIN: 24-80-025-010
Project Number: BRFN-025-1(013)--39-80
Location: Stream 2.3 mi N of N Jct Co Rd J23
Type of Work: Culvert Repair
Project Directory: 8002501024

Survey Personnel

Eric Miller – Survey Project Manager
Adam Catrenich – Survey Party Chief
Sam Blaisdell – Survey Cad Technician

Date(s) of Survey

Begin Date	01/27/2025
End Date	02/07/2025

General Information

This survey is for design services associated with the replacement of a box culvert Stream 2.3 miles North of N Junction County Road J23. 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

Measurement units for this survey are US survey feet. Project coordinate system is relative to the Iowa Regional Coordinate System, Zone 12. Horizontal control originated from Ringold County's control network. Verification checks were observed on county control point 1007 using IaRTN with multiple observations with appropriate time spans in between. Positions were within tolerance and published coordinates and elevations were accepted (Coordinates are published in NAD83(2011) Iowa State South Zone and converted to IaRCS Zone 12 using Leica Geo Office).

Additional project primary control (FENO1) was set for this project using nearby Iowa Real Time Network reference stations to obtain horizontal and vertical control positions. 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.

Alignment Information

The horizontal alignment for Iowa Hwy 25 this survey is a retrace of As-built Plans No. F Proj. No. 4-51 (6) Survey stationing was equated to the plan POT at Sta. 825+64.1 and carried back and ahead with/without equation throughout the survey. Due to lack of centerline monumentation, the roadway as constructed was used to establish alignment.

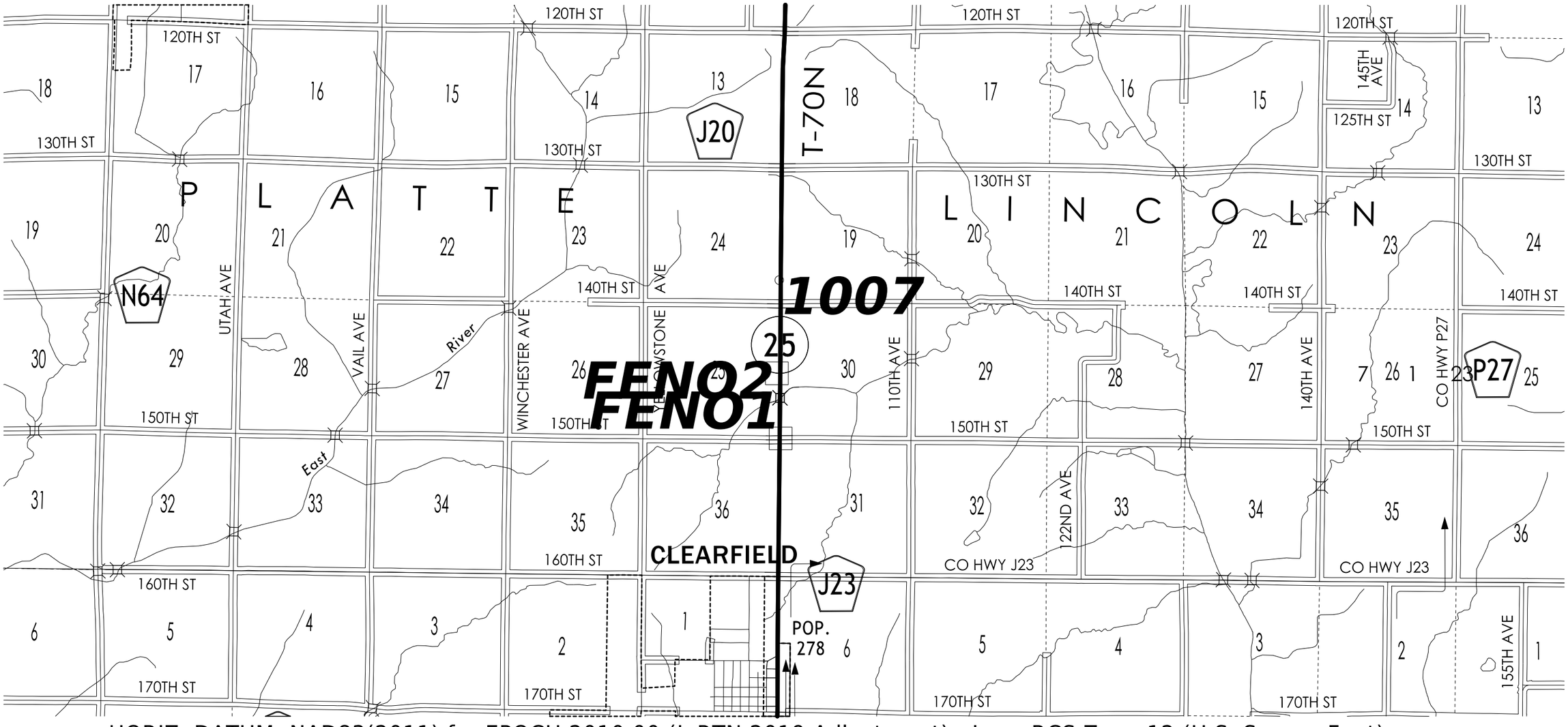
Survey stationing relates to as built plan stationing as follows:

POT Sta. 825+64.1 As-built Plans Project No. F Proj. No. 4-51 (6)
This Survey POT Sta. 825+64.1 (Fnd Mag Nail)

PC Sta. 862+70.3 As-built Plans Project No. F Proj. No. 4-51 (6)
This Survey PC Sta. 862+70.3

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 12 (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 12 (U.S. Survey Foot)

VERT. DATUM: NAVD88
Geoid Model: 2018u3

V

Point Name	Northing	Easting	Elevation	Code Feature Description
1007	6174361.319	22300263.03	1252.036	CP CP1007 FOUND FENO MONUMENT//+/-50' WEST OF HWY 25//+/-25' SOUTH OF FIELD ENTRANCE//+/-900' NORTH OF 140TH STREET
FENO1	6168234.814	22300317.14	1241.918	FENO FENO1 SET FENO MONUMENT//+/-25' EAST OF HWY 25//+/-25' NORTH OF 150TH STREET//+/-100' SOUTH OF GRAVEL DRIVEWAY//+/-10' NORTH OF STOP SIGN
FENO2	6170755.67	22300176.28	1197.83	FENO FENO2 SET FENO MONUMENT//WEST SIDE OF HWY 25//+/ 125' WEST OF CENTERLINE//+/ 8' EAST OF FENCE//SECOND FIELD DRIVE WEST OF CULVERT

108_23A
8/15/22

TRAFFIC CONTROL PLAN

1. Iowa 25 will be closed to traffic during construction. Follow detour route shown on Sheet J.2.
2. Access to individual properties will be maintained at all times.
3. Coordinate with the Engineer prior to closing the roadway. Notification will be required 10 business days prior to closure to allow the public to be informed.

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 Subbase
- Proposed Special Backfill
- Temporary Barrier Rail
- Proposed Granular Shoulder
- Temporary Shoulder
- Existing Shoulder Strengthening
- 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

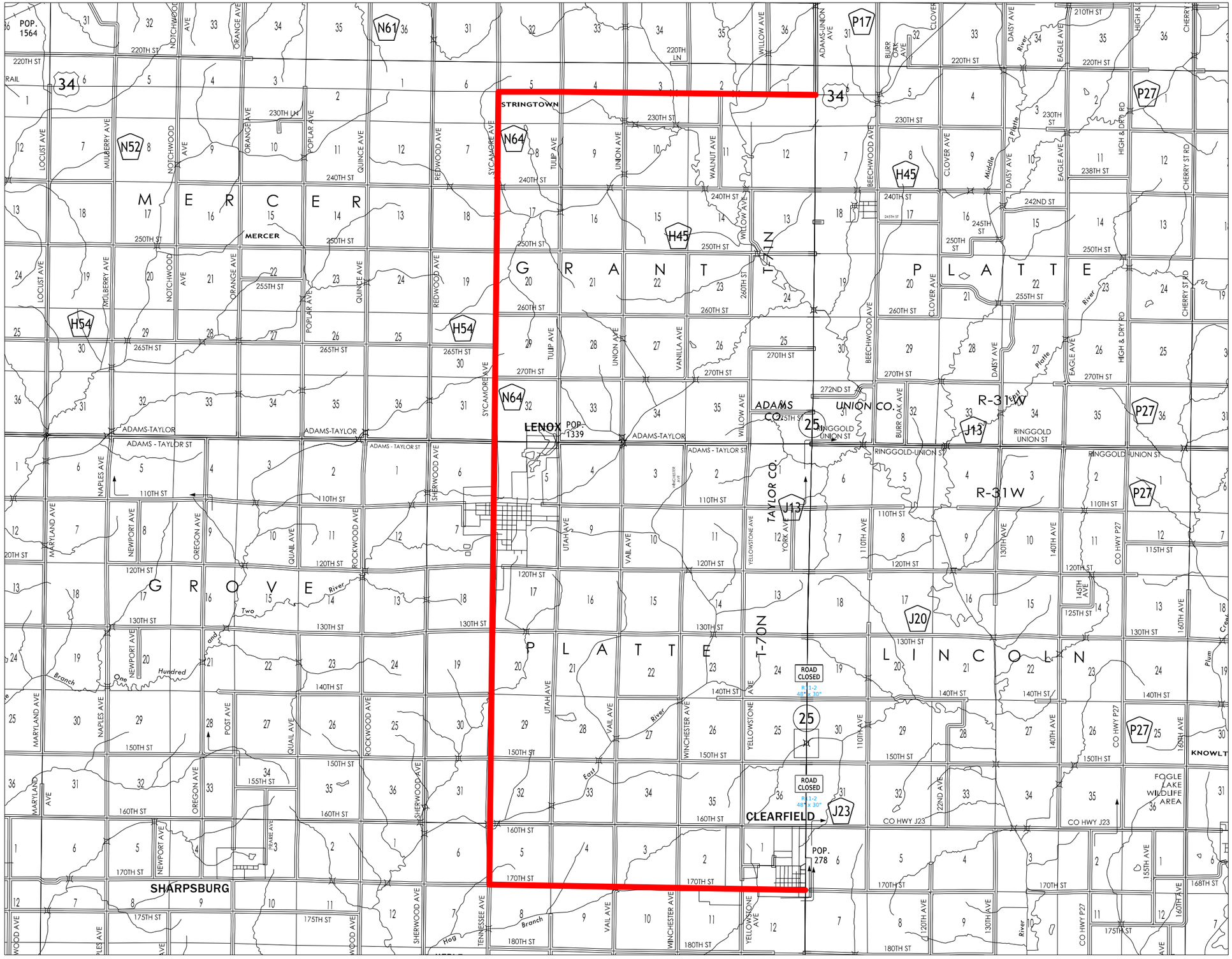
PLAN VIEW PATTERN AND SYMBOL LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS

- Channelizing Device
- Drum
- Temporary Lane Separator
- Tubular Marker
- Channelizer Marker
- Concrete Barrier Marker
- Delineator
- Temporary Barrier Rail
- Pavement Removal
- Sand Barrel Layout
- Crash Cushion (Temp or Perm)
- Traffic Signal
- Flagger
- Temporary Floodlighting
- Traffic Sign
- Type III Barricade
- Type A Warning Light
- Direction of Traffic
- Safety Closure
- 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)



LEGEND

DETOUR ROUTE

ROAD CLOSED
R11-2
48" x 30"

DETOUR ROUTE

FILE NO.	ENGLISH	DESIGN TEAM **SNYDER AND ASSOCIATES, INC.**	**RINGGOLD** COUNTY	PROJECT NUMBER **BRFN-025-1(13)--39-80**	SHEET NUMBER **J.3**

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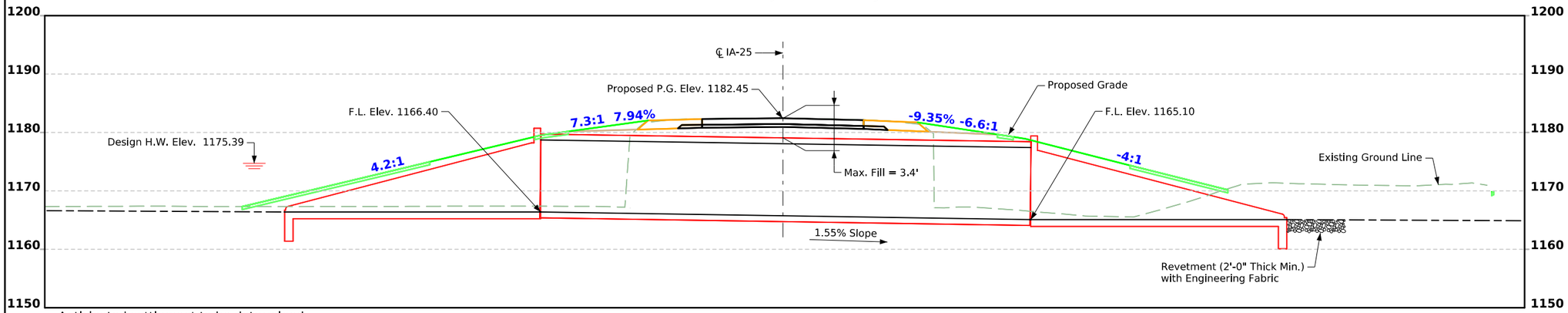
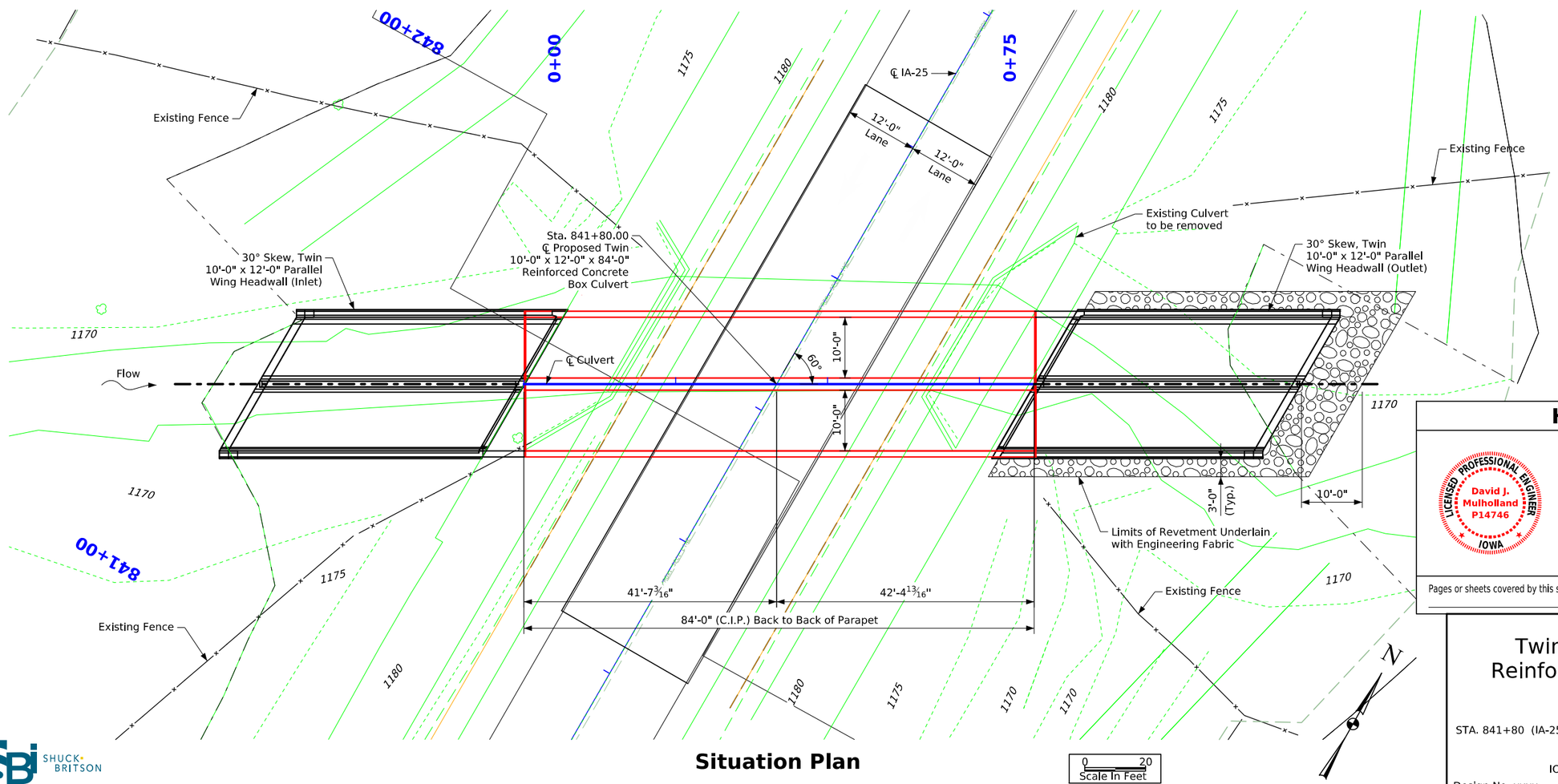
Control Point 1001: Northing 6168234.81 Easting 22300317.14 Elevation 1241.92 Feno Feno1 Set Feno Monument ± 25' East of HWY 25, ± 25' East of HWY25, ± North of 150th St., ±100' South of Gravel Driveway, ±10' North of Stop Sign



Anticipated settlement to be determined.

Longitudinal Section Along ℄ Culvert

Note: This concept level submittal is subject to refinement of alignment, grading, skew and other design parameters dependent on upcoming preliminary design analysis.



Situation Plan

SHUCK-BRITSON

Proposed Profile Grade on IA-25

(Use as Constructed)

Hydraulic Data

RIDB:
Drainage Area = 1382 Acres
Stream Slope = 15.8 Ft./Mi.
Q_{50} = 1,060 cfs
HW Elev. = 1175.39
Exit Velocity = 7.7 fps

Traffic Estimate

2016 AADT	1,250 V.P.D.
2045 AADT	??? V.P.D.
2045 DHV	??? V.P.H.
TRUCKS	16 %
Total Design ESALs	???

Location

IA-25 over drainage ditch
T-70N R-31/32W
Section 30/25
Platte/Lincoln Township
Ringgold County
FHWA No. 046490
Latitude 40.831530°
Longitude -94.471642°

Utilities Legend

No Known Utilities

Utilities shown on this sheet are for information only, see Road Design sheets for final utility information.

Hydraulic Design

LICENSED PROFESSIONAL ENGINEER David J. Mulholland P14746 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 2-24-2025 Date

Printed or Typed Name David J. Mulholland

My license renewal date is December 31, 2026

Pages or sheets covered by this seal: Sheet V.1 (Hydraulic Data, Channel Grading & Revetment)

Preliminary Not For Construction

Design For 30 Degree RA

Twin 10'-0" x 12'-0" x 84'-0" Reinforced Concrete Box Culvert

Situation Plan

STA. 841+80 (IA-25)

Turn-in Date: Feb. 2025

Ringgold County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. xxxx Design Sheet No. 1 of FHWA 046490

FILE NO. 98765	ENGLISH	DESIGN TEAM SMK\JLH\CLS	Ringgold COUNTY	PROJECT NUMBER BRFN-025-1(013)--39-80	SHEET NUMBER V.1

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CROSS SECTION VIEW COLOR LEGEND

Design Color No.	Feature
Aggregate	
(64)	Choke Stone
(42)	Engineering Fabric
(8)	Flooded Backfill
(92)	Macadam Stone
(20)	Modified
(12)	Plowing Shaping
(14)	Porous Backfill
(8)	Revetment Class A
(6)	Revetment Class B
(62)	Revetment Class C
(188)	Revetment Class D
(28)	Revetment Class E
(12)	Shoulder Special Backfill
(12)	Special Backfill
(20)	Subbase
(20)	Subbase Lower
(20)	Subbase Upper
(118)	Subgrade Treatment
Asphalt	
(207)	HMA Base Course
(207)	HMA Interim Course
(207)	HMA Surface Course
Bridge	
(0)	Bridge
Concrete	
(0)	Barrier Concrete
(0)	Barrier Concrete Footing
(0)	Curb Gutter
(48)	Flowable Mortar
(0)	Median Concrete
(0)	PCC Pavement
(0)	Sidewalk
Existing	
(0)	Existing Pavement
Shoulder	
(209)	Shoulder HMA
(0)	Shoulder PCC
(6)	Shoulder Granular
Structural	
(112)	Noise Wall
(112)	Noise Wall Footing
(112)	Retaining Wall Back
(112)	Retaining Wall Back Excavate
(112)	Retaining Wall Face
(112)	Retaining Wall Front Excavate
(112)	Retaining Wall Front Footing
(112)	Retaining Wall MSE Gutter
(112)	Retaining Wall Reinforced Earth

Design Color No.	Feature
Grading	
(8)	Behind Curb Cut
(6)	Granular
(13)	Granular Back Fill
(48)	Rock Undercut
(8)	Shoulder Earth Fill
(2)	Side Slopes
(226)	Side Slopes Dressing
Substrata	
(128)	Boulder
(209)	Boulder Removed
(48)	Broken Weathered
(210)	Broken Weathered Removed
(3)	Core Out
(115)	Core Out Remove Only
(195)	Core Out Remove and Replace
(203)	Existing Pavement
(184)	Existing Pavement Remove Only
(200)	Existing Pavement Remove and Replace
(6)	Loam
(211)	Loam Removed
(80)	Rock
(212)	Rock Removed
(4)	Select Sand
(214)	Select Sand Removed
(3)	Shale
(215)	Shale Removed
(10)	Topsoil
(2)	Topsoil Remove Only
(4)	Topsoil Remove and Replace
Unsuitable / Waste	
(3)	Unsuitable Type A
(216)	Unsuitable Type A Removed
(13)	Unsuitable Type B
(217)	Unsuitable Type B Removed
(11)	Unsuitable Type C
(218)	Unsuitable Type C Removed
(3)	Waste
(219)	Waste Removed

NOTES:

Text

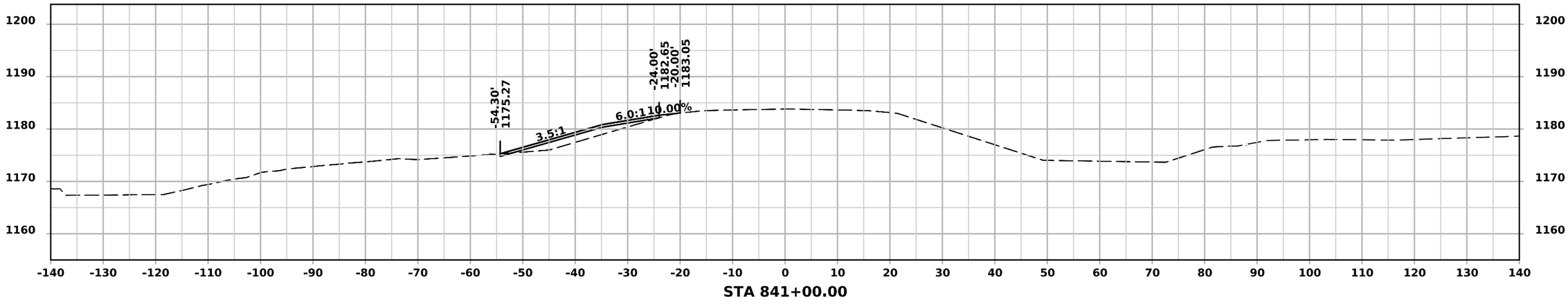
NOTES:

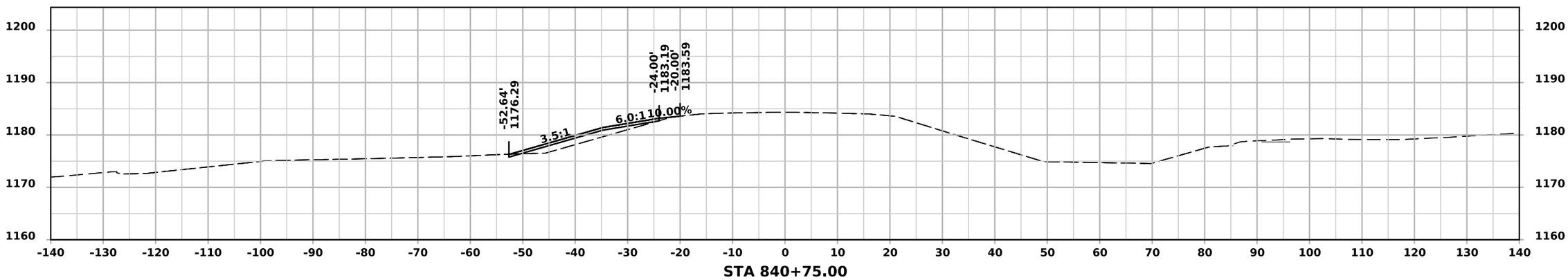
Text

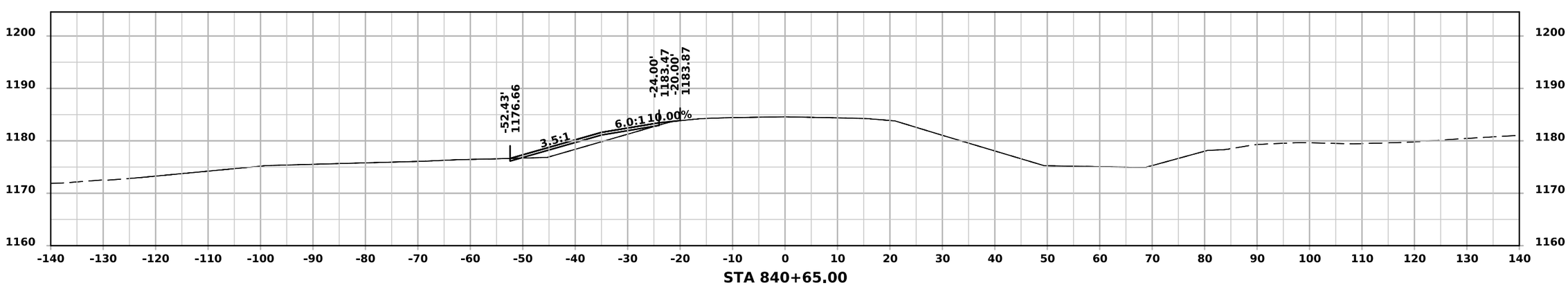
CROSS SECTIONS
LEGEND AND INFORMATION SHEET

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

IOWA 25







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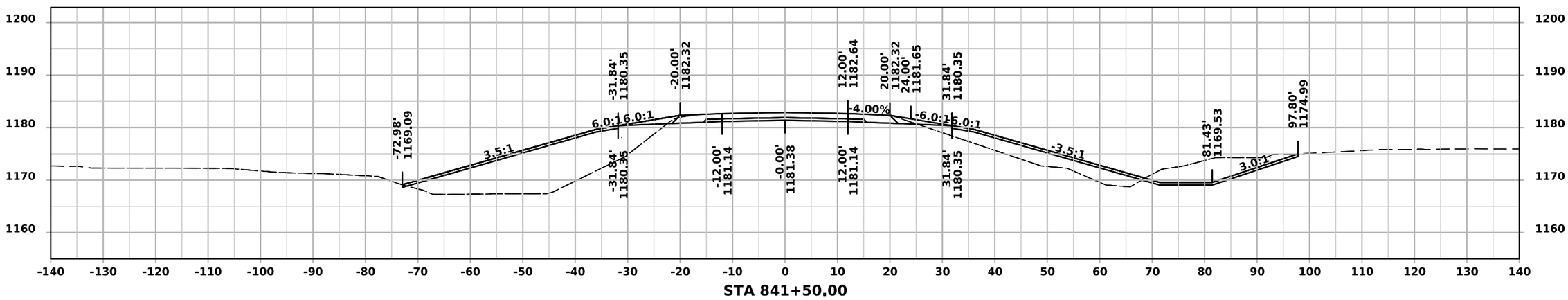
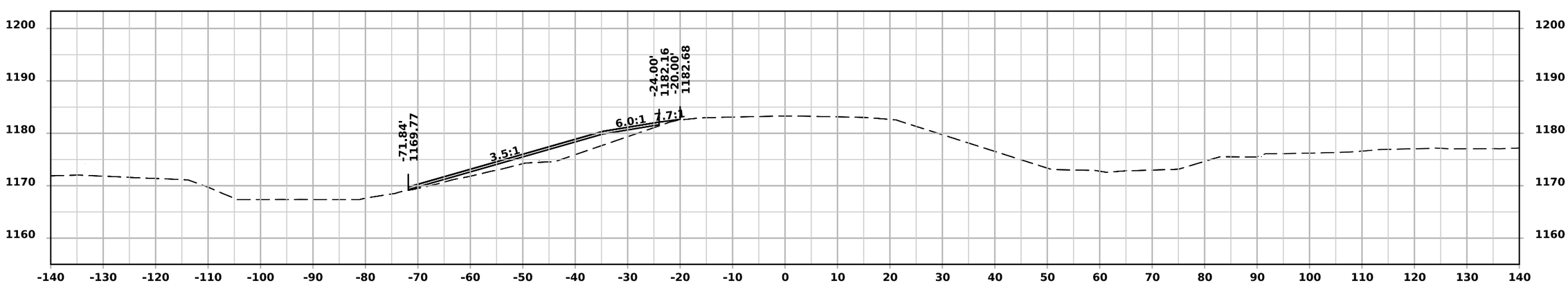


STA 841+50.00



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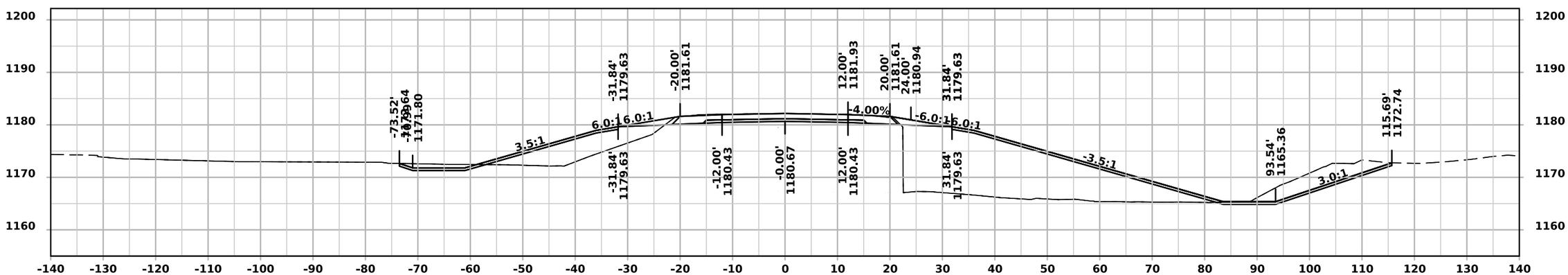
IOWA 25



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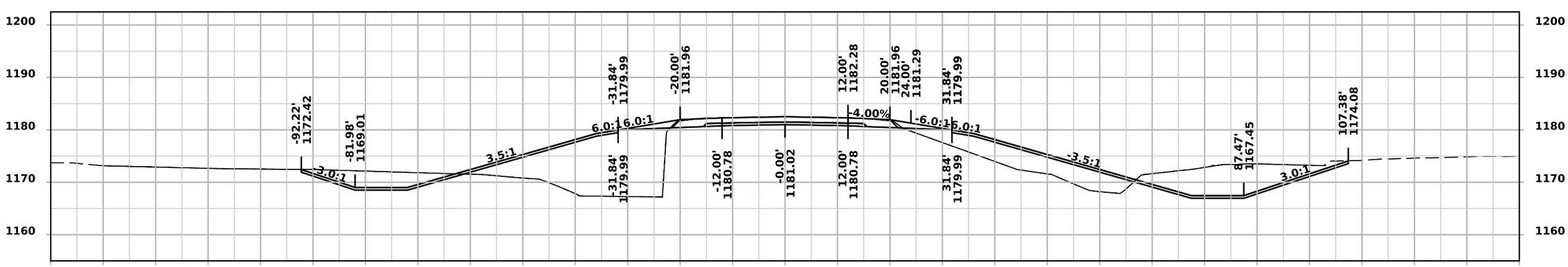

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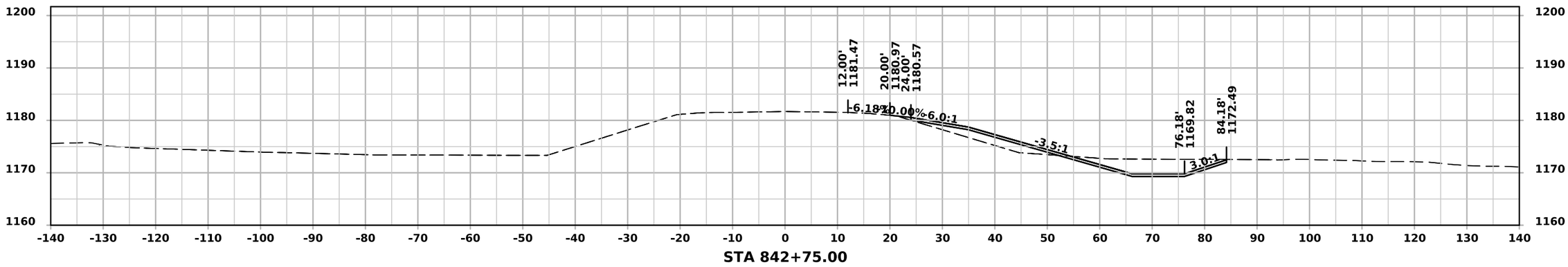
IOWA 25



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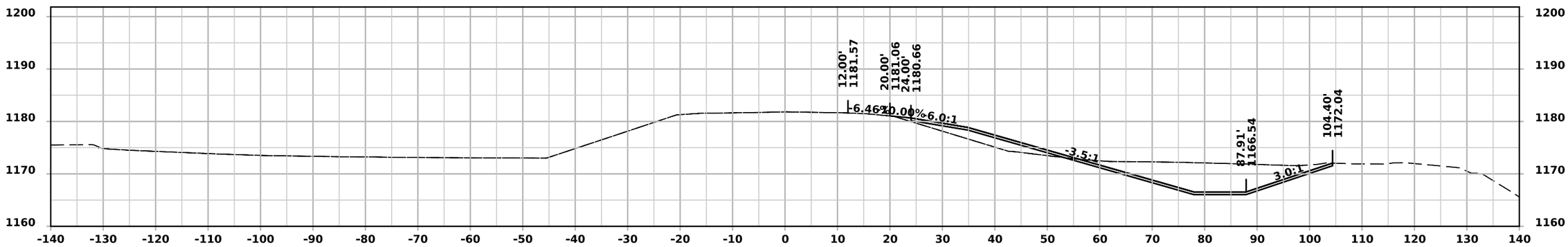

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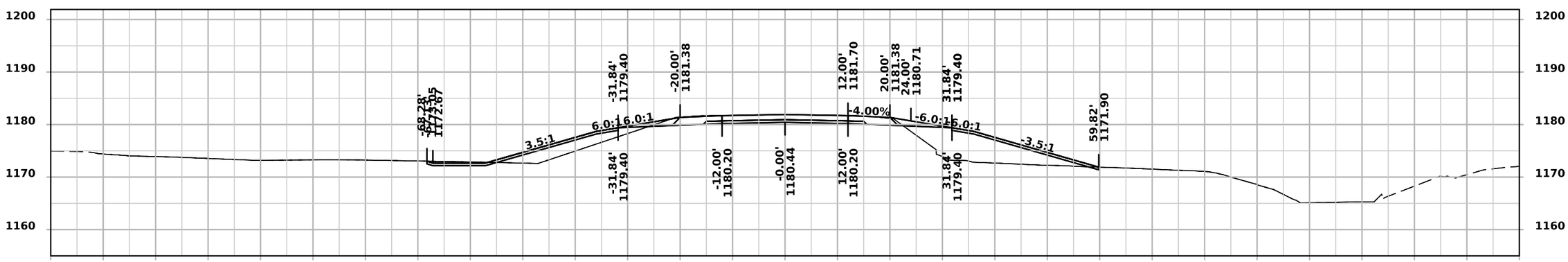

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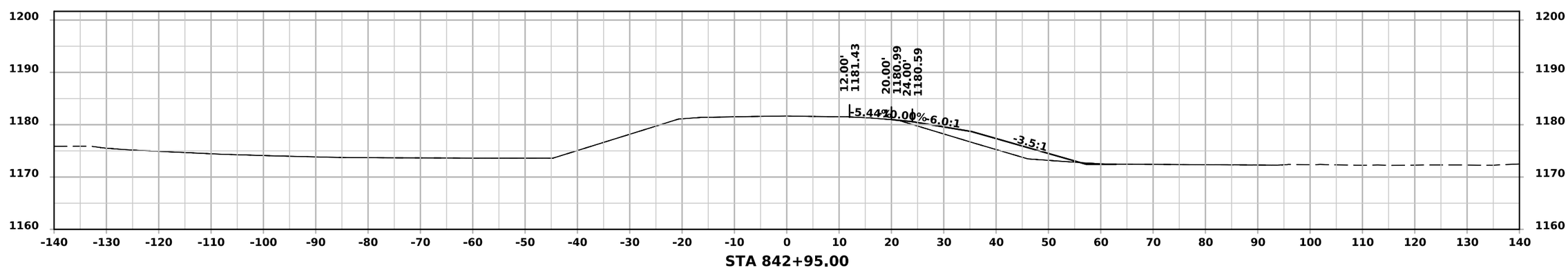
1200
1190
1180
1170
1160
12.00'
1181.43
20.00'
1180.99
24.00'
1180.59
-5.44%
-20.00%
-6.0:1
-3.5:1
-140 -130 -120 -110 -100 -90 -80 -70 -60 -50 -40 -30 -20 -10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140
STA 842+95.00