



Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

**PRIMARY ROAD SYSTEM
KEOKUK COUNTY
BRIDGE REPLACEMENT**

IA 78 Over Richland Creek, 5.8 Miles E of IA 149

SCALES: As Noted

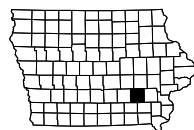
Refer to the Proposal Form for list of applicable specifications.

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



INDEX OF SHEETS	
No.	DESCRIPTION
A Sheets	Title Sheets
* A.1	Title Sheet
* A.2	Location Map Sheet
B Sheets	Typical Cross Sections and Details
B.1 - 2	Typical Cross Sections and Details
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C.1	Estimated Project Quantities
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C.1	Standard Road Plans
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W.2 - 5	Mainline Cross Sections
	* Color Plan Sheets

For Project Location Map
Refer to Sheet No. A.02



DESIGN DATA RURAL			
2022	AADT	1,700	V.P.D.
2042	AADT	1,900	V.P.D.
2042	DHV	200	V.P.H.
	TRUCKS	19	%
	Total		
	Design ESALs	--	

INDEX OF SEALS		
SHEET NO.	NAME	TYPE
A.1	Michael J. Janecek	Primary Signature Block
V.1	Phillip M. Harpole	Hydraulic Design

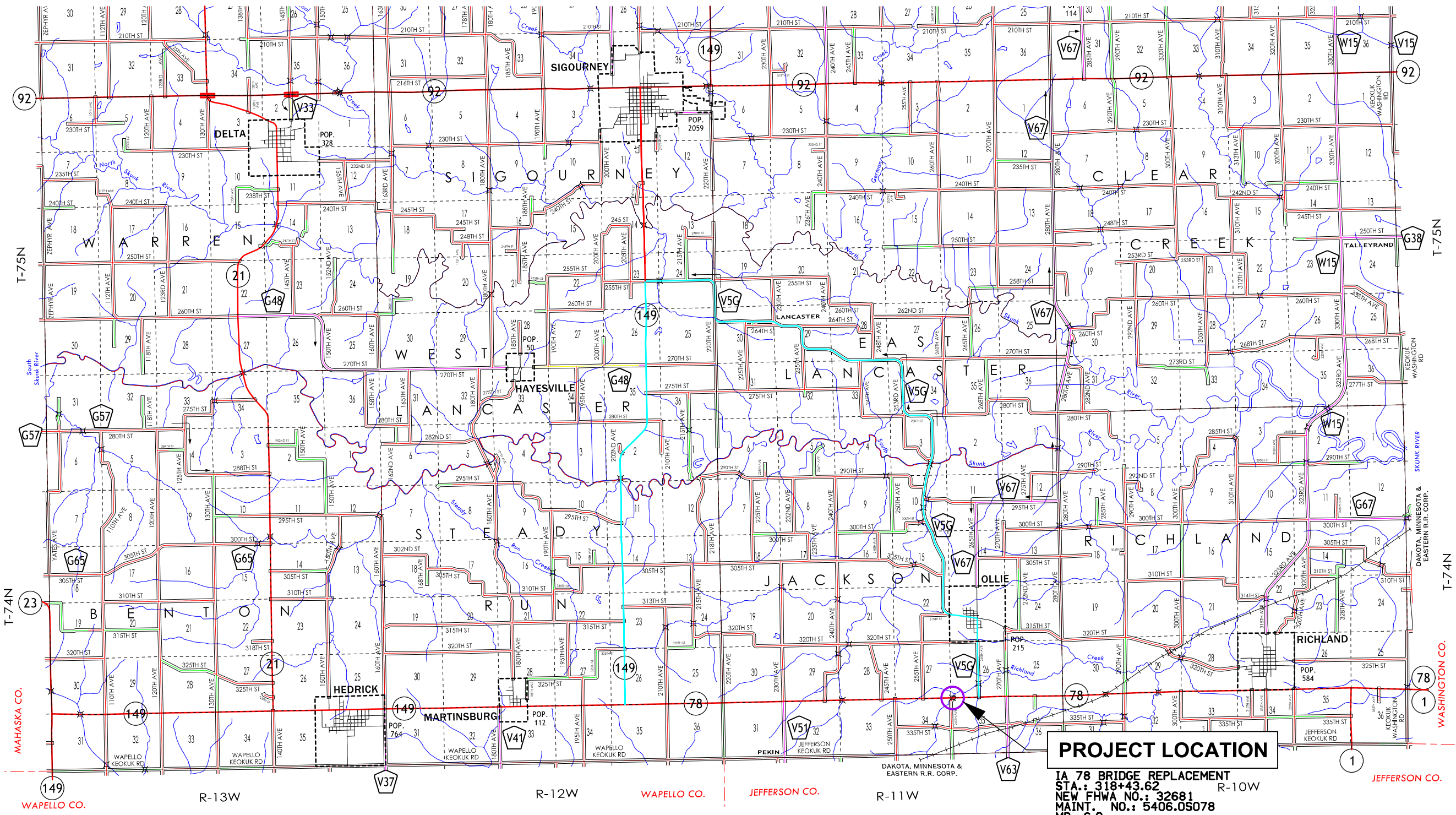
D4 PLAN – September 21, 2022

PRELIMINARY PLANS

Subject to change by final design.

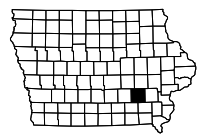
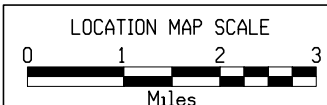
D5 PLAN – December 18, 2020

REVISIONS		TOTAL
		21
PROJECT IDENTIFICATION NUMBER		
18-54-078-010		
PROJECT NUMBER		
BRFN-078-1(22)--39-54		
R.O.W. PROJECT NUMBER		
STPN-078-1(23)--2J-54		



PROJECT LOCATION

IA 78 BRIDGE REPLACEMENT
 STA.: 318+43.62
 NEW FHWA NO.: 32681
 MAINT. NO.: 5406.05078
 MP: 6.0

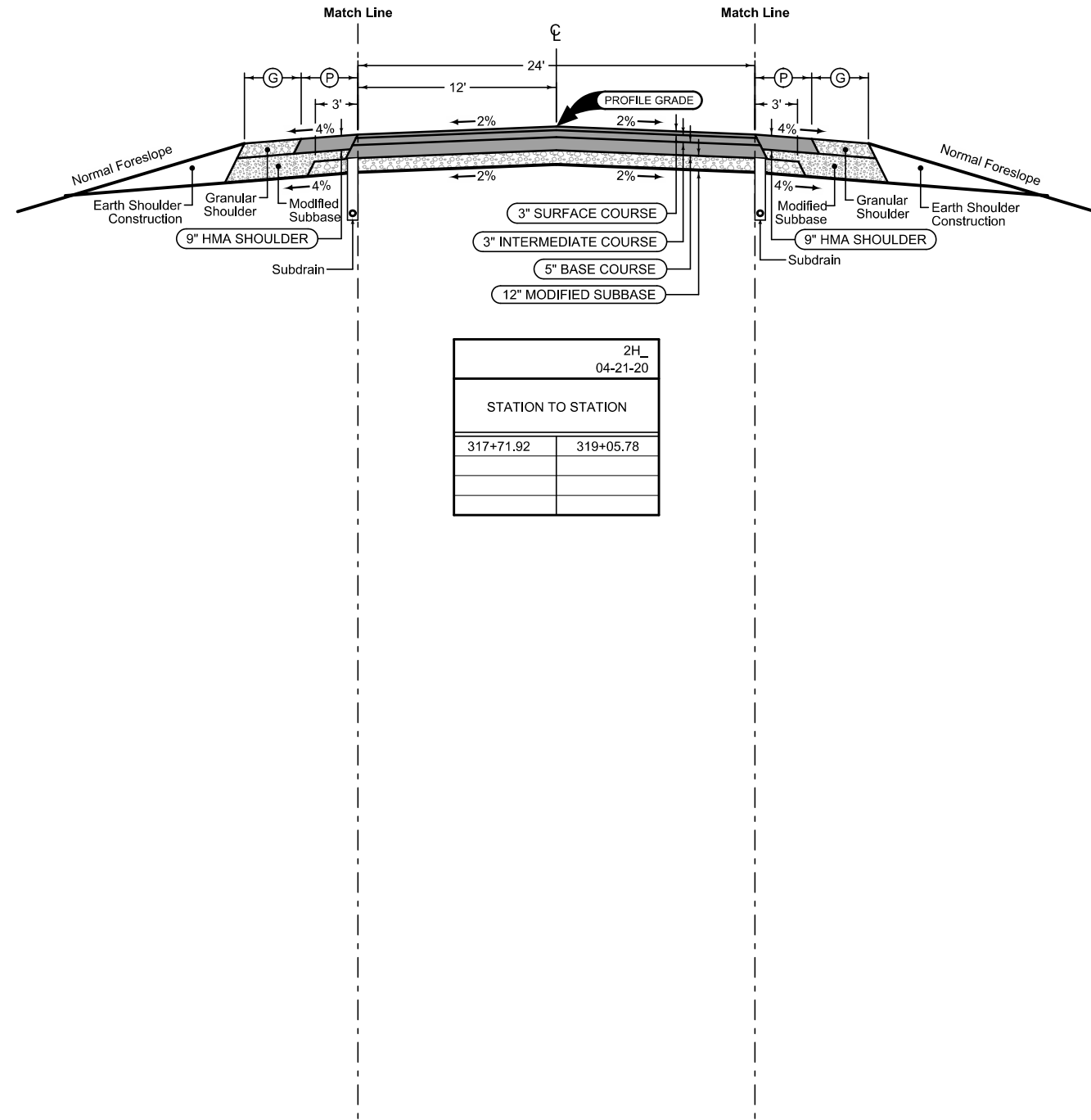


Combination Shoulder

Shoulder Jointing:
Longitudinal joint: B

STATION TO STATION		(P) Feet	(G) Feet
315+22.00	316+00.00	4-8	UAC
316+00.00	317+71.92	8*	0
317+71.92	319+05.78	8*	0
319+05.78	320+64.00	8*	0
320+64.00	621+56.00	4-8	UAC

*TRIMMED DOWN
FROM DETOUR PAVEMENT
(SEE J-SHEETS)



STATION TO STATION	
317+71.92	319+05.78

Combination Shoulder

Shoulder Jointing:
Longitudinal joint: B

STATION TO STATION		(P) Feet	(G) Feet
316+86.92	317+71.92	4	4
317+71.92	319+05.78	4	4
319+05.78	319+47.80	4	4

USED FOR STAGING

USED FOR STAGING

See Tab 100-24 or 100-25 for pavement quantities.
See Tab 112-9 for shoulder quantities.

IA 78

SURVEY SYMBOLS

- FENO FENO Monument
- CP Control Point
- BM Bench Mark
- SCR Section Corner
- POT Tangent Point
- BL Topo Breakline
- BNK Stream Bank
- FW Wire Fence
- D Centerline Draw or Stream (Down)
- ENU Edge Unpaved Entrance & Parking
- ENT Centerline BL of Entrance
- SNP Unpaved Shoulder
- EP Edge of Paved Roads (ML or SR)
- C Centerline BL of Road (ML or SR)
- SH Paved Shoulder
- LIN Miscellaneous Line
- TIL Tile Line
- OUT Tile Outlet
- PIP Pipe Culvert
- SOP Size of Pipe or Culvert
- PLG Location of General Photo
- TPD Telephone Pedestal
- TL1D Telephone Line Co. 1 - Quality D
- FO1D Fiber Optic Co. 1 - Quality D
- WL1D Water Line Co. 1 - Quality D
- TL2D Telephone Line Co. 2 - Quality D
- PPA Power Pole Co. 1
- CON Concrete or A/C Slab
- GR Ground Shot
- BLS Bridge Low Steel
- GU Gutter In Front of Curb
- CU Back of Curb
- DTM Photogrammetry Elevation Control Check
- PRO Profile Shot
- EW Edge of Water
- BRG Bridge
- BD Bridge Deck
- BCL Bridge Centerline
- REF Reference Tie Point
- EG Edge of Gravel Road
- TW Top of Water
- CUL Culvert
- SBR Size of Bridge

UTILITY LEGEND

Sub-Surface Utility Mapping Quality Level is in accordance with CI/ASCE 38-02 Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data.

Remark Abbreviations
 QLA Quality Level A Highest guideline quality level
 QLD Quality Level D Lowest guideline quality level

- TL1D Telephone Line Windstream - Quality D
 Luke Niles
 501-748-5893
 Luke.t.niles@windstream.com
- FO1D Fiber Optic Windstream - Quality D
 Luke Niles
 501-748-5893
 Luke.t.niles@windstream.com
- WL1D Water Line Wapello Rural Water - Quality D
 Krista Huffman
 641-682-8351
 kristah@wapelloruralwater.com
- TL2D Telephone Line Farmers & Merchants (Farmtel) - Qlty D
 Ray Fears
 319-256-2736 ext 5213
 rayfear@farmtel.com
- PPA Power Pole Alliant Energy
 Mary Montgomery
 319-786-4768
 marymontgomery@alliantenergy.com

PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design	Color No.	Description
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.	Description
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

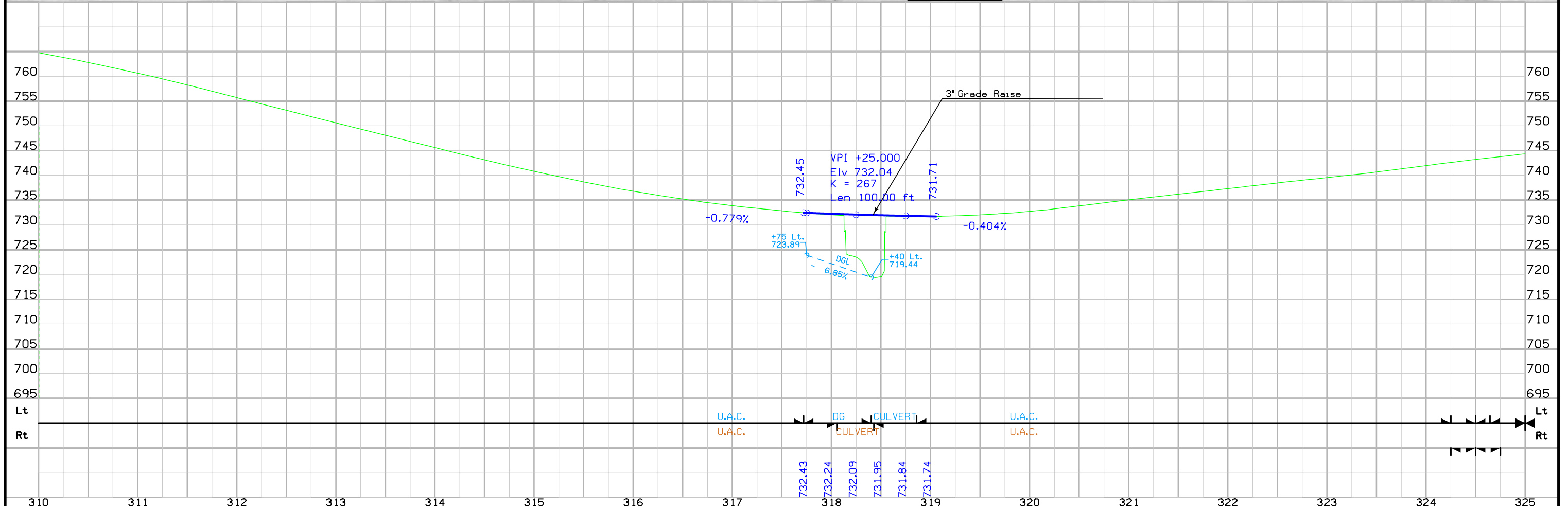
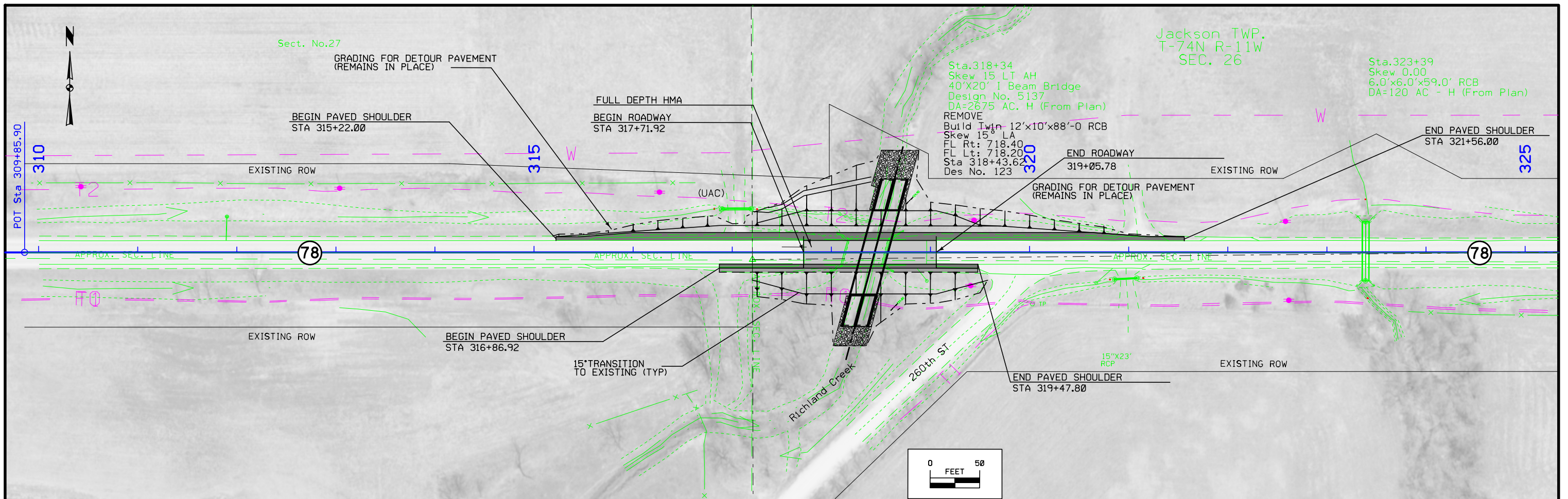
- Station
- Survey Line
- Section Corner
- Ground Line Intercept
- Saw Cut
- Guardrail
- Trench Drain
- HighTension Cable Guardrail
- Sheet Pile
- Pavement Removal
- Clearing & Grubbing Area

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)



Survey Information

County: Keokuk
SAP 684.2
PIN: 18-54-078-010
Project Number: BRFN-078-1(22)--39-54
Location: Richland Creek 5.8 mi E of IA 149
Type of Work: Bridge-Unspecified
Project Directory: 5407801018

Party Personnel

Nels Sutherland- Party Chief
 Myron Fox- Assistant Survey Party Chief

Date(s) of Survey

Begin Date 04/15/2019
 End Date 06/03/2019

General Information

Measurement units for this survey are US survey feet. This survey is for proposed bridge reconstruction over Richland Creek on Hwy78. Project datum and control information is provided by Design Survey Office. This project is a Partial DTM with Photo control.

Vertical Control

Vertical datum for this survey is NAVD88 (Computed using Geoid12B). Benchmarks were placed throughout the project using post processed static observations relative to laRTN Base Network. A minimum of 6hrs of data was simultaneously collected on each of the primary control points.

Horizontal Control

The project coordinate system for this survey is laRCS Zone 13 (U.S. Survey Feet). This survey control is relative to laRTN reference stations. laRTN Reference Station coordinates are relative to the National Reference Station network datum: NAD83 (2011) for Epoch 2010.00.

Point Name	North Coordinate	East Coordinate	Elevation	Feature Code- Monument Description
300	6737919.11	23447351.41	783.26	FENO1 FENO MON W/BRASS DISC 4IN BELOW SURFACE 940FT E OF INTERSECTION 255TH AVE AND HWY78 THEN S 43FT FROM CL HWY78.
301	6737907.56	23449312.64	731.5	CP FROM INTERSECTION OF 260TH AVE AND HWY78 S 59FT AND 1FT FROM FENCE LINE 4X4 CM
307	6737927.43	23458309.94	778.15	CP 0.76 MILES E OF INTERSECTION V63 AND HWY78 THEN S 57FT FROM CL HWY78 4X4 CM
308	6737901.79	23459664.62	775.52	CP 1.02 MILES E OF INTERSECTION V63 AND HWY78 THEN S 60FT FROM CL HWY78 4X4 CM
302	6738032.31	23450386.92	759.02	CP 0.25 MILES W OF INTERSECTION V5G AND HWY78 THEN N 64FT FROM CL HWY78 4X4 CM
306	6737926.19	23456983.14	770.79	CP 0.51 MILES E OF INTERSECTION V63 AND HWY78 THEN S 63FT FROM CL HWY78 4X4 CM
310	6737962.38	23462990.91	769.02	FENO2 0.42 MILES W OF INTERSECTION 290TH AVE AND HWY78 THEN S 62FT FROM CL HWY78 FENO MONUMENT W/BRASS DISC 4IN BELOW SURFACE
312	6738052.56	23466012.46	744.99	CP 577FT E OF INTERSECTION 290TH AVE AND HWY78 THEN S 64FT FROM CL HWY78 4X4 CM

Alignment Information

The horizontal alignment for this survey is a retrace of As-built Plans No. 879. Survey stationing was equated to the plan POT at Sta 309+85.9 and ahead without equation throughout the survey.

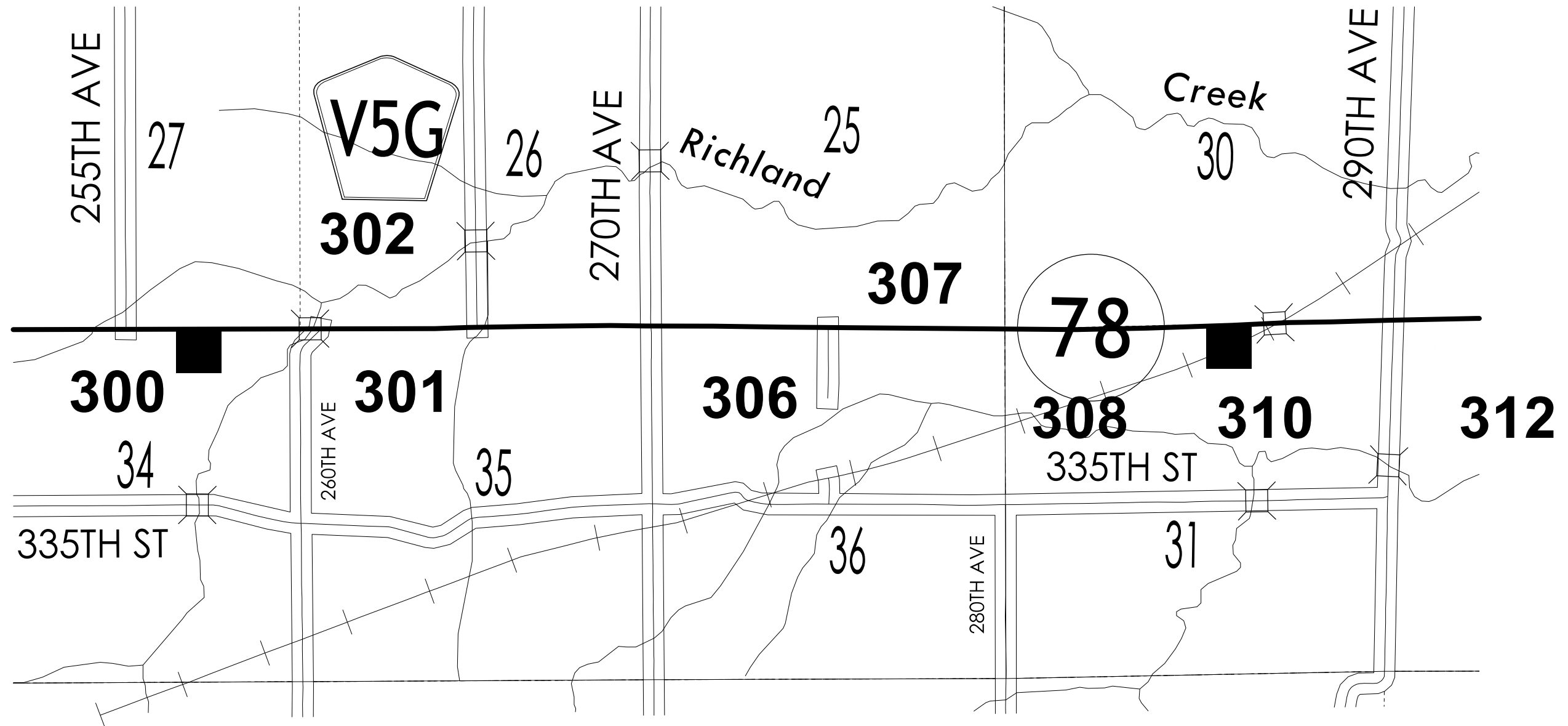
Survey stationing relates to as built plan stationing as follows:

POT Sta. 309+85.9 As-built Plans Project No. 879
 Survey POT Sta. 309+85.9

POT Sta 330+32.9 Project No. 879
 Survey POT Sta 330+32.67

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 13

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

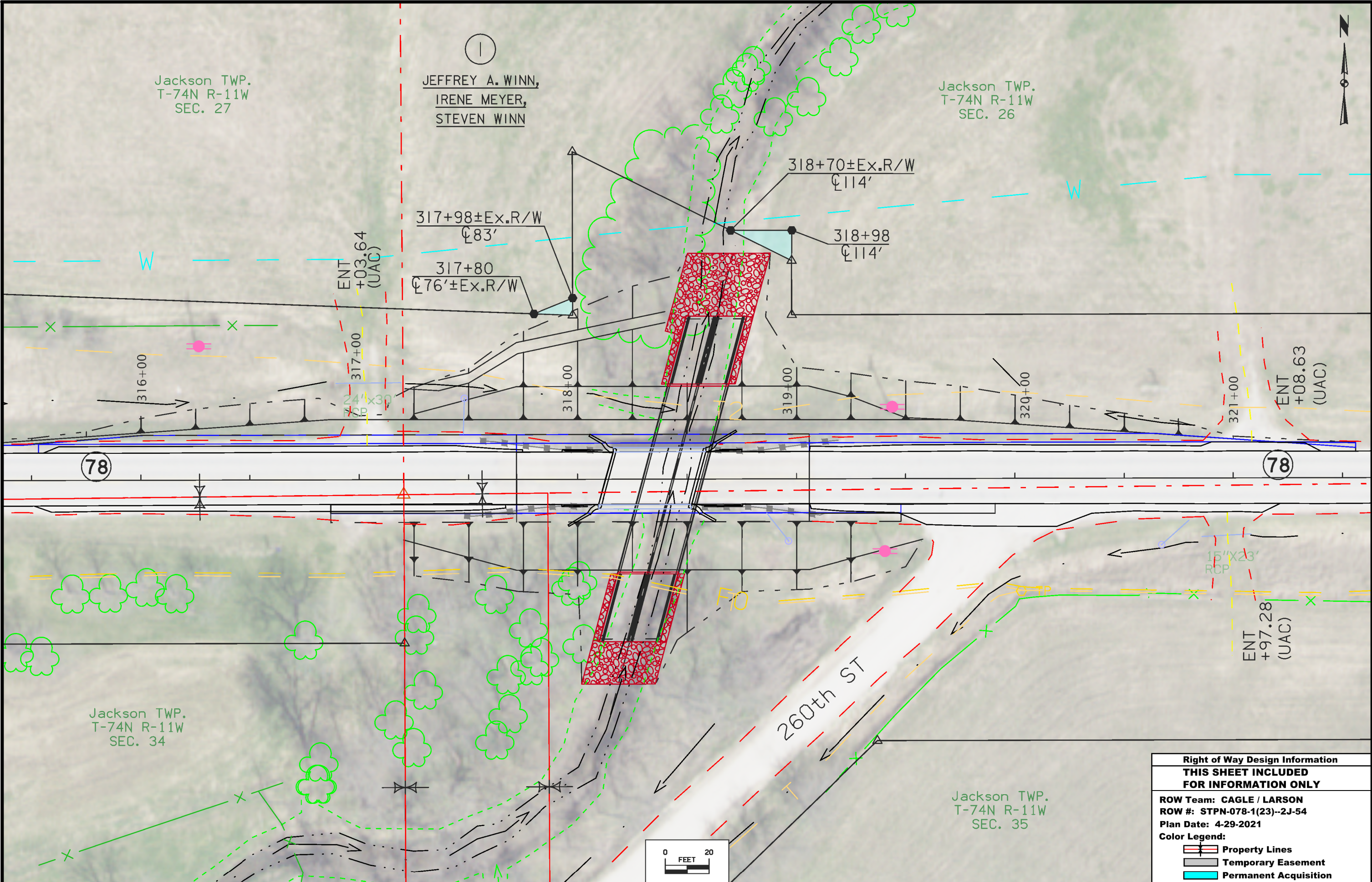
Ia. Regional Coordinate System Zone 13

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301	6737907.56	23449312.64	731.5	CP FROM INTERSECTION OF 260TH AVE AND HWY78 S 59FT AND 1FT FROM FENCE LINE 4X4 CM
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Jackson TWP.
T-74N R-11W
SEC. 27

①
JEFFREY A. WINN,
IRENE MEYER,
STEVEN WINN

Jackson TWP.
T-74N R-11W
SEC. 26



78

78

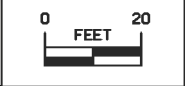
Jackson TWP.
T-74N R-11W
SEC. 34

Jackson TWP.
T-74N R-11W
SEC. 35

**Right of Way Design Information
THIS SHEET INCLUDED
FOR INFORMATION ONLY**

ROW Team: CAGLE / LARSON
ROW #: STPN-078-1(23)--2J-54
Plan Date: 4-29-2021

- Color Legend:**
- Property Lines
 - Temporary Easement
 - Permanent Acquisition



108-26A
08-01-08

STAGING NOTES

Stage 1:
Remove north portion of roadway and place north half of culvert with traffic shifted to EB lane using temporary signals. Place temporary pavement for Stage 2.

Stage 2:
Remove and replace south half of the roadway and complete culvert with traffic shifted to WB lane using temporary signals.

Stage 3:
Remove temporary pavement used in Stage 2. Complete north half of roadway shoulder and grading work. Reopen to normal traffic after completion of stage 3.

108-23A
08-01-08

TRAFFIC CONTROL PLAN

- 1) While bridge and approaches are being removed and replaced by standard pavement and a box culvert, IA 78 traffic shall be maintained by staged construction with temporary signals allowing one lane of traffic at all times.
- 2) Contractor shall furnish, install, maintain, and remove road closure signage and barricades. These functions are included in the Traffic Control Bid Item.
- 3) 260th St on the east end of the project shall be closed at IA 78.

108-25
10-21-14

511 TRAVEL RESTRICTIONS

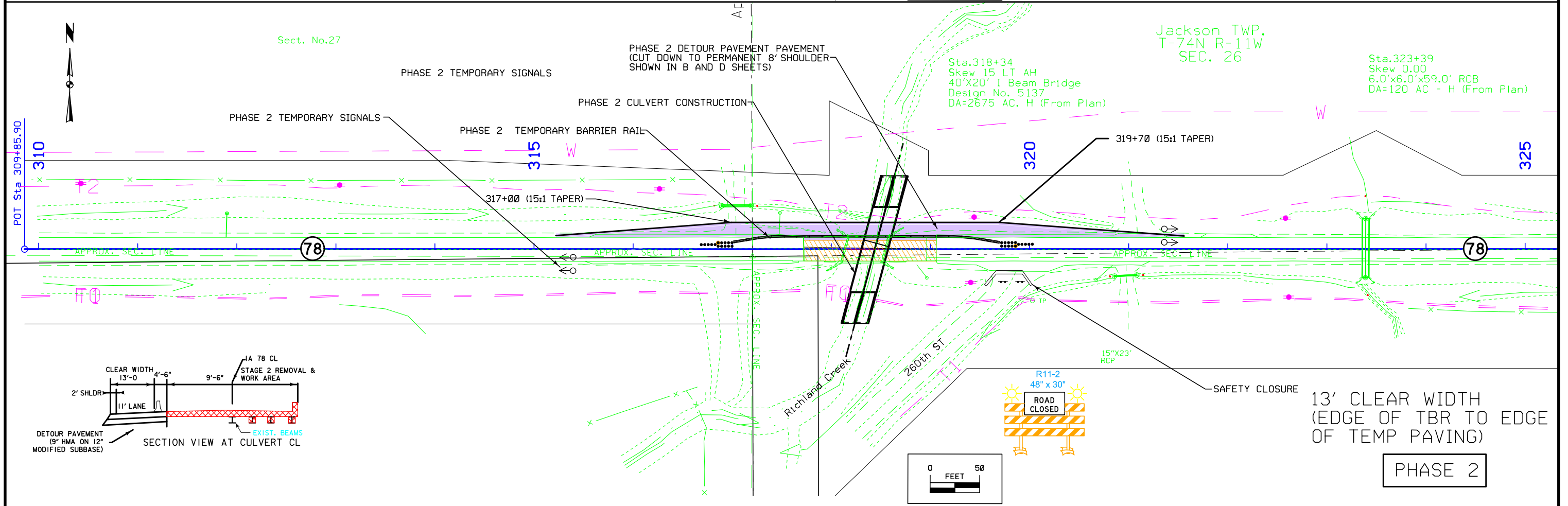
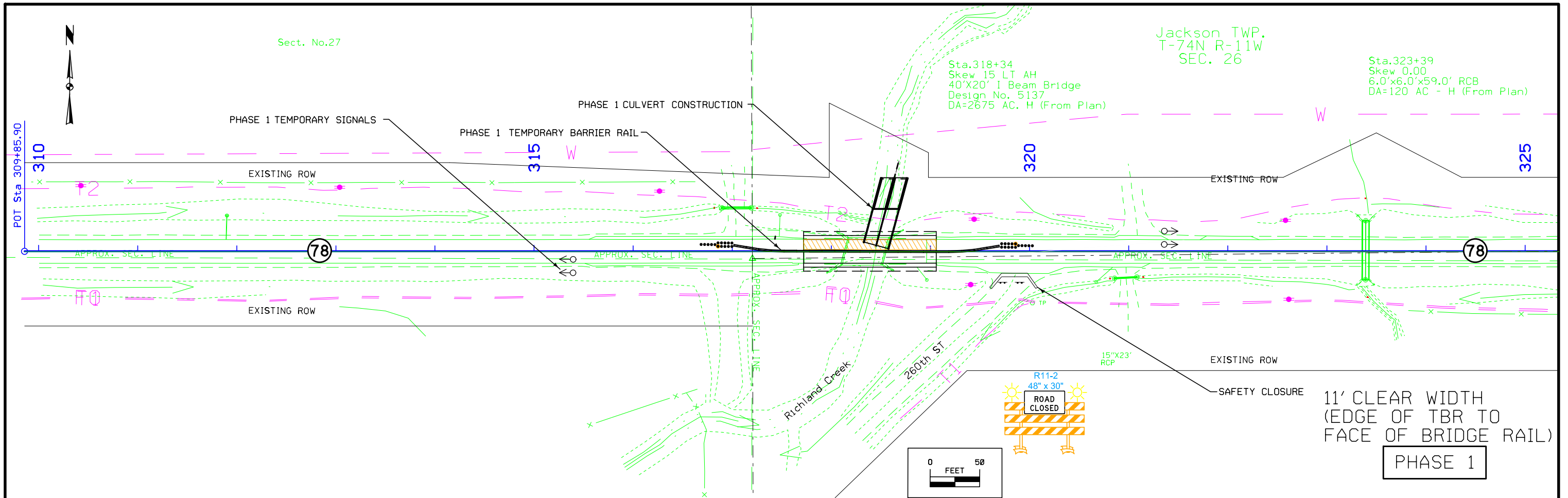
Route	Direction	County	Location Description	Feature Crossed	Object Type	Maint. Bridge No., Structure ID, or FHWA No.	Type of Restriction	Existing Measurement	Construction Measurement	Construction Measurement as Signed	Projected As Built Measurement	Remarks
IA 78	Both	Keokuk	Richland Creek (5.8 Mi E of IA 149)	Bridge (River)	Temp signal, barrier	FHWA#: 32681	Height, Width	N/A	15', 11'	15', 10'	N/A	

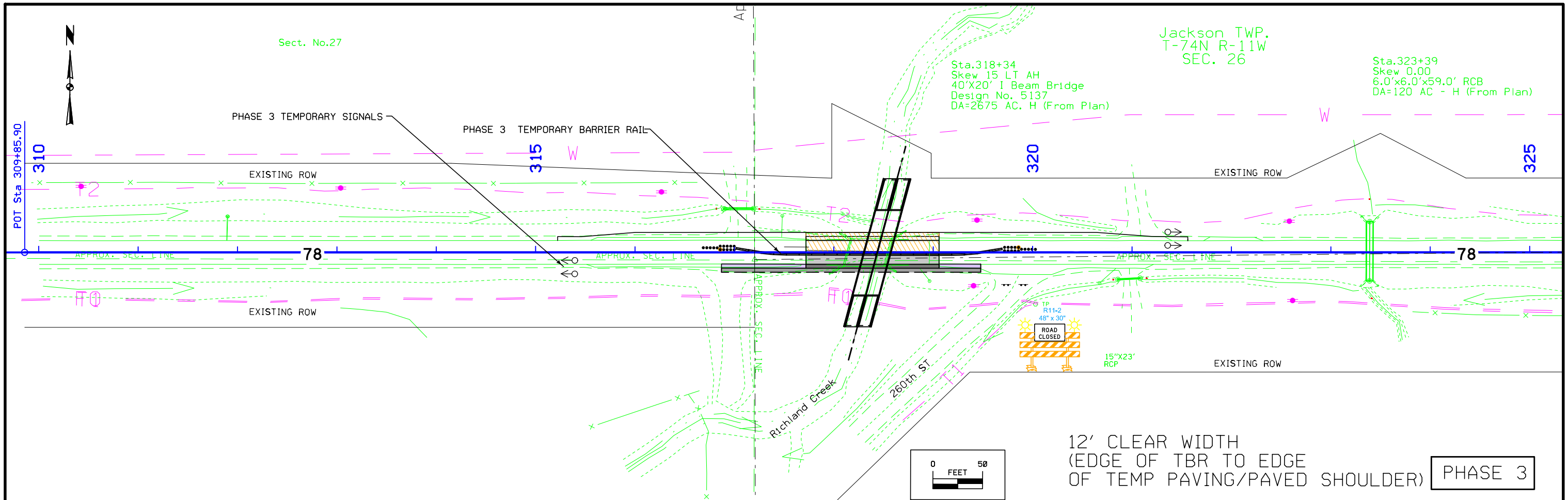
111-01
04-17-12

COORDINATED OPERATIONS

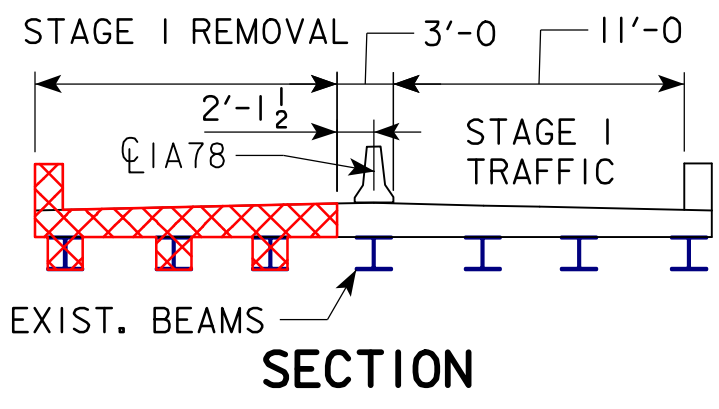
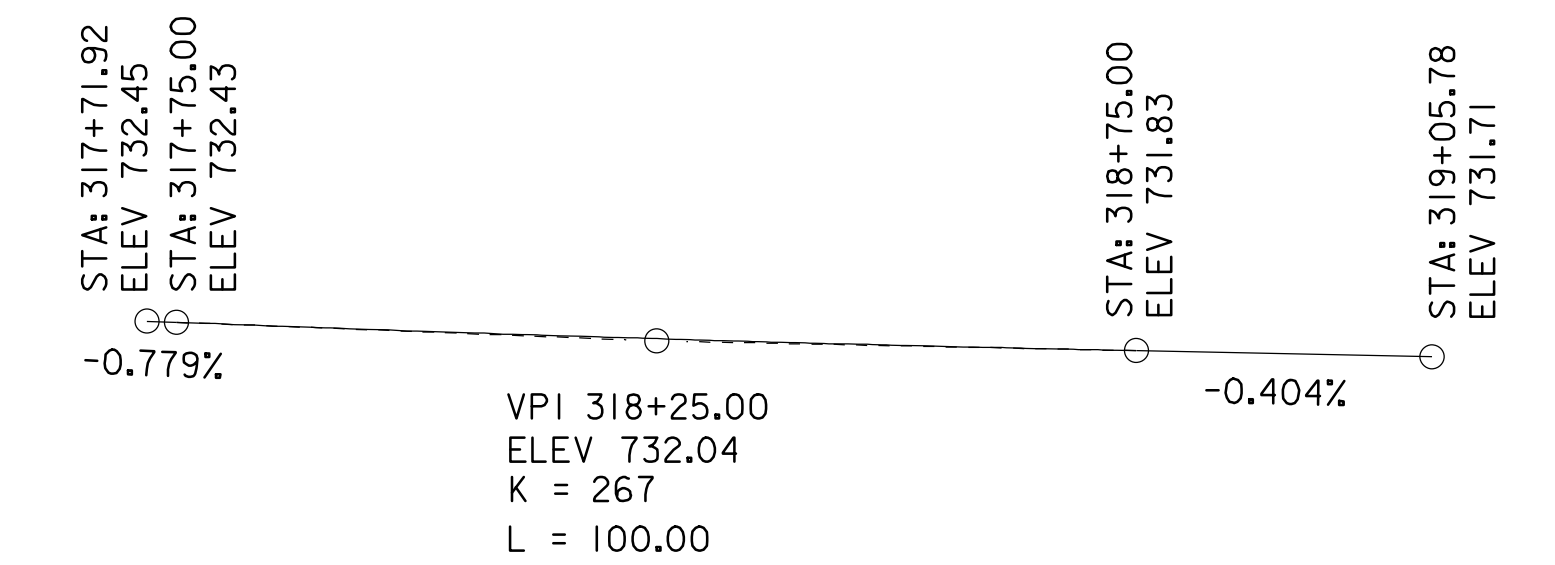
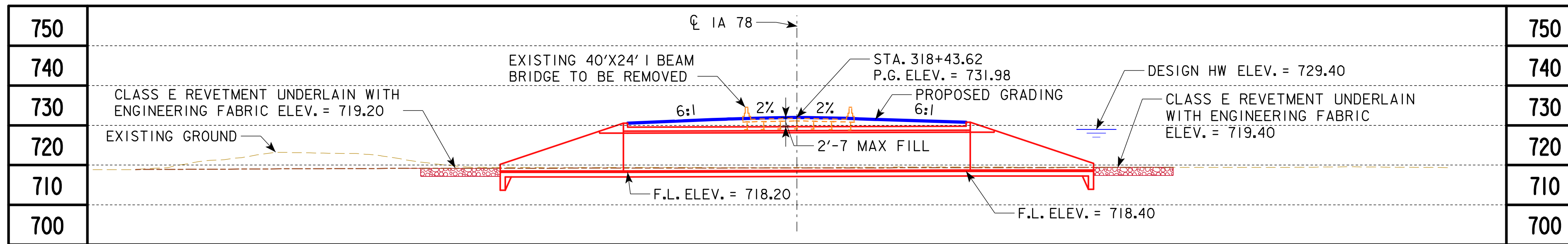
Other work in progress during the same period of time will include the construction of the projects listed. Coordinate operations with those of other contractors working within the same area.

Project	Type of Work
None Provided	

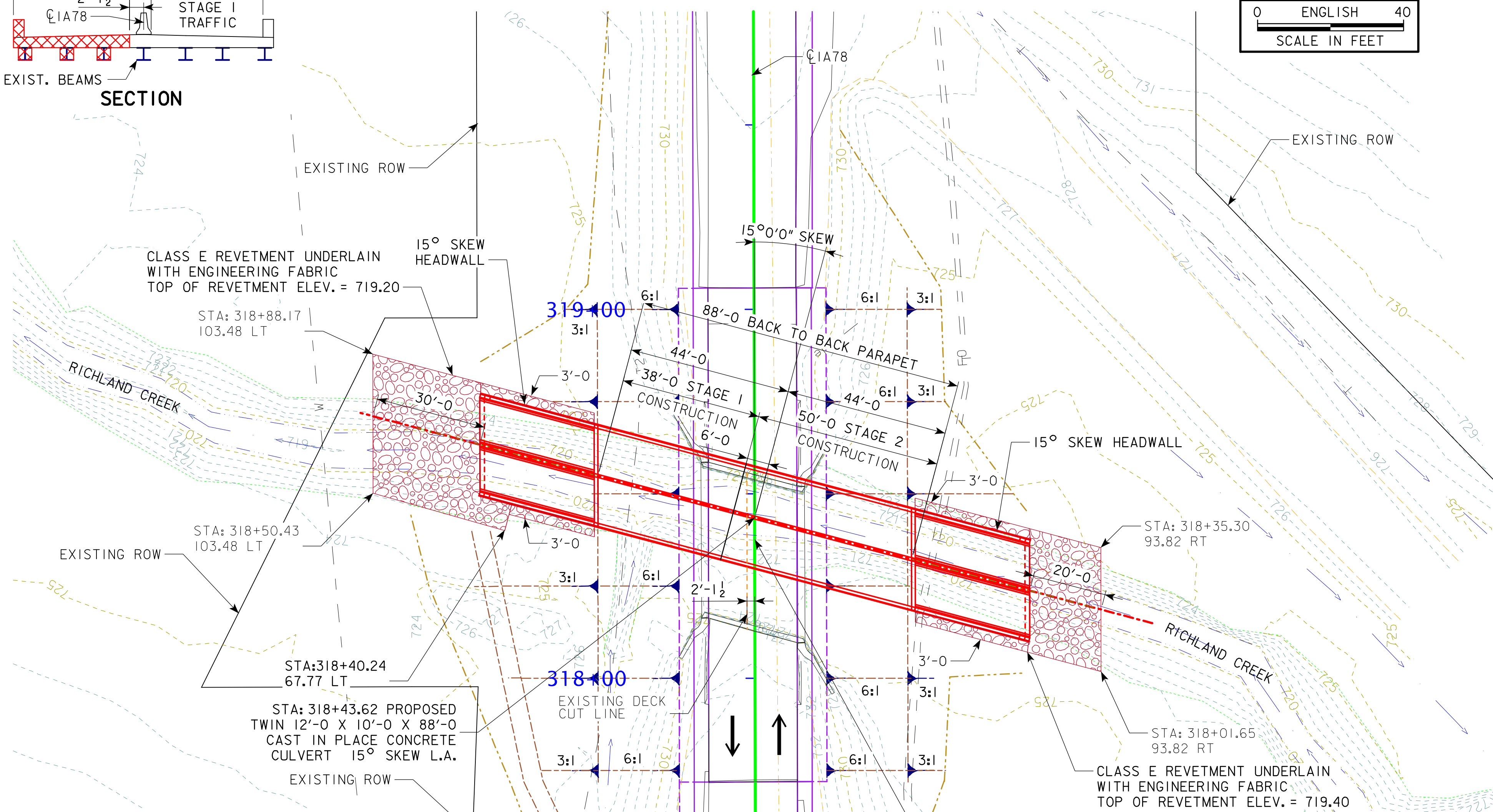
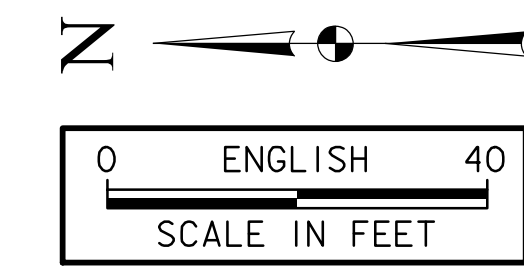




BENCH MARK NO. FENO1 FENO MON W/BRASS DISC 4IN BELOW SURFACE 940FT E OF INTERSECTION
255TH AVE AND HWY78 THEN S 43FT FROM CL HWY78. ELEV 783.26



LONGITUDINAL SECTION ALONG CL CULVERT



PROPOSED PROFILE GRADE
IA 78

NOTES:

- EXISTING 40'-0 x 24'-0 I-BEAM BRIDGE DESIGN NO. 5137.
- DRAINAGE THROUGH EXISTING CULVERT/CHANNEL MUST BE MAINTAINED THROUGHOUT CONSTRUCTION.
- FLOW LINE OF CULVERT NOMINALLY BURIED 1.0 FOOT.
- BURIED AND OVERHEAD UTILITIES TO BE RELOCATED TEMPORARILY OR PERMANENTLY AS REQUIRED FOR CONSTRUCTION.

HYDRAULIC DATA

DRAINAGE AREA = 3.95 SQ.MI.
Q₅₀ = 1,960 CFS
HW ELEV. = 729.40
STREAM SLOPE = 27.60 FT./MI.
Q₁₀₀ = 2,350 CFS, HW ELEV. = 730.80
Q₅₀₀ = 3,320 CFS, HW ELEV. = 731.80

UTILITIES LEGEND:

- W — — WAPELLO RUAL WATER LINE
- FO — — WINDSTREAM FIBER OPTIC LINE
- T — — WINDSTREAM TELEPHONE LINE
- T2 — — FARMERS & ELA MERCHANTS MUTUAL TELEPHONE LINE

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

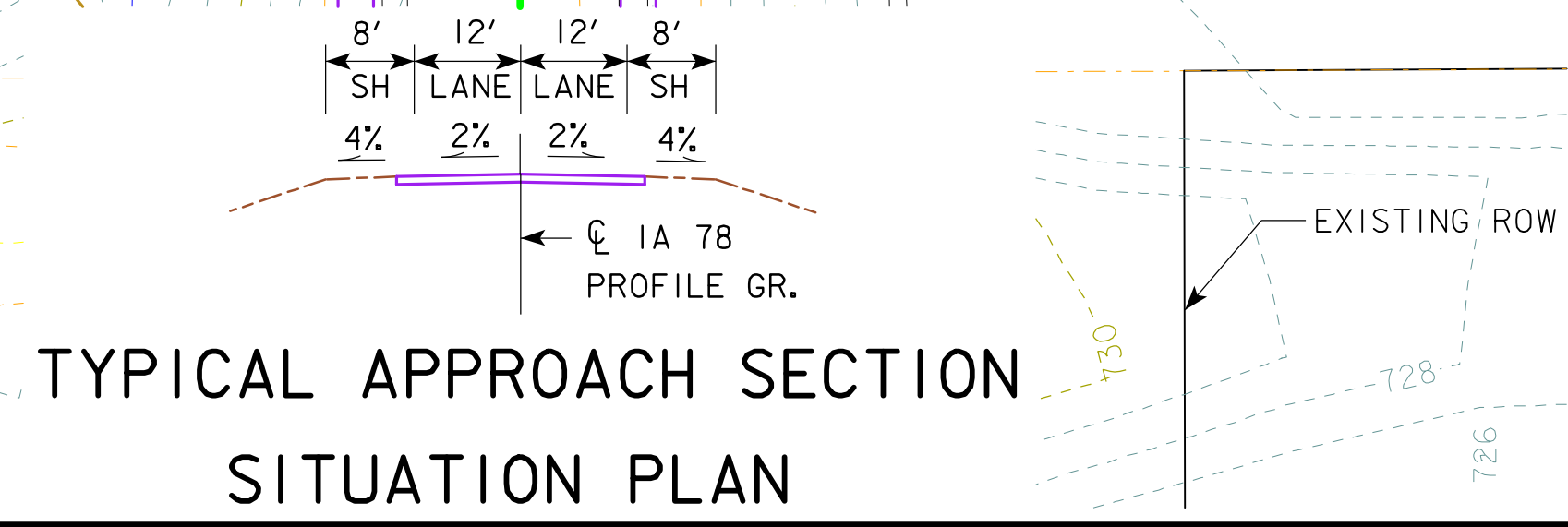
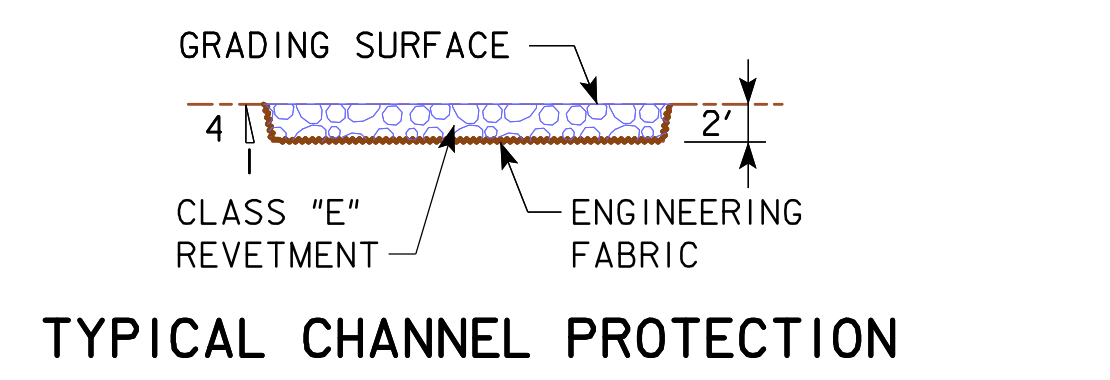
LOCATION

IA 78 OVER RICHLAND CREEK
5.8 MI E OF IA 149
T-74N R-11W
SECTION 26
JACKSON TOWNSHIP
KEOKUK COUNTY
FHWA NO. 32681
BRIDGE MAINT. NO. 5406.05078
LATITUDE 41.177545°
LONGITUDE -92.101334°

TRAFFIC ESTIMATE

2022 AADT	1,700	V.P.D.
2042 AADT	1,900	V.P.D.
2042 DHV	200	V.P.H.
TRUCKS	19	%

LOCATION	REVELTMENT CL. "E" (TON)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
INLET	97.5	118.8	61.0
OUTLET	131.9	156.6	82.4
TOTALS	229.4	275.4	143.4



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.

Philip M. Harpole 11-17-2020
Signature Date
Printed or Typed Name
My license renewal date is December 31, 2021

Pages or sheets covered by this seal: V.I

PRELIMINARY

DESIGN FOR 15° SKEW L.A.

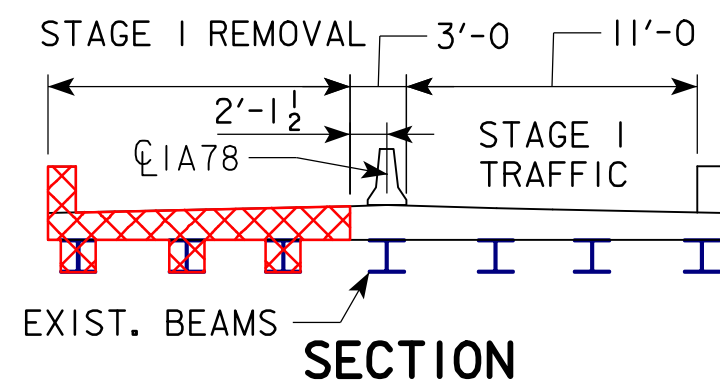
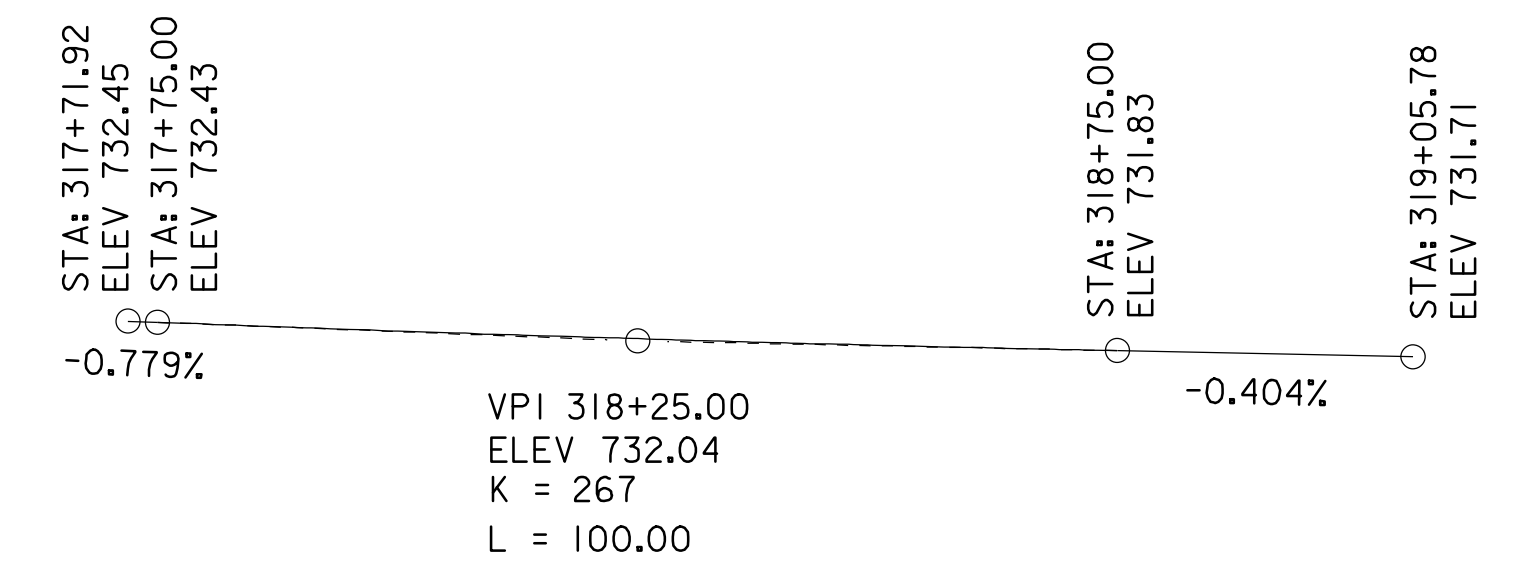
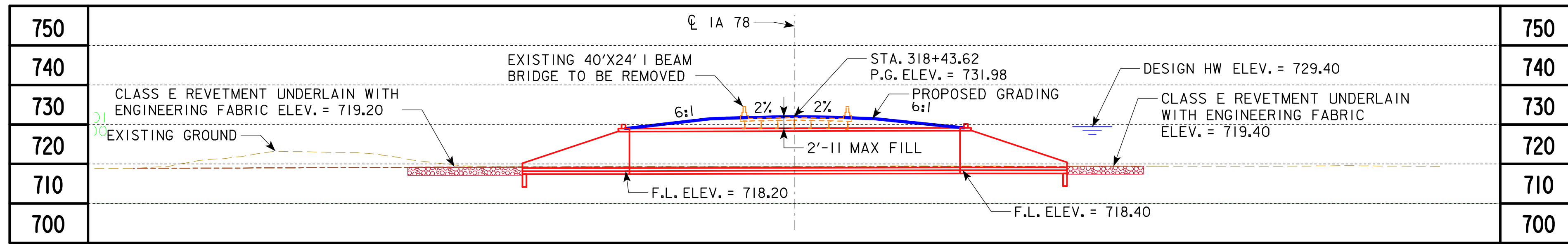
**TWIN 12'-0 X 10'-0 X 88'-0
CAST IN PLACE CONCRETE CULVERT**

SITUATION PLAN

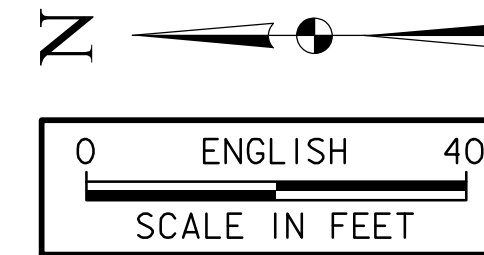
STATION 318+43.62 NOVEMBER 2020
KEOKUK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 1 OF 2 FILE NO. 31706 DESIGN NO. 123

BENCH MARK NO. FENO1 FENO MON W/BRASS DISC 4IN BELOW SURFACE 940FT E OF INTERSECTION
255TH AVE AND HWY78 THEN S 43FT FROM CL HWY78. ELEV 783.26



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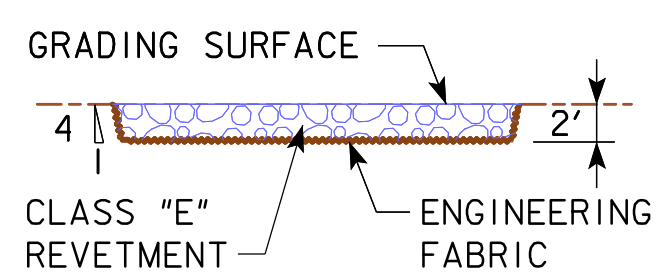
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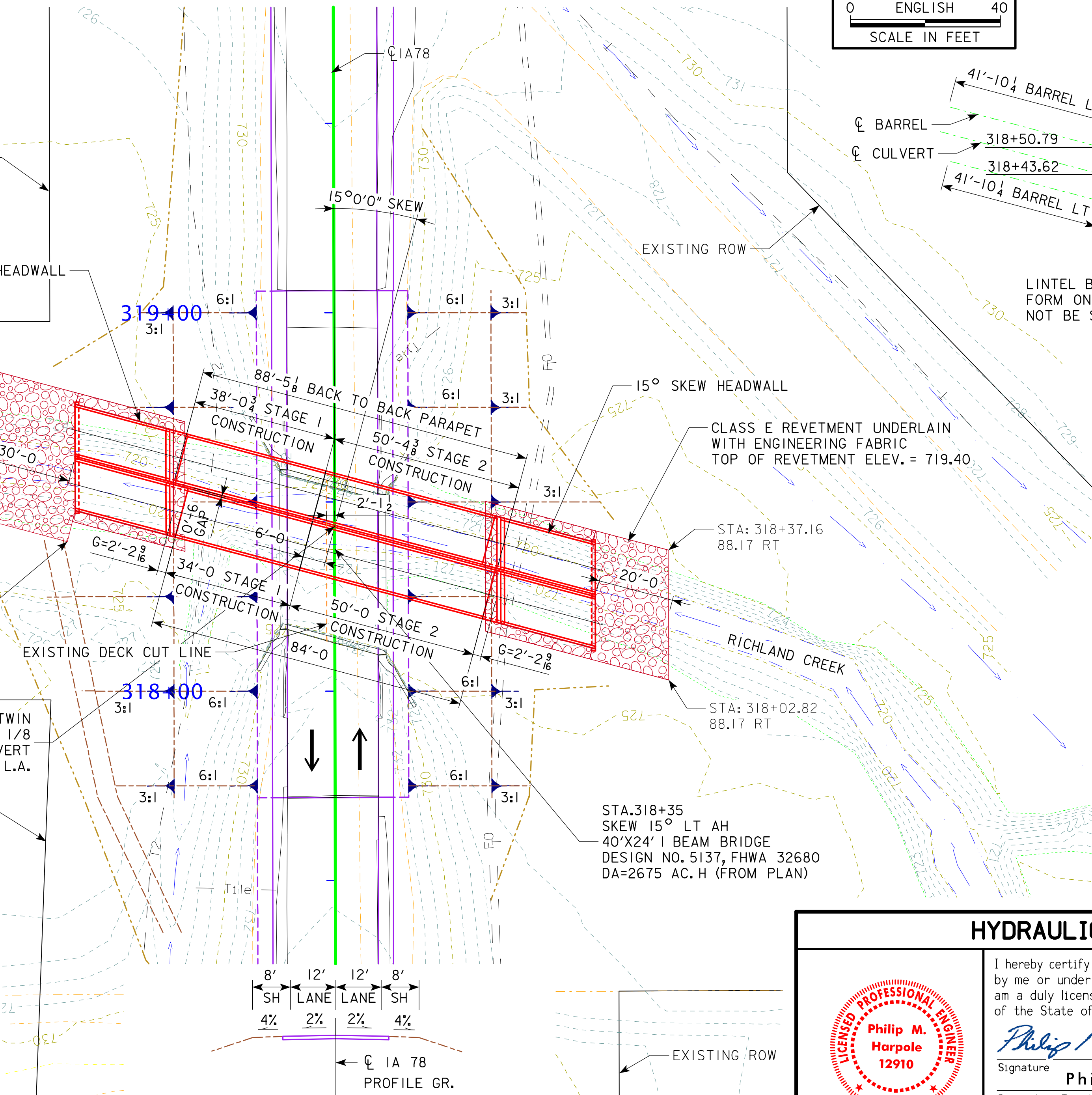
TRAFFIC ESTIMATE

IA 78 OVER RICHLAND CREEK 2022 AADT 1,700 V.P.D.
5.8 MI E OF IA 149 2042 AADT 1,900 V.P.D.
T-74N R-11W SECTION 26 2042 DHV 200 V.P.H.
JACKSON TOWNSHIP TRUCKS 19 %
KEOKUK COUNTY
FHWA NO. 32681
BRIDGE MAINT. NO. 5406.05078
LATITUDE 41.177467°
LONGITUDE -92.101334°

ESTIMATED REVETMENT QUANTITIES			
LOCATION	REVETMENT CL. "E" (TON)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
INLET	109.0	164.4	48.6
OUTLET	167.1	232.2	84.9
TOTALS	276.1	396.6	133.5



TYPICAL CHANNEL PROTECTION



TYPICAL APPROACH SECTION
SITUATION 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.
Philip M. Harpole 11-17-2020
Signature Philip M Harpole Date
Printed or Typed Name
My license renewal date is December 31, 2021

Pages or sheets covered by this seal: V.2

PRELIMINARY

DESIGN FOR 15° SKEW L.A.

TWIN 12'-0" X 10'-0" X 88'-5 1/8"
PRECAST CONCRETE CULVERT

SITUATION PLAN

STATION 318+43.62 NOVEMBER 2020

KEOKUK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 2 OF 2 FILE NO. 31706 DESIGN NO. 123

LINE STYLE LEGEND OF CROSS SECTION SHEETS (ROAD)

- - - - - - Existing Ground Line
- Proposed Template
- Proposed Topsoil Placement
- - - - - Additional Topsoil Removal
- Subgrade Treatment
- - - - - Granular Shoulder
- Pavement
- - - - - Existing Pipe\R/CB
- Proposed Pipe\R/CB
- Proposed Dike
- All Elements Associated with Proposed Entrances

LINE STYLE LEGEND OF CROSS SECTION SHEETS (SOILS)

- Topsoil (Class 10)
- Slope Dressing Only
- Class 10 Materials
- Select Loams And Clay-Loams
- Select Sand
- Unsuitable Type A Disposal
- Unsuitable Type B Disposal
- Unsuitable Type C Disposal
- Shale
- Waste
- Broken and Weathered Rock
- Solid Rock
- Boulders

Note: All layer lines and descriptions identify layers above the line.

Note: Vertical or near vertical lines connecting soil layers at edges of cross sections are only for the purpose of calculating template quantities and do not depict soil stratification.

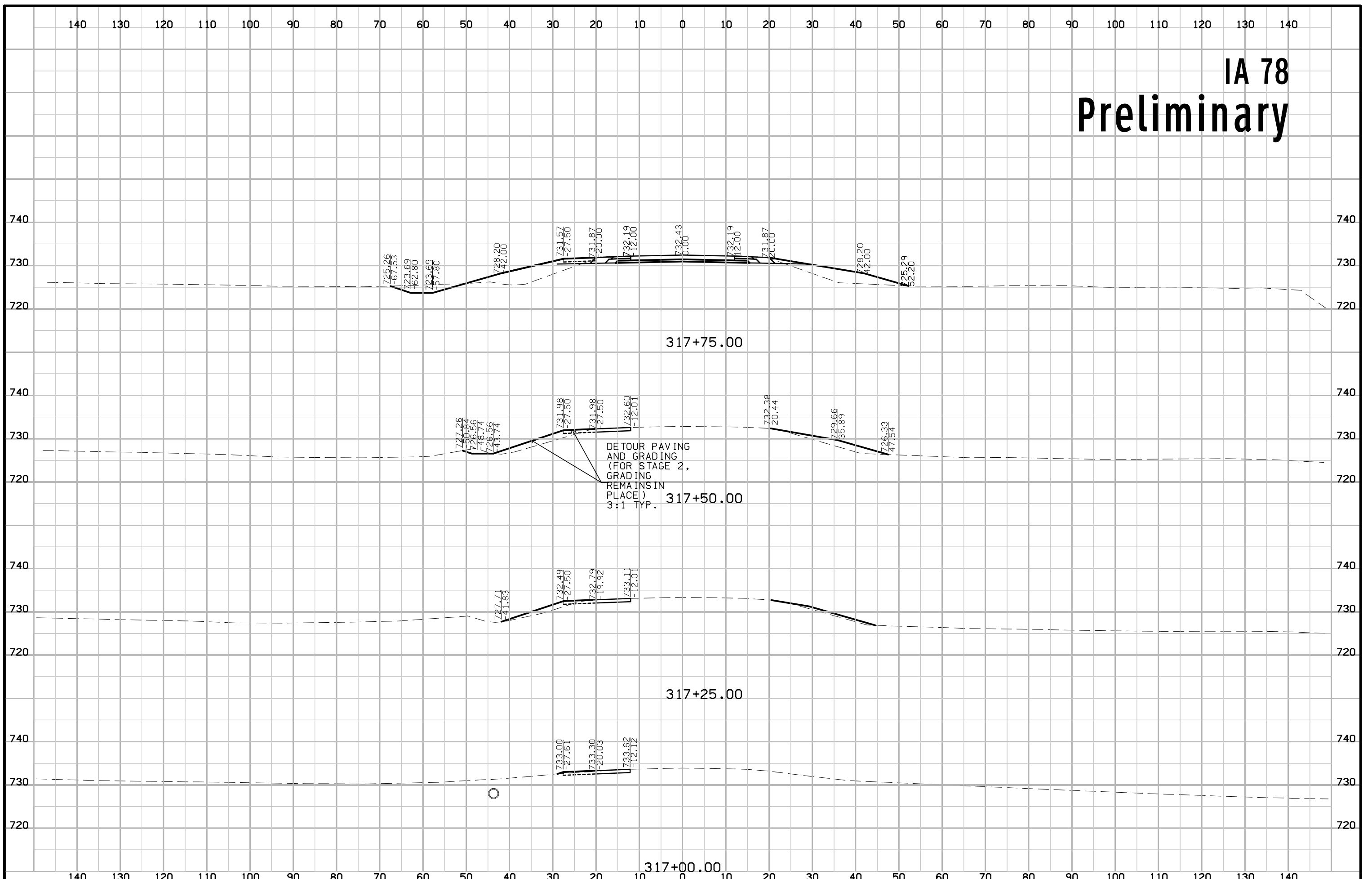
SYMBOL LEGEND OF CROSS SECTION SHEETS

- Existing ROW
|
Existing Right-of-Way Limit
- Proposed ROW
|
Proposed Right-of-Way Limit
- Temporary ROW
|
Temporary Right-of-Way Limit

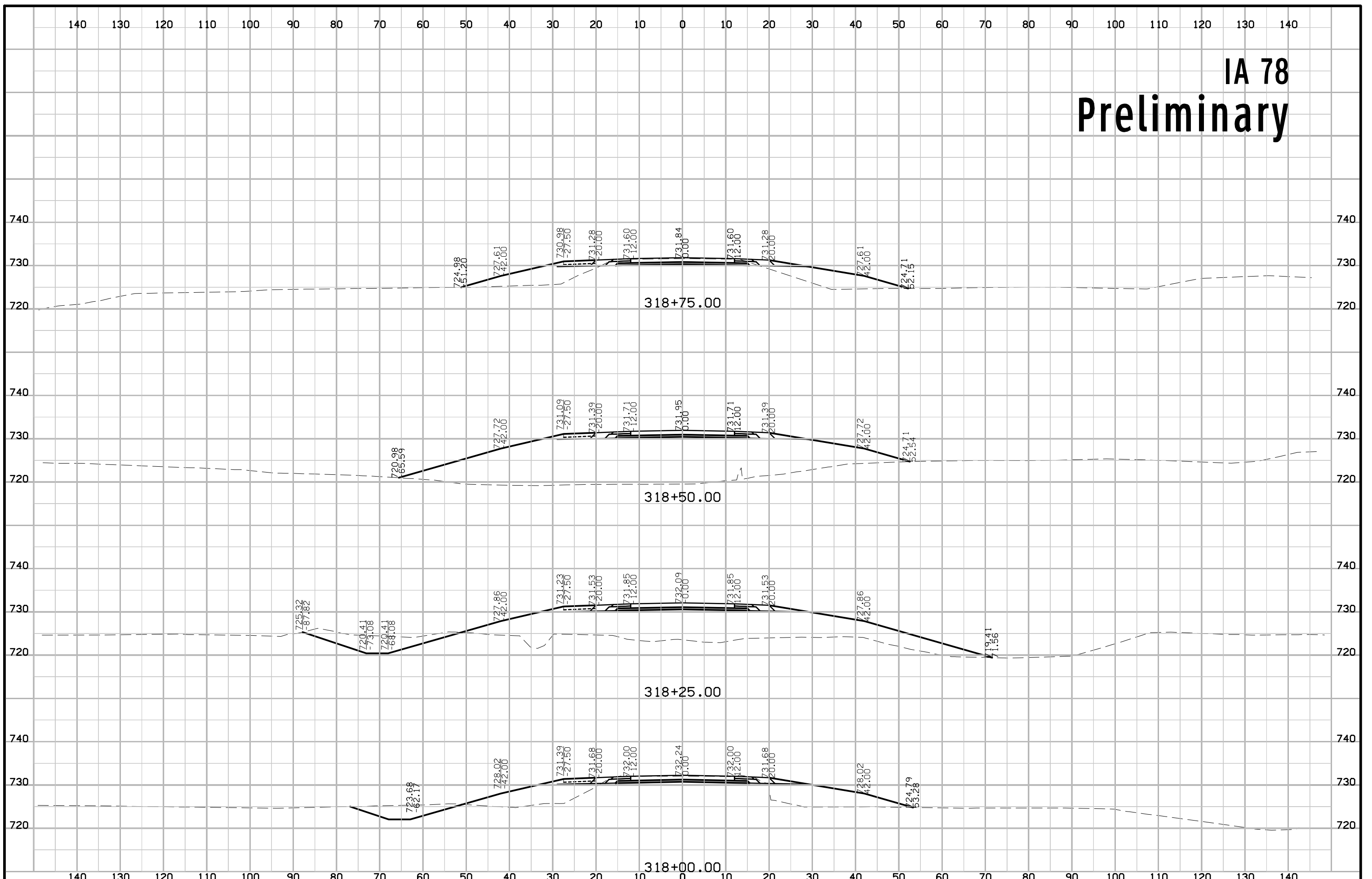
**CROSS SECTION
LEGEND AND SYMBOL
INFORMATION SHEET**

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

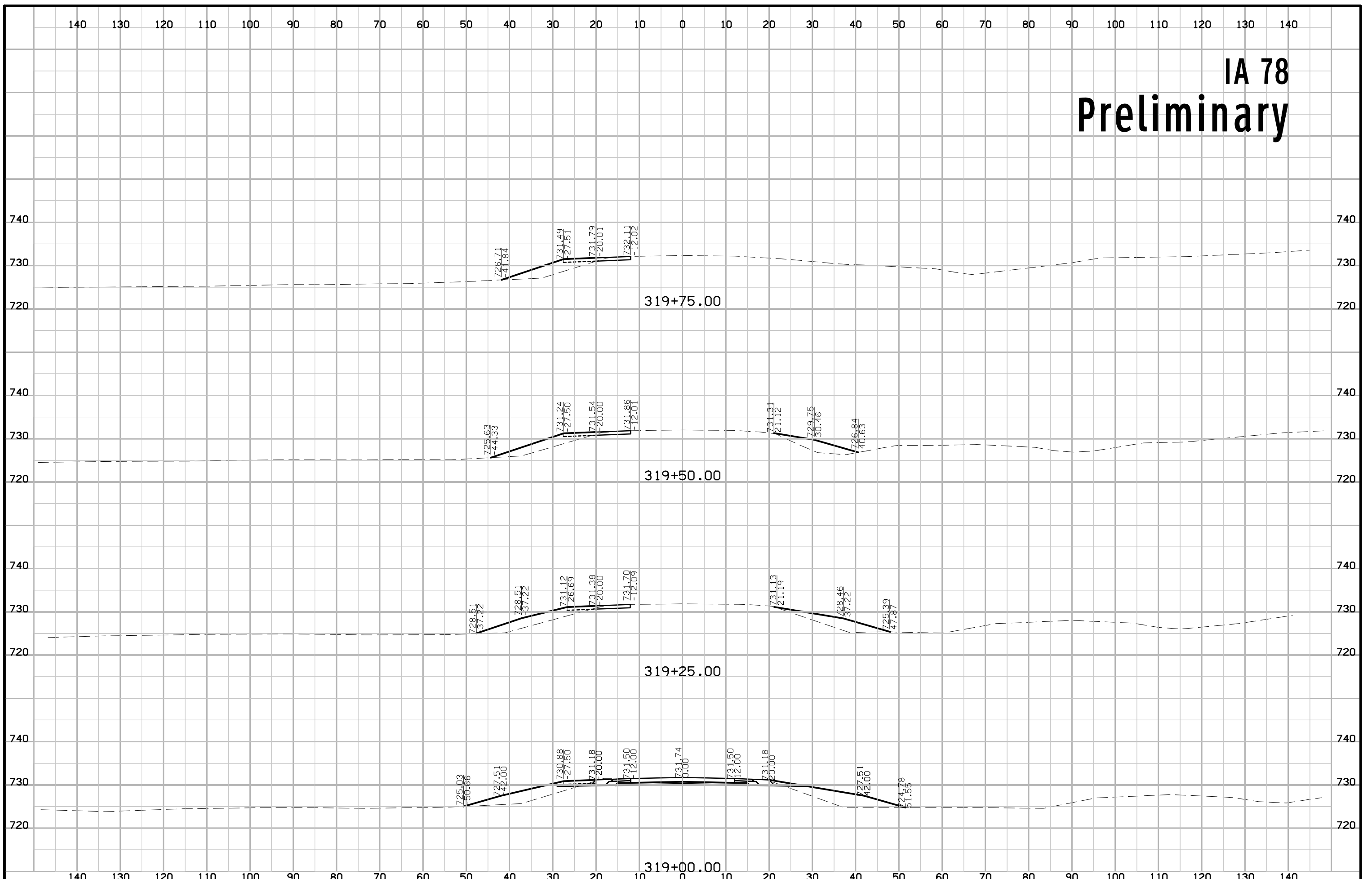
IA 78 Preliminary



IA 78 Preliminary



IA 78 Preliminary



IA 78 Preliminary

