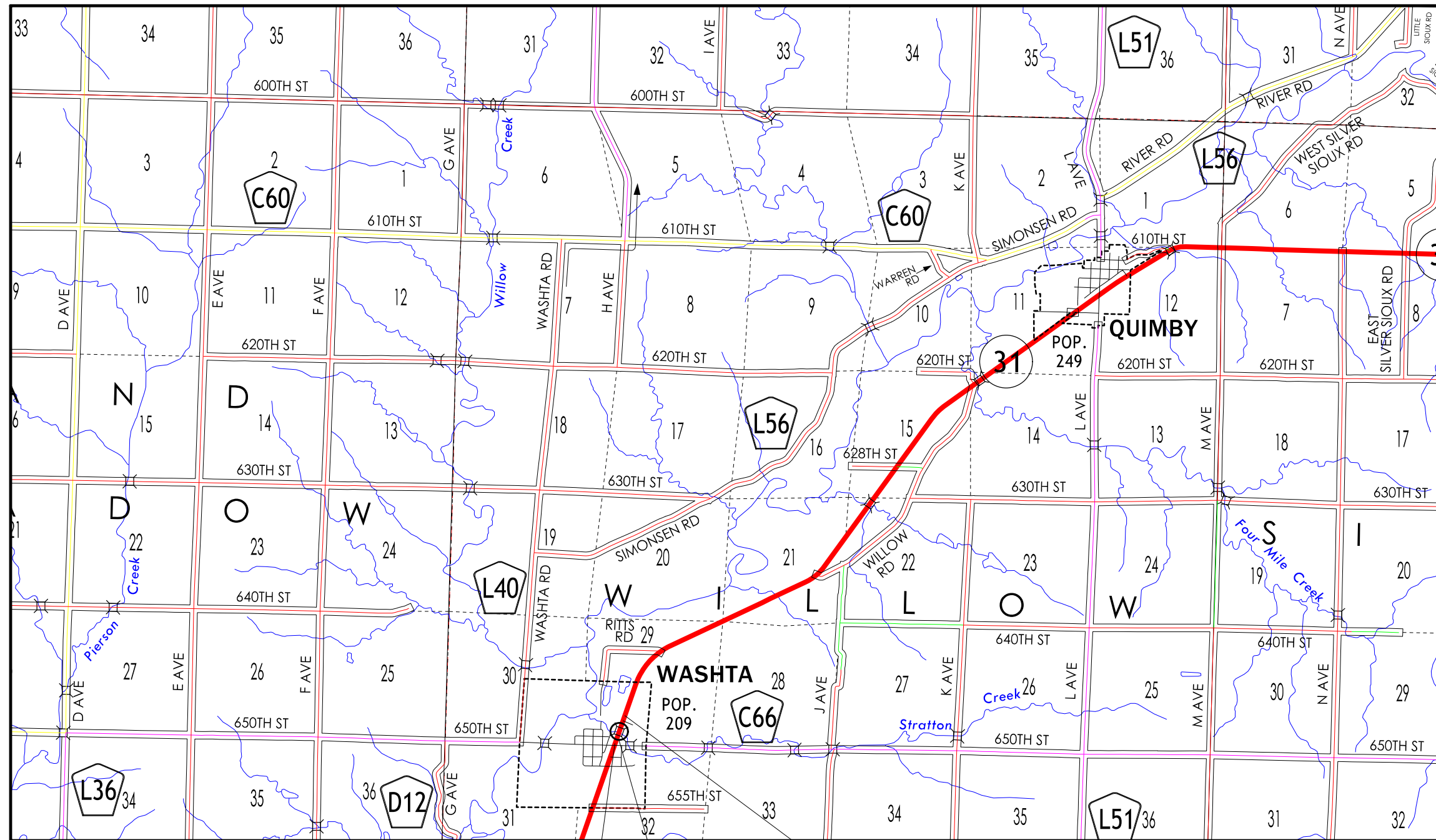




# CHEROKEE COUNTY



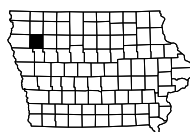
IA 31 over Stratton Creek  
 0.1 mil N of Co Rd C66  
 BRFN-031-3(016)--39-18  
 PIN 24-18-031-010

STA 1+97.34  
 BEGIN PROJECT

STA 3+94.50  
 FHWA No. 019491  
 Maint. No. 1829.1S031  
 PIN 24-18-031-010

STA 5+91.65  
 END PROJECT

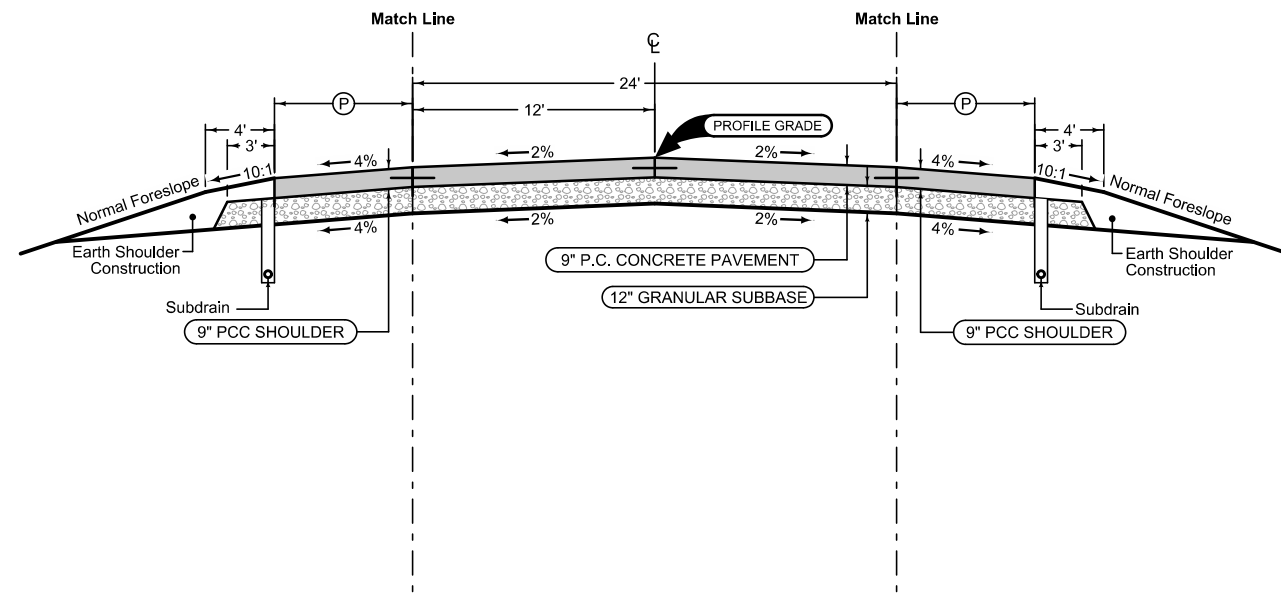
LOCATION MAP SCALE



**PROJECT LOCATION**

<b>BRIDGE ESTIMATE:</b>				
Item	Quantity	Unit	Rate	Amount
Excavation, Class 10, Channel	728.44	CY	\$8.20	\$5,973
Engineering Fabric	1158.62	SY	\$3.44	\$3,986
Revetment, Class E	1123.29	TON	\$50.00	\$56,165
Erosion Stone	42.74	TON	\$64.90	\$2,774
Bridge - CCS Slab Bridge	6160	SF	\$130.00	\$800,800
Remove Existing Bridge	1400	SF	\$10.00	\$14,000
Mobilization	1	LS	10%	\$88,369
	Base Cost:			\$972,066
	Contingency:			15% \$145,810
	4 Years Inflation:			4.5% \$215,212
	<b>BRIDGE TOTAL:</b>			<b>\$1,333,088</b>
<b>ROADWAY ESTIMATE:</b>				
Item	Quantity	Unit	Rate	Amount
Clearing and Grubbing	0.004	ACRE	\$30,000.00	\$120
Excavation, Class 10, Roadway and Borrow	725	CY	\$11.50	\$8,338
Excavation, Class 10, Waste	529	CY	\$18.00	\$9,522
Compaction with Moisture and Density Control	151	CY	\$9.00	\$1,359
Topsoil, Furnish and Spread	234	CY	\$75.00	\$17,550
Modified Subbase	182	CY	\$56.00	\$10,192
Paved Shoulder, PCC, 9"	242	SY	\$110.00	\$26,620
Shoulder Construction, Earth	7	STA	\$615.00	\$4,305
PCC Pavement, 9"	305	SY	\$160.00	\$48,800
Longitudinal Grooving in Concrete, Bridge Deck	622	SY	\$16.00	\$9,952
Removal of Steel Beam Guardrail	522	LF	\$12.00	\$6,264
Steel Beam Guardrail	50	LF	\$40.00	\$2,000
Steel Beam Guardrail Barrier Transition Section, BA-201	4	EACH	\$3,100.00	\$12,400
Steel Beam Guardrail End Anchor, Bolted	4	EACH	\$320.00	\$1,280
Steel Beam Guardrail Tangent End Terminal BA-205	4	EACH	\$3,250.00	\$13,000
Removal of Pavement	1370	SY	\$25.00	\$34,250
Bridge Approach Pavement	622	SY	\$290.00	\$180,380
Longitudinal Grooving in Concrete, Pavement	1675	SY	\$15.00	\$25,125
Bridge End Drain, DR-402	4	EACH	\$4,500.00	\$18,000
Silt Fence	1275	LF	\$2.00	\$2,550
Silt Fence for Ditch Checks	231	LF	\$2.00	\$462
Silt Basins	8	EACH	\$450.00	\$3,600
Removal of Silt Fence or Silt Fence for Ditch Checks	753	LF	\$0.50	\$377
Removal of Silt Basins	8	EACH	\$450.00	\$3,600
Maintenance of Silt Fence or Silt Fence for Ditch Check	151	LF	\$0.75	\$113
Stabilized Construction Entrance	300	LF	\$60.00	\$18,000
Floating Silt Curtain (Hanging)	200	LF	\$27.00	\$5,400
Maintenance of Floating Silt Curtain	100	LF	\$5.50	\$550
Additional Roadway Items	1	LS	\$10,000.00	\$10,000
Detour	1	LS	5%	\$23,205
Mobilization	1	LS	10%	\$46,411
	Base Cost:			\$543,724
	Contingency:			20% \$108,745
	4 Years Inflation:			4.5% \$125,613
	<b>ROADWAY TOTAL:</b>			<b>\$778,082</b>
	<b>PROJECT TOTAL:</b>			<b>\$2,111,170</b>

**D05 Cost Estimate**



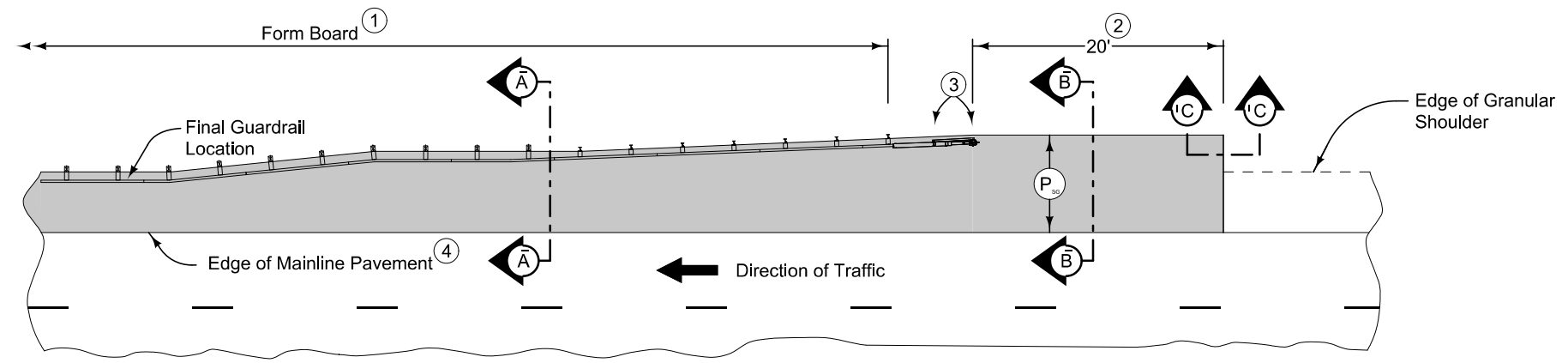
Mainline Jointing:  
 Transverse joints: CD at 17' spacing  
 Longitudinal joint: L-2

2P_	
04-21-20	
STATION TO STATION	
1+97.34	2+54.50
5+34.50	5+91.65

**Full Depth PCC Shoulder**

Shoulder Jointing:  
 Longitudinal joint: BT-2, or L-2  
 Transverse joints: C at 17' spacing

2_P_FullPCC_		
04-15-25		
STATION TO STATION		(P) Feet
1+97.34	2+17.34	10
2+17.34	2+54.50	8.5-10
5+34.50	5+71.65	8.5-10
5+71.65	5+91.65	10



PLAN VIEW

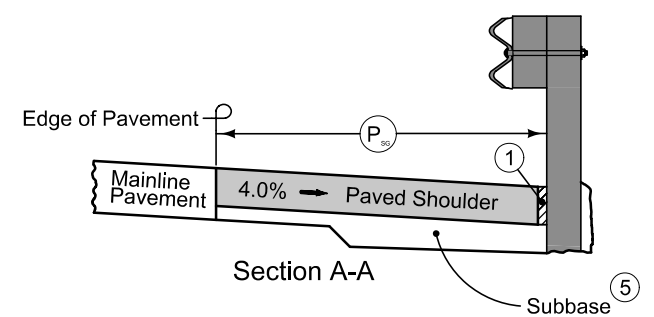
9" HMA Paved Shoulder at guardrail. 8" PCC may be substituted with the following jointing layout:

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

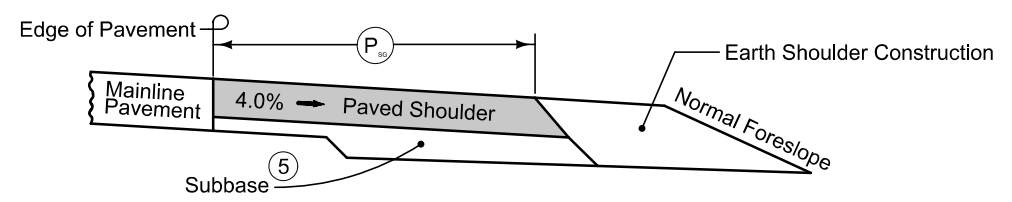
Compaction of HMA is required to face of guardrail post. Hand compaction will be allowed under guardrail. Removal and reinstallation of guardrail will be allowed with no additional payment.

Refer to Tabulation 112-9 for shoulder quantities.

- ① PCC option only: When guardrail posts are installed prior to construction of PCC paved shoulder, fasten form board to the face of guardrail posts for the length shown.
- ② Continue paved shoulder 20 feet beyond the center of the first post.
- ③ Shoulder may be notched for first 2 posts or post sleeves may be installed through pavement. Do not drive posts through pavement.
- ④ 'BT' joint (per PV-101) for PCC shoulder. 'B' joint (per PV-101) for HMA shoulder.
- ⑤ Refer to other details in the plan.

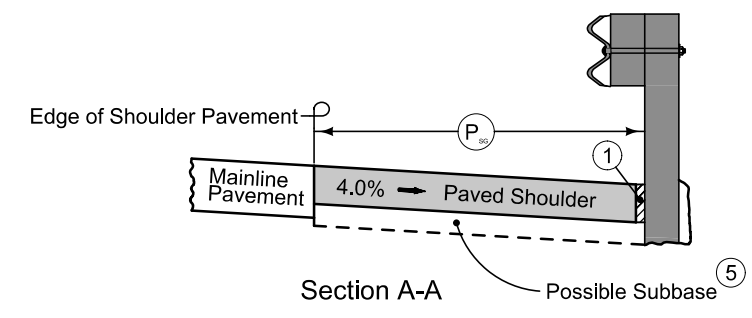


Section A-A

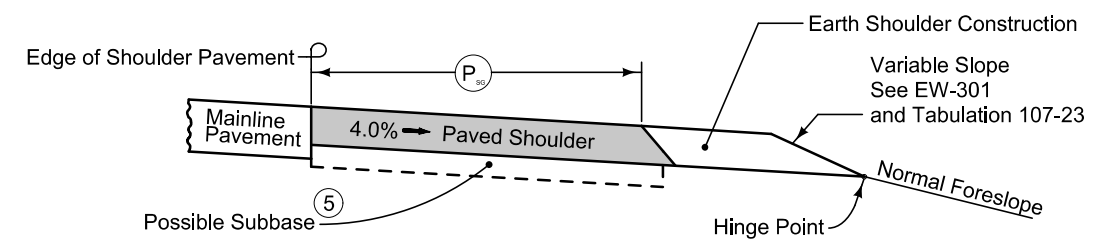


Section B-B

NEW CONSTRUCTION

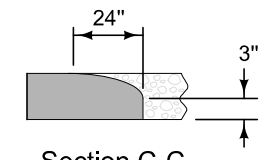


Section A-A



Section B-B

EXISTING SHOULDER

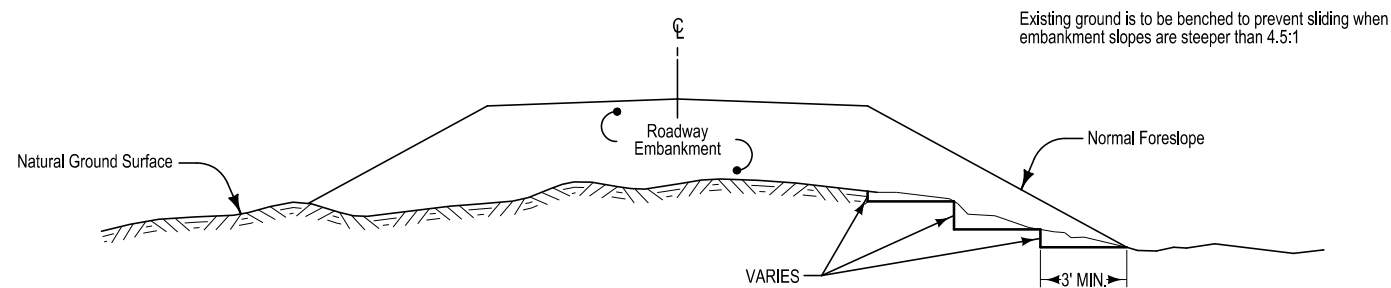


Section C-C

Roll down at granular shoulder or earth.

PAVED SHOULDER AT GUARDRAIL  
(GRANULAR SHOULDER ADJACENT TO MAINLINE)

BENESCH-1  
11-18-25



TYPICAL CROSS SECTION  
STEPPED FORESLOPE

100\_01D  
8/15/22

### PROJECT DESCRIPTION

This project involves the bridge replacement at IA 31 over Stratton Creek in Cherokee County. The work entails replacing the existing 40' x 24' I-beam bridge on IA 31 with a 140' x 40' continuous concrete slab bridge and reconstructing approximately 395' of IA 31.

105\_04  
4/21/26

### STANDARDS

The following Standards apply to construction work on this project.

Number	Date	Title
BA-200	04-21-26	Steel Beam Guardrail Components
BA-201	10-18-22	Steel Beam Guardrail Barrier Transition Section (MASH TL-3)
BA-202	04-15-25	Steel Beam Guardrail Bolted End Anchor
BA-205	10-17-23	Steel Beam Guardrail Tangent End Terminal (MASH TL-3)
BA-206	10-19-21	Steel Beam Guardrail Flared End Terminal For Cable Connection
BA-250	10-21-25	Steel Beam Guardrail Installation at Concrete Barrier or Bridge End Post (MASH TL-3)
BR-203	04-21-26	Double Reinforced 12in Approach
BR-211	04-21-26	Bridge Approach (Abutting PCC or Composite Pavement)
DR-303	10-17-17	Subdrains (Longitudinal)
DR-305	04-19-22	Subdrain Outlets (Standard Subdrain, Pressure Release and Special)
DR-402	04-16-24	Rock Flume for Bridge End Drain
EC-201	04-20-21	Silt Fence
EC-202	10-21-14	Floating Silt Curtain
EC-204	10-19-21	Perimeter, Slope and Ditch Check Sediment Control Devices
EC-303	10-19-21	Stabilized Construction Entrance
EW-301	04-16-24	Guardrail Grading
EW-403	04-18-17	Temporary Erosion Control Measures
PM-110	10-15-24	Line Types
PV-101	10-21-25	Joints
SI-211	10-18-22	Object Marker and Delineator Placement with Guardrail
TC-1	10-15-19	Work Not Affecting Traffic (Two-Lane or Multi-Lane)
TC-252	10-21-25	Routes Closed to Traffic

111\_25  
4/21/26

### INDEX OF TABULATIONS

Tabulation	Tabulation Title	Sheet No.
100_01D	PROJECT DESCRIPTION	C.1
100_10	FLOATING SILT CURTAINS	C.4
100_14	SILT BASINS	C.4
100_17	TABULATION OF SILT FENCES	C.4
100_18	SILT FENCES FOR DITCH CHECKS	C.5
103_07	SHRINKAGE DATA	C.5
104_08A	SCOUR PROTECTION OR ROCK FLUME FOR BRIDGE END DRAIN	C.5
105_04	STANDARD ROAD PLANS	C.2
107_23	GRADING FOR GUARDRAIL INSTALLATIONS	C.6
108_08A	STEEL BEAM GUARDRAIL AT CONCRETE BARRIER OR BRIDGE RAIL END SECTION	C.6
110_17	CLEARING AND GRUBBING	C.6
111_25	INDEX OF TABULATIONS	C.2
112_06	BRIDGE APPROACH SECTION	C.6
232_03A	EROSION CONTROL (RURAL SEEDING)	C.3
232_03C	EROSION CONTROL (NATIVE GRASS SEEDING)	C.3
262_05	UTILITIES (POINT 25 PROJECT)	C.3
281_01	SECTION 404 PERMIT AND CONDITIONS	C.3
101_16	ALIGNMENT COORDINATES	G.5
108_23A	TRAFFIC CONTROL PLAN	J.1
108_25	511 TRAVEL RESTRICTIONS	J.1
108_26A	STAGING NOTES	J.1
111_01	COORDINATED OPERATIONS	J.1

232\_03A  
9/28/22

### EROSION CONTROL (RURAL SEEDING)

Area to be seeded is estimated to be less than 1 acre. If the contractor determines the area exceeds 2 acres, notify the Engineer. Approved quantity in excess of 2 acres will be paid for as extra work according to Article 1109.03,B of the Standard Specifications.

Following the completion of work in a disturbed area and according to the seeding dates in Section 2601 of the Standard Specifications, place seed, fertilizer, and mulch on the disturbed area lying 8 feet adjacent to shoulder and median as follows:

Place seed and fertilize according to the requirements of Article 2601.03,C,3 and Section 4169 of the Standard Specifications.

Place mulch according to the requirements of Articles 2601.03,E,2,a and 4169.07,A of the Standard Specifications.

Preparing the seedbed, furnishing and applying seed, fertilizer, and mulch are all incidental to mobilization and will not be paid for separately.

262\_05  
9/28/22

### UTILITIES (POINT 25 PROJECT)

This is a POINT 25 project and is subject to the provisions of IAC 761-115.25.

281\_01  
9/28/22

### SECTION 404 PERMIT AND CONDITIONS

Construct this project according to the requirements of U.S. Army Corps of Engineers Nationwide, Permit No. <<\_\_\_\_\_>>. A copy of this permit is available from the Iowa DOT website (<http://www.envpermits.iowadot.gov/>). The U.S. Army Corps of Engineers reserves the right to visit the site without prior notice.

232\_03C  
8/28/24

### EROSION CONTROL (NATIVE GRASS SEEDING)

Area to be seeded is estimated to be less than 1 acre. If the Contractor determines the area exceeds 2 acres, notify the Engineer. Approved quantity in excess of 2 acres will be paid for as extra work according to Article 1109.03,B of the Standard Specifications.

Following the completion of work in a disturbed area and according to the seeding dates in Section 2601 of the Standard Specifications, place seed and mulch on the disturbed area lying 8 feet or more beyond the shoulder as follows:

SEED MIX:  
Big bluestem (Andropogon gerardii) 6 lbs. PLS/Acre (7.0 kg/ha)  
Indiangrass (Sorghastrum nutans) 6 lbs. PLS/Acre (7.0 kg/ha)  
Little bluestem (Schizachyrium scoparium) 6 lbs. PLS/Acre (7.0 kg/ha)  
Partridge Pea (Chamaecrista fasciculata) 4 lbs. PLS/Acre (4.5 kg/ha)  
Sideoats grama (Bouteloua curtipendula) 4 lbs. PLS/Acre (4.5 kg/ha)  
Canada wildrye (Elymus canadensis) 2 lbs. PLS/Acre (2.2 kg/ha)  
Switchgrass (Panicum virgatum) 1 lbs. PLS/Acre (1.1 kg/ha)  
Oats (Avena sativa) 32 lbs./Acre (36.0 kg/ha)

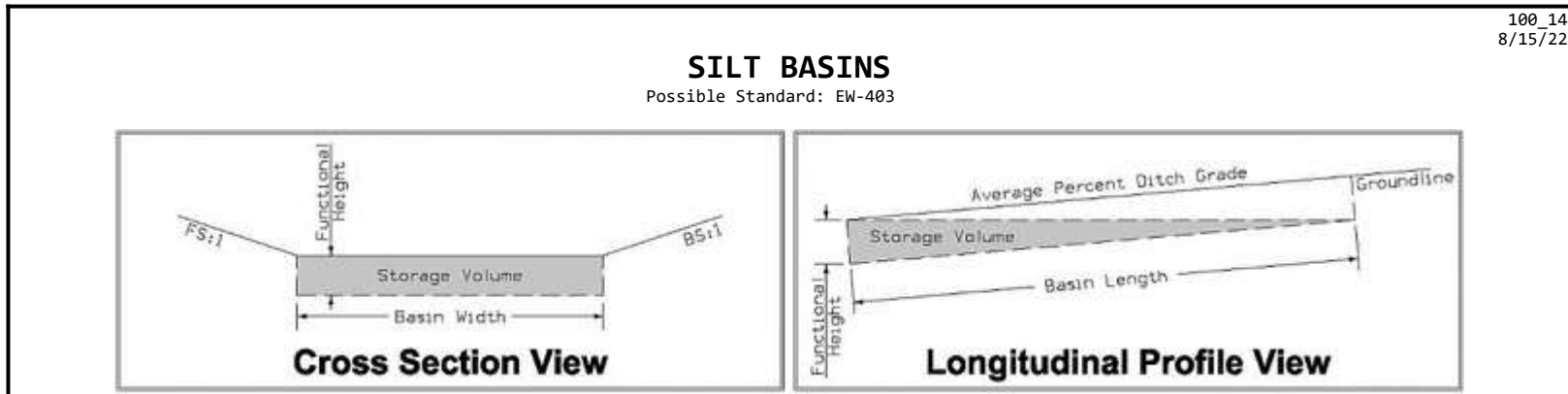
Furnish Big bluestem, Indiangrass, Canada wildrye and Little bluestem that is debarbed or equal to facilitate the application of seed.

Furnish seed certified as Source Identified Class (Yellow Tag) Source G0-Iowa. Oats are excluded from this requirement. Place seed according to the requirements of Article 4169.02 of the Standard Specifications.

Place mulch according to the requirements of Articles 2601.03,E,2,a and 4169.07,A of the Standard Specifications.

Preparing the seedbed, furnishing and applying seed and mulch are incidental to mobilization and will not be paid for separately.

FLOATING SILT CURTAINS					100_10 8/15/22
Refer to EC-202					
Station	Hanging (LF)	Containment (LF)	Clean-out (Containment) (LF)	of Floating Silt Curtain (LF)	Remarks
3+85.00	100.0			50.0	
4+28.00	100.0			50.0	
<b>Total:</b>	<b>200</b>			<b>100</b>	



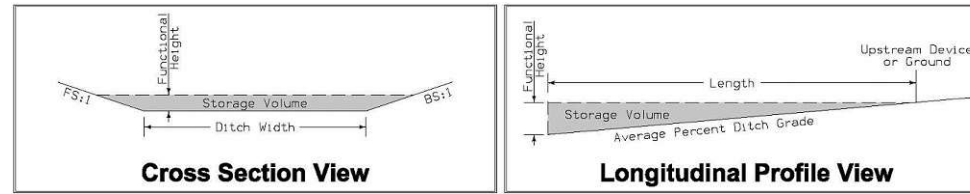
\* The functional height used in the volume equation is 95% of effective height. Effective height is 3 feet as shown in EW-403.  
 \* Volume equation:  $(0.5 * Length * (Width * Height + Width * (Height - Length * Avg\ Slope)))$

Basin No.	Station	Side	Installation (Each)	Removal (Each)	Basin Width (FT)	Basin Length (FT)	Height (FT)	Avg. % Slope	Volume (CF)	Remarks
1	3+25.00	Right	1.0	1.0	10.0	128.0	2.85	1.8	2173.44	
2	4+65.00	Right	1.0	1.0	10.0	127.0	2.85	2.2	1845.31	
3	3+25.00	Left	1.0	1.0	10.0	128.0	2.85	2.4	1824.00	
4	4+65.00	Right	1.0	1.0	10.0	127.0	2.85	2.4	1809.75	
			4.0	4.0						TAB QUANTITY
			8.0	8.0						BID QUANTITY (100% INC.)

TABULATION OF SILT FENCES					100_17 8/15/22
Refer to EC-201					
Station From	Station To	Side	Length (FT)	Remarks	
1+97.00	3+25.00	Left	128.00	MID-SLOPE	
1+97.00	3+25.00	Left	128.00	TOE OF SLOPE	
1+97.00	3+25.00	Right	128.00	MID-SLOPE	
1+97.00	3+25.00	Right	128.00	TOE OF SLOPE	
4+65.00	5+92.00	Left	127.00	MID-SLOPE	
4+65.00	5+92.00	Left	127.00	TOE OF SLOPE	
4+65.00	5+92.00	Right	127.00	MID-SLOPE	
4+65.00	5+92.00	Right	127.00	TOE OF SLOPE	
			1020.00	TAB QUANTITY	
			1275.00	BID QUANTITY (25% INC.)	

### SILT FENCES FOR DITCH CHECKS

Possible Standard: EC-201



\* The functional height used in the volume equation is 85% of effective height. Effective height is 1.58 feet as shown on EC-201.  
\* Volume equation:  $[0.5 * \text{Spacing} * (0.5 * H^2 * FS + DW * H + 0.5 * H^2 * BS)]$

Basin No.	Type	Station	Side	Installation (LF)	Maintenance (LF)	Removal (LF)	Foreslope (FS:1)	Backslope (BS:1)	Ditch Width (FT)	Avg. % Slope Ditch Grade	Volume (CF)	Remarks
1	Type 1	2+50.00	Right	22.0	2.2	11.0	3.0	3.0	10.0	1.8	706.50	
2	Type 1	5+25.00	Right	22.0	2.2	11.0	3.0	3.0	10.0	2.2	565.20	
2	Type 1	5+85.00	Right	22.0	2.2	11.0	3.0	3.0	10.0	2.2	565.20	
3	Type 1	2+05.00	Left	22.0	2.2	11.0	3.0	3.0	10.0	2.4	565.20	
3	Type 1	2+65.00	Left	22.0	2.2	11.0	3.0	3.0	10.0	2.4	565.20	
4	Type 1	5+25.00	Left	22.0	2.2	11.0	3.0	3.0	10.0	2.4	565.20	
4	Type 1	5+85.00	Left	22.0	2.2	11.0	3.0	3.0	10.0	2.4	565.20	
				154.0	15.4	77.0						TAB QUANTITY
				231.0	23.1	115.5						BID QUANTITY (50% INC.)

### SHRINKAGE DATA

Material	%	Remarks
EXCAVATION, CLASS 10	30.0	

### SCOUR PROTECTION OR ROCK FLUME FOR BRIDGE END DRAIN

Refer to Standard Road Plan DR-401 and DR-402

Bridge Station	Bridge Corner	Distance DI-1 or DI-2 (FT)	Bridge End Drain Type	Macadam Stone Base (TONS)	Engineering Fabric (SY)	Erosion Stone (TON)	Remarks
4+06.49	SW	20.0	DR-402	1.467	33.3	33.240	
4+06.49	SE	20.0	DR-402	1.467	27.1	26.568	
4+06.49	NW	20.0	DR-402	1.467	21.9	20.904	
4+06.49	NE	20.0	DR-402	1.467	22.5	21.624	
<b>Total:</b>				<b>5.868</b>	<b>104.8</b>	<b>102.336</b>	

## GRADING FOR GUARDRAIL INSTALLATIONS

Refer to EW-301.

107\_23  
8/15/22

(1) Lane(s) to which the installation is adjacent.

Direction of Traffic (1)	Station	Side	Foreslope at Guardrail	X1 (FT)	Y1 (FT)	X2 (FT)	Y2 (FT)	X3 (FT)	Y3 (FT)	X4 (FT)	Y4 (FT)	Z (FT)	Excavation Class 10 (CY)	Embankment-in-Place (CY)	Remarks
NB	3+27.99	Left	3:1	41.7	12.7					98.6	15.0	68.0			SEE TAB 107-28 ON T.3 FOR EARTHWORK QUANTITIES
NB	3+27.99	Right	3:1	41.7	12.7					98.6	15.0	68.0			SEE TAB 107-28 ON T.3 FOR EARTHWORK QUANTITIES
SB	3+27.99	Right	3:1	41.7	12.7					98.6	15.0	68.0			SEE TAB 107-28 ON T.3 FOR EARTHWORK QUANTITIES
SB	3+27.99	Left	3:1	41.7	12.7					98.6	15.0	68.0			SEE TAB 107-28 ON T.3 FOR EARTHWORK QUANTITIES

## STEEL BEAM GUARDRAIL AT CONCRETE BARRIER OR BRIDGE RAIL END SECTION

Possible Standards: BA-200, BA-201, BA-202, BA-205, BA-206, BA-209, BA-210, BA-211, BA-221, BA-225, BA-250, BA-260, LS-625, LS-626, LS-630, LS-635, SI-172, SI-173 and SI-211.

108\_08A  
4/25/25

(1) Lane(s) to which the obstacle is adjacent.  
(2) Not a bid item. Incidental to guardrail installation.

Direction of Travel (1)	Side	Station	Offset (FT)	Barrier Transition Section	Barrier Transition Section (EA)	End Terminal	End Terminal Count (EA)	VT1 (LF)	VF (LF)	VT2 (LF)	ET (LF)	BA-211 Station	BA-211 (Type)	SI-211 (Type) (2)	Delineator SI-172 Type 1 (EA) (2)	Object Marker Type 2 (EA) (2)	Object Marker Type 3 Lt (EA) (2)	Object Marker Type 3 Rt (EA) (2)	Bolted End Anchor BA-202 (Type)	Bolted End Anchor BA-202 (EA)	Post Adapter BA-210 (EA)	Steel Beam Guardrail BA-200 (LF)	Remarks
NB	Left	3+27.99	20.0	BA-201	1	BA-205	1	53.125			47.70						1		D	1		12.5	
NB	Right	3+27.99	20.0	BA-201	1	BA-205	1	53.125			47.70							1	D	1		12.5	
SB	Right	4+84.99	20.0	BA-201	1	BA-205	1	53.125			47.70							1	D	1		12.5	
SB	Left	4+84.99	20.0	BA-201	1	BA-205	1	53.125			47.70						1		D	1		12.5	
<b>Total:</b>					<b>4</b>		<b>4</b>										<b>2</b>	<b>2</b>		<b>4</b>		<b>50</b>	

## BRIDGE APPROACH SECTION

Refer to the BR Series.

112\_06  
2/22/24

\* Not a bid item

Bridge Station	End	Skew Ahead Left (Degrees)	Skew Ahead Right (Degrees)	(T) Thickness (IN)	Pay Length (FT)	Non-Reinf. Area (SY)	Single-Reinf. Area (SY)	Double-Reinf. Area (SY)	SRP Approach	SRP Abutment Type	SRP Abutting Pavement	Perforated * 4" Subdrain (LF)	Subdrain * Outlet (STA)	Subdrain * Outlet Side	Porous * Backfill (CY)	Class 'A' * Crushed Stone Backfill (CY)	Modified * Subbase (TON)	Polymer * Grid (SY)	Remarks
4+06.49	S			12.0	70.0	133.4	88.9	88.9	BR-203		BR-211	52.0	2+76.50	Right	1.5	0.2	237.700	265.2	
4+06.49	N			12.0	70.0	133.4	88.9	88.9	BR-203		BR-211	52.0	2+76.50	Right	1.5	0.2	237.700	265.2	
<b>Total:</b>						<b>266.8</b>	<b>177.8</b>	<b>177.8</b>				<b>104</b>			<b>3</b>	<b>0.4</b>	<b>475.4</b>	<b>530.4</b>	

## CLEARING AND GRUBBING

110\_17  
1/27/25

Line No.	Station From	Station To	Direction of Traffic	Work and Material Type	>3"-6"	>6"-9"	>9"-12"	>12"-15"	>15"-18"	>18"-24"	>24"-30"	>30"-36"	>36"-42"	>42"-48"	>48"-60"	>60"-72"	>72"	Other Materials Length (FT)	Other Materials Width (FT)	Estimated Units	Estimated Area (Acres)	Estimated Herbicide Application (EA)	Remarks	
1.0	2+35.40	3+06.81	NB	Trees - Clearing and Grubbing																	0.004			
<b>Total:</b>																					<b>0.004</b>			

### 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
- Water Hydrant (Rural)
- Septic Tank
- Cistern
- L.P. Gas Tank (No Footing)
- Underground Storage Tank
- Latrine
- Satellite TV Dish
- Water Hook Up
- Radio Tower
- Tower Anchor
- Guardrail (Beam or Cable)
- Guard Post (one or two)
- Guard Post (over two)
- Filler Pipe
- Gas Valve
- Water Valve
- Speed Limit Sign
- 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

Existing Fiber Optics

### 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
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
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
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

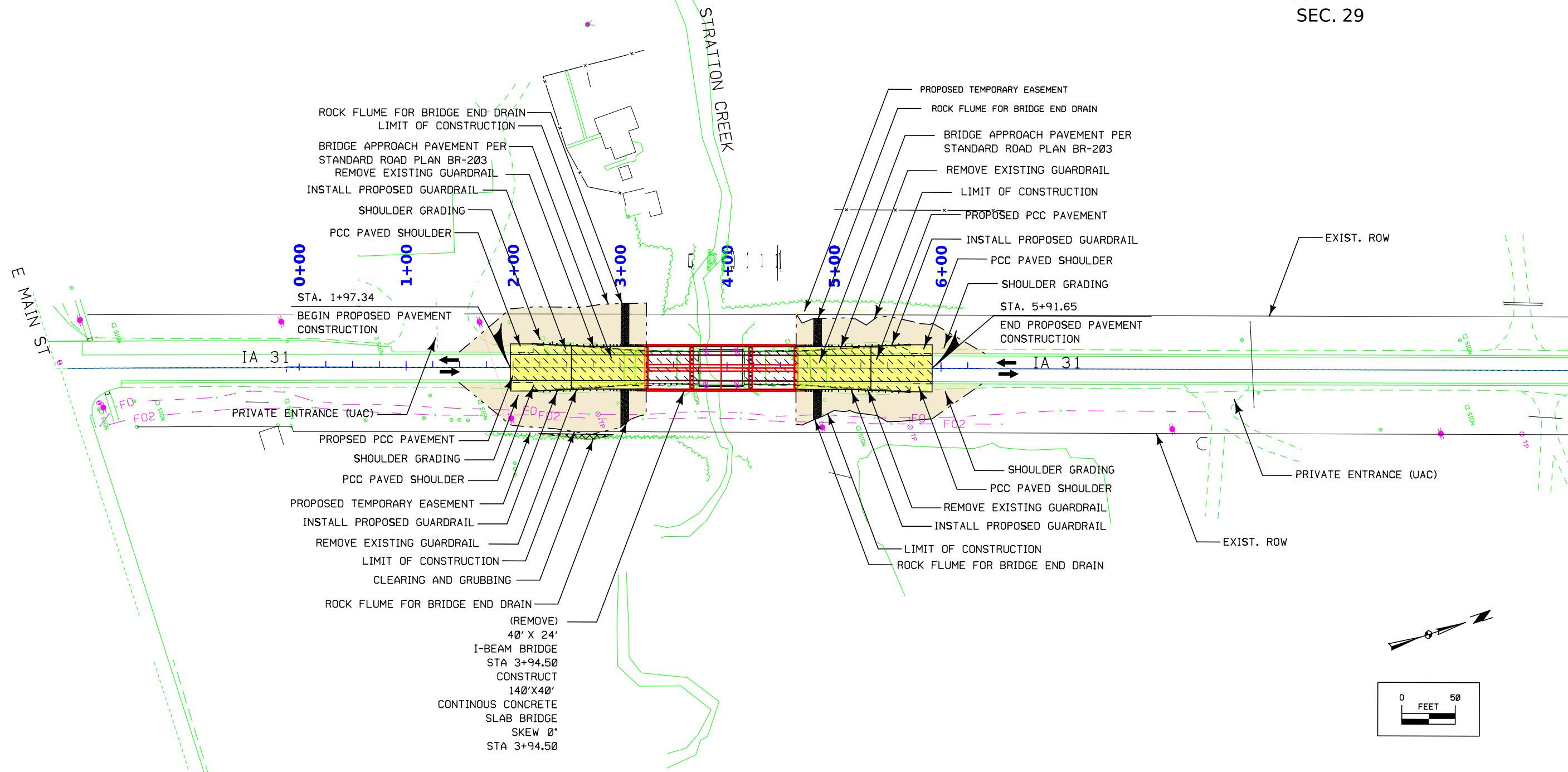
### RIGHT-OF-WAY LEGEND

- Proposed Right-of-Way 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

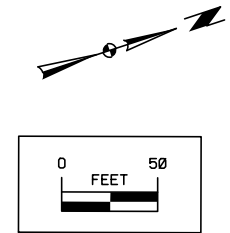
(COVERS SHEET SERIES D, E, F, & K)

Willow TWP.  
T-90N R-41W  
SEC. 29

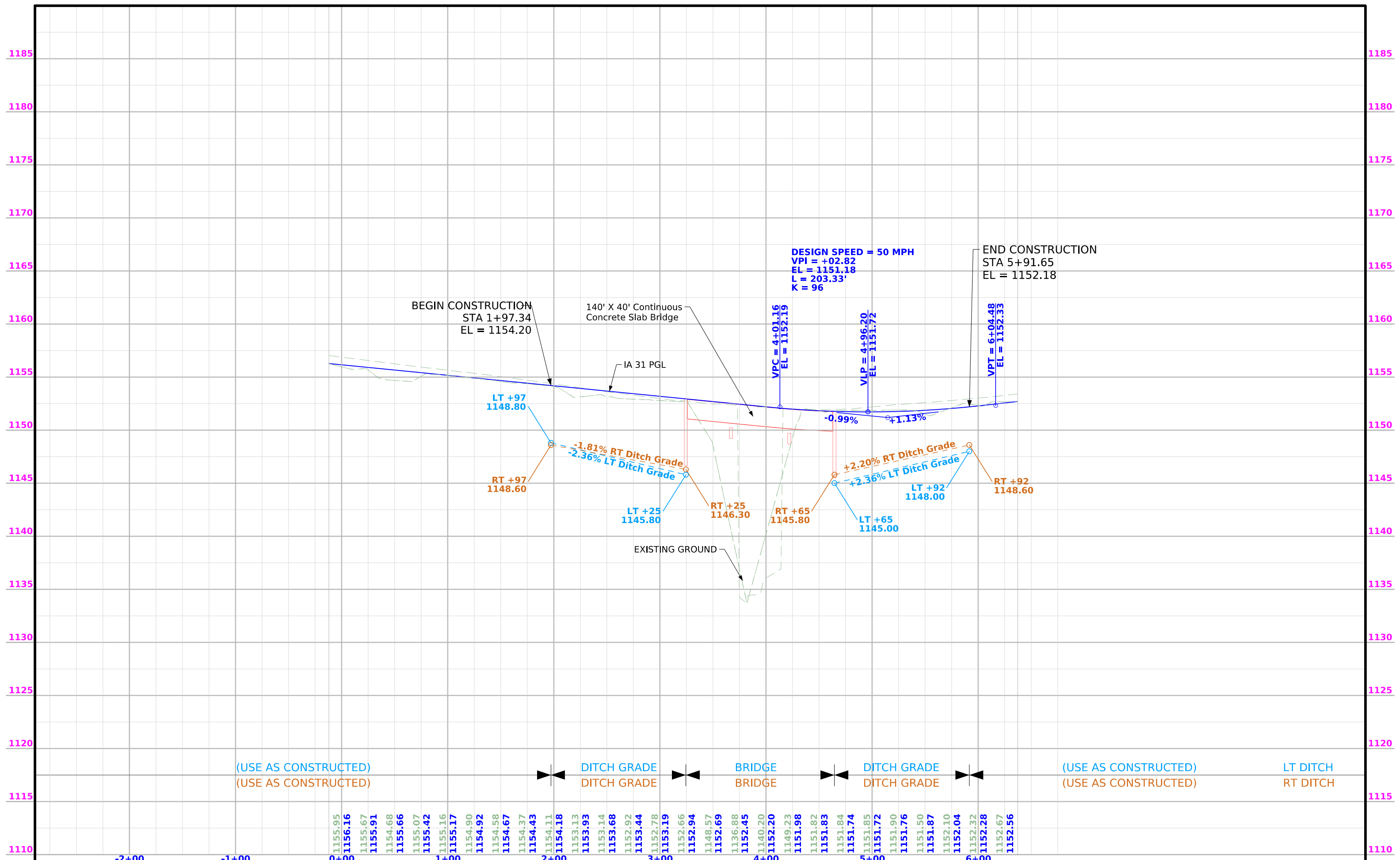


ROCK FLUME FOR BRIDGE END DRAIN  
 LIMIT OF CONSTRUCTION  
 BRIDGE APPROACH PAVEMENT PER  
 STANDARD ROAD PLAN BR-203  
 REMOVE EXISTING GUARDRAIL  
 INSTALL PROPOSED GUARDRAIL  
 SHOULDER GRADING  
 PCC PAVED SHOULDER  
 STA. 1+97.34  
 BEGIN PROPOSED PAVEMENT  
 CONSTRUCTION  
 IA 31  
 PRIVATE ENTRANCE (UAC)  
 PROPOSED PCC PAVEMENT  
 SHOULDER GRADING  
 PCC PAVED SHOULDER  
 PROPOSED TEMPORARY EASEMENT  
 INSTALL PROPOSED GUARDRAIL  
 REMOVE EXISTING GUARDRAIL  
 LIMIT OF CONSTRUCTION  
 CLEARING AND GRUBBING  
 ROCK FLUME FOR BRIDGE END DRAIN  
 (REMOVE)  
 40' X 24'  
 I-BEAM BRIDGE  
 STA 3+94.50  
 CONSTRUCT  
 140' X 40'  
 CONTINUOUS CONCRETE  
 SLAB BRIDGE  
 SKEW 0°  
 STA 3+94.50

PROPOSED TEMPORARY EASEMENT  
 ROCK FLUME FOR BRIDGE END DRAIN  
 BRIDGE APPROACH PAVEMENT PER  
 STANDARD ROAD PLAN BR-203  
 REMOVE EXISTING GUARDRAIL  
 LIMIT OF CONSTRUCTION  
 PROPOSED PCC PAVEMENT  
 INSTALL PROPOSED GUARDRAIL  
 PCC PAVED SHOULDER  
 SHOULDER GRADING  
 STA. 5+91.65  
 END PROPOSED PAVEMENT  
 CONSTRUCTION  
 IA 31  
 PRIVATE ENTRANCE (UAC)  
 SHOULDER GRADING  
 PCC PAVED SHOULDER  
 REMOVE EXISTING GUARDRAIL  
 INSTALL PROPOSED GUARDRAIL  
 LIMIT OF CONSTRUCTION  
 ROCK FLUME FOR BRIDGE END DRAIN



Design No. 0329  
File No. 32880



(USE AS CONSTRUCTED)  
(USE AS CONSTRUCTED)

DITCH GRADE  
DITCH GRADE

BRIDGE  
BRIDGE

DITCH GRADE  
DITCH GRADE

(USE AS CONSTRUCTED)  
(USE AS CONSTRUCTED)

LT DITCH  
RT DITCH

1155.95	1156.16	1155.67	1155.91	1154.68	1155.66	1155.07	1155.42	1155.16	1155.17	1154.90	1154.92	1154.58	1154.67	1154.37	1154.43	1154.11	1154.18	1153.13	1153.93	1153.14	1153.68	1152.92	1153.44	1152.78	1153.19	1152.66	1152.94	1148.57	1152.69	1136.88	1152.45	1140.20	1152.20	1149.23	1151.98	1151.82	1151.83	1151.84	1151.74	1151.85	1151.72	1151.90	1151.76	1151.50	1151.87	1152.10	1152.04	1152.32	1152.28	1152.67	1152.56
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## Survey Information

### SURVEY INDEX

**County: Cherokee**

**PIN: 24-18-031-010**

**Project Number: BRFN-031-3(016)--39-18**

**Location: IA 31 bridge over Stratton Creek, 0.1 mi. N of SR C66**

**Type of Work: Bridge Replacement**

**Project Directory: 1803101024**

### Survey Personnel

Tom Pajula – Survey Party Chief

Eric Wesel – Assistant Survey Party Chief

### Date(s) of Survey

Begin Date 01/07/2025

End Date 01/15/2025

### General Information

This survey is for IA 31 bridge replacement over Stratton Creek at location 0.1 mi N of SR C66. 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 04**

**(U.S. SURVEY FOOT)**

**VERTICAL DATUM: NAVD88**

**GEOID MODEL: 2018u3**

### Alignment Information

The horizontal alignment for IA 31 for this survey is a retrace of Plans No. F-744(1). Survey stationing was equated to the plan face of east abutment at Sta. 4+14.50, split the pavement to the east, and carried back and ahead without equation throughout the survey. Stationing increases to the east in both the plan and the survey.

Survey stationing relates to as built plan stationing as follows:

POT Sta. 4+14.50 Plans Project No. F-744(1)

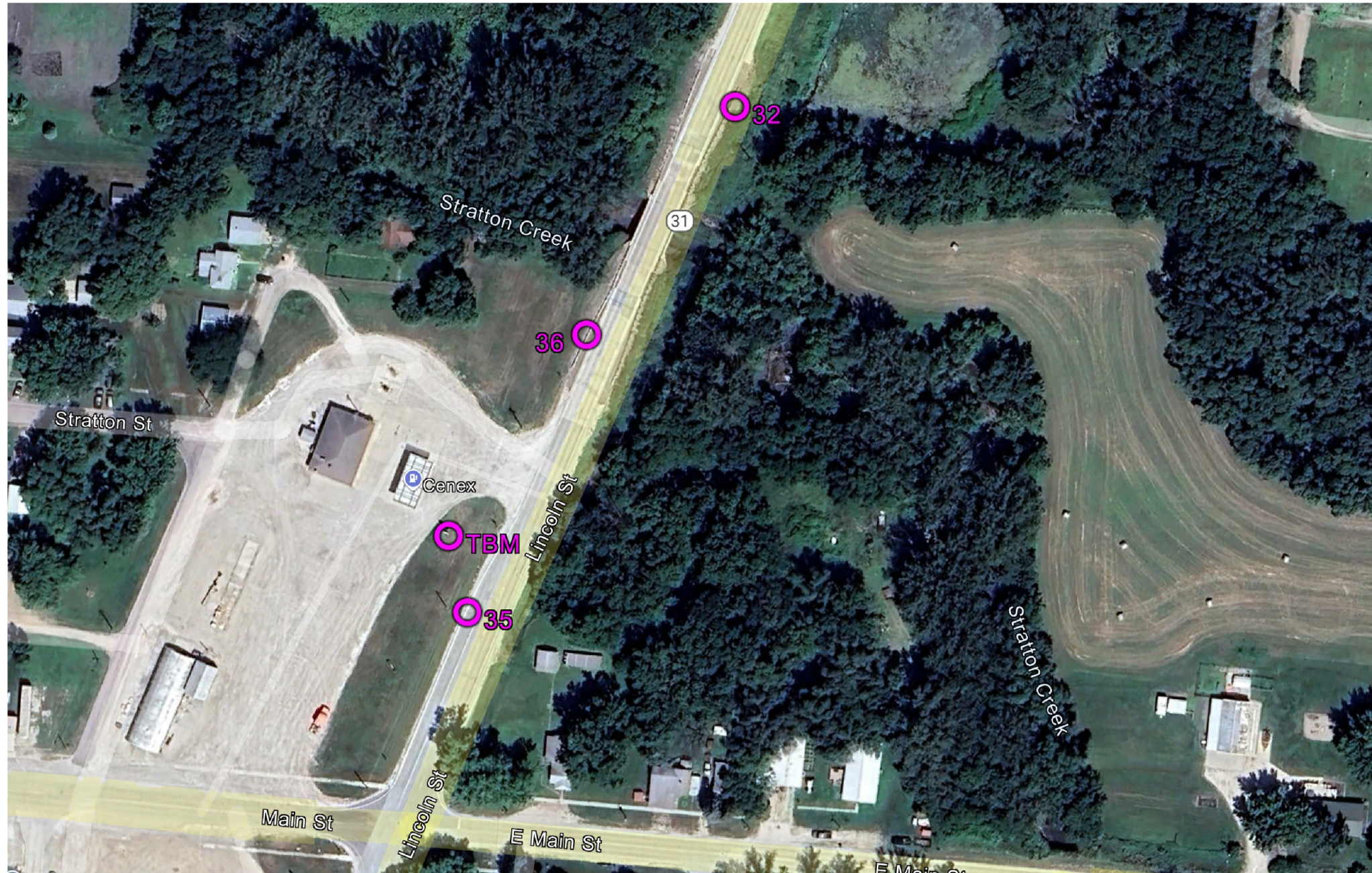
Survey POT Sta. 4+14.50

PT Sta. 3+84 Plans Project No. F-744(1)

Survey PT Sta. 3+84

## 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
32	8617333.42	14262681.83	1151.77	CP SET REBAR WITH CAP +/-139FT NORTH OF STRATTON CREEK +/-8.6FT EAST OF THE EAST EDGE OF CONC SHOULDER OF IA 31 +/-52.9FT NORTHWEST OF THE FIRST POWERPOLE NORTH OF STRATTON CREEK
35	8616833.75	14262466.54	1156.44	CP SET CROSS CUT IN WEST CONC SHOULDER OF IA 31 +/-390 SOUTH OF STRATTON CREEK +/-19.4FT EAST OF SECOND POWERPOLE SOUTH OF STRATTON CREEK WEST OF IA 31 +/-74.9FT SOUTHEAST OF THE GAS STATION SIGN FOUNDATION
36	8617106.65	14262558.57	1152.63	SET REBAR WITH CAP +/-101FT SOUTH OF STRATTON CREEK +/-8.3FT WEST OF THE WEST EDGE OF CONC SHOULDER OF IA 31 +/-110.0FT NORTHEAST OF FIRST POWERPOLE SOUTH OF STRATTON CREEK WEST OF IA 31
TBM	8616904.7	14262442.5	1154.08	BM SQUARE CUT SET ON THE SOUTHEAST CORNER OF THE FOUNDATION FOR NEW COOPERATIVE GAS STATION SIGN WEST SIDE OF IA 31 SOUTH OF THE BRIDGE OVER STRATTON CREEK

0+00

1+00

2+00

3+00

4+00

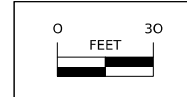
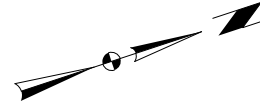
5+00

6+00

POB -0+11.99

POE 6+37.18

CL IA 31

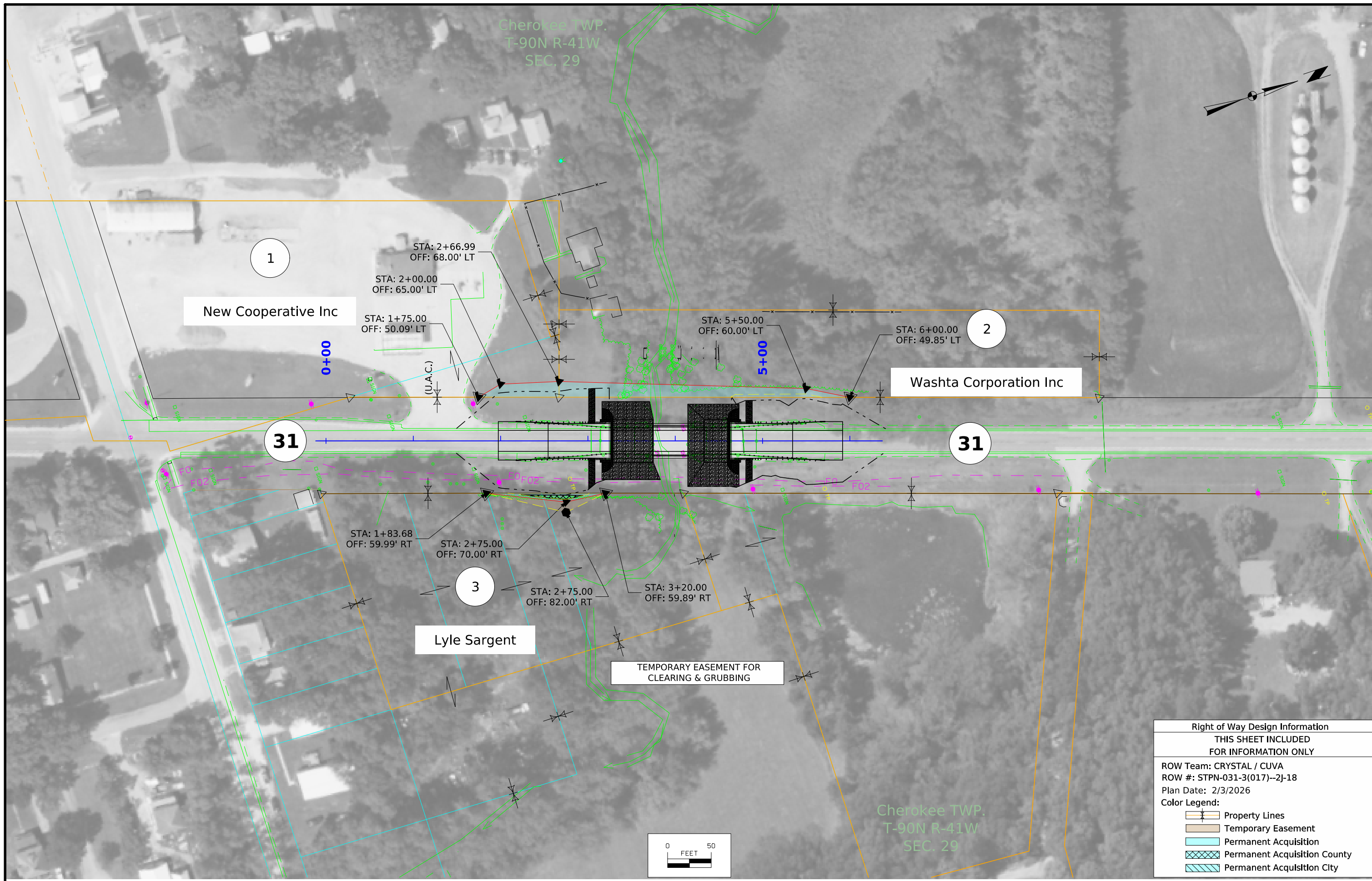


ALIGNMENT  
IA 31

**ALIGNMENT COORDINATES**

Name	Location	Point on Tangent Station	Point on Tangent Y Northing	Point on Tangent X Easting	Begin Spiral Station	Begin Spiral Y Northing	Begin Spiral X Easting	Begin Curve Station	Begin Curve Y Northing	Begin Curve X Easting	Simple Curve PI or Master PI Station	Simple Curve PI or Master PI Y Northing	Simple Curve PI or Master PI X Easting	End Curve Station	End Curve Y Northing	End Curve X Easting	End Spiral Station	End Spiral Y Northing	End Spiral X Easting
PrCL IA 31	Mainline	-11.99	8616825.51	14262488.88															
PrCL IA 31	Mainline	6+37.18	8617441.55	14262693.63															

NO ACCESS RIGHTS ARE TO BE ACQUIRED ON THIS PROJECT.



Right of Way Design Information	
THIS SHEET INCLUDED FOR INFORMATION ONLY	
ROW Team: CRYSTAL / CUVA	
ROW #: STPN-031-3(017)--2J-18	
Plan Date: 2/3/2026	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition
	Permanent Acquisition County
	Permanent Acquisition City

108\_23A  
8/15/22

**TRAFFIC CONTROL PLAN**

IA 31 will be closed to traffic during construction using Standard Road Plan TC-252. Traffic will be detoured via County Road C66 (650th Street) and US 59 (Q Avenue). All detour signs are to be provided, placed, maintained and removed by the Contractor as part of the Traffic Control bid item.

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
			NONE ANTICIPATED				None					

108\_26A  
8/15/22

**STAGING NOTES**

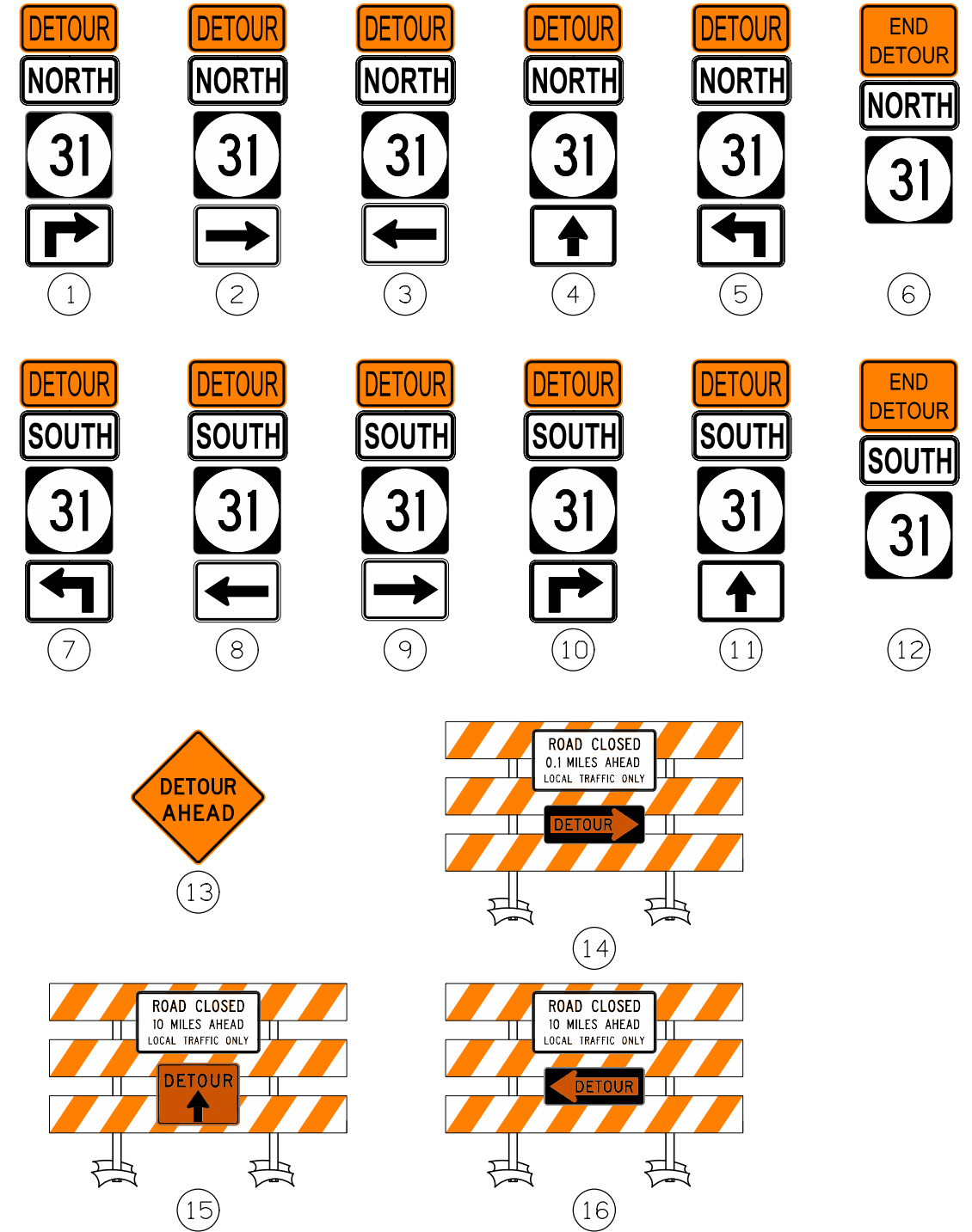
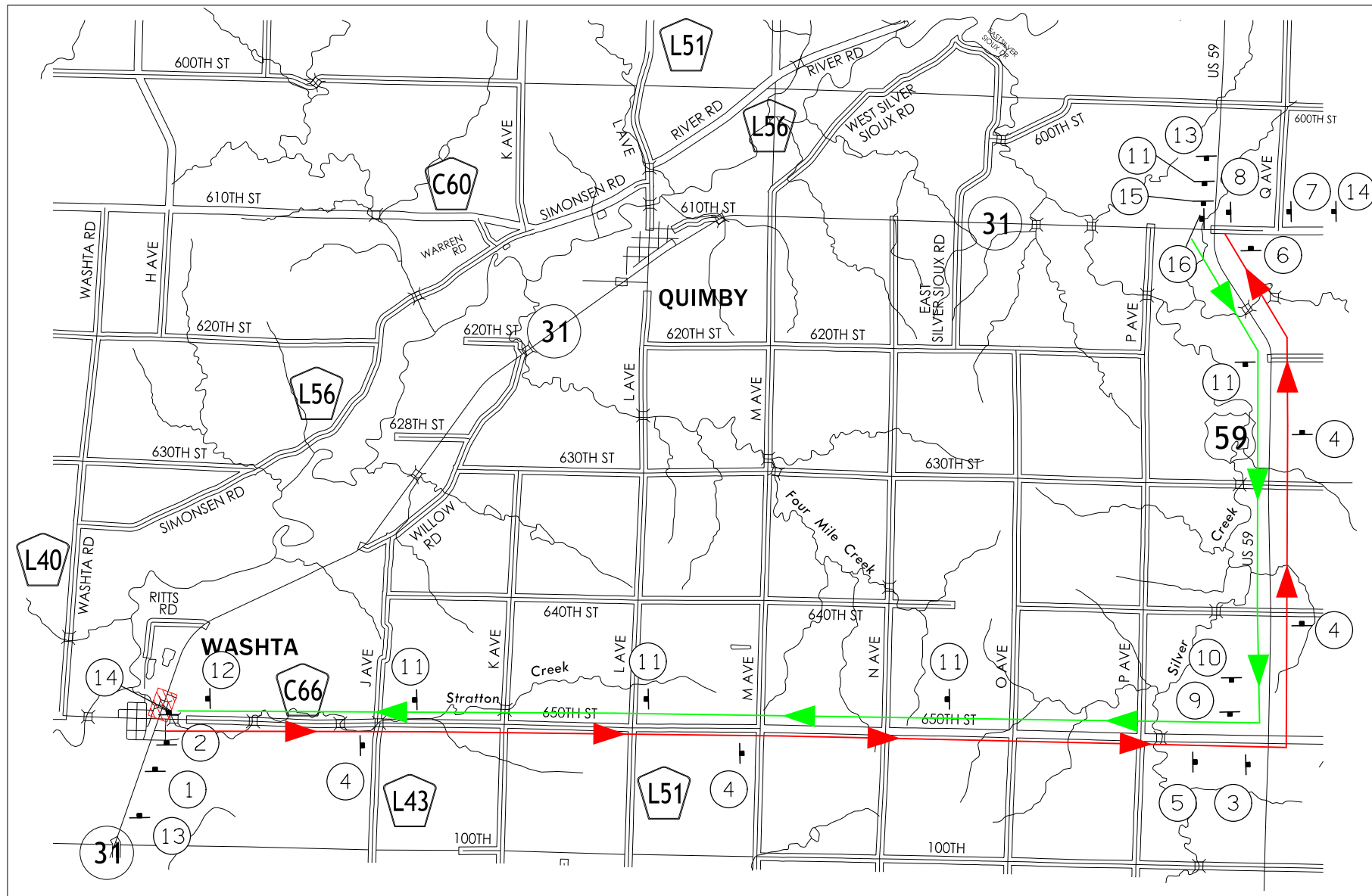
Construction will be performed in a single stage during a full closure of the bridge.

111\_01  
10/14/22

**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 ANTICIPATED	



Notes:

All detour signs are to be provided, placed, maintained and removed by the Contractor as part of the Traffic Control bid item.

Access to all entrances on IA 31 shall be maintained.

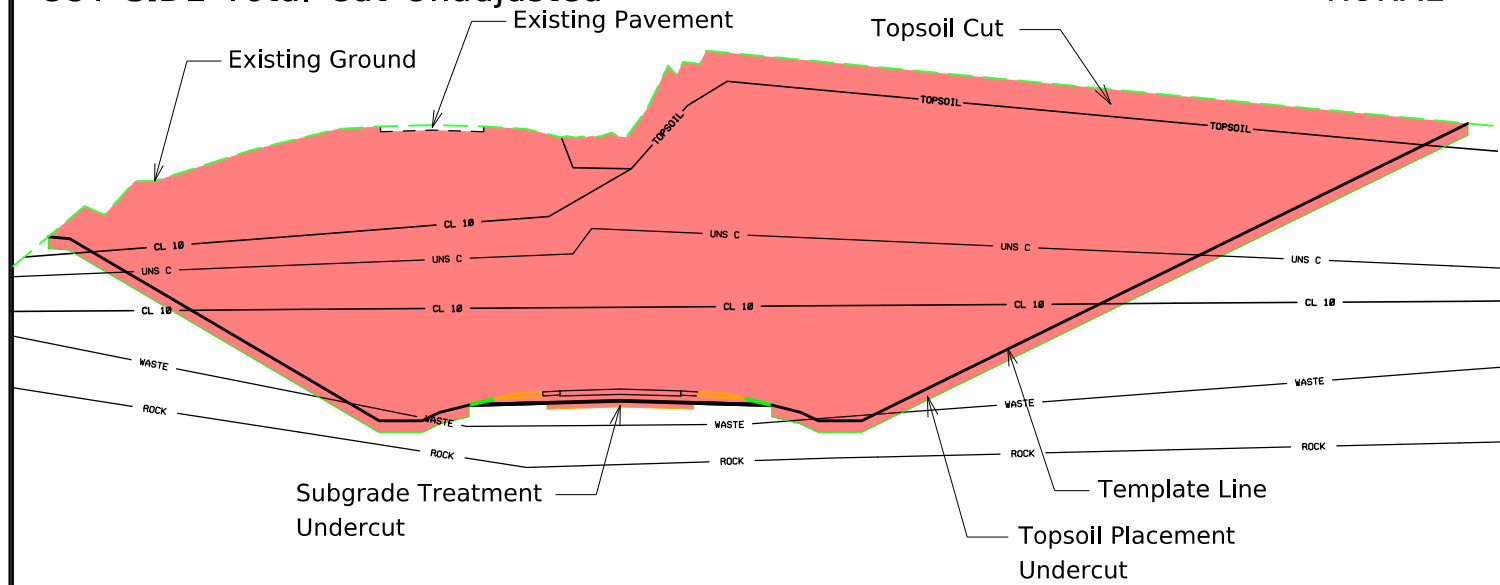
The Contractor shall cover or temporarily turn all conflicting signing along the detour routes.

The Contractor shall maintain MUTCD required spacing between all signing while placing detour signing.

- IA-31 SB Detour Route
- IA-31 NB Detour Route
- Road Closed

**DETOUR  
FOR CLOSURE OF IA 31**

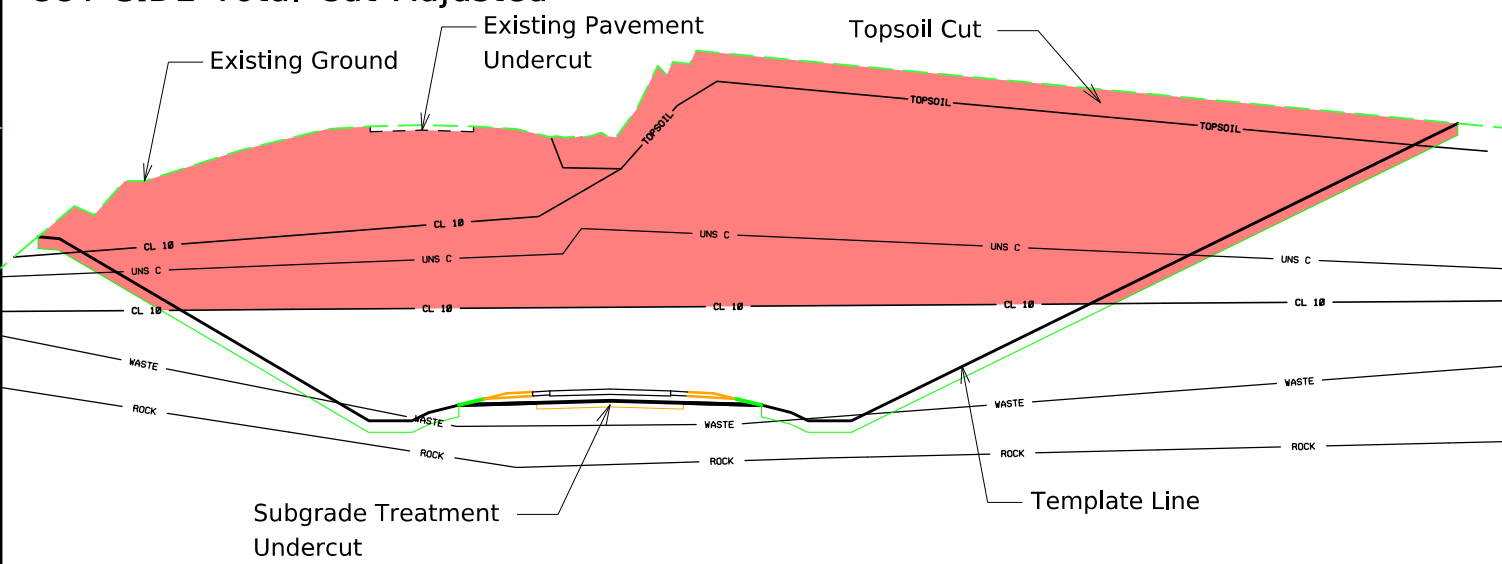
### CUT SIDE Total Cut Unadjusted RURAL



**Notes:**

1. "Total Cut Unadjusted" Column includes all cut values in the Station Range based on Typical, Topsoil and Subgrade Treatment needs.
2. "Total Cut Unadjusted" does not include and Existing Pavement values inside or outside the cut template as shown on cross sections.
3. Tabulated Plowing and Shaping operations are included in the "Total Cut Unadjusted" values.

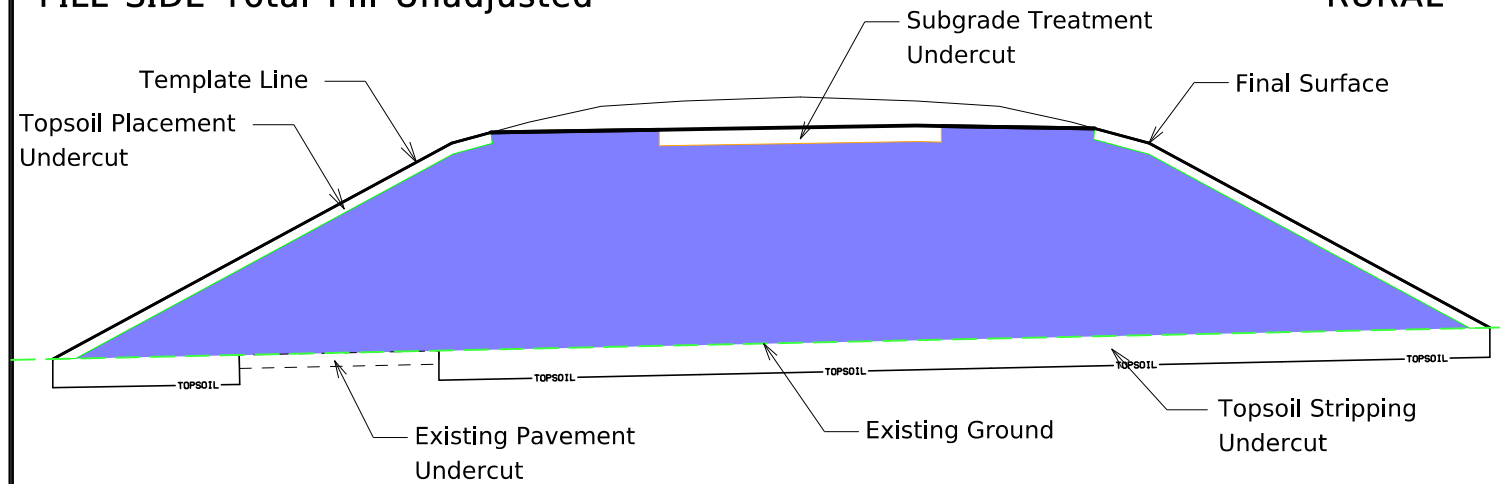
### CUT SIDE Total Cut Adjusted



**Notes:**

1. "Total Cut Adjusted" Column includes all cut values usable as Class 10 material.
2. "Total Cut Adjusted" does not include and Existing Pavement , Existing Topsoil, or material to be wasted.

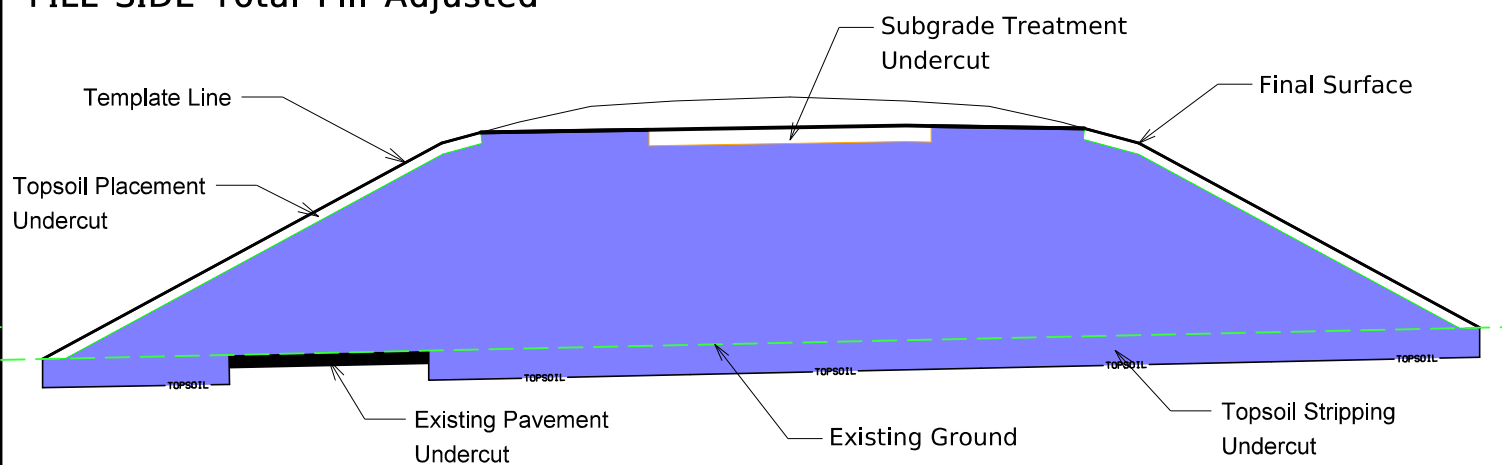
### FILL SIDE Total Fill Unadjusted RURAL



**Notes:**

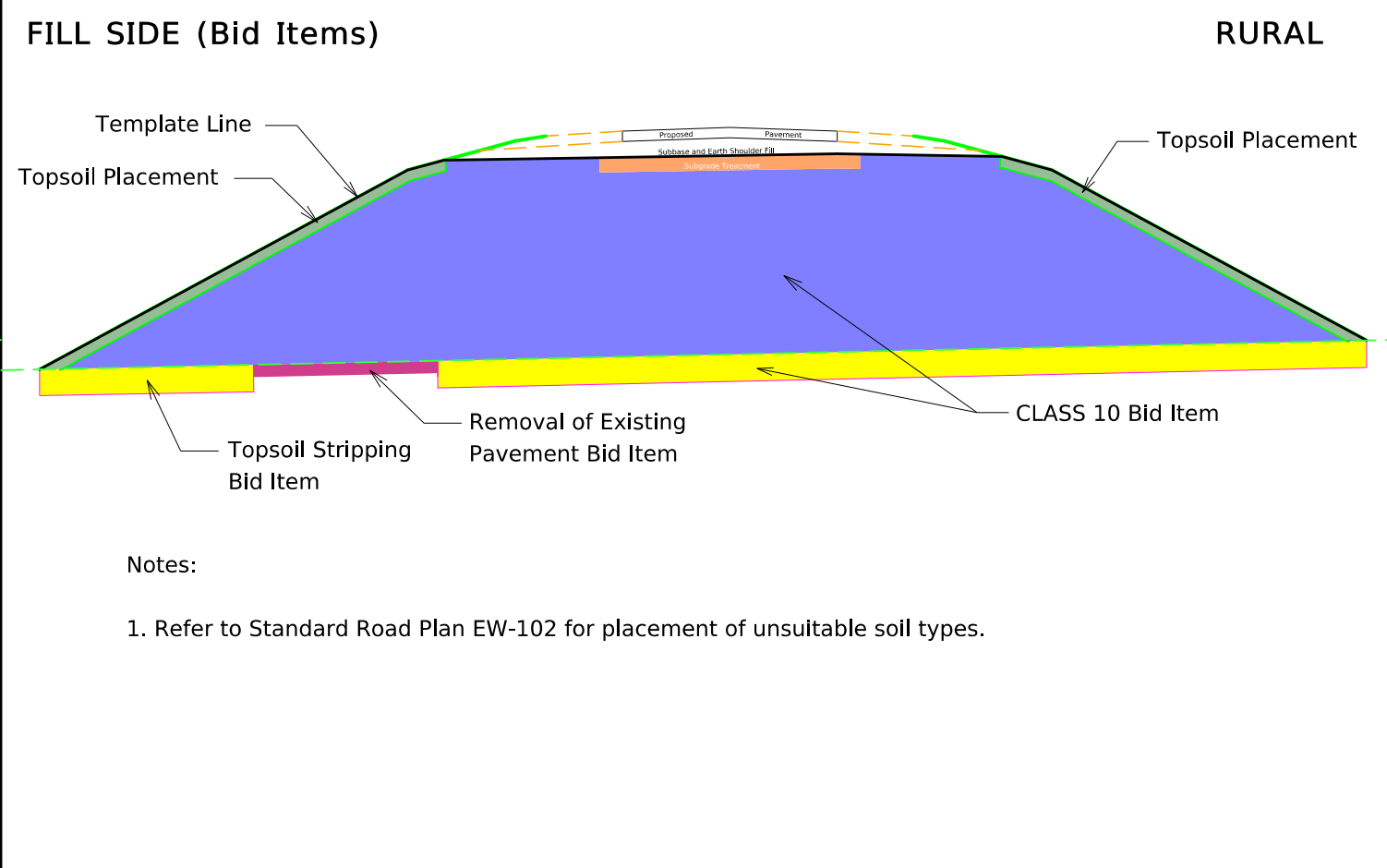
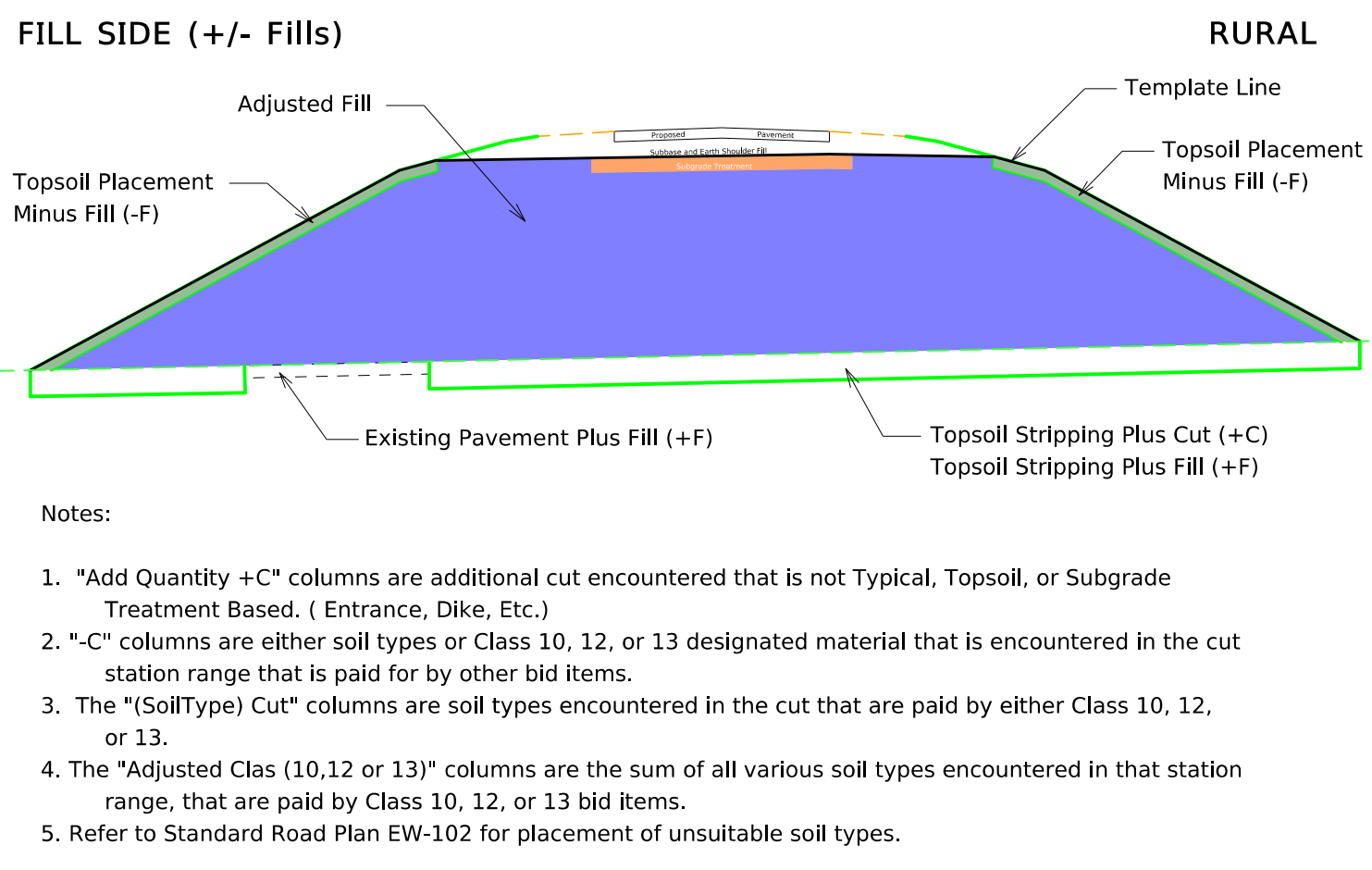
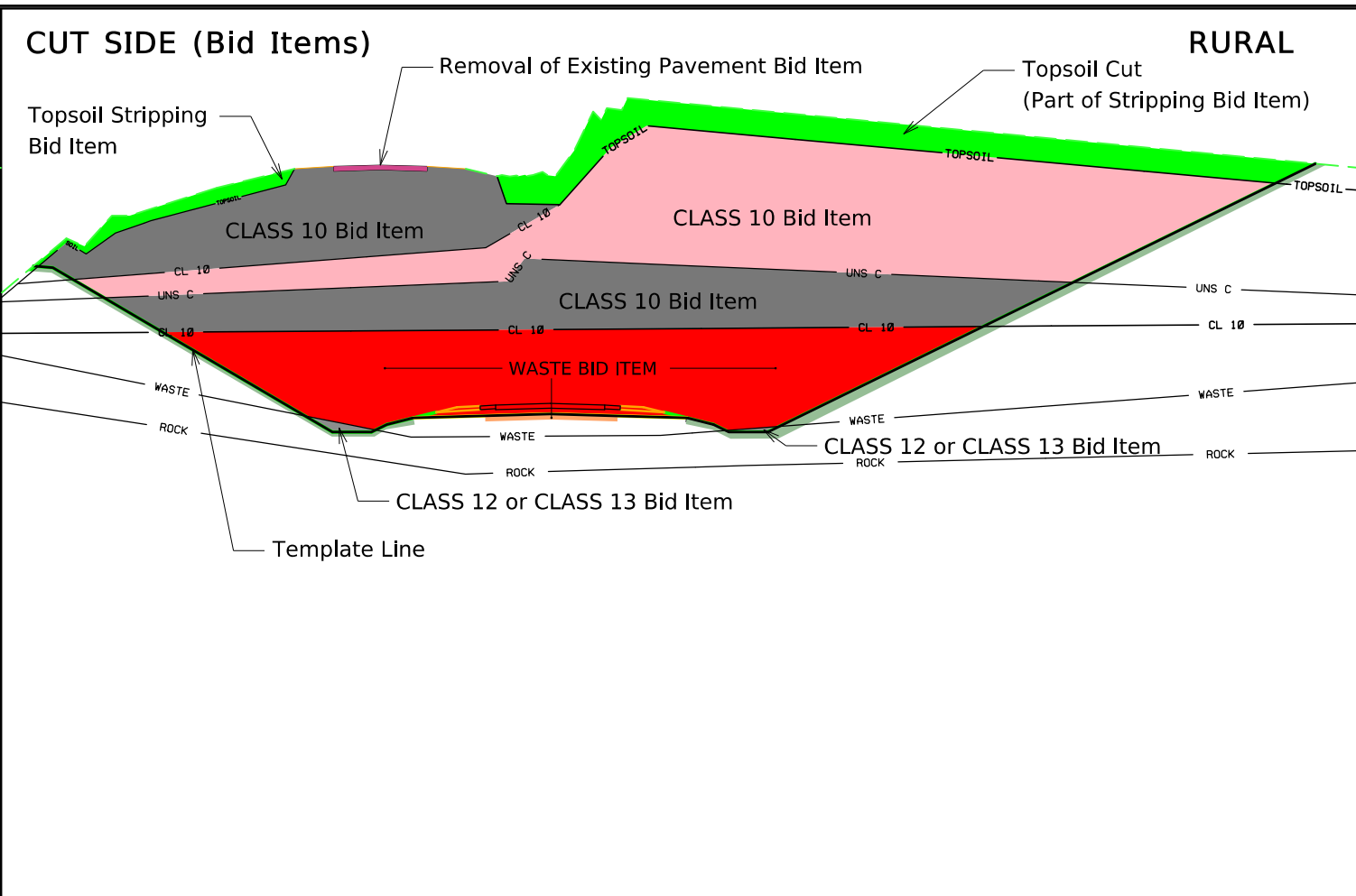
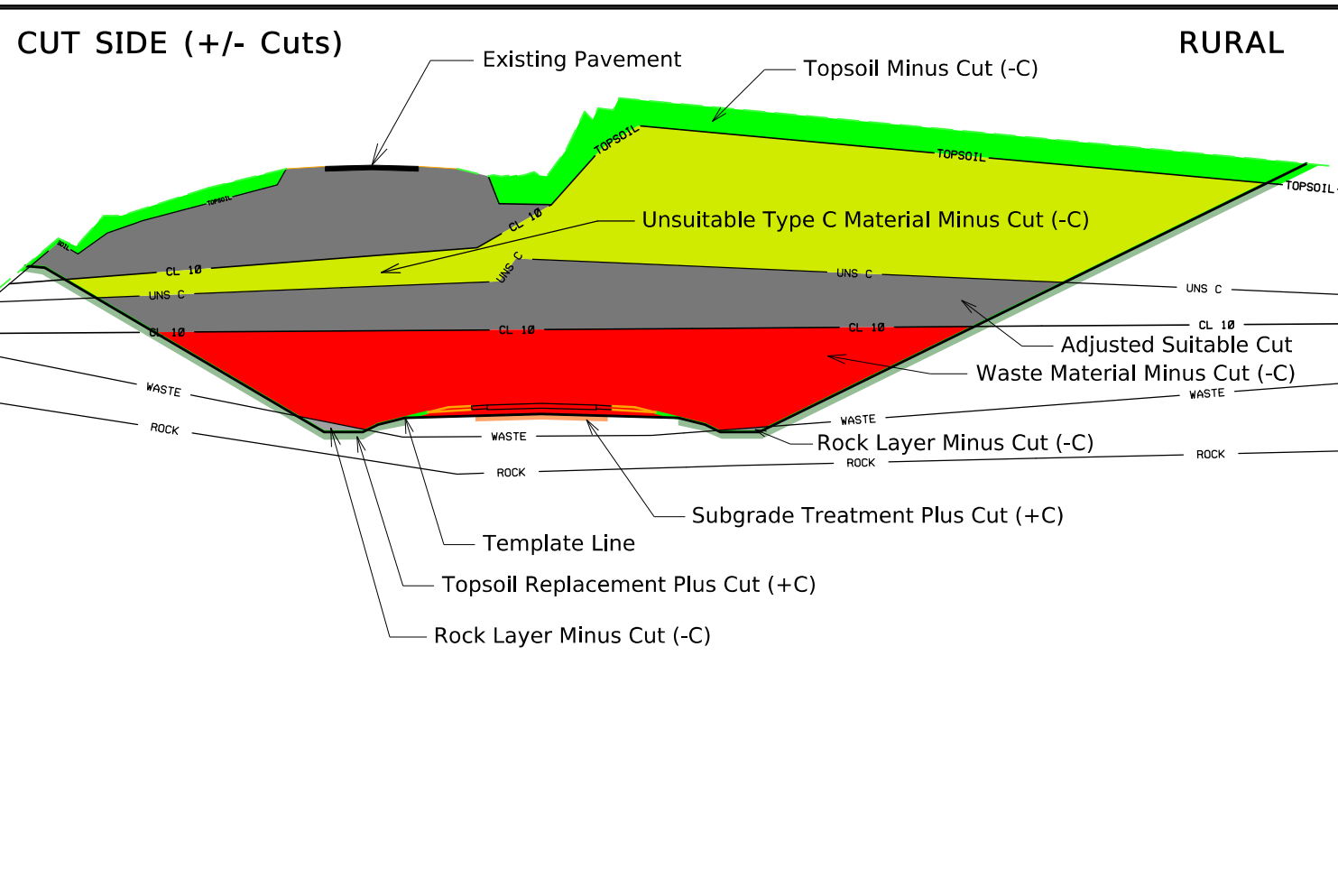
1. "Total Fill Unadjusted" Column includes all Class 10, 12, and 13 fill. This excludes the topsoil, subgrade treatment, subbase, new pavement, and shoulder fill needs in that station range.
2. "Total Fill Unadjusted" Column does not include adjustments for additional fill from cuts such as existing pavement removed, plowing and shaping operations, entrances, dikes, or topsoil stripping.

### FILL SIDE Total Fill Adjusted



**Notes:**

1. "Total Fill Adjusted" Column includes all Class 10, 12, and 13 fill and adjustments for additional fill from cuts such as existing pavement, plowing and shaping operations, entrances, dikes, and topsoil stripping.
2. The available area to place unsuitable materials in the T Sheet tabulation does not include the undercut values from the topsoil stripping, existing pavement, or plowing and shaping

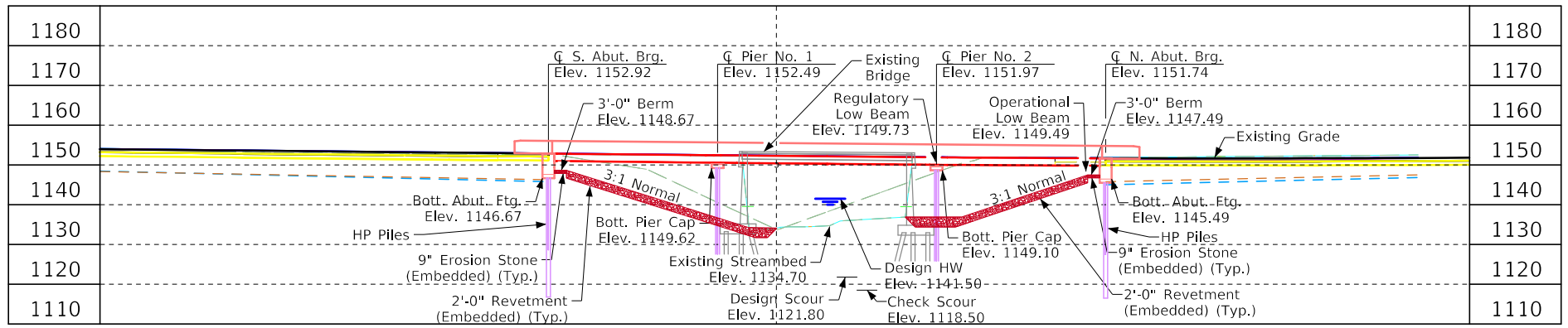


- Notes:
1. "Add Quantity +C" columns are additional cut encountered that is not Typical, Topsoil, or Subgrade Treatment Based. ( Entrance, Dike, Etc.)
  2. "-C" columns are either soil types or Class 10, 12, or 13 designated material that is encountered in the cut station range that is paid for by other bid items.
  3. The "(SoilType) Cut" columns are soil types encountered in the cut that are paid by either Class 10, 12, or 13.
  4. The "Adjusted Clas (10,12 or 13)" columns are the sum of all various soil types encountered in that station range, that are paid by Class 10, 12, or 13 bid items.
  5. Refer to Standard Road Plan EW-102 for placement of unsuitable soil types.

- Notes:
1. Refer to Standard Road Plan EW-102 for placement of unsuitable soil types.



Control Point 32: Set Rebar with cap ±139 ft. north of Stratton Creek ±8.6 ft. east of the east edge of concrete shoulder of IA 31 ±52.9 ft. northwest of the first powerpole north of Stratton Creek, N:8617333.42, E:14262681.83, Elev. 1151.77

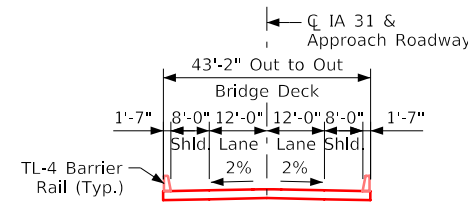


Longitudinal Section along  $\bar{C}$  Bridge

- Plan Notes:
- Top of bridge deck at centerline roadway is .03' below the profile grade to account for deck cross slope and parabolic crown.
  - Class E revetment stone is embedded.

- Design Notes:
- IA 31 will be closed during construction.
  - TL-4 Single Slope Bridge Railing Proposed.
  - Standard Bridge Index No. J40.
  - Fully Encased Pile Bent - 3'-0" cap.
  - There is a potential for conflicts with existing foundations. The existing abutment footing/ piles with the new pier piles.
  - An Iowa DNR Flood Plan Permit has been submitted. The permit will be placed in the PW Regulatory\_Permits subdirectory folder upon receipt.

General Notes:  
This design is for the replacement of the existing 40'-0" x 30'-0" I-Beam Bridge, Cherokee County, Original Design No. 55, FHWA No. 019490, Maint. No. 1829.1S031



Typical Bridge Section

### Hydraulic Design

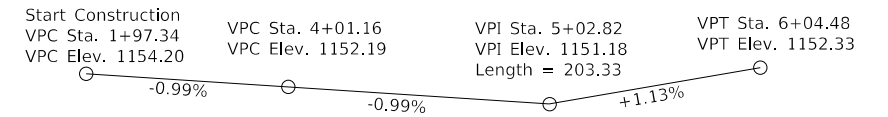
I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

*Eric J. Dean* 10/3/2025  
Signature Date

Eric J. Dean  
Printed or Typed Name

My license renewal date is December 31, 2026

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



Proposed Profile Grade IA 31

### Hydraulic Data

RIDB: "Not Applicable"  
Drainage Area = 5.4 Sq. Mi.  
Stream Slope (HGL) = 34.8 ft./Mi.  
Avg. Low Water Stage = 1134.3

Operational Low Beam = 1149.49  
Channel Low Beam = 1149.73

Q<sub>50</sub> = 2557 cfs  
Stage = 1141.50  
Operational Freeboard = 7.99 ft.  
Avg. Bridge Velocity = 6.9 fps

Q<sub>100</sub> = 3035 cfs  
Stage = 1142.50  
Operational Freeboard = 6.99 ft.  
Backwater = 0.9 ft.  
Avg. Bridge Velocity = 7.3 fps

Q<sub>200</sub> = 3944 cfs  
Stage = 1142.40  
Calculated Design Scour = 1121.80

Q<sub>500</sub> = 4325 cfs  
Stage = 1144.9  
Channel Freeboard = 4.83 ft.  
Avg. Bridge Velocity = 7.7 fps  
Calculated Check Scour = 1118.50

### Utilities Note:

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

### General Utility Symbols:

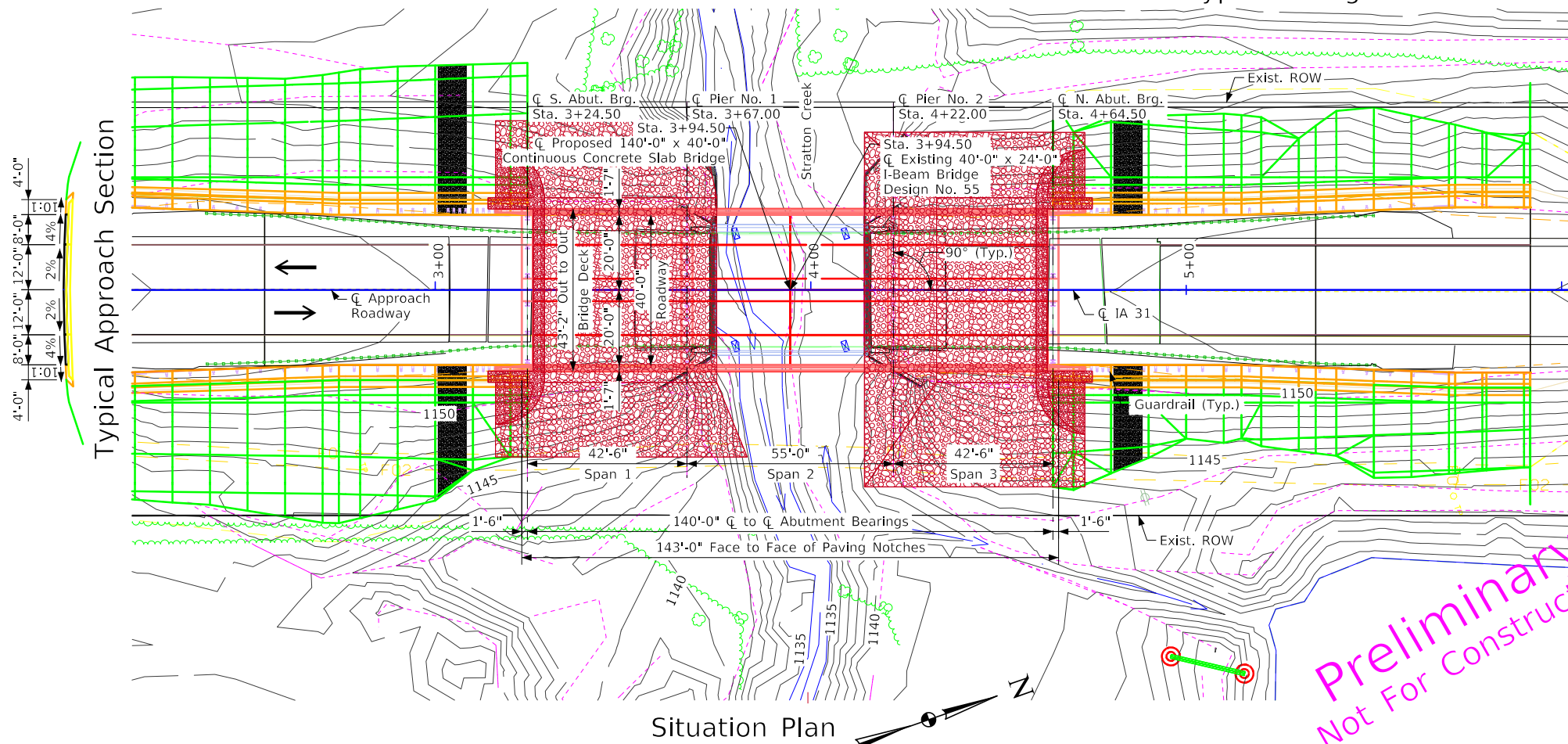
- E - Electric Line
- G - Gas Line
- SAN. - Sanitary Sewer
- T - Telephone Line
- W - Water Line
- FO - Fiber Optic Line
- GHP - Gas High Pressure
- ST S - Storm Sewer
- TV - TV
- - Power Poles

### Location

IA 31 over Stratton Creek  
City of Washta  
T-90N R-41W  
Section 29  
Willow Township  
Cherokee County  
FHWA No. 019491  
Bridge Maint. No. 1829.1S031  
Latitude 42.577093°  
Longitude -95.714676°

### Traffic Estimate

2024 AADT	1,370 V.P.D.
2029 AADT	1,543 V.P.D.
TRUCKS	13 %
Total Design ESALs	600,000



Situation Plan

Preliminary  
Not For Construction

Design For 0 Degree  
**140'-0" x 40'-0" Continuous Concrete Slab Bridge**  
42'-6" End Spans 55'-0" Center Span  
Situation Plan  
STA. 3+94.50 (IA 31) Turn-In Date: Dec 2025  
Cherokee County  
IOWA DEPARTMENT OF TRANSPORTATION  
Design No. 0329 Design Sheet No. 1 of 2 FHWA No. 019491

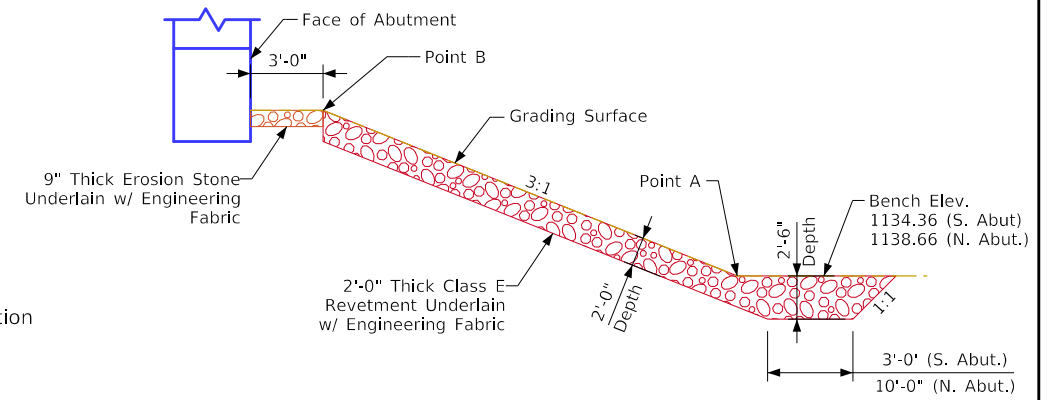
Control Point 32: Set Rebar with cap ±139 ft. north of Stratton Creek ±8.6 ft. east of the east edge of concrete shoulder of IA 31 ±52.9 ft. northwest of the first powerpole north of Stratton Creek, N:8617333.42, E:14262681.83, Elev. 1151.77

Berm Slope Location Table						
Points	South Abutment			North Abutment		
	Station	Offset	Elev.	Station	Offset	Elev.
A1	3+74.94	24.58 Lt.	1134.36	4+33.50	24.58 Lt.	1138.66
A2	3+74.94	24.58 Rt.	1134.36	4+33.50	24.58 Rt.	1138.66
B1	3+29.00	24.58 Lt.	1148.67	4+60.00	24.58 Lt.	1147.49
B2	3+29.00	24.58 Rt.	1148.67	4+60.00	24.58 Rt.	1147.49
W1	3+16.00	24.58 Lt.	1152.25	4+73.00	24.58 Lt.	1150.97
W2	3+16.00	24.58 Rt.	1152.25	4+73.00	24.58 Rt.	1150.97

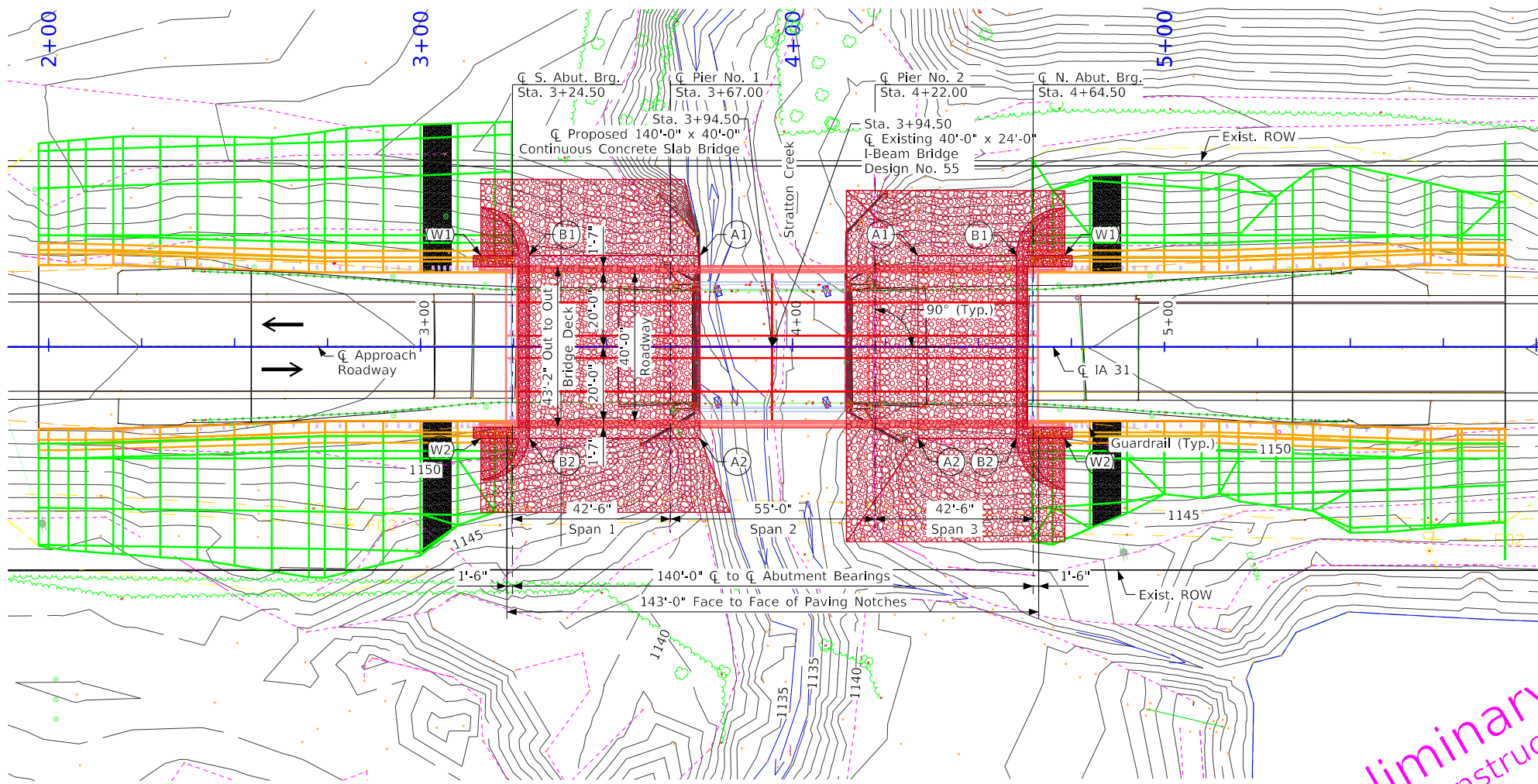
Berm slope elevations reflect the grading surface.  
Offsets are given from the  $\bar{C}$  IA 31.  
All points are 3'-0" from the edge of the bridge deck

Estimated Berm Armoring Quantities				
Location	Erosion Stone (Ton)	Revetment CL. E (Ton)	Engineering Fabric (SY)	CL. 10 Channel Excavation (CY)
Berm Lining - South	20.60	555.78	571.91	360.08
Berm Lining - North	22.14	567.51	586.71	368.36
Totals	42.74	1123.29	1158.62	728.44

Excavation quantity calculated from proposed grading surface and includes only the excavation required to embed the slope protection.  
Revetment based on density of 1.6 ton/CY.  
Erosion stone based on a density of 120 lb/CF.

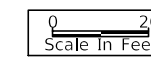


Section Thru Embedded Revetment Berm



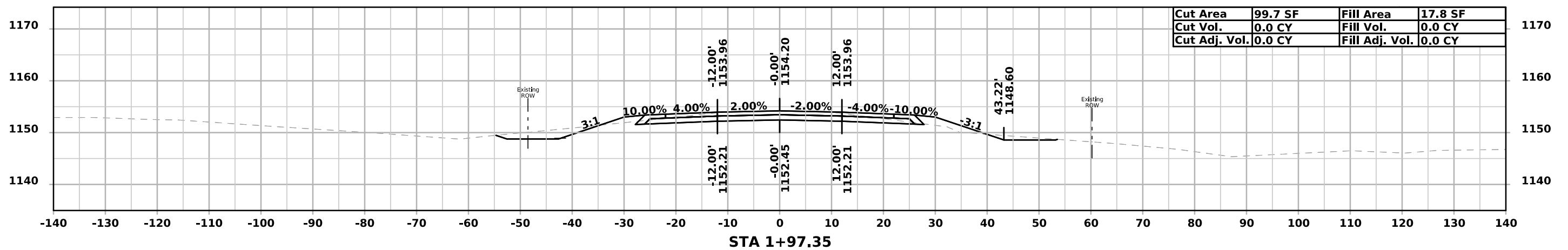
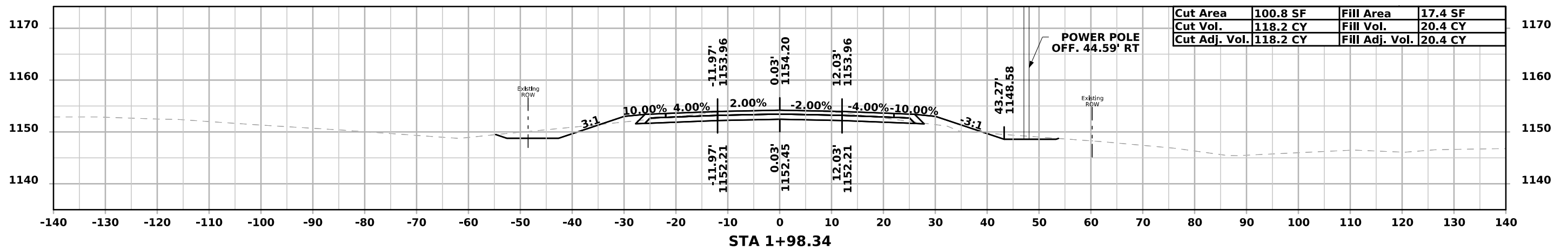
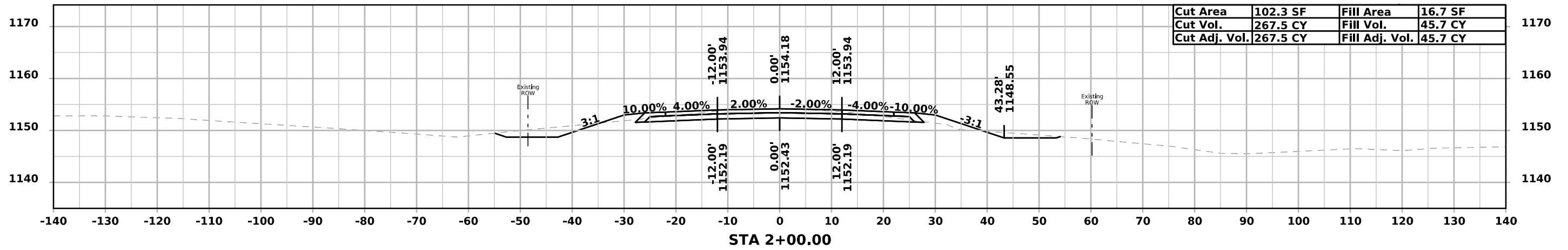
Site Plan

*Preliminary  
Not For Construction*

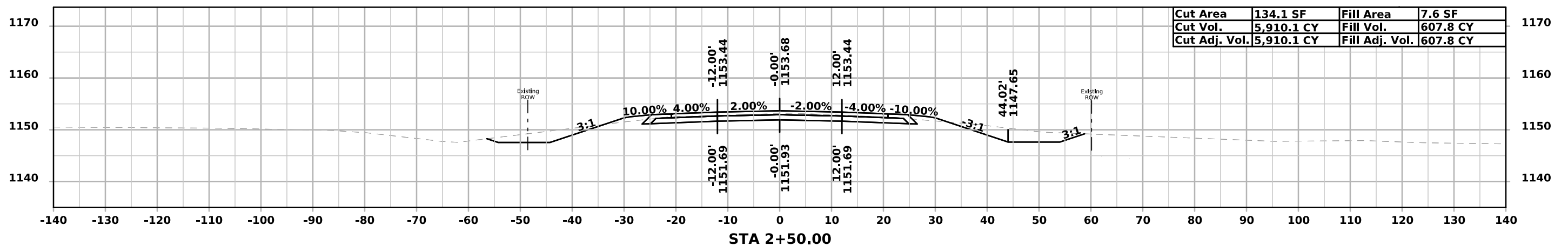
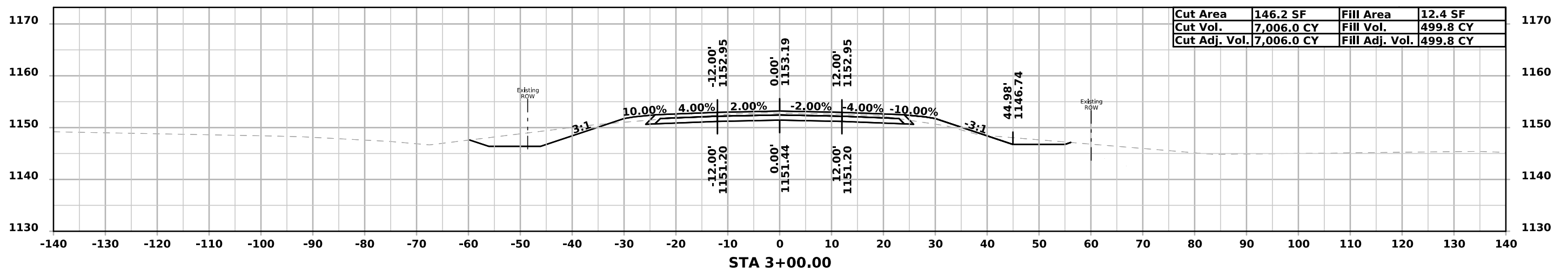
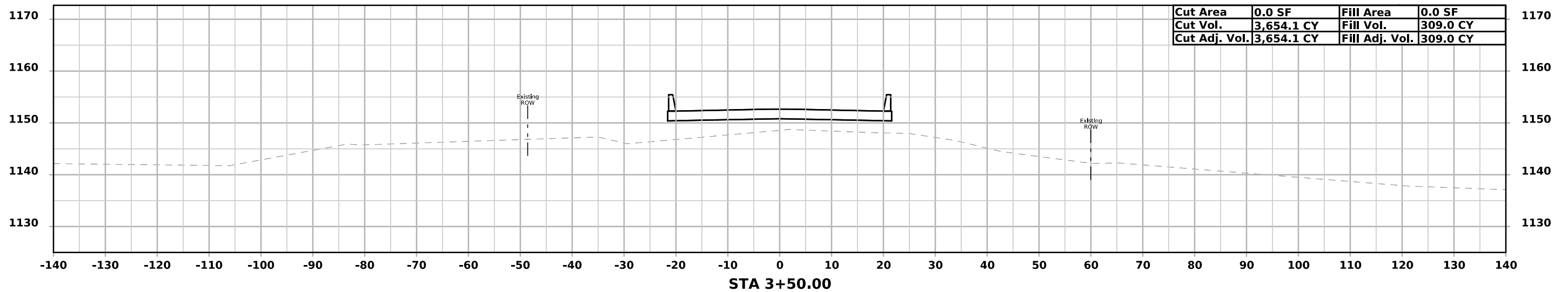


Design For 0 Degree  
**140'-0" x 40'-0" Continuous Concrete Slab Bridge**  
 42'-6" End Spans      55'-0" Center Span  
**Situation Plan - Site**  
 STA. 3+94.50 (IA 31)      Turn-in Date: Dec 2025  
**Cherokee County**  
 IOWA DEPARTMENT OF TRANSPORTATION  
 Design No. 0329      Design Sheet No. 2 of 2      FHWA No. 019491

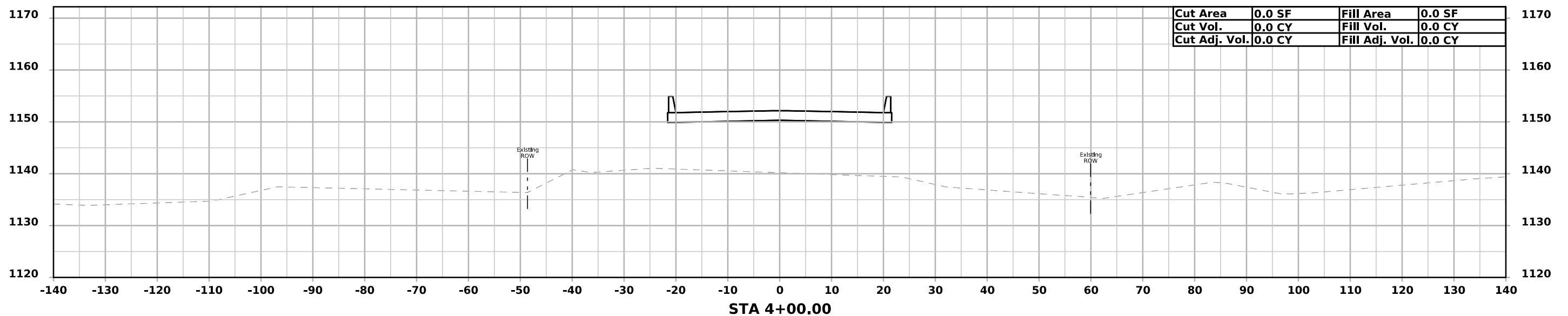
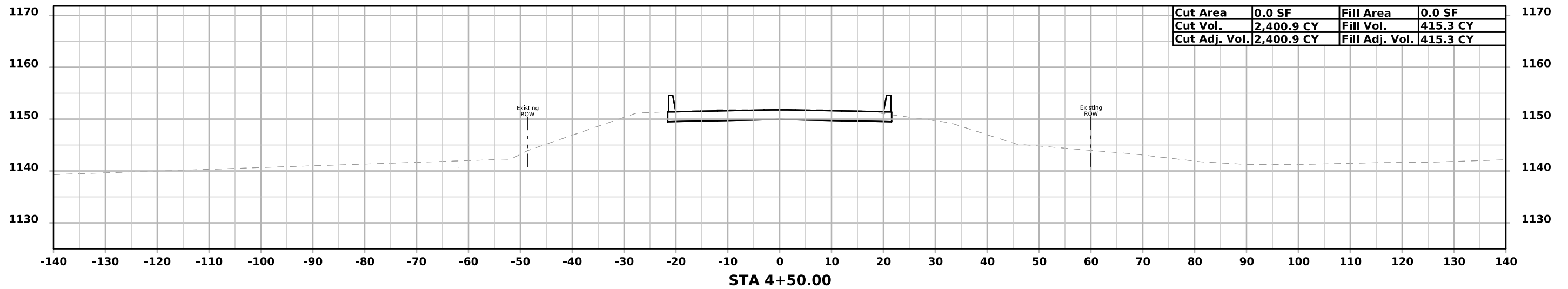
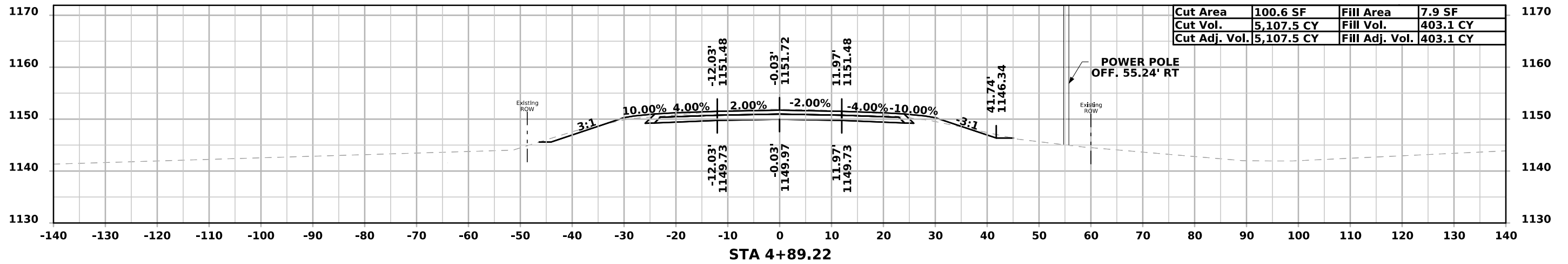
# ML - IA 31



# ML - IA 31



# ML - IA 31



# ML - IA 31

