

BRIDGE REPLACEMENT
 BRF-069-4(115)--38-77
 LETTING DATE
 11-15-2022

POLK CO.



Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM

POLK COUNTY

BRIDGE REPLACEMENT

Fourmile Creek 0.8 mi S of Co Rd F22

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

16

PROJECT IDENTIFICATION NUMBER

18-77-069-020

PROJECT NUMBER

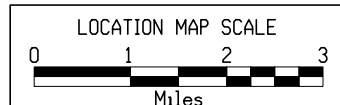
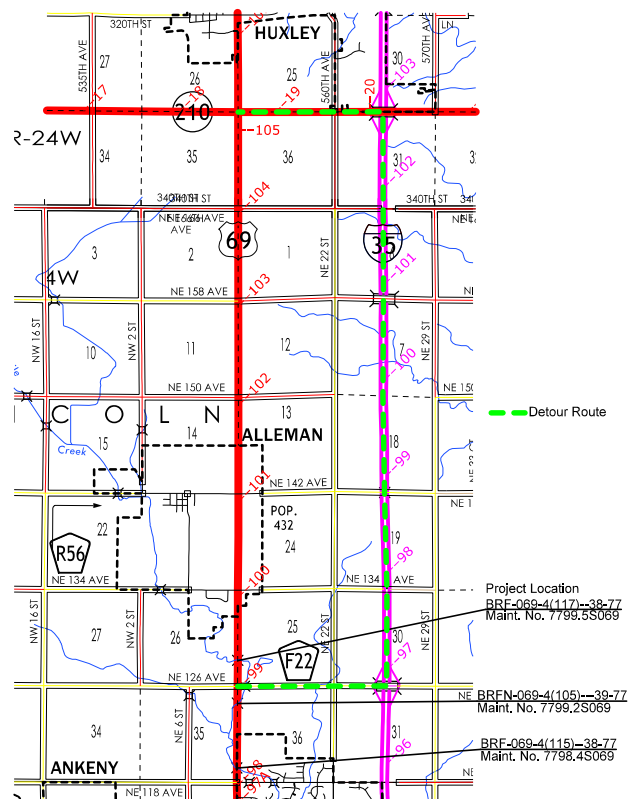
BRF-069-4(115)--38-77

R.O.W. PROJECT NUMBER

STPN-069-4(116)--2J-77

INDEX OF SHEETS

No.	DESCRIPTION
A Sheets	Title Sheets
A.1	Title Sheet
B Sheets	Typical Cross Sections and Details
B.1	Typical Cross Sections and Details
D Sheets	Mainline Plan and Profile Sheets
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2 - 3	US 69
G Sheets	Survey Sheets
G.1 - 3	Reference Ties and Bench Marks
J Sheets	Traffic Control and Staging Sheets
* J.1	Traffic Control Plan
V Sheets	Bridge and Culvert Situation Plans
* V.1 - 2	Bridge and Culvert Situation Plans
W Sheets	Mainline Cross Sections
W.1 - 5	Mainline Cross Sections
	* Color Plan Sheets



DESIGN DATA RURAL

2023	AADT	6,700	V.P.D.
2043	AADT	8,600	V.P.D.
2043	DHV	890	V.P.H.
	TRUCKS	3	%
	Total		
	Design ESALs	--	

INDEX OF SEALS

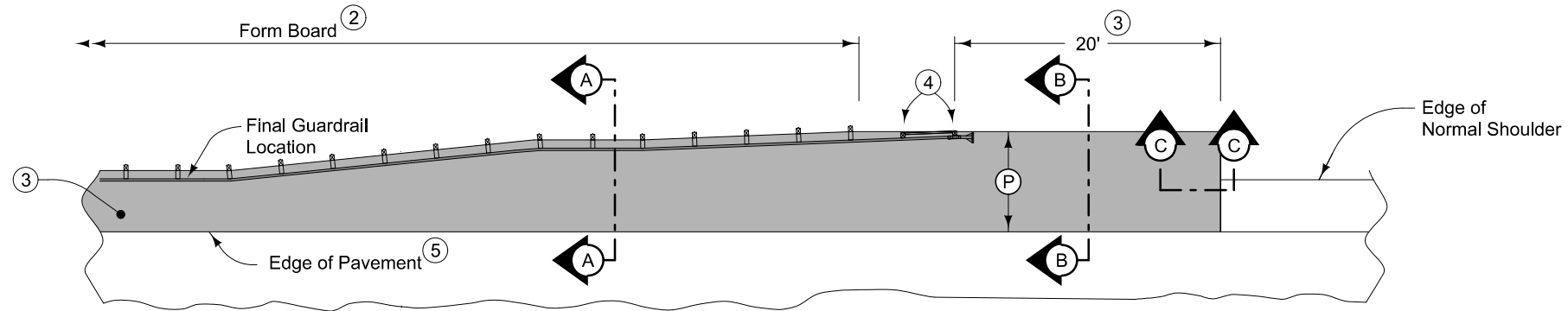
SHEET NO.	NAME	TYPE
A.1	X	Primary Signature Block
X	X	X

S4 PLAN - Date: 6-8-2021
 D4 PLAN - Date: 7-19-2022
 Letting - Date: 11-15-2022

PRELIMINARY PLANS

Subject to change by final design.

D5 PLAN - Date: 11-3-2020



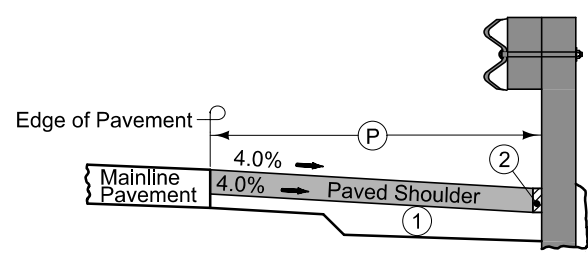
PLAN VIEW

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

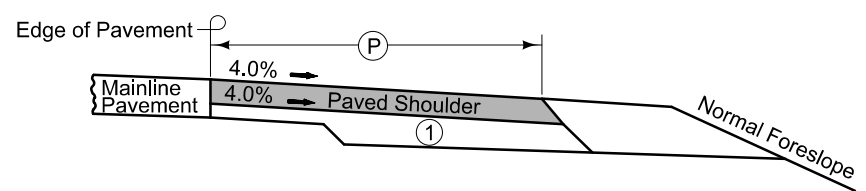
Match mainline pavement joint spacing. When mainline pavement is 8" or greater in thickness, place additional transverse 'C' joints in shoulder at mid-panel of the mainline pavement. Place longitudinal 'C' joint at P/2 from edge of mainline pavement when P is greater than 10' wide. Terminate longitudinal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



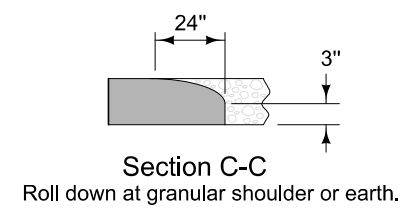
Section A-A



Section B-B

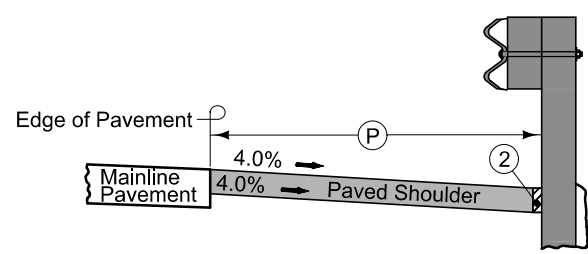
NEW CONSTRUCTION

- ① For subgrade treatment, refer to other details in the plan.
- ② 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. Refer to note 4 for final 2 posts.
- ③ Continue paved shoulder to existing paved shoulder or 20 feet beyond the center of the first post.
- ④ Shoulder may be notched for final 2 posts or post sleeves may be installed through pavement. Do not drive posts through pavement.
- ⑤ 'KT-1 joint for PCC shoulder. 'B' joint for HMA shoulder.

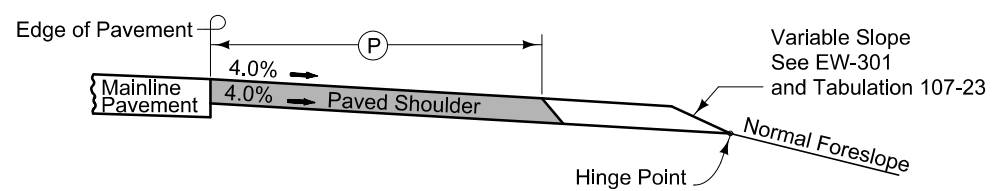


Section C-C

Roll down at granular shoulder or earth.



Section A-A



Section B-B

EXISTING SHOULDER

PAVED SHOULDER AT GUARDRAIL

SURVEY SYMBOLS

- WC Wild Card (Misc. Field Shot)
- △ PI Tangent Point
- + REF Reference Tie Point
- △ SCR Section Corner
- TW Top of Water
- CP Control Point
- EW Edge of Water
- BL Topo Breakline
- ← DU Centerline Draw or Stream (Up)
- GR Ground Shot
- △ Centerline Draw or Stream (Down)
- ▽ RIP Rip-Rap
- BLS Bridge Low Steel
- CON Concrete or A/C Slab
- GU Gutter In Front of Curb
- CU Back of Curb
- EP Edge of Paved Roads (ML or SR)
- SH Paved Shoulder
- C Centerline BL of Road (ML or SR)
- SNP Unpaved Shoulder
- SIGN
- FW Wire Fence
- PPA Power Pole Co. 1
- BNK Stream Bank
- GDL Guard Rail Steel
- LIN Miscellaneous Line
- SBR Size of Bridge
- BRG Bridge
- BD Bridge Deck
- FO1D FO1D Fiber Optic Co. 1 - Quality D
- OUT Tile Outlet
- TIL Tile Line
- PR Electric Riser Pole
- PLG Location of General Photo
- MIS Miscellaneous
- PCP Photo Control Point
- WV Water Valve
- FHD Fire Hydrants
- EB Electrical Box
- LUM Luminaire
- E1 EL1D Electric Line Co. 1 - Quality D
- W WL1D Water Line Co. 1 - Quality D
- TPD Telephone Pedestal
- F03 FO3D Fiber Optic Co. 3 - Quality D
- F02 FO2D Fiber Optic Co. 2 - Quality D
- DTM Photogrammetry Elv Control Check
- SOP Size of Pipe or Culvert
- PIP Pipe Culvert
- PRO Profile Shot
- BCL Bridge Centerline

UTILITY LEGEND

This is NOT a POINT 25 Project and is not subject to the provisions of IAC 761-115.25.

- E1- Consumers Energy
Jim Kidd
2075 Marshalltown Blvd
Marshalltown, IA 50158-1058
(641) 752-1593
jkidd@consumersenergy.coop
- F0- Aureon Network Services
Jeff Klocko
7760 Office Plaza Drive South
West Des Moines, IA 50266
(515) 830-0445
jeff.klocko@aureon.com
- F02- Unite Private Networks
Clark Lundy
2320 Wakonda View Dr.
Des Moines, IA 50321
(515) 321-3336
clark.lundy@upnfiber.com
- F03- Centurylink
Steve Parker
2103 E. University Ave.
Des Moines, IA 50317
(515) 265-0968
Steven.Parker4@centurylink.com
- W- ANKENY
Donald Clark
220 W. 1st Street
Ankeny, IA 50023
(515) 963-3529
dclark@ankenyiowa.gov

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.		
Yellow	(4)	Highlight for Critical Notes or Features
Red	(3)	Delineates Restricted Areas
Lavender	(9)	Temporary Pavement Shading
Gray, Light	(48)	Proposed Pavement Shading
Gray, Med	(80)	Proposed Granular Shading
Gray, Dark	(112)	Proposed Grade and Pave Shading "In conjunction with a paving project"
Brown, Light	(236)	Grading Shading
Tan	(8)	Proposed Sidewalk Shading
Blue, Light	(230)	Proposed Sidewalk Landing Shading
Pink	(11)	Proposed Sidewalk Ramp Shading

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	
Green	(2)	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

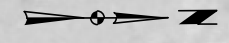
RIGHT-OF-WAY LEGEND

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

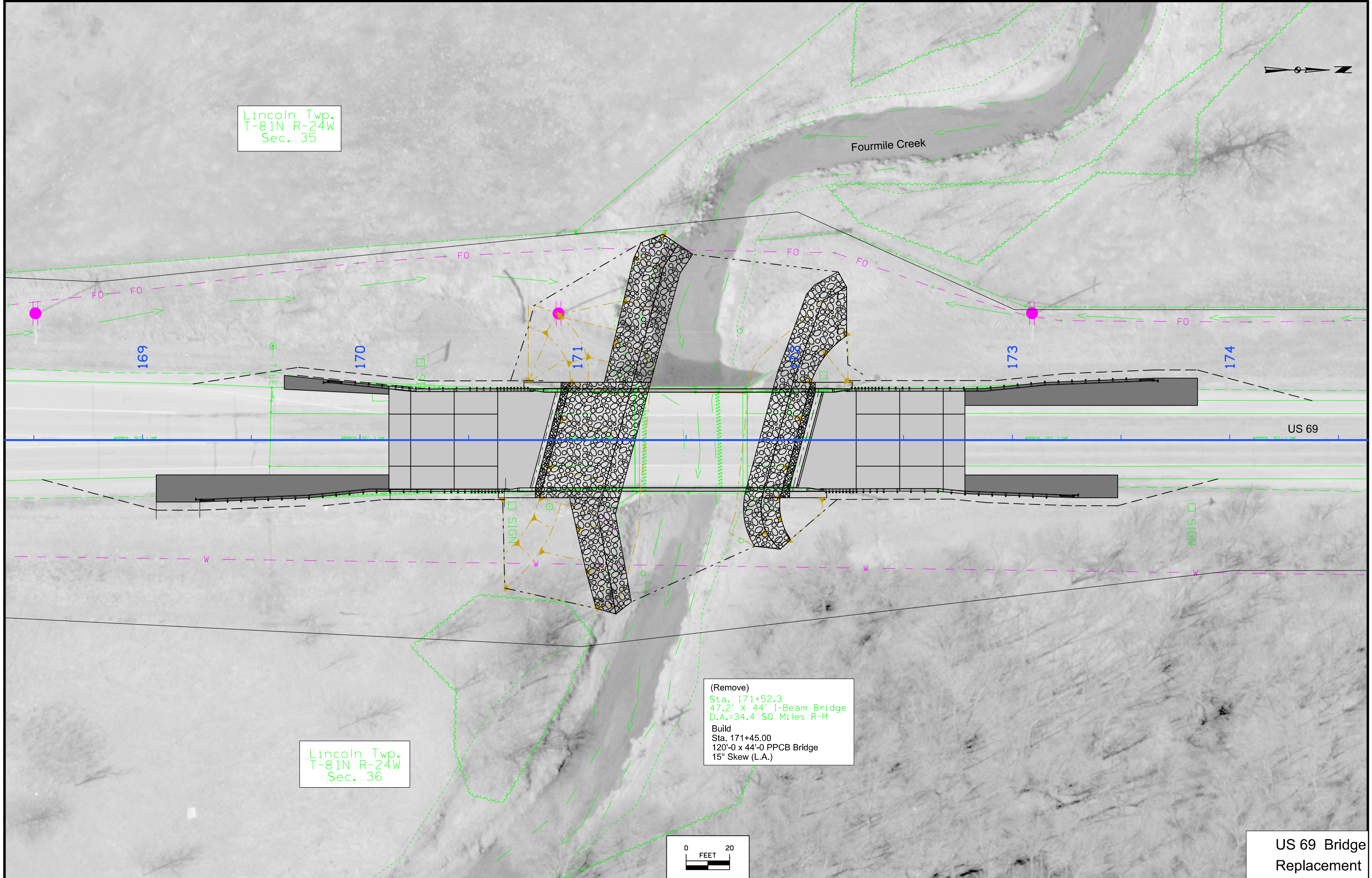
PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

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

Lincoln Twp.
T-81N R-24W
Sec. 35

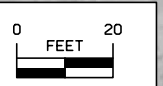


Fourmile Creek



Lincoln Twp.
T-81N R-24W
Sec. 36

(Remove)
Sta. 171+52.3
47.2' X 44' I-Beam Bridge
D.A.=34.4 SQ Miles R-H
Build
Sta. 171+45.00
120'-0 x 44'-0 PPCB Bridge
15° Skew (L.A.)



US 69 Bridge
Replacement



Survey Information

Polk County
BRF-069-4(115)--38-77
Four Mile Creek 0.8 mi S of Co Rd F22
18-77-069-020
Sap-0882.1

Date(s) of Survey

Begin Date 09/19/2019
End Date 03/10/2020

General Information

Measurement units for this survey are US survey feet. This survey is for bridge and approaches-PPCB, @ Four Mile Creek 0.8 mi S of Co Rd F22. Project datum and control information is provided by Design Survey Office. This project is a partial field survey, supplemented with photo control.

Vertical Control

Vertical Control was established on this project by 6 hour GPS static sessions. Vertical datum for this survey is relative to NAVD88. Geoid 12 B was used in processing. GRS80 Ellipsoidal Height was computed at project Pts. Vertical control was checked with IARTN checks.

This survey observed AB Plan bridge seat to compare to local ground control:

North bridge seat AB Plans Project # FN-69-4(51)--21-77 Elevation 930.36
= North bridge cap Survey Elev. = 929.31

Horizontal Control

The project coordinate system for this survey is Iowa RCS Zone 8 (U.S. Survey Feet). This survey control is relative to IARTN reference stations. IARTN Reference Station coordinates are relative to the National Reference Station network datum: NAD83 (2011). Coordinates were determined by conducting six hour static observations. control was checked with IARTN checks.

Point Name	Northing	Easting	Elevation	Description
CP 2	7561251.242	18531575.348	948.536	Feno Monument
3	7559009.902	18531645.037	935.075	Feno Monument
CP 4	7553632.672	18531699.541	938.074	Feno Monument
CP 5	7566498.859	18531693.108	979.906	Feno Monument

Alignment Information

US Hwy 69

The alignment for this survey is a retrace of As-built Plans Project # 187 (3). Survey stationing was equated to the plan at PI Sta. 189+98.0, and was run back and ahead with no equation throughout the survey.

Survey stationing relates to as built plan stationing as follows:

PI Sta. 163+60.20 This Survey
= PI Sta. 163+58.5 As-built Plans Project # 187 (3)
= PI Sta. 163+56.41 As-built Plans Project # STP-69-4(87)—2C-77

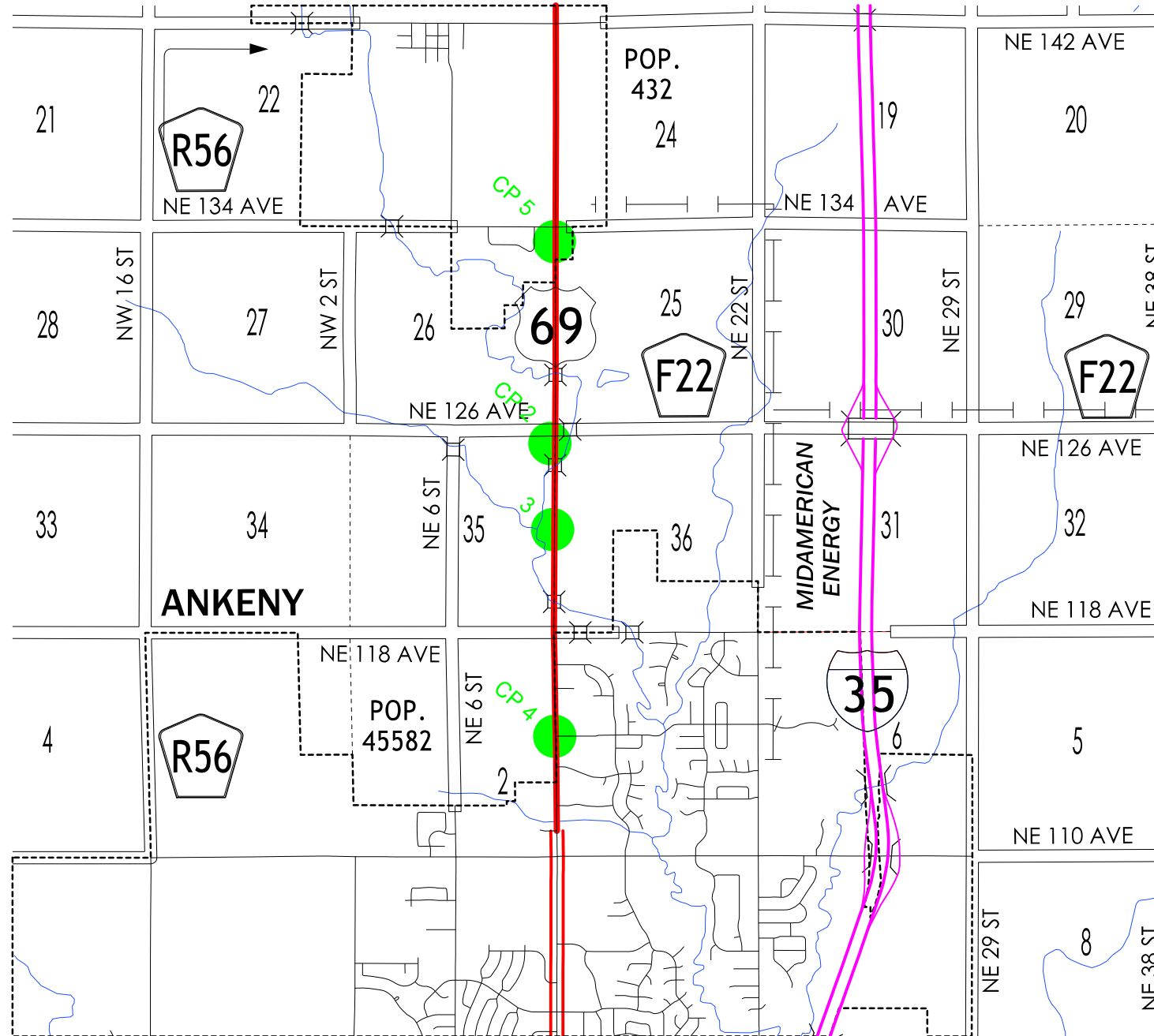
PI Sta. 189+98.0 This Survey
= PI Sta. 189+98.0 As-built Plans Project # 187 (3)

PI Sta. 216+32.38 This Survey
= PI Sta. 216+32.1 As-built Plans Project # 187 (3)

PI Sta. 242+72.91 This Survey
= PI Sta. 242+73.1 As-built Plans Project # 187 (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) EPOCH 2010.00

VERT. DATUM: NAVD88

1a. Regional Coordinate System Zone 8

Coordinate listing from next sheet will be used with 1aRTN for monument recovery. No other reference ties are given.

HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING

HORIZ. DATUM: NAD83(2011) EPOCH 2010.00

VERT. DATUM: NAVD88

Ia. Regional Coordinate System Zone 8

Point Name	North	East	Elevation	Feature Definition-Description
3	7559009.90	18531645.04	935.08	CP FENO MONUMENT 50.5' west of US Hwy 69, 86' south power pole, 43' north conc corner post, 10' east of fence
CP2	7561251.24	18531575.35	948.54	CP FENO MONUMENT 377' southwest intersection of US Hwy 69 & County Rd. F22, 37.4' west of US Hwy 69, 73' west power pole, 8' east fence
CP4	7553632.67	18531699.54	938.07	CP FENO MONUMENT On a fore slope just west of intersection US Hwy 69 & NE 47th St.. The mark is 141' northwest of sta. sign 135, 113' northwest of luminaire pole, 99' west of luminaire pole, 94' south of power pole, 28' east of fence, 17' west of the west edge ac slab.
CP5	7566498.86	18531693.11	979.91	CP FENO MONUMENT On a fore slope just west of US Hwy 69 . The mark is 378' southwest intersection US Hwy 69 & NE 134th Ave, 29.5' west center US Hwy 69, 89' northwest of sta. sign 265, 89' southwest of mile marker 100, 117' north of water valve, 42' east of south corner hdwl and wing rcb.

511 TRAVEL RESTRICTIONS

Route	Direction	County	Location Description	Feature Crossed	Object Type	Maint. Bridge No., Structure ID, or FHWA No.	Type of Restriction	Existing Measurement	Construction Measurement	Construction Measurement as Signed	Projected As Built Measurement	Remarks
US 69	Both	Polk	No restrictions anticipated.									

108-23A
08-01-08

TRAFFIC CONTROL PLAN

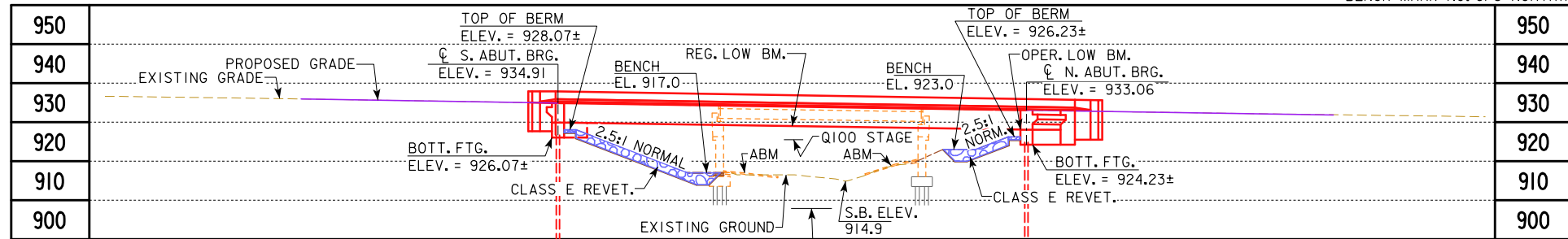
Traffic on US 69 shall be maintained at all times via offsite detour. See map on Sheet A.1.

111-01
04-17-12

COORDINATED OPERATIONS

Other work in progress during the same period of time will include the construction of the projects listed. Coordinate operations with those of other contractors working within the same area.

Project	Type of Work



LONGITUDINAL SECTION ALONG \bar{C} APPROACH ROADWAY

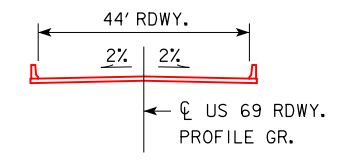
- NOTES:
- TOP OF BRIDGE DECK CROWN 0.03 BELOW PROFILE GRADE.
 - CLASS E REVETMENT IS EMBEDDED.
 - EXISTING ARTICULATING BLOCK MATS (ABM) SHALL BE REMOVED.
- DESIGN NOTES (TO BE REMOVED FROM TSL):
- TL-3 BRIDGE RAILING PROPOSED.
 - BTC BEAM PROPOSED.
 - AN IOWA DNR FLOOD PLAIN CONSTRUCTION PERMIT IS REQUIRED.
 - BERM SLOPES TO BE CONFIRMED DURING FINAL DESIGN.
 - AN OFF SITE DETOUR IS PROPOSED FOR MAINTENANCE OF TRAFFIC DURING CONSTRUCTION.

G = -1.538%

VPI STA = 170+19.236 VPI ELEV = 935.948

VPI STA = 172+83.604 VPI ELEV = 931.881

PROPOSED PROFILE GRADE US 69



TYPICAL BRIDGE SECTION

HYDRAULIC DATA

DRAINAGE AREA = 29.9 SQ. MI.
 STREAM SLOPE = 5.7 FT./MI.
 AVG. LOW WATER STAGE = 916.2

Q₅₀ = 2627 CFS
 STAGE = 925.3
 REGULATORY LOW BEAM = 929.0
 BACKWATER = 0.7 FT.

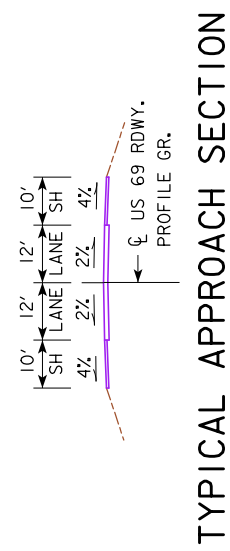
Q₁₀₀ = 3240 CFS
 STAGE = 925.5
 OPERATIONAL LOW BEAM = 928.0
 BACKWATER = 0.8 FT.
 AVG. BRIDGE VELOCITY = 5.4 FPS

Q₂₀₀ = 3800 CFS
 STAGE = 926.0
 CALCULATED DESIGN SCOUR = 907.9

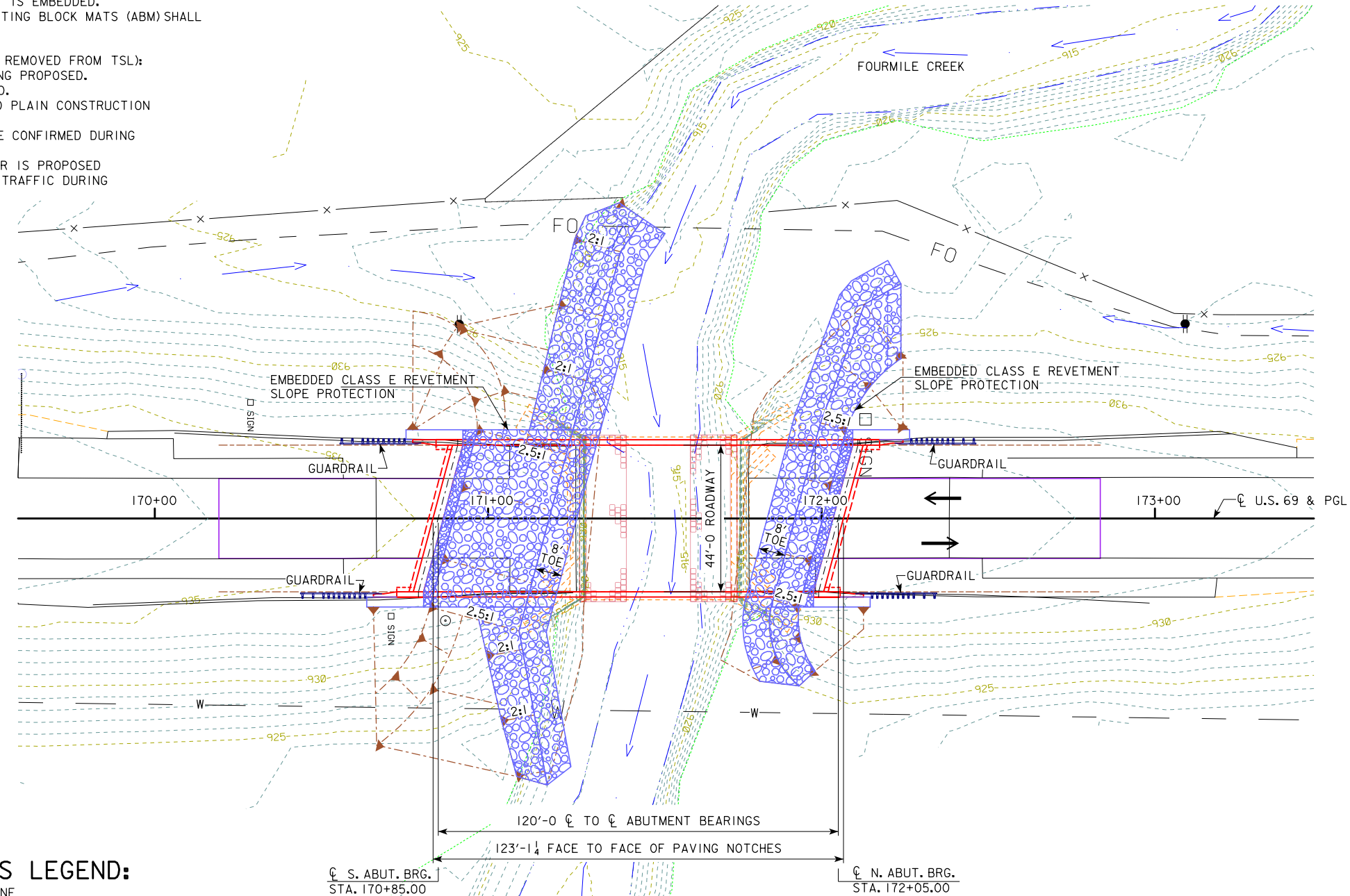
Q₅₀₀ = 4601 CFS
 STAGE = 926.5
 CALCULATED CHECK SCOUR = 906.5

ROADWAY OVERTOP ELEV. 928.8
 STA. 176+87

50, 100 & 500 YR. DISCHARGES FROM THE POLK COUNTY F.I.S., DATED FEB. 1, 2019. 200 FROM FREQUENCY DISCHARGE PLOT. F.I.S. DATUM IS THE SAME AS THE PROJECT DATUM.



TYPICAL APPROACH SECTION



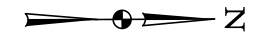
SITUATION PLAN

UTILITIES LEGEND:

- E1 - ELECTRIC LINE
- FO - FIBER OPTIC LINE
- FO2- FIBER OPTIC LINE
- FO3- FIBER OPTIC LINE
- W - WATER LINE

UTILITIES SHOWN ON THIS SHEET ARE FOR INFORMATION ONLY, SEE ROAD DESIGN SHEETS FOR FINAL UTILITY INFORMATION.

- GENERAL NOTES (FOR INCORPORATION INTO GENERAL NOTES FOR FINAL PLAN SET. THEN, DELETE FROM TSL):
- EXISTING 48'-10 1/2" x 44" I-BEAM BRIDGE (DESIGNS 1521/2848/2290/2708) TO BE REMOVED. INCLUDES REMOVAL OF ARTICULATING BLOCK MATS.



TRAFFIC ESTIMATE

2023 AADT	6700	V.P.D.
2043 AADT	8600	V.P.D.
2043 DHV	890	V.P.H.
TRUCKS	3	%
TOTAL DESIGN ESALS	-	

LOCATION

US 69 OVER FOURMILE CREEK
 T-81 N R-24 W
 SECTION 35 & 36
 LINCOLN TOWNSHIP
 CITY OF ANKENY
 POLK COUNTY
 FHWA NO. 40661
 BRIDGE MAINT. NO. 7798.4S069
 LATITUDE 41.778953°
 LONGITUDE -93.600501°

PRELIMINARY

DESIGN FOR 15° SKEW (L.A.)

120'-0" x 44'-0" PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

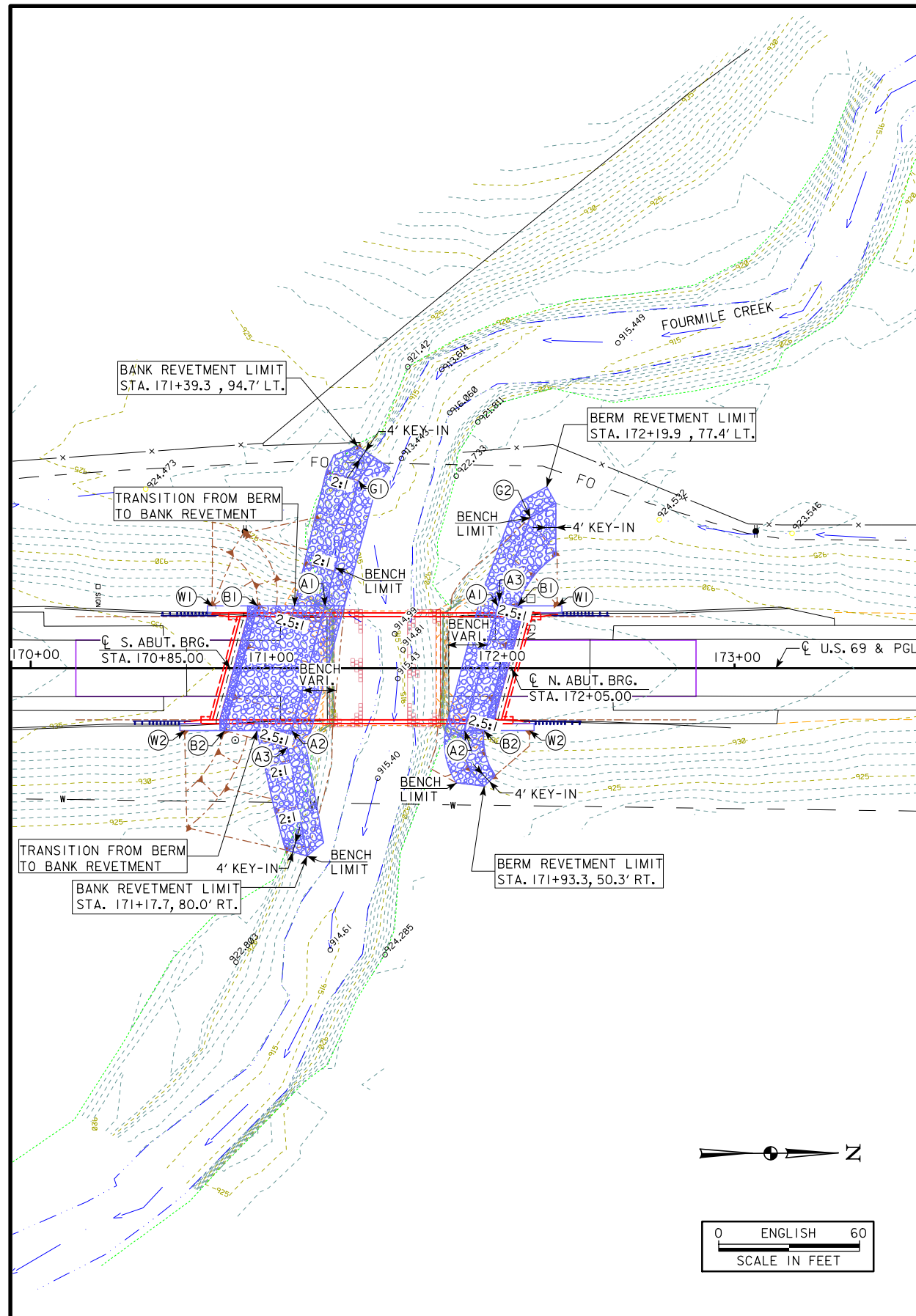
120'-0" SINGLE SPAN (BTC BEAMS)

SITUATION PLAN

STATION 171+45.00 (U.S. 69) AUGUST 2020

POLK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 1 OF 2 FILE NO. 31912 DESIGN NO. 123



BERM SLOPE LOCATION TABLE

POINTS	SOUTH ABUTMENT			NORTH ABUTMENT		
	STATION	OFFSET	ELEV.	STATION	OFFSET	ELEV.
A1	171+25.43	26.58' LT	917.00	171+99.10	26.58' LT	923.00
A2	171+11.19	26.58' RT	917.00	171+84.86	26.58' RT	923.00
A3	171+09.27	33.75' RT	917.00	171+99.66	28.67' LT	923.00
B1	170+96.78	26.58' LT	928.07	172+07.46	26.58' LT	926.23
B2	170+82.54	26.58' RT	928.07	171+93.22	26.58' RT	926.23
W1	170+77.39	26.58' LT	934.46	172+24.39	26.58' LT	932.20
W2	170+65.61	26.58' RT	934.64	172+12.61	26.58' RT	932.38

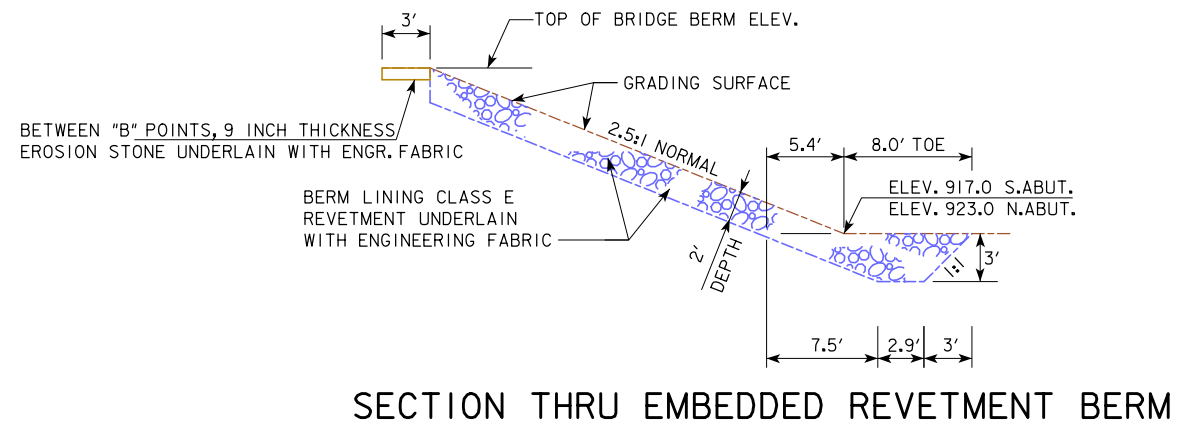
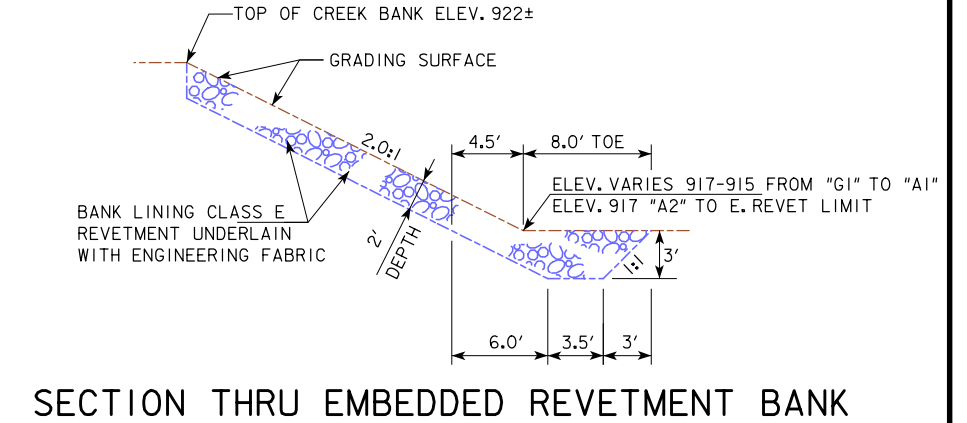
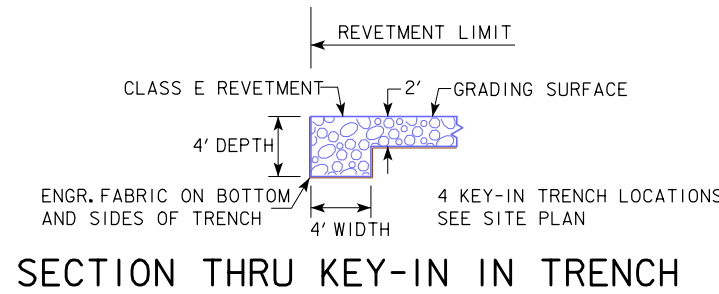
BERM SLOPE ELEVATIONS REFLECT THE GRADING SURFACE

GRADING CONTROL POINTS:
 G1 = 171+39.75, 80.00' LT, ELEV. = 915.0
 G2 = 172+12.89, 64.30' LT, ELEV. = 923.0

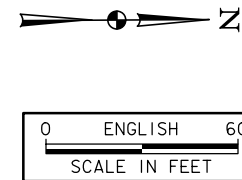
ESTIMATED BERM/BANK ARMORING QUANTITIES

LOCATION	REVTMENT CL. E (TON)	EROSION STONE (TON)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
BERM LINING - SOUTH ABUTMENT	255.2	7.3	270.9	164.1
BANK LINING - SOUTH ABUTMENT	340.4	0.0	359.7	212.8
BERM LINING - NORTH ABUTMENT	308.4	7.3	339.0	197.4
TOTALS	904.0	14.6	969.6	574.3

EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE.



SITE PLAN



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.

Patricia G. Schwarz AUG. 24, 2020
 Signature Date

Printed or Typed Name: **Patricia G. Schwarz**

My license renewal date is December 31, 2020

Pages or sheets covered by this seal: 1 AND 2 OF 2

PRELIMINARY

DESIGN FOR 15° SKEW (L.A.)

120'-0 x 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

120'-0 SINGLE SPAN (BTC BEAMS)

SITUATION PLAN-SITE

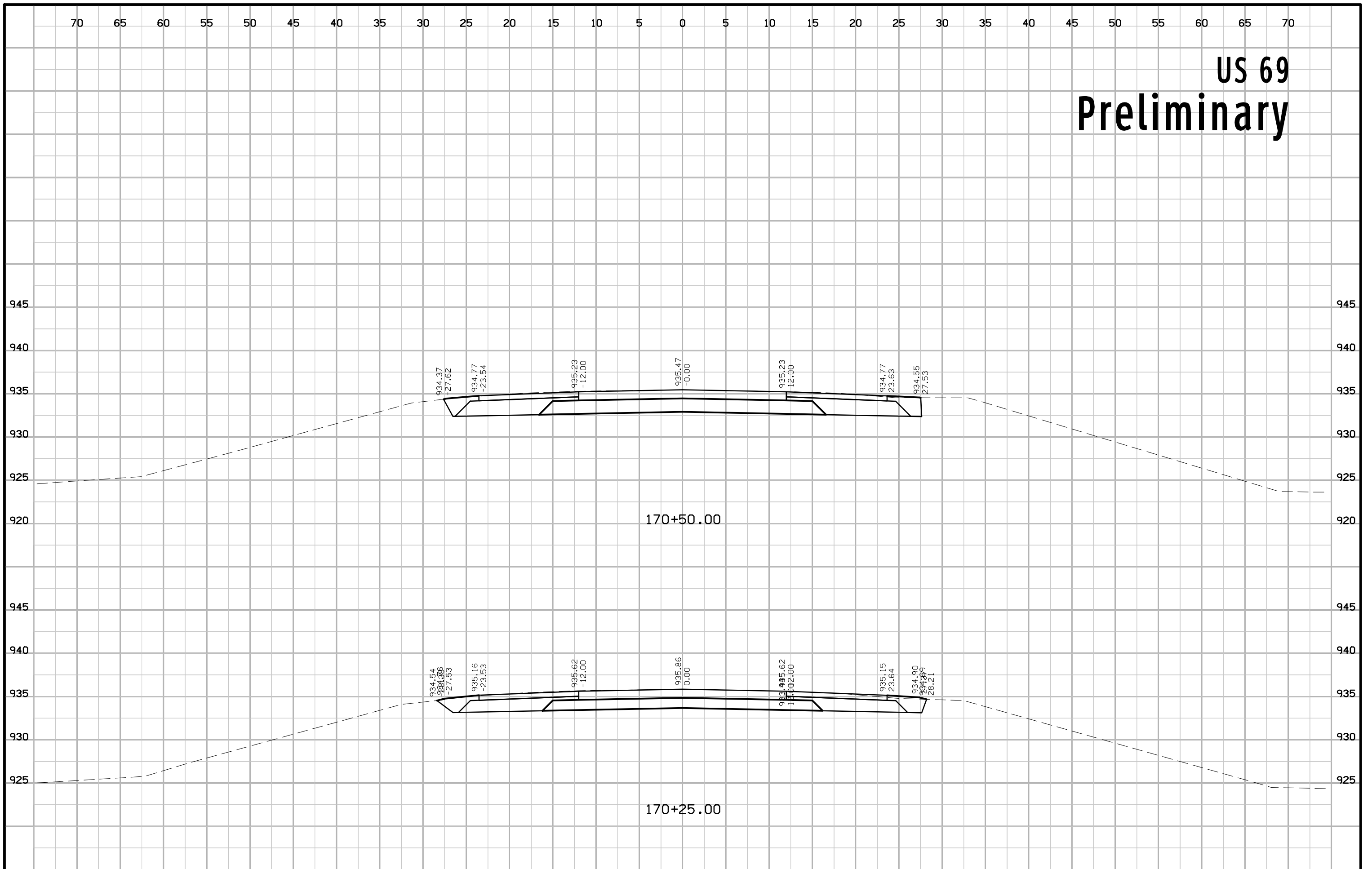
STATION 171+45.00 (U.S. 69) AUGUST 2020

POLK COUNTY

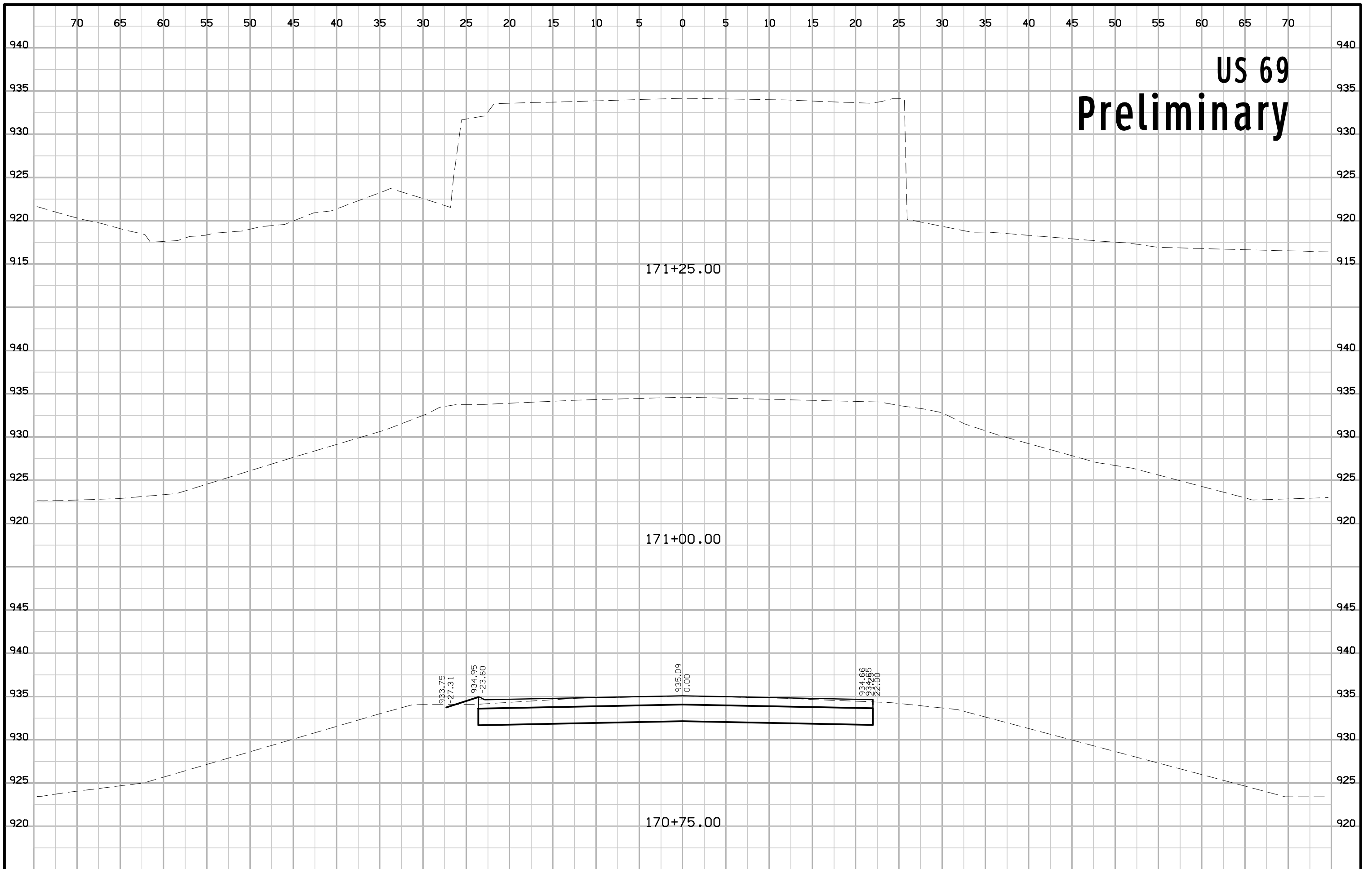
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 2 OF 2 FILE NO. 31912 DESIGN NO. 123

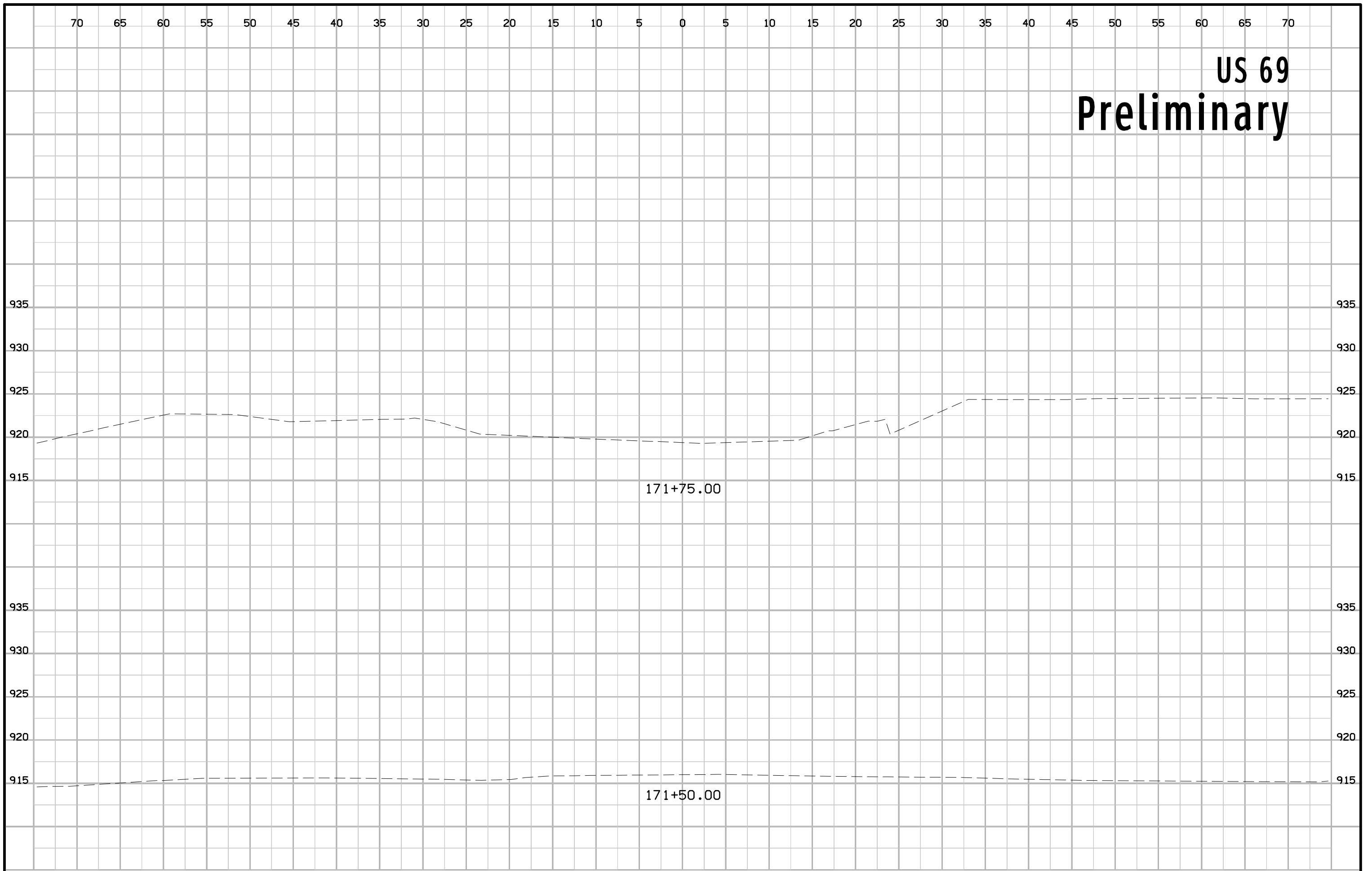
US 69 Preliminary



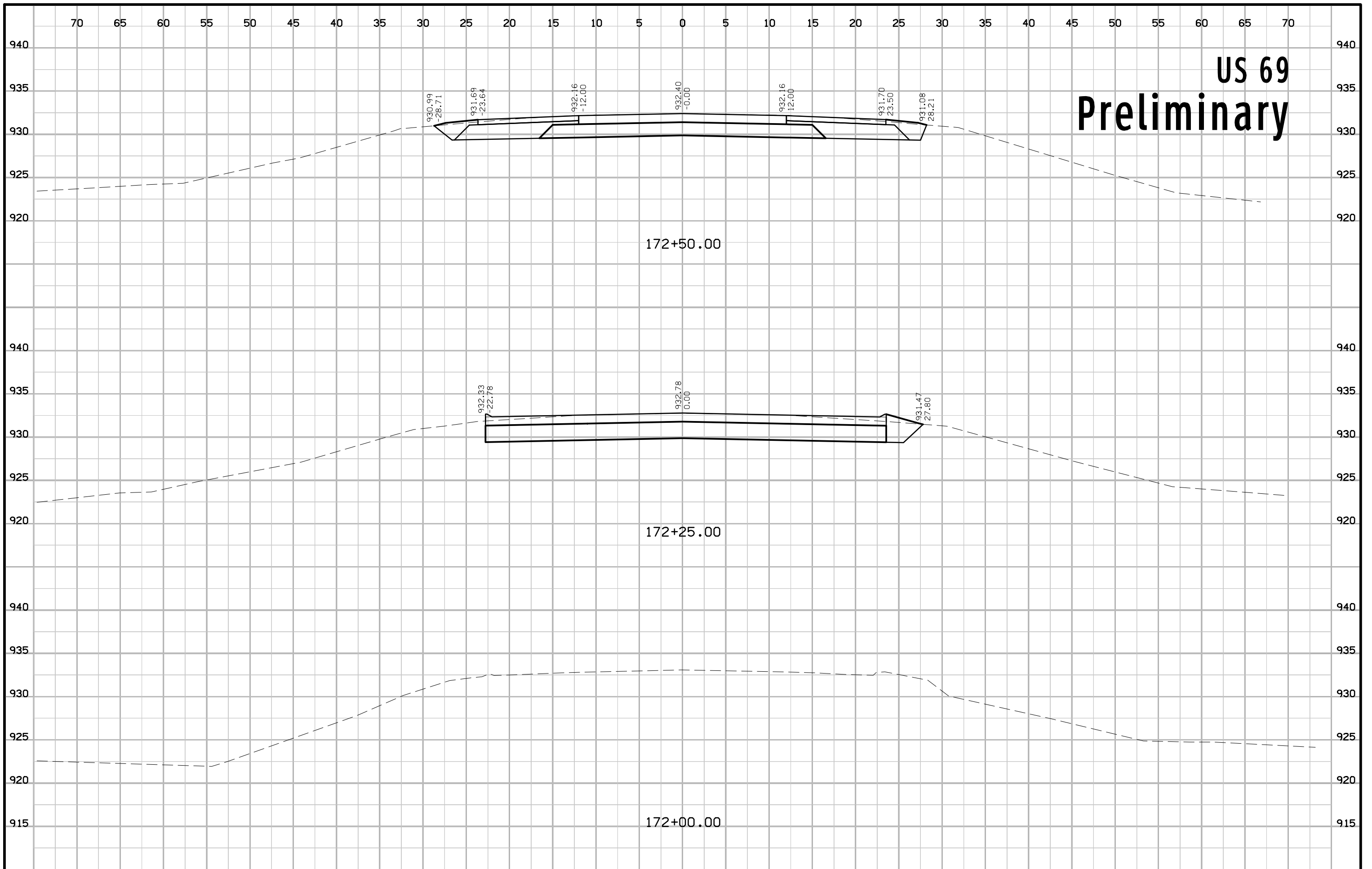
US 69 Preliminary



US 69 Preliminary



US 69 Preliminary



US 69 Preliminary

