LETTING DATE Oct 19 2027

BRF-034-3(41)--38-02

Bridge Replacement - Continuously Welded Plate Girder

ADAMS COUNTY

INDEX OF SHEETS

IOWA DOT

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM

ADAMS COUNTY

Bridge Replacement - Continuously Welded Plate Girder

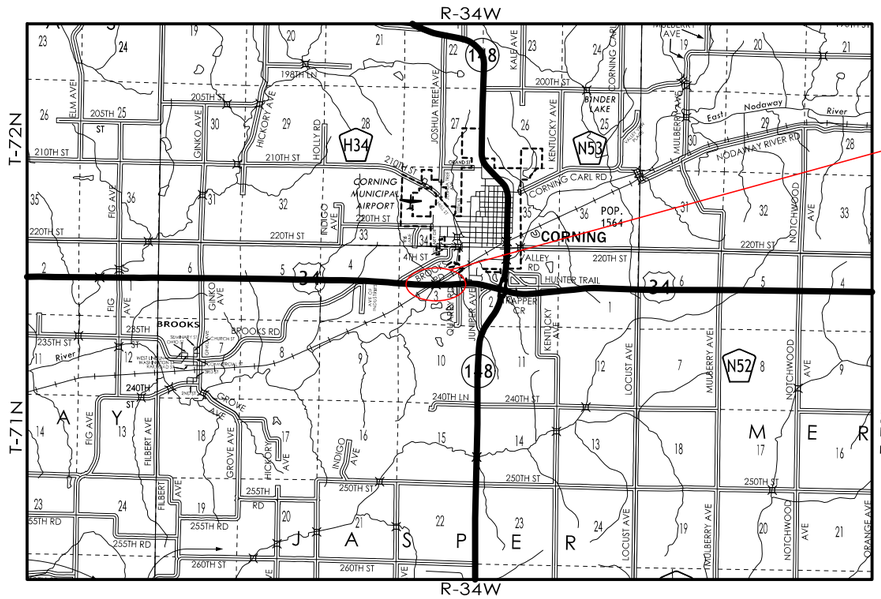
E Nodaway River and RR 0.8 mi W of IA 148

SCALES: As Noted

<---- H Sheets

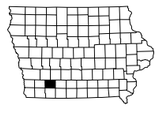
Refer to the Proposal Form for list of applicable specifications.

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



FHWA # 013320
PROJECT LOCATION
STA 474+70.74 TO STA 517+60.97

NOT TO SCALE



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DESIGN DATA RURAL

20 16	AADT	2,960	V.P.D.
20 –	AADT	–	V.P.D.
20 –	DHV	–	V.P.H.
TRUCKS		–	%
Total Design ESALs		–	

INDEX OF SEALS

SHEET NO.	NAME	TYPE	BID QUANTITY SHEETS
A.1	X	Structural Design	X
B.1	Cindy A. Spencer	Roadway Design	X
V.2	David J. Mulholland	Hydraulic Design	X

D5 PLANS

D5 PLAN - September 6, 2024

REVISIONS

	TOTAL
	85
PROJECT IDENTIFICATION NUMBER	
22-02-034-020	
PROJECT NUMBER	
BRF-034-3(41)--38-02	
R.O.W. PROJECT NUMBER	
NHSN-034-3(42)--2R-02	
X	
X	

Roadway	U.S. 34				
PIN Number	22-02-034-020			**Submittal Date**	
Project Number	BRF-034-3(041)--38-02				**Approval Date**
District	District 4	**Assistant District Engineer**	Wes Mayberry		
County	ADAMS		**or**		
Route	U.S. 34	**Office Director**			
Location	Over BNSF and Nodaway River, just SW of Corning				
Work Type	Bridge Replacement				
Segment Manager					
Designer	Snyder & Associates, Inc.				

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	GB Section 7.2.2
Maximum superelevation rate (Refer to Section 2A-2)		6%	8%	6%	GB page 7-6
Design lane width (ft)		12	12	12	GB table 7-3
Full depth paved width (ft)		12	12	12	--
Right turn lane (ft)		12	10	12	GB section 9.7.1
Climbing Lane (ft)		12	12	12	GB page 3-141
Left turn lane (ft)		12	10	12	GB section 9.7.1
Pavement cross-slope (on tangent sections)	Through lanes	2%	1.5% minimum, 2% maximum	2%	GB page 7-6
	Auxiliary and turn lanes	3%	3% maximum	3%	GB page 7-15
	Crown break at centerline	4%	4% maximum	4%	GB page 4-6
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%	GB Section 4.4.3
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	4" sloped	
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	RDG section 3.3.2
	Beyond standard ditch depth and design clear zone	3.5:1	3:1	3.5:1	
	Curbed roadways	2%	not steeper than 3:1		
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	GB Section 4.8.4
Transverse Slopes	w/ drainage structures	8:1	6:1	8:1	RDG Section 3.2.3
	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	GB Section 7.2.5
	Bridge length > 200 ft	design lane widths + effective shoulder widths	design lane width + 4' right and left of the design lane widths	44'	
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	GB Section 7.2.5
	Over non-primary	16.5 at interchange locations, 15 at all other locations	14	N/A	GB pages 5-9 and 6-8
	Over railroad	23.3	23.3	23.5'	--
	Sign trusses and pedestrian bridges	17.5	17	N/A	GB section 7.2.5
Structural Capacity		Contact Office of Bridges and Structures	Contact Office of Bridges and Structures		--
Level of Service		B	B	B	GB section 7.2.2

*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 =												

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	6	GB section 9.7.1
Turn lanes with curbs	6	See Section 3C-2	Turn lanes with curbs	6	0	6	GB section 9.7.1 and 4.7.3
	Effective Shoulder Width	Paved Width		Effective Shoulder Width	Paved Width		
Climbing Lanes	6	4	Climbing Lanes	4	0		GB page 3-141
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*	10' effective, 10' paved	GB table 7-3
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

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						Acceptable Criteria, Design Speed, mph						Project Values	
			50	55	60	65	70	75	50	55	60	65	70	75		
Stopping sight distance (ft) (Refer to Section 6D-1)			425	495	570	645	730	820	425	495	570	645	730	820	570	GB Table 3-1
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	GB Table 3-7
		e_{max} = 8%	--	--	--	--	--	--	758	960	1200	1480	1810	2210		GB Table 3-7
Minimum vertical curve length (ft) (Refer to Section 2B-1)			150	165	180	195	210	225	150	165	180	195	210	225	180	GB page 3-167
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	GB Table 3-35
	sag vertical curves	roadways without fixed-source lighting	96	115	136	157	181	206	96	115	136	157	181	206	136	GB Table 3-37
		roadways with fixed-source lighting	96	115	136	157	181	206	54	66	78	91	106	121	136	GB page 3-176
Minimum gradient (%)	(Refer to Section 2B-1)		0.5						0.3% with a curb, 0.0% without a curb						.5	GB page 3-130
Maximum gradient (%)	(Refer to Section 2B-1)	Urban roadways	4		3				7	6	6	--	--	--		GB Table 7-4a
		Rural roadways							5	5	4	4	4	4	3	GB Table 7-2
		Interstates							5	5	4	4	4	4		IDG page 3
Clear zone			See "Preferred Clear Zone" table in Section 8A-2						See "Acceptable Clear Zone" table in Section 8A-2						30'	

PROJECT CONCEPT STATEMENT

Bridge on U.S. 34 over BNSF Railway and East Nodaway River

Adams County
Project # BRF-034-3(41)--38-02
PIN: 22-02-034-020
Maintenance No. 0261.5S034
FHWA No. 013320

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

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

November 17, 2023

I. STUDY AREA

A. Project Description

This project involves replacement of the U.S. 34 bridge over the BNSF Railway and East Nodaway River (Maintenance No. 0261.5S034) on the south side of Corning, in Adams County.

B. Present Facility--Need for Project

The existing bridge is an 824' x 30' continuous welded girder bridge constructed in 1964. The bridge has 6 spans, with 116-foot-long end spans and 148-foot-long center spans, and was constructed at a 45 degree skew. U.S. 34 is skewed at 59 degrees to the railroad, meaning bridge piers are not parallel to the railroad. Past repairs have consisted of a bridge deck overlay in 1995 and bridge painting in 2012.

The bridge was last inspected in April 2023 and has deck, superstructure, and substructure condition ratings of 5, 7 and 5, respectively, on a scale of 0 to 9. A rating of 4 or less on any of the condition ratings would make the bridge "Structurally Deficient". An asbestos inspection noted the presence of asbestos in both samples taken on the existing bridge.

Per the programming recommendations, dated December 23, 2019, contained with the Asset Details on SIIMS:

1. The bridge deck overlay that was added in 1995 is now reaching the end of its service life.
2. The bridge deck has leaching cracks, delamination, and spalls with exposed reinforcement.
3. The abutments have narrow to wide cracking, delamination in the bridge seats, and spalling.
4. Due to the condition of the bridge, this structure should be replaced.

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

The roadway east and west of the bridge, located on the south side of Corning, is a 24-foot-wide paved rural section with 10-foot-wide composite shoulders. Roadway foreslopes vary from 2.5:1 to 3:1, and the roadway was built without clear zone considerations. The posted speed limit through the project area is 55 mph.

U.S. 34 intersects with Loomis Avenue approximately 1,771 feet east of the bridge. Approximately 800 feet west of the bridge is a former quarry site on each side of the road that has been flooded to create ponds. Steel beam guardrail is installed through the former quarry site to protect traffic. The BNSF railway beneath the bridge currently has a single track, although the as-built plans for the bridge indicate that three tracks were present at that time. We would anticipate that the BNSF railway would request that the new bridge accommodate three tracks.

The FRA crossing number for this location is 095320M. Per the FRA Crossing Inventory Form, the BNSF Railway through the project area carries 13 trains per day, which includes 2 daily AMTRAK passenger trains, at a maximum timetable speed of 79 miles per hour.

C. Hydrology

StreamStats discharges for the East Nodaway River at the project site are 18,000 cfs (50-year), 21,200 cfs (100-year) and 24,400 cfs (500-year) for the 168 square mile drainage area.

D. Traffic Estimates

The 2016 traffic count was 2,960 vehicles per day (VPD). The 2020 truck traffic was 560 trucks per day, which is 19% of the 2016 ADT. Historic traffic counts dating back to 2000 vary between 1,710 VPD and 3,310 VPD.

Iowa DOT Office of Systems Planning forecasts an AADT volume of 3,238 VPD in Year 2027 and 3,800 VPD in Year 2047 with 19% truck percentage for both years. Year

2047 design hour forecast volumes are 390 vehicles per hour for the AM peak hour PM peak hour.

E. Crash History

One property damage only crash was reported on U.S. 34 in the project limits in the last 5 years. This was an "animal" crash located away from the bridge. It appears that the existing alignment has adequate sight distance available.

F. Sufficiency Rating – Bridge Condition Index

The official Federal bridge sufficiency rating is 48.3. With a sufficiency rating below 50 and the near-deficiency condition ratings of two of the major bridge components (deck and substructure), replacement is the clear choice.

The bridge condition rating is considered fair. The Bridge Condition Index (BCI) is 46.5.

The bridge has a priority ranking of 37.4.

G. Accelerated Bridge Construction Score

Traffic Carried on Existing Bridge:
The Accelerated Bridge Construction (ABC) normalized score using state roads is 15, which is far below the threshold (50) that would qualify the project for further evaluation of ABC techniques. The contributing factors to the raw score are the out of distance travel (OODT) weighted score of 0, average annual daily traffic (AADT) weighted score of 10, a daily road user costs (DRUC) weighted score of 0, and an economy of scale (EOS) weighted score of 15.

Traffic Carried on Detour:
The Accelerated Bridge Construction (ABC) normalized score using state roads is 27, which is below the threshold (50) that would qualify the project for further evaluation of ABC techniques. The out of distance travel detour is 3 miles (4.8 km). The contributing factors to the raw score are the out of distance travel (OODT) weighted score of 10, average annual daily traffic (AADT) weighted score of 10, a daily road user costs (DRUC) weighted score of 10, and an economy of scale (EOS) weighted score of 27.

H. Access Control

Access rights will not be acquired on this project.

I. Utilities

An electrical transmission line owned by CIPCO runs along the north side of the existing roadway. Preliminary estimates indicate that moving the electrical lines will cost $400,000 - $500,000, plus the cost of right-of-way if necessary.

II. PROJECT CONCEPT

A. Proposed Improvements

Bridge alternatives proposed as part of this concept are all on relocated alignments and are not expected to impact the existing bridge during construction. Extensive roadway reconstruction will be necessary to connect the new roadway and bridge alignment to existing U.S. 34. Four alternative alignments were reviewed. Refer to attached sheets for additional information.

For all alignments, the vertical profile is controlled by clearance over the BNSF Railway. Per the Union Pacific Railroad and BNSF Railway Guidelines for Railroad Grade Separation Projects, 23'–6" clearance is required from the top of rail to the lowest part of the bridge, within an envelope that extends to 9 feet outside of the track centerline. If the BNSF Railway wishes for the bridge to be able to accommodate three tracks, then that envelope extends to 9 feet from the center of the outermost tracks. The railroad also requires that bridge piers and / or abutments be located outside railroad right-of-way. For this project, railroad right-of-way width varies from 250 feet to 390 feet and includes the East Nodaway River. These are perpendicular widths, and the actual length of roadway within right-of-way will be much longer due to the skew of the roadway with respect to the tracks. Keeping all structural piers out of the railroad right-of-way is impractical, and further coordination will be necessary with the BNSF Railway during project design.

All four alternative alignments use a 60-mph design. The U.S. 34 roadway section will consist of two – 12-foot lanes with 10-foot paved shoulders. A barnroof section will be used, with a 6:1 slope to a 30-foot clear zone, then 3.5:1. Ditches will be 10 feet wide with a 3:1 backslope.

1. Alternative Number 1: Far Northern Realignment – Replace Existing Bridge with a 4-span horizontally curved 820'-0 x 44'-0 CWPG Bridge

The aim of this realignment is to reduce the skew of the roadway relative to the BNSF Railway tracks, which requires a greater deviation from the existing alignment. At its furthest point, this alignment is 123 feet north of existing U.S. 34. The alignment uses three horizontal curves, including 5,000-foot radius curves at the east and west tie-ins and a 3,500-foot radius curve just west of the railroad. Note that the 3,500-foot radius curve will continue onto the west end of the proposed bridge.

The proposed realignment impacts three drainage structures: a 4' x 5' RCB, a 36" RCP with a flume, and an 8' x 8' RCB. The 5' x 4' RCB would be extended with a 60" RCP. The flume off the 36" RCP does not appear to be very tall, and will likely be able to be removed with the pipe extension at a sufficient slope. The 8' x 8' RCB will be extended to account for grading to barnroof section.

The overall length of reconstruction with this option is 3,504.93 feet. The skew of the roadway over the railroad is reduced to 54 degrees with this option.

The existing 824'-0" x 30'-0 Continuous Welded Plate Girder (CWPG) bridge will be replaced with an 820'-0" x 44'-0" CWPG Bridge with a skew of 45 degrees L.A. The bridge has four spans: (250'-0") – (250'-0") – (180'-0") – (140'-0"). A horizontal curve extends onto the west half of the bridge, which will necessitate the use of horizontally curved steel continuous welded plate girders. The 44'-0" wide roadway width consists of two 12'-0" lanes and 10'-0" shoulders on each side. The bridge will have stub abutments and T-Piers. Since the bridge is located over the BNSF Railway it will have standard single slope TL-5 barriers for its full length.

Estimated Construction Cost

Bridge Item	Estimated Cost
Bridge	$ 7,412,000
Remove Existing Bridge	$ 308,000
Cofferdams (3 required)	$ 150,000
Revetment, Class E (East Abutment Only)	$ 25,000
Mobilization (10%)	$ 790,000
Contingency (20%)	$ 1,737,000
Bridge Total	**$10,422,000**

Roadway Item	Estimated Cost
Embankment-in-Place	$ 2,298,384
Excavation, Class 10 Roadway and Borrow	$ 173,720
Modified Subbase	$ 124,511
Paved Shoulders, 10" PCC	$ 345,360
Bridge Approach Section	$ 211,845
PCC Pavement, Class C, Class 3, 10"	$ 498,045
Removal of Existing Structures	$ 25,000
RCB Extension	$ 56,595
Pipe Extensions	$ 54,802
Guardrail	$ 31,738
Removal of Pavement	$ 94,904
Traffic Control (5%)	$ 195,745
Mobilization (5%)	$ 195,745
Contingency (30%)	$ 1,291,918
Roadway Total	**$ 5,598,312**
Utility Relocation	**$ 500,000**

Project Total: $ 16,520,312

2. Alternative Number 2: Parallel Alignment, Replace Existing Bridge with a 4-span 880'-0 x 44'-0 CWPG Bridge

The as-built plans for existing U.S. 34 show a survey alignment parallel to the existing roadway at the bridge, located 40 feet to the north. Alternative 2 approximates the survey alignment, with some small changes. To accommodate a new 44' wide bridge without impacting the existing bridge, the offset between existing and proposed alignments is increased to 42 feet. A 6,000-foot radius curve ties the relocated alignment back to existing on the west end, and a 3,770-foot radius is used at the east end, to tie the alignment with adequate distance to runout the superelevation prior to the spiral immediately to the east. Total length of roadway reconstruction with this alternative is 3,786 feet. The portion of the alignment through railroad ROW is 750.6 feet long. The skew of the roadway to the railroad is 59 degrees, which matches the existing roadway skew to the tracks.

The proposed realignment impacts three drainage structures, a 4' x 5' RCB that would be extended with a 60" RCP, a 36" RCB with a flume, and an 8' x 8' RCB. The 5' x 4' RCB would be extended with a 60" RCP. It is assumed that the flume on the 36" RCP can be eliminated with the pipe extension.

Replace the existing 824'-0" x 30'-0 Continuous Welded Plate Girder (CWPG) bridge with an 880'-0" x 44'-0" CWPG Bridge with a skew of 45 degrees L.A.

The bridge has four spans: (200'-0") – (265'-0") – (235'-0") – (180'-0"). The 44'-0" wide roadway width consists of two 12'-0" lanes and 10'-0" shoulders on each side. The bridge will have stub abutments and T-Piers. Since the bridge is located over the BNSF Railway the bridge will have standard single slope TL-5 barriers for the full length of the bridge.

Estimated Construction Cost

Bridge Item	Estimated Cost
Bridge	$ 7,531,000
Remove Existing Bridge	$ 308,000
Cofferdams (3 required)	$ 150,000
Revetment, Class E (East Abutment Only)	$ 25,000
Mobilization (10%)	$ 801,000
Contingency (20%)	$ 1,763,000
Bridge Total	**$10,578,000**

Roadway Item	Estimated Cost
Embankment-in-Place	$ 645,858
Excavation, Class 10 Roadway and Borrow	$ 323,728
Modified Subbase	$ 136,125
Paved Shoulders, 10" PCC	$ 376,338
Bridge Approach Section	$ 189,660
PCC Pavement, Class C, Class 3, 10"	$ 544,508
Removal of Existing Structures	$ 25,000
RCB Extension	$ 70,101
Pipe Extensions	$ 49,037
Guardrail	$ 31,738
Removal of Pavement	$ 105,055
Traffic Control (5%)	$ 124,857
Mobilization (5%)	$ 124,857
Contingency (30%)	$ 824,059
Roadway Total	**$ 3,570,921**
Utility Relocation	**$ 500,000**

Project Total: $ 14,648,921

3. Alternative Number 3: Southern Realignment, Replace Existing Bridge with a 4-span horizontally curved 915'-0 x 44'-0 CWPG Bridge

Similar to Alternative 1, this alternative aims to reduce the skew of the roadway

over the BNSF railroad. The railroad right-of-way is relatively narrower south of the existing roadway, so this would also reduce overall impact to railroad property. However, the railroad right-of-way is shifted to the west just north of the existing bridge and therefore the west pier is located further west of the railroad tracks to be placed outside the right-of-way. The existing tangent from the west is extended over the tracks, with a horizontal curve added east of the tracks to redirect the alignment back toward existing. At the east end of the alignment, the existing horizonal curve (PI Sta. 522+28.74) will be lengthened to the west, with a tangent off the lengthened curve extending to the tangent from the west. Note that the existing curve that is being extended has spirals; we do not propose adding the spiral back in after the curve is extended. This will result in a curve with a spiral at one end and not at the other. Quarry Road, south of U.S. 34, will need to be relocated, since the proposed U.S. 34 alignment is approximately 18 feet closer to Quarry Road than the existing highway. The proposed alignment is also closer to the pond south of U.S. 34 and east of the River, though we do not believe that construction will impact the pond.

Note that this project will have excess cut to waste off-site. Alternatives 1 and 2 will both require fill material to be imported to the project.

The proposed realignment impacts three drainage structures, a 4' x 5' RCB that would be extended with a 60" RCP, a 36" RCB with a flume which will be completely replaced with a 36" pipe (pipe may be able to be downsized after hydraulic review), and an 8' x 8' RCB that will be extended.

The overall length of reconstruction with this option would be 3,832.76 feet. The skew of U.S. 34 to the BNSF railroad would be reduced to 54 degrees.

Replace the existing 824'-0" x 30'-0 Continuous Welded Plate Girder (CWPG) bridge with a 915'-0" x 44'-0" horizontally curved CWPG Bridge with a skew of 45 degrees L.A. The bridge has four spans: (245'-0") – (310'-0") – (200'-0") – (160'-0"). The 310-foot center span is necessary to keep the west pier out of the railroad right-of-way and to position the east pier at a distance greater than 25 feet from the east future railroad track. The bridge is partially located in a horizontal curve (approximately 56 feet of bridge at the east end is in a horizontal curve with a radius of 3,000 feet). The 44'-0" wide roadway width consists of two 12'-0" lanes and 10'-0" shoulders on each side. The bridge will have stub abutments and T-Piers. Since the bridge is located over the BNSF Railway the bridge will have standard single slope TL-5 barriers for the full length of the bridge.

Estimated Construction Cost

Bridge Item	Estimated Cost
Bridge	$ 8,698,000
Remove Existing Bridge	$ 308,000
Cofferdams (3 required)	$ 150,000
Revetment, Class E (East Abutment Only)	$ 25,000
Mobilization (10%)	$ 918,000
Contingency (20%)	$ 2,020,000
Bridge Total	**$12,119,000**

Roadway Item	Estimated Cost
Excavation, Class 10 Roadway and Borrow	$ 1,488,360
Modified Subbase	$ 136,832
Paved Shoulders, 10" PCC	$ 378,216
Bridge Approach Section	$ 189,660
PCC Pavement, Class C, Class 3, 10"	$ 547,320
Removal of Existing Structures	$ 25,000
RCB Extension	$ 85,522
Culvert Pipe	$ 57,732
Guardrail	$ 31,738
Removal of Pavement	$ 106,203
Traffic Control (5%)	$ 152,329
Mobilization (5%)	$ 152,329
Contingency (30%)	$ 1,005,372
Roadway Total	**$ 4,356,613**

Project Total: $ 16,475,613

4. Alternative Number 4: Southern Parallel Realignment, Replace Existing Bridge with a 4-span horizontally curved 1070'-0 x 44'-0 CWPG Bridge

Alternative number 3 cuts through a fairly large bluff on the east side of the Nodaway River, resulting in earthwork waste. This alternative aims to reduce waste dirt and overall project impacts by moving the proposed bridge closer to the existing. Similar to Alternative Number 2, the bridge is located parallel to and 42 feet from the centerline of the existing roadway, this time to the south. The tangent from the west is extended to the tangent over the railroad and river. East of the river, the horizontal curve east of the project (PI Sta. 522+28.74) will be lengthened to the west, with a tangent off the lengthened curve extending to the tangent over the river and railroad. Similar to Alternative 3, this removed the west spiral from the curve, which will not be replaced. The resulting alignment does not

meet preferred design practice in that it results in two horizontal curves in the same direction with a relatively short tangent between them. In this case, the curves on either end of the proposed bridge have a 1,193-foot tangent between.

Similar to Alternative 3, this alternative will have more cut than fill.

Total length of roadway reconstruction with this alternative is 3,889.3 feet. The skew of the roadway to the railroad is 59 degrees, which matches the existing roadway skew to the tracks.

The proposed realignment impacts three drainage structures, a 4' x 5' RCB that would be extended with a 60" RCP, a 36" RCB with a flume, which will be extended with a 36" RCP to the south, and an 8' x 8' RCB that will be extended.

Replace the existing 824'-0" x 30'-0 Continuous Welded Plate Girder (CWPG) bridge with a 1070'-0" x 44'-0" horizontally curved CWPG Bridge with a skew of 45 degrees L.A. The bridge has four spans: (265'-0") – (355'-0") – (250'-0") – (200'-0"). The 355-foot center span is necessary to keep the west pier out of the railroad right-of-way and to position the east pier at a distance greater than 25 feet from the east future railroad track. The shift to the west of the railroad ROW results in this long span. One option to shorten this span would be to coordinate with the BNSF Railway and determine if they would allow Pier 1 to be located outside of a projected ROW line from the ROW location north of the existing bridge. The end span to interior span ratios are set close to the ideal span ratio for structural efficiency and to limit or eliminate uplift at the abutment. The west end span is a ratio of approximately 0.75 of span 1, this ratio is close to the ideal end span to interior span ratio of 0.8. The east interior span was set at 250'-0 to place Pier 3 in the east riverbank. The east end span is a ratio of 0.8. The bridge is partially located in a horizontal curve (approximately 186 feet of bridge at the west end is in a horizontal curve with a radius of 3,000 feet). The 44'-0" wide roadway width consists of two 12'-0" lanes and 10'-0" shoulders on each side. The bridge will have stub abutments and T-Piers. Since the bridge is located over the BNSF Railway the bridge will have standard single slope TL-5 barriers for the full length of the bridge.

Estimated Construction Cost

Bridge Item	Estimated Cost
Bridge	$10,160,000
Remove Existing Bridge	$ 308,000
Cofferdams (3 required)	$ 150,000
Revetment, Class E (East Abutment Only)	$ 25,000

Mobilization (10%)	$ 1,064,000
Contingency (20%)	$ 2,341,000
Bridge Total	**$14,048,000**

Roadway Item	Estimated Cost
Excavation, Class 10 Roadway and Borrow	$ 533,520
Modified Subbase	$ 132,066
Paved Shoulders, 10" PCC	$ 365,508
Bridge Approach Section	$ 185,310
PCC Pavement, Class C, Class 3, 10"	$ 528,263
Removal of Existing Structures	$ 25,000
RCB Extension	$ 67,823
Culvert Pipe	$ 42,249
Guardrail	$ 31,738
Removal of Pavement	$ 108,729
Traffic Control (5%)	$ 101,010
Mobilization (5%)	$ 101,010
Contingency (30%)	$ 666,668
Roadway Total	**$ 2,888,894**

Project Total: $ 16,936,894

B. Recommendations

We recommend Alternative 2 since the overall construction cost is the lowest for this option. It also minimizes impacts to surrounding properties.

C. Traffic Control

U.S. 34 will remain open to traffic during construction. Short duration lane closures will be necessary to construct the tie-ins at each end of the roadway reconstruction. Shoulder closures with temporary barrier rail will be necessary for bridge construction and construction of embankment and culvert extensions within the clear zone of the existing highway.

Note that construction coordination will be necessary with the BNSF Railway. Railroad flaggers will be needed for all work within 50 feet of the railroad. The time for setting of beams may be controlled by railroad operations.

D. Special Considerations

Extensive coordination will be necessary with BNSF Railway during preliminary design to ensure that they approve of the design.

Additional right-of-way may be necessary north of the existing north right-of-way line to accommodate the new bridge location and fill.

The need for permits is unknown. The need for permits will be evaluated as part of the environmental review for the 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 the District 4 Office.

F. Program Status

This project is listed in the 2024-2028 Iowa Transportation Improvement Program with $16,421,000 programmed for construction in FY 2028. $13,000 is programmed for right-of-way. The project is currently scheduled for an October 20, 2026 letting.

IOWA DEPARTMENT OF TRANSPORTATION

TO OFFICE: District #4

DATE: April 17, 2024

ATTENTION: Scott Schram, District Engineer

REF.: Adams County
Project # BRF-034-3(41)--38-02
Project Code: 22-02-024-020

FROM: Cindy Spencer, P.E.

OFFICE: Snyder & Associates, Inc.

SUBJECT: U.S. 34 Bridge Replacement over BNSF RR and East Nodaway River
Field Exam Review (D-2)

A field exam plan review meeting was held on April 9, 2024, via Microsoft Teams, with an in-person field exam following the next day. The following people attended:

Name	Office	Email
Kevin Patel	Iowa DOT – Design	Kevin.Patel@iowadot.us
Deann Newell	Iowa DOT – LEB	Deann.newell@iowadot.us
Nicole Cuva	Iowa DOT – ROW	Nicole.cuva@iowadot.us
Jeremy Harris	Iowa DOT – Prelim Survey	Jeremy.Harris@iowadot.us
Jim Ellis	Iowa DOT – Bridge	Jimmy.Ellis@iowadot.us
Matthew Erickson	Iowa DOT – Bridge	Matthew.Erickson@iowadot.us
Christian Kennel	Iowa DOT – Bridge	Christian.kennel@iowadot.us
Phil Mescher	Iowa DOT – Program Mgmt	Phil.mescher@iowadot.us
Wes Mayberry	Iowa DOT – District 4	Wes.Mayberry@iowadot.us
Dan Redmond	Iowa DOT – District 4	daniel.redmond@iowadot.us
Nate Epperson	Iowa DOT – District 4	nathaniel.epperson@iowadot.us
Orest Lechnowsky	Iowa DOT – District 4	orest.lechnowsky@iowadot.us
Todd Frank	Iowa DOT – District 4	Todd.Frank@iowadot.us
Bill Fox	Iowa DOT – District 4	Bill.Fox@iowadot.us
Gabe Nelson	Snyder & Associates, Inc.	gnelson@snyder-associates.com
Cindy Spencer	Snyder & Associates, Inc.	cspencer@snyder-associates.com
Luther Harris	Snyder & Associates, Inc.	lharris@snyder-associates.com
Dave Mulholland	Snyder & Associates, Inc.	dmulholland@snyder-associates.com
Jerome Hatlewick	Shuck-Britson, Inc.	jhatlewick@shuck-britson.com
Tyler Thorson	Shuck-Britson, Inc.	tthorson@shuck-britson.com
Jordan Gustafson	Shuck-Britson, Inc.	jgustafson@shuck-britson.com

This project involves the replacement of the bridge on U.S. 34 over the BNSF Railway and East Nodaway River, as well as associated roadway reconstruction.

U.S. 34 is on the Commercial and Industrial highway network. The 2016 ADT was 2,960 VPD with 19% trucks. The 2047 ADT is estimated at 3,800 VPD with 19% trucks.

The proposed project will involve construction of a proposed 880'-0 x 44'-0 continuous welded plate girder bridge (CWPG), and realignment of 4,290 feet of roadway, plus associated grading and paving.

Design criteria was reviewed. The proposed roadway was designed using a 60 mph design speed and preferred design criteria. A maximum centerline grade of 3% was used, along with a 30 foot clear zone. This matches what was discussed during concept development. The Iowa DOT would like to investigate using centerline slopes up to 4% (acceptable design criteria) if that will reduce impacts.

Typical sections / B Sheets were reviewed. The roadway will consist of 2 - 12 foot wide lanes and 10 foot wide fully paved shoulders. Grading utilized a barnroof section, including a four foot width of 10:1 slope adjacent to the shoulders, then 6:1 to clear zone, then 3.5:1 past clear zone. The Iowa DOT recommended removing the 10:1 section. They would also like to investigate the use of 4:1 foreslopes in lieu of the 6:1 / 3.5:1 barnroof section, to see if that lessens impacts, particularly in the vicinity of Quarry Road. The paved shoulder typical on Sheet B.1 shows subdrains on the outside of the shoulders – this needs to be revised to show subdrains between the mainline pavement and the shoulder. It was noted that backslope benching may be necessary in areas of deep cuts, depending on geotechnical review. Benching is not currently shown in the plan set.

Alignment and profile were reviewed. The Iowa DOT noted that the length of horizontal curves should be at least 15 times the design speed. For this project, that would mean a minimum horizontal curve length of 900 feet. The design horizontal curve lengths are currently 328 feet and 96 feet. It was also noted that the curve that is being tied into at the east end of the project currently has spirals, and no spiral was proposed with the design alignment. A slight realignment may be necessary at the east end to make for a smoother transition; the Iowa DOT also encouraged Snyder & Associates to investigate replacing the spiral that is being removed. Longer U.S. 34 reconstruction than what is currently shown is considered acceptable to accommodate horizontal curve and other alignment corrections. The Bridges and Structures Bureau (BSB) indicated their preference is to have the roadway horizontal alignment meet preferred design criteria.

It was noted that Quarry Road is very close to U.S. 34 at the east end of the project. The ditch between U.S. 34 and Quarry Road currently pinches together, and construction limits as modeled appear to impact the roadway. The impacts to Quarry Road will be reanalyzed with a 4:1 mainline foreslope to see if that improves the situation.

The Loomis Avenue intersection will need to be reconstructed with this project. The intersection may need to be reconstructed half at a time to allow emergency vehicle access to that neighborhood, as the only other access available has an at-grade crossing with the BNSF railway.

Vertical profile required minimum 23.5 feet of clearance from the top of rail to the bottom of structure, for an envelope extending 9 feet each way perpendicular from the centerline of tracks. In this case, the envelope was extended from potential / future tracks. Design provides 24.3 feet of clearance, which was determined to be adequate but not excessive. Vertical profile at tie-ins matches existing profile; although a 3% maximum centerline grade was used for the realignment, the existing roadway at the west tie in is at 3.74%. For this reason, the Iowa DOT felt that the use of profile grades up to 4% would be acceptable on this project.

Updated D2 plans, with horizontal and vertical alignment updates and revised foreslope modeling, will be reviewed by the project team prior to commencing with D3 plan submittal.

Only one access within the project corridor was identified in the as-built plans, at Sta. 474+28 RT. Currently this is not impacted by construction, although it might be once the alignment is revised. Three additional accesses were found through survey / field review, at Sta. 477+45

LT and RT, and at 505+84 LT. The Iowa DOT will review records to ensure that these are permitted. All three additional entrances are located at or near ditch high points and should not require entrance pipes. A safety dike will be constructed opposite Loomis Avenue. Reflectors / delineators have recently been installed at this location so that traffic doesn't attempt to access Quarry Road here – these will need to be removed and reinstalled with this project.

Staging was discussed. Project staging is intended as follows:

- Stage 1: Roadway grading, paving, and bridge construction. Two-way traffic will be maintained on U.S. 34 during this stage. TBR will be installed on the north shoulder of U.S. 34 to allow construction within clear zone. The Iowa DOT would like to review a typical section showing the proposed TBR placement. Snyder & Associates will also need to review staged drainage to ensure water doesn't get trapped between new and existing roadway embankment.
- Stage 2: Close WB lanes using temporary signals and construct WB tie-ins between new and existing pavement. Separate signal installations will be necessary at the east and west tie-ins due to the length between them.
- Stage 3: Move traffic only newly constructed WB lanes and new bridge. Construct EB tie-ins. Will require temporary signals (2 set-ups).
- Stage 4: Two-way traffic utilizes new pavement and bridge. Remove existing bridge and pavement and grade through embankment.

The Iowa DOT anticipates that this will be a multi-year contract. An analysis will need to be done to determine what state is acceptable to leave the project in over the winter, and notes added to the J sheets to that effect.

Bridge design was discussed in greater detail. Finger plate expansion joints will be used on the bridge due to length. Steel girders will utilize disc bearings at all substructure units, with fixed disc bearings at Pier 2. Structural steel will be weathering steel, not painted. Proposed piers are T-piers on pile. Barrier rail will be TL-5 single slope rail for entire bridge length. It is assumed that aesthetics will not be included in bridge design. Hydraulics are not a controlling factor in bridge design. Freeboard and backwater requirements are met. It is assumed that any future access road required for BNSF Railway will be constructed by railroad forces at a later time and will not be included in this project. Northeast wingwall of bridge may need to be extended (similar to a retaining wall) to limit fill into river. It may be necessary to armor that west river bank at Pier 2 due to bank erosion throughout the river bend. The District also discussed the erosion associated with the discharge of the bridge deck drains with such a large fall distance. The discharge from the bridge deck drains blows around and misses the 8' x 8' splash basins that are installed with bridge construction. The District indicated a desire to provide protection under the bridge deck drains to eliminate the erosion issue. SBI indicated that the design would attempt to limit the number of deck drains to reduce the number of areas where erosion can occur. SBI also mentioned that perhaps a riprapped flume type channel be centered under the drains to protect the drip line area from the drain discharge erosion. SBI mentioned that they would discuss potential details with the BSB.

Culverts impacted by construction include the following:

- Culvert Sta. 475+40. Existing 48" RCP with D section and elbow at inlet (LT) and flume at outlet. Field review indicated FES at inlet is separated from pipe, and flume at outlet is very short and the waterway silted. Proposed extension LT will interfere with existing 36" CMP that is noted to be in "terrible shape." Field visit indicated severe erosion around inlet headwall, with berm over top eroded away and pipe exposed. It is believed that the CMP originally was a pond outlet, but the pond is no longer present. CMP is entirely within U.S. 34 ROW. DOT is OK with removing the CMP. Flume at outlet will be removed and pipe extended to new foreslope.

36" CMP (failed)

- Sta. 476+40. Existing 4' x 5.5' arched RCB, believed to be a cattle pass. Site visit confirmed. Iowa DOT will coordinate with landowner to determine if cattle pass still required. If so, replacement with a new, larger diameter pipe or structure might be more economical than a special structure extension.

Cattle Pass. Opening within existing clear zone.

- Culvert Sta. 483+79. Existing 4' x 5' RCB. Remove headwall LT (existing headwall bulging / failing) and extend with 60" RCP.
- Culvert Sta. 504+89. Existing 36" RCP with flume LT. Flume is shallow and can be removed. Extend with 36" RCP left.
- Culvert Sta. 510+89. Existing 8' x 8' RCB. Remove headwalls LT and extend with 8' x 8' RCB. Note heavy erosion at box inlet, particularly at Quarry Road foreslope.

Where pipes are required under entrances, RCP will need to be used. The condition of all structures / pipes will need to be confirmed prior to extension.

During field review, a slope failure was observed at Sta. 490+00 RT. Field review also noted a shallow pond extending within DOT ROW to the roadway foreslope near Sta. 482+00 – 483+00 LT. This pond will need to be addressed during environmental review. It is likely that a rock berm will be constructed near the ROW line to prevent runoff from new roadway embankment from entering the portion of the pond north of DOT ROW.

Pond within roadway ROW LT near Sta. 483+00

Also noted during field review, the existing roadway has centerline and shoulder rumble strips. The Iowa DOT requested double sized end drains / rock flumes be installed off the end of the bridge due to the amount of time it takes for grass to establish itself and general erosion problems in the project corridor. Wood excelsior matting may also be necessary on bridge abutment foreslopes. Large erosion holes were noted underneath the outlets of the existing bridge deck drains – the new bridge will need to incorporate measures to control erosion from runoff / bridge drains.

Project earthwork was calculated using straight cut and fill and not based on staged construction. Quantities include 49,939 CY cut and 141,124 CY fill + 30% shrink (91,184 CY need). Note that most of the cut consists of existing embankment and will not be available for use in construction of new embankment / will need to be wasted.

Project cost estimates are $4.7 million for roadway work and $10.2 million for the bridge, for a total project cost of $14.9 million.

ROW will be required to construct the project. Right of entry permitting from railroad property will also be necessary.

Preliminary plan submittal dates are as follows:

- D3: April 19, 2024. This date will be delayed to accommodate roadway realignment and potential foreslope changes.
- B1: July 19, 2024
- S2: August 30, 2024
- D5: September 6, 2024
- S3: December 4, 2024

This waterway is not on a state water trail or paddling route.

This project is currently scheduled for a January 20, 2027 letting. The estimated cost of construction shown in the final concept was $14,648,921. The current cost estimate is $14.9 million.

Machine Guidance Electronic Files Checklist

Add information to address any incomplete items below:

Yes	N/A	No	
☐	☐	☒	Horizontal and Vertical Alignments Complete
☒	☐	☐	Typical Templates showing proposed Pavement, Shoulder, Foreslope design
☒	☐	☐	Correct Feature Naming for Roadway Breaklines and Components

cc:

B. Hofer	S. J. Gent	M. J. Kennerly
W. A. Sorenson	E. C. Wright	K. D. Nicholson
B. Bradley	K. K. Patel	K. Brink
J. E. Laaser-Webb	C. Poole	N. Pohlen
N. L. Cuva	M. A. Swenson	C. B. Brakke
D. E. Sprengeler	J. S. Nelson	M. V. Dyke
M. Nop	S. P. Anderson	D. Stokes
B. Smith	M. Dell	R. Harris
D. Heeren	D. T. Ta	J. E. Bartholomew
G. Cagle	D. Blue	S. Cook
J. Hart	S. Majors	J. Ellis
B. Worrel	R. Meyer	
T. Quam (RR)		
S. Schram	W. Mayberry	B. Smith
N. Epperson	D. Redmond	Local FHWA
Others on Field Exam		

From: Scott Prouty <sprouty@schildberg.com>
Sent: Tuesday, May 14, 2024 10:16 AM
To: Asberry, Blake <Blake.Asberry@iowadot.us>
Subject: Sorry for the delay

Blake,

I am fine with the proposed closing of the cattle crossing under HWY 34 west of Corning in Adams County, Iowa. Please note the owner of the affected properties is Midwest Rock Products, Inc., of which I also serve as the CFO. Should you have any questions or further comments, please contact me at your convenience. Have a great week!

Scott Prouty, CPA
Chief Financial Officer
Schildberg Construction Co., Inc.

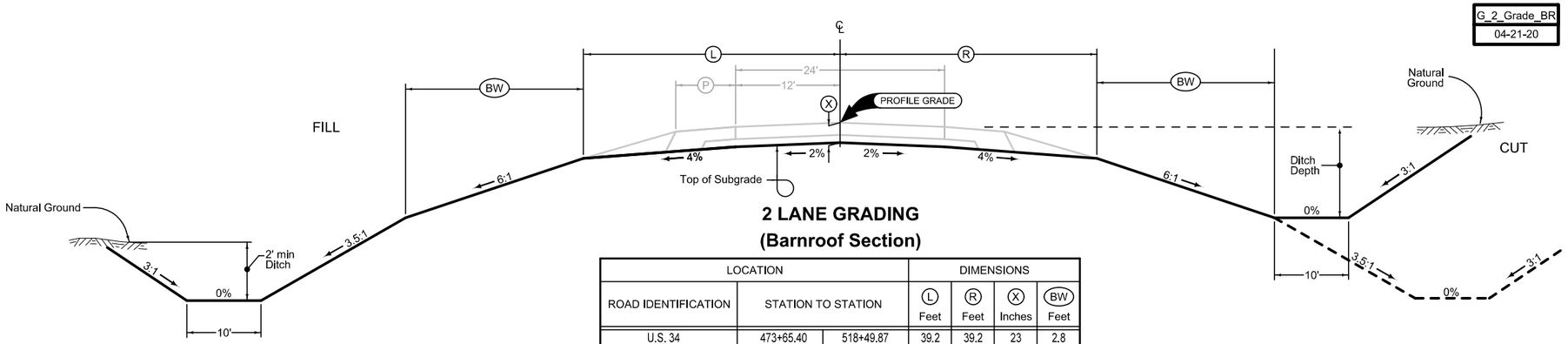
EST SCHILDBERG CONSTRUCTION 1937
SOLID AS A ROCK

P.O. Box 358 Greenfield, Iowa 50849
641-743-2131

G_2_Grade_BR
04-21-20

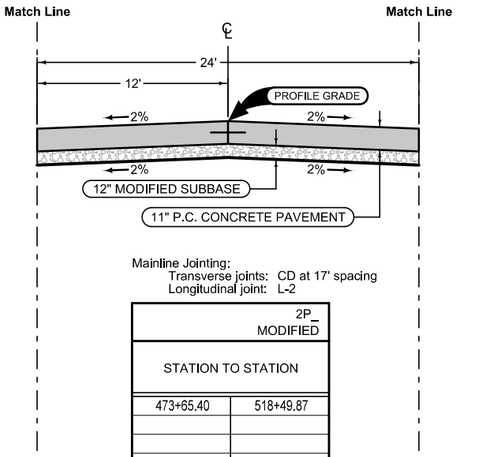
Normal section shown may be modified appropriately in areas of superelevated curves or other locations specifically designated by the Engineer.

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



2 LANE GRADING
(Barnroof Section)

LOCATION			DIMENSIONS			
ROAD IDENTIFICATION	STATION TO STATION		(L) Feet	(R) Feet	(X) Inches	(BW) Feet
U.S. 34	473+65.40	518+49.87	39.2	39.2	23	2.8



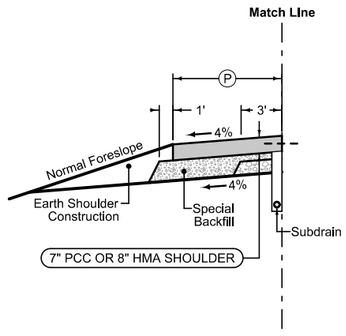
Mainline Jointing:
Transverse joints: CD at 17' spacing
Longitudinal joint: L-2

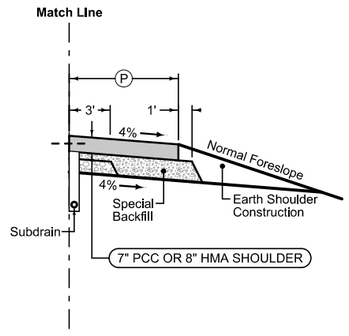
2P_ MODIFIED	
STATION TO STATION	
473+65.40	518+49.87

Paved Shoulder Alternates

PCC Shoulder Jointing:
Longitudinal joint: BT-1 or BT-5
Transverse joints: C at 17' spacing
HMA Shoulder Jointing:
Longitudinal joint: B

2_P_ALT_ 04-21-20		
STATION TO STATION		(P) Feet
473+65.40	518+49.87	10

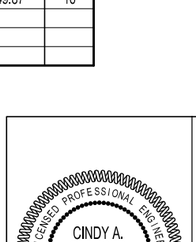




Paved Shoulder Alternates

PCC Shoulder Jointing:
Longitudinal joint: BT-1 or BT-5
Transverse joints: C at 17' spacing
HMA Shoulder Jointing:
Longitudinal joint: B

2_P_ALT_ 04-21-20		
STATION TO STATION		(P) Feet
473+65.40	518+49.87	10



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.

Cindy A. Spencer, P.E. Date

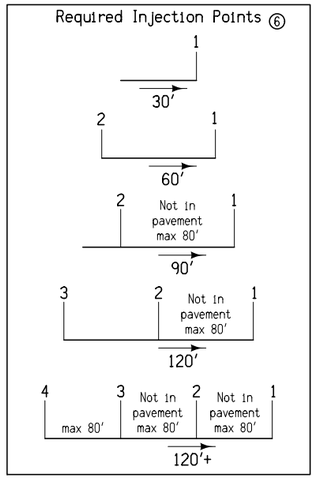
License Number P17561

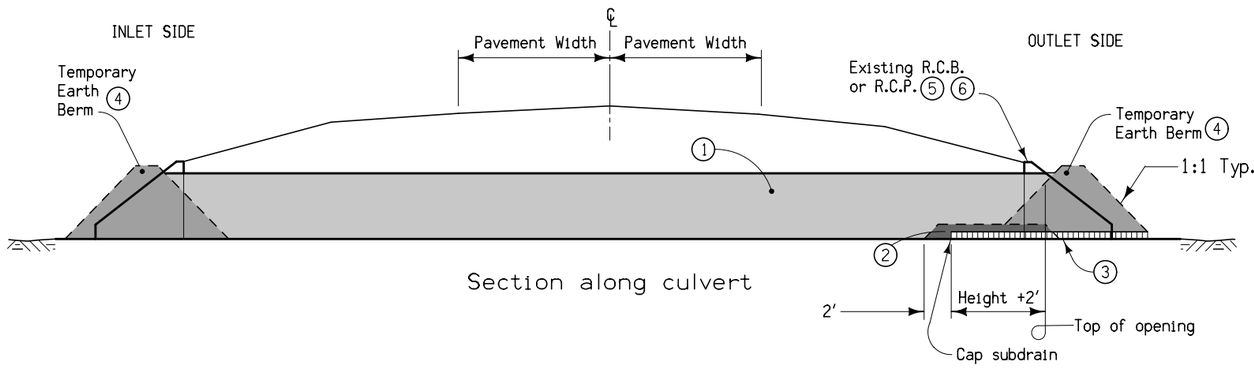
My License Renewal Date is December 31, 2022

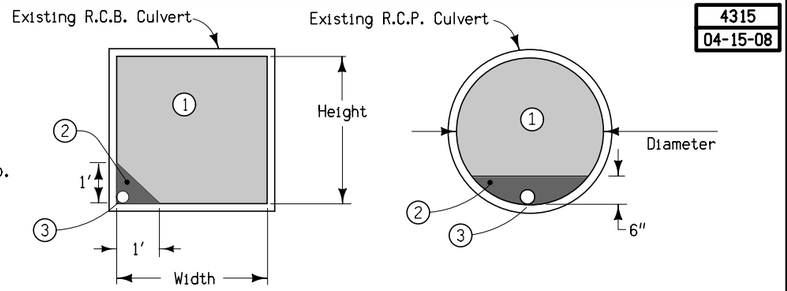
Pages or sheets covered by this seal:
A.1-A.12, B.1-B.3, D.1-D.5, E.1, G.1-G.4, J.1-J.18, U.1-U.3, W.1-W.27

PRELIMINARY

4315
04-15-08



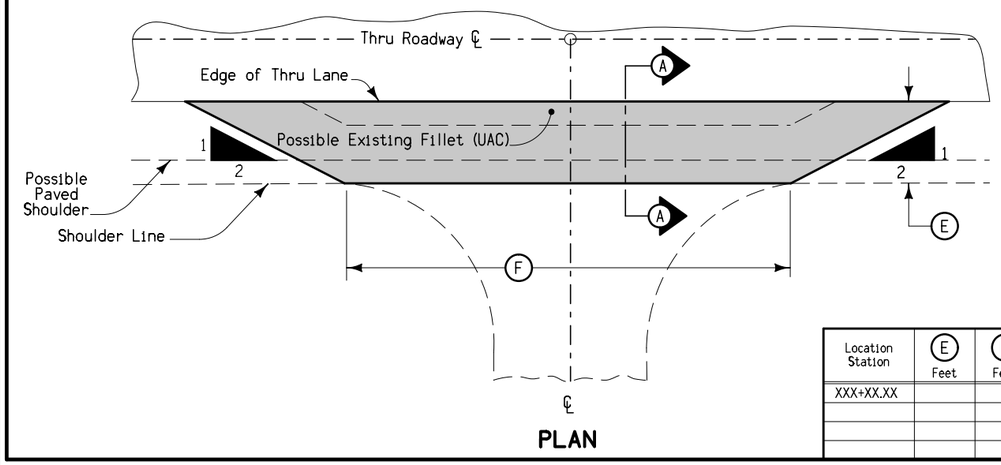




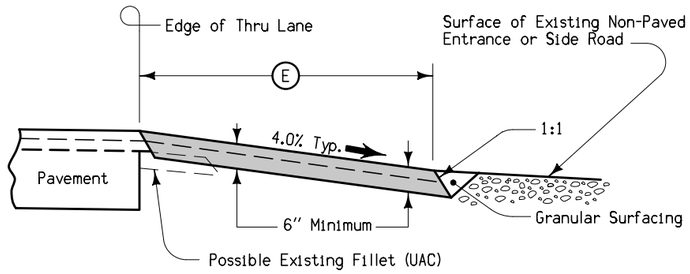
① Flowable Mortar.
② Granular Backfill.
③ 4″ subdrain at flowline elevation of culvert shall be extended into the culvert a distance of 2′ plus the height of the culvert. Granular Backfill covers subdrain and extends an additional 2′. Subdrain and granular backfill are incidental to flowable mortar.
④ Ends of culvert shall be plugged sufficiently to retain flowable mortar. Temporary earth berms are incidental to flowable mortar.
⑤ Removal of headwalls may be required.
⑥ Outlet shall be filled first. See injection point detail for additional information.

DETAILS OF CULVERT ABANDONMENT WITH FLOWABLE MORTAR
(Rectangular structures less than 8′ in either height or width. Circular structures less than 10′ Dia.)

7148
10-21-14



Location Station	E Feet	F Feet
XXX+XX.XX		



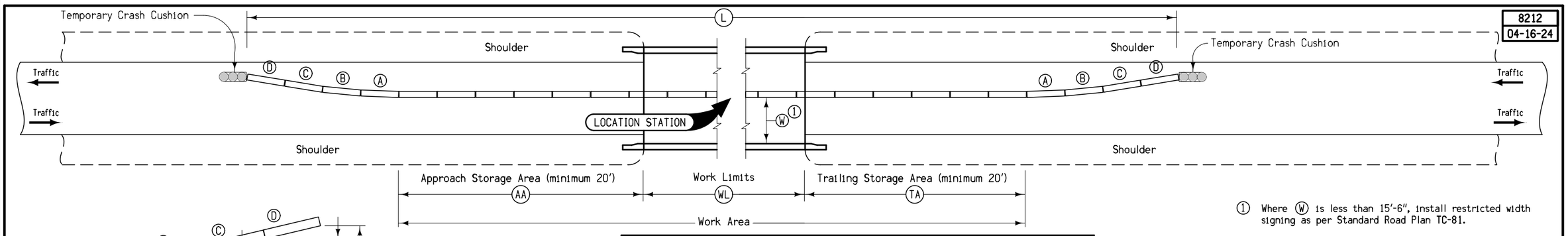
SECTION A-A

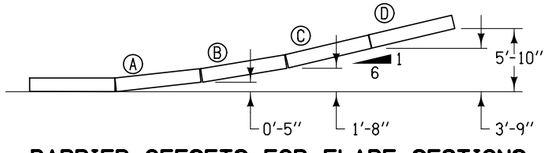
Special shaping of existing surface prior to placement of fillet may be required by the Engineer and is incidental to other work on the project.

Quantites included with mainline quantities.

FILLET FOR NON-PAVED ENTRANCES OR SIDE ROADS

8212
04-16-24



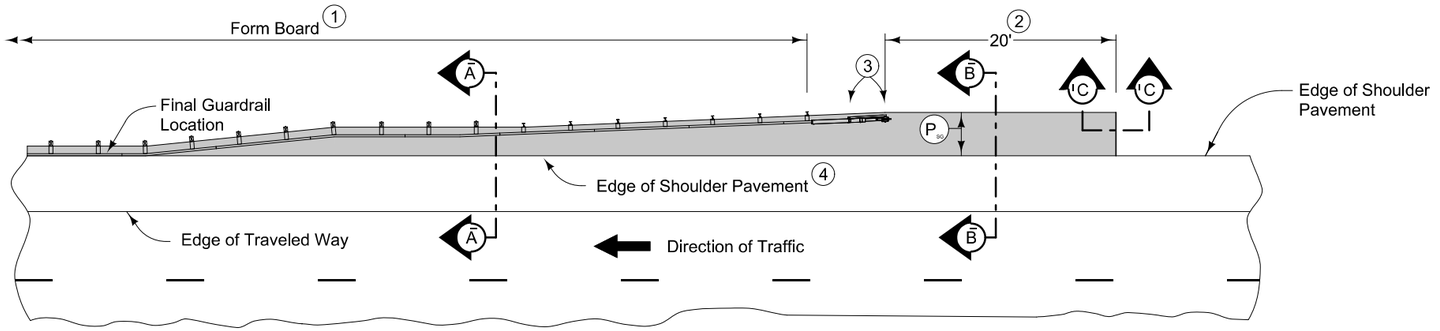


BARRIER OFFSETS FOR FLARE SECTIONS

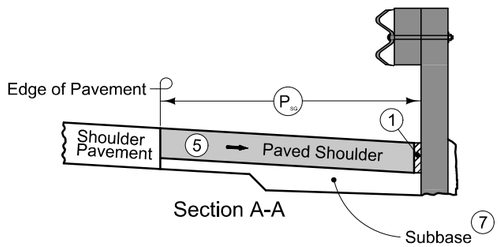
Station	Side	AA Feet	WL Feet	TA Feet	L Feet	Anchored X	W Ft-Inches	Remarks
XXX+XX.XX								

Ⓘ Where Ⓦ is less than 15′-6″, install restricted width signing as per Standard Road Plan TC-81.

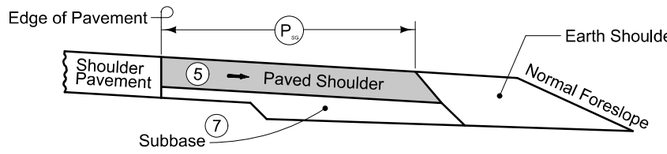
TEMPORARY CONCRETE BARRIER LAYOUT for Two-Way Traffic



PLAN VIEW

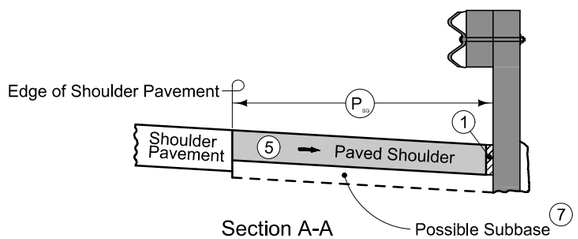


Section A-A

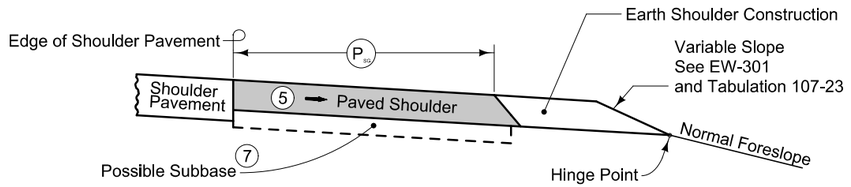


Section B-B

NEW CONSTRUCTION 6



Section A-A



Section B-B

EXISTING SHOULDER

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

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

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

Refer to Tabulation 112-9 for shoulder quantities.

(1) PCC option only: When guardrail posts are installed prior to construction of PCC paved shoulder, fasten form board to the face of guardrail posts for the length shown.

(2) Continue paved shoulder 20 feet beyond the center of the first post.

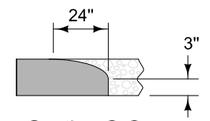
(3) Shoulder may be notched for first 2 posts or post sleeves may be installed through pavement. Do not drive posts through pavement.

(4) 'KT' (per PV-101) joint for PCC shoulder.
'B' (per PV-101) joint for HMA shoulder.

(5) Match shoulder slope.

(6) The Contractor has the option to pave the paved shoulder at guardrail and the full width paved shoulder as one operation.

(7) Refer to other details in the plan.



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

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

SURVEY SYMBOLS

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

UTILITY LEGEND

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

- E1(B) — ***EL1B, MIDAM-Mid-American Energy - Quality B&D***
- FO(B) — ***FO1B, ICN-Iowa Communications Network - Quality B&D***
- FO2(B) — ***FO2B, Windstream Communications - Quality B***
- FO3(B) — ***FO3B, Aureon - Quality B&D***
- T1(B) — ***TL1B, Frontier Communications - Quality B***
- TV(B) — ***TV1B, Mediacom - Quality B***
- W(B) — ***WL1B, Southern Iowa Rural Water Association - Quality B***
- W2(B) — ***WL2B, Corning Municipal Utilities - Quality B***
- SAN. — ***SA1D, City of Corning - Quality D***

PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	
Green	(2)	Existing Topographic Features and Labels
Blue	(1)	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Magenta	(5)	Existing Utilities
SHADING	**Design Color No.**	
Lavender	(9)	Temporary Pavement Shading
Yellow	(4)	Proposed Pavement Shading
Orange	(6)	Proposed Granular Shading
Orange	(70)	Proposed Shoulder Granular Shading
Yellow	(68)	Proposed Shoulder Paved Full Depth Shading
Yellow	(132)	Proposed Shoulder Paved Partial Depth Shading
Gray, Dark	(112)	Proposed Grade and Pave Shading "In conjunction with a paving project"
Brown, Light	(236)	Grading Shading
Orange, Light	(134)	Proposed Granular Entrance Shading
Yellow	(220)	Proposed Paved Entrance Shading
Tan	(8)	Proposed Sidewalk Shading
Blue, Light	(230)	Proposed Sidewalk Landing Shading
Pink	(11)	Proposed Sidewalk Ramp Shading
Green, Light	(225)	Existing Pavement Shading
Red	(3)	Proposed Structure Shading
Red	(3)	Delineates Restricted Areas

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

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

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

PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

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

FILE NO.	ENGLISH	DESIGN TEAM **Snyder & Associates**	**ADAMS** COUNTY	PROJECT NUMBER **BRF-034-3(41)--38-02**	SHEET NUMBER **D.1**

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JASPER T-71N R-34W
SEC. 4

BROOKS ROAD 5 ROAD

Remove Pipe and Headwalls

Δ = 04°41'47.49" (LT)
T = 389.57'
L = 778.71'
R = 9500.00'
E = 7.98'
e = NC
I = 0
x = 0

PC 473+65.40

PT 481+44.11

Remove Pipe

Remove Headwall

Sta. 477+37 LT Type D Entrance

Construction Limits

BEGIN PROJECT
STA 473+65.40

18" Conc. Pipe

STA 474+79, 55.5' RT
FL = 1145.12

Remove Headwall

STA 473+76, 43.7' RT
FL = 1150.69

Remove flume

13.8'

10'

Sta. 477+37 RT Type D Entrance

PI 477+54.97

Sta. 474+23 RT Type C Entrance

Install 18" x 92' Ent. Pipe

Sta. 475+40.93
Install 46 LF of 48" RCP Extension
Skew 30° RT AH
FL LT = 1132.00
FL OTHER = 1131.71
FL OTHER = 1130.56
FL RT = 1129.00

(Extend)
Sta. 475+40.93
Skew 30° LT AH
48"x136' RCP
D.A.=34 AC-R

(Abandon)
Sta. 476+40.00
Skew 0°
48" WIDE x 6' TALL X 77' ARCH RCP
D.A.=UAC - R

0 50 FEET

Type C Entrance
Sta 474+23 RT

VPI 22.0' LT 1152.98
VPI 12.0' LT 1153.38
VPI 12.0' RT 1153.38
VPI 22.0' RT 1152.98
VPI 0' LT/RT 1153.61
VPI 40.0' RT 1152.44
VPI 70' RT 1153.56
2.0%
4.0%
-2.0%
-4.0%
-2.98%
3.74%
Existing Grade Line

Type D Entrance
Sta 477+37 LT & RT

VPI 92.0' LT 1147.93
VPI 32.0' LT 1140.91
VPI 22.0' LT 1141.23
VPI 12.0' LT 1141.63
VPI 12.0' RT 1141.63
VPI 22.0' RT 1141.23
VPI 66.70' RT 1139.30
VPI 0' LT/RT 1141.87
2.00%
-11.70%
3.22%
4.00%
-2.00%
-4.00%
-4.32%
Existing Grade LIne

BEGIN PROJECT
STA 473+65.40
ELEV 1155.77

-2.00% RT Ditch Grade
RT +76 1150.69
RT +65 1150.91
-15.07% RT Ditch Grade
-14.52% LT Ditch Grade
-3.74%
RT +79 1145.12
LT +65 1150.53
+4.22% LT Ditch Grade
+0.40% LT Ditch Grade
LT +20 1137.19
RT +20 1134.91
LT +93 1132.00
RT +40 1134.40
RT +86 1129.00
+0.64% RT Ditch Grade
LT +05 1136.73
Proposed Profile
RT +25 1120.00
-10.20% RT Ditch Grade
LT +10 1127.69
RT +75 1125.10
Existing Ground
RT +75 1128.57
-3.47% RT Ditch Grade
-19.82% LT Ditch Grade
LT +00 1109.85

Ditch Grade | D.G. | Ent. | Ditch Grade | Ditch Grade | No Ditch | Ditch Grade | Ent | 5' Ditch | Ditch Grade | Ditch Grade | 5' Ditch | Ditch Grade

1155.77 1155.41 1154.48 1153.54 1152.61 1151.67 1150.74 1149.80 1148.87 1147.93 1147.00 1146.06 1145.13 1144.19 1143.26 1142.32 1141.39 1140.45 1139.52 1138.58 1137.67 1136.81 1136.00 1135.23 1134.50 1133.82 1133.19 1132.60 1132.06 1131.57 1131.12 1130.71

468+00 469+00 470+00 471+00 472+00 473+00 474+00 475+00 476+00 477+00 478+00 479+00 480+00 481+00

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER D.2

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481+00 482+00 483+00 484+00 485+00 486+00 487+00 488+00 489+00 490+00 491+00 492+00 493+00 494+00 495+00 496+00

JASPER T-7-N R-34W
SEC. 4

PT 481+44.11

Construction Limits

4636 4656

F0 F03 E1 SAN. SB EB

34

BNSF RR

(Remove Headwalls LT)
Sta. 483+86.22
Skew 10° LT AH
4' X 5' X 129' RCBC
D.A.=19 AC-R

Remove pipe

Sta. 483+79.06
Install 66' of 60" RCP Extention LT
and 1 Apron
Skew 7° RT AH
FL LT = 1105.50
FL OTHER = 1104.06
FL RT = UAC

0 50 FEET

1165 1160 1155 1150 1145 1140 1135 1130 1125 1120 1115 1110 1105 1100 1095 1090

VPI = +82.54
EL = 1121.47
L = 920.00'
K = 136

VLP = 483+33.01
EL = 1129.13

VPT = 487+42.54
EL = 1135.27

VPC = 490+75.00
EL = 1145.25

Proposed Profile

Existing Ground

-26.50% RT Ditch Grade
-3.74%
+3.00%
-20.91% RT Ditch Grade
RT +60
1110.20
+5.72% LT Ditch Grade
LT +33
1106.46
LT +00
1107.33
-0.71% LT Ditch Grade
+1.10% RT Ditch Grade
+4.75% RT
Ditch Grade
+0.96% RT
Ditch Grade
RT +00
1110.25
RT +00
1115.00
RT +03
1115.99
RT +85
1104.10
RT +50
1105.32
LT +68
1105.50
RT +00
1104.10
RT +93
1103.30
+3.54% RT Ditch Grade

Lt Med Rt
No Ditch
Ditch Grade
No Ditch
Ditch Grade

1130.35 1130.04 1129.78 1129.55 1129.38 1129.25 1129.17 1129.13 1129.14 1129.19 1129.29 1129.44 1129.63 1129.87 1130.15 1130.48 1130.85 1131.27 1131.74 1132.25 1132.81 1133.41 1134.06 1134.76 1135.50 1136.25 1137.00 1137.75 1138.50 1139.25 1140.00 1140.75 1141.50 1142.25 1143.00 1143.75 1144.50 1145.25 1145.98 1146.68 1147.34 1147.96 1148.55 1149.10 1149.62 1150.11 1150.55 1150.96 1151.34 1151.68 1151.98 1152.25 1152.48 1152.68 1152.84 1152.96 1153.05

482+00 483+00 484+00 485+00 486+00 487+00 488+00 489+00 490+00 491+00 492+00 493+00 494+00 495+00

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER D.3

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JASPER T-71N R-34W
SEC. 4

Construction Limits

Sta. 505+84
Proposed Entrance

12.7'
10'

Sta. 504+88.85
Install 62' of 36" RCP Extention LT
and 1 Apron
Skew 16° RT AH
FL LT = 1124.74
FL OTHER = 1127.31
FL RT = 1128.51

Sta. 505+28 RT
Proposed Type M Dike
Top Elev = 1130.01

(Extend)
Sta. 505+04.82
Skew 15° LT AH
36"x73' RCP
D.A.=14 AC-R

0 FEET 50

Type C Entrance
Sta 505+84 LT

VPI 74.3' LT
1132.01
VPI 12.0' LT
1132.68
VPI 12.0' RT
1132.68
VPI 22.0' LT
1132.28
VPI 0' RT/LT
1132.91
VPI 22.0' RT
1132.28

0.5%
4.0%
1.99%
-4.0%
-1.99%

Existing Grade Line

VPI = +00.00
EL = 1161.00
L = 1050.00'

+3.00%
-3.00%

VHP = 496+00.00
EL = 1153.12

K = 175

Existing Ground

Proposed Profile

VPT = 501+25.00
EL = 1145.25

-1.57% RT Ditch Grade

RT +93
1139.79

RT +75
1138.50

VPC = 503+85.66
EL = 1137.43

RT +60
1130.14

-3.79% RT Ditch Grade

RT +03
1128.51

LT +50
1128.24

-4.54% LT Ditch Grade

LT +20
1131.60

LT +71
1124.74

+4.43% LT Ditch Grade

VPI = +45.66
EL = 1126.62
L = 720.00'
K = 137

-3.00%
+2.27%

RT +65
1126.07

LT +65
1126.07

-0.50% LT Ditch Grade
-0.91% RT Ditch Grade

VLP = 507+95.34
EL = 1131.28

13.22% LT Ditch Grade

LT +75
1125.02

5' Ditch
Ditch Grade
Dike

Lt
Med
Rt

496+00	497+00	498+00	499+00	500+00	501+00	502+00	503+00	504+00	505+00	506+00	507+00	508+00	509+00
1153.11	1153.12	1153.11	1153.05	1152.96	1152.84	1152.68	1152.48	1152.25	1151.98	1151.68	1151.34	1150.96	1150.55	1150.10	1149.62	1149.10	1148.55	1147.96	1147.34	1146.68	1145.98	1145.25	1144.50	1143.75	1143.00	1142.25	1141.50	1140.75	1140.00	1139.25	1138.50	1137.75	1137.00	1136.30	1135.65	1135.04	1134.47	1133.96	1133.48	1133.06	1132.68	1132.34	1132.05	1131.81	1131.61	1131.46	1131.35	1131.29	1131.28	1131.31	1131.39	1131.51	1131.68	1131.89	1132.15	1132.46

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER D.4

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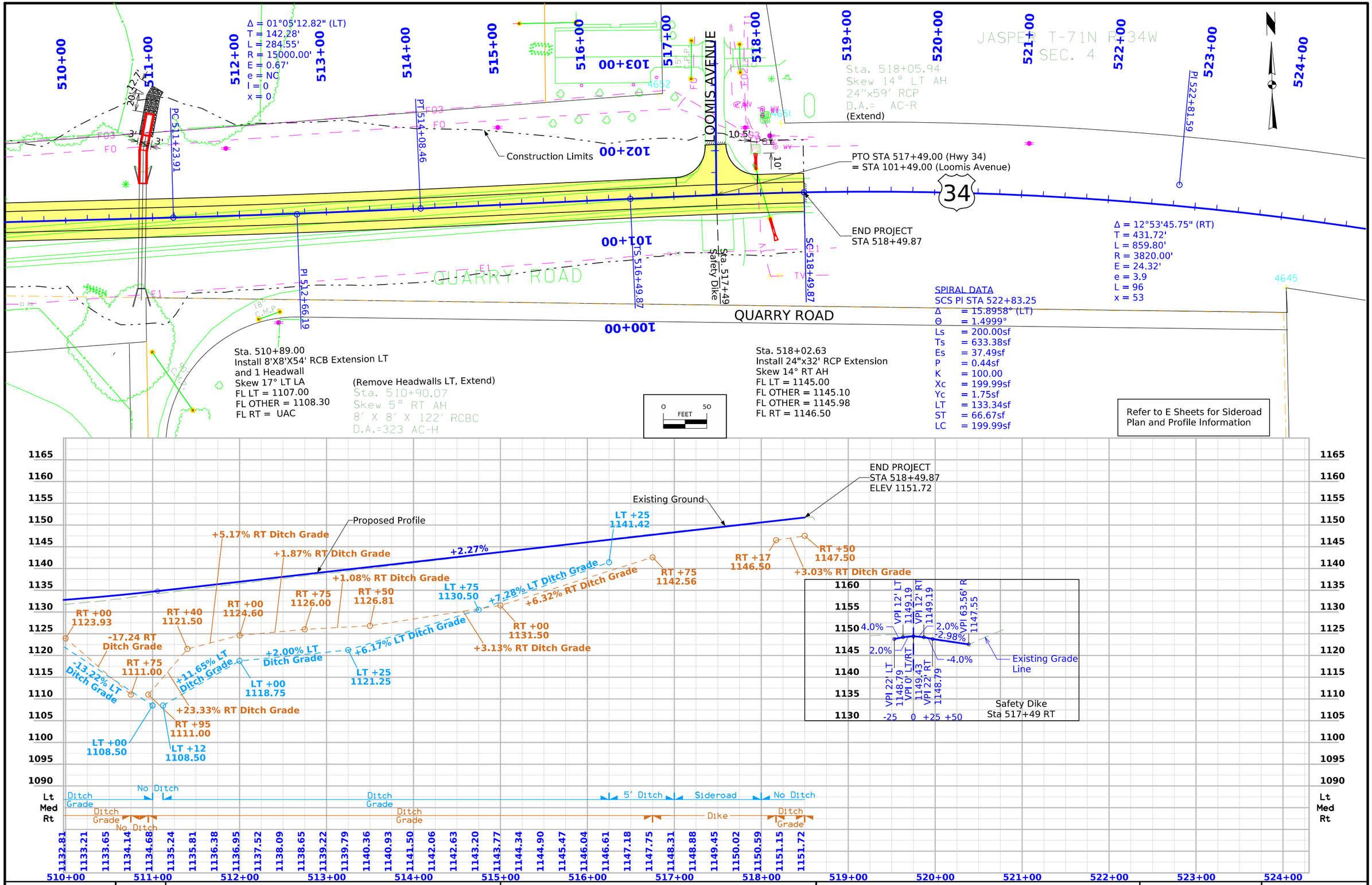

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER D.5

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JASPER T-71N R-34W
SEC. 3

100+00
101+00
102+00
103+00
516+00
517+00
518+00
519+00
520+00

PTO STA 101+49.00 (Loomis Avenue)
STA 517+49.00 (Hwy 34)

BEGIN PAVING
101+61.01

Sta. 517+49
Safety Dike

LOOMIS AVENUE

QUARRY ROAD

END PAVING
102+07.03

Construction Limits

Sta. 518+05.94
Skew 14° LT AH
24"x59' RCP
D.A.= AC-R

34

0 50
FEET

Refer to D Sheets for Mainline Plan and Profile Information

1195
1190
1185
1180
1175
1170
1165
1160
1155
1150
1145
1140
1135
1130
1125
1120
Lt
Med
Rt

Proposed Grade Line

BEGIN PAVING
STA 101+61.01
ELEV 1149.42

END PAVING
STA 102+07.03
ELEV 1149.50

Existing Ground

No Ditch
No Ditch

1149.42
1149.44
1149.48
1149.50

100+00
101+00
102+00
103+00

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER E.1

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Adams County
BRF-034-3(041)—38-02
US34 E Nodaway River and RR 0.8 mi W of IA 148
Project Directory: 0203402022
SAP-671.2

Party Personnel

Eric Miller - Survey Project Manager/PLS
Brian Leonard - Survey Party Chief
Jeff Pavelka - Survey Party Chief
Sam Blaisdell - Office Technician

Date(s) of Survey

Begin Date	09/11/2023
End Date	01/24/2024

General Information

Measurement units for this survey are US survey feet. This project is for preliminary survey and bridge/roadway concept design for the replacement of U.S. 34 Bridge over the E. Nodwaway River and the BNSF Railroad in Adams County, Iowa just southwest of Corning.

Vertical Control

Vertical datum for this survey is relative to NAVD88, Geoid 12a. Orthometric elevations were computed by averaging a minimum of five observations with appropriate time spans between from nearby Iowa RTN reference stations at control point FENO1. The vertical standard deviation of these observations was less than 0.05'. Additional benchmarks were placed throughout the project using a GNSS Base-Rover setup relative to control point FENO1. A minimum of three observations with appropriate time spans between were collected. The vertical standard deviation of these observations was less than 0.03'.

Horizontal Control

The project coordinate system is the Iowa Regional Coordinate System, Zone 12. Horizontal datum is NAD83 (2011) for Epoch 2010.00. The projection parameters for Zone 12 of the IaRCS is defined below:

Traverse Mercator Projection North American Datum of 1983
Origin Lat: 40°55'00"N
Origin Central Meridian: 093°45'00"W
Central Meridian Scale: 1.000037
False Northing: 6,200,000
False Easting: 22,500,000

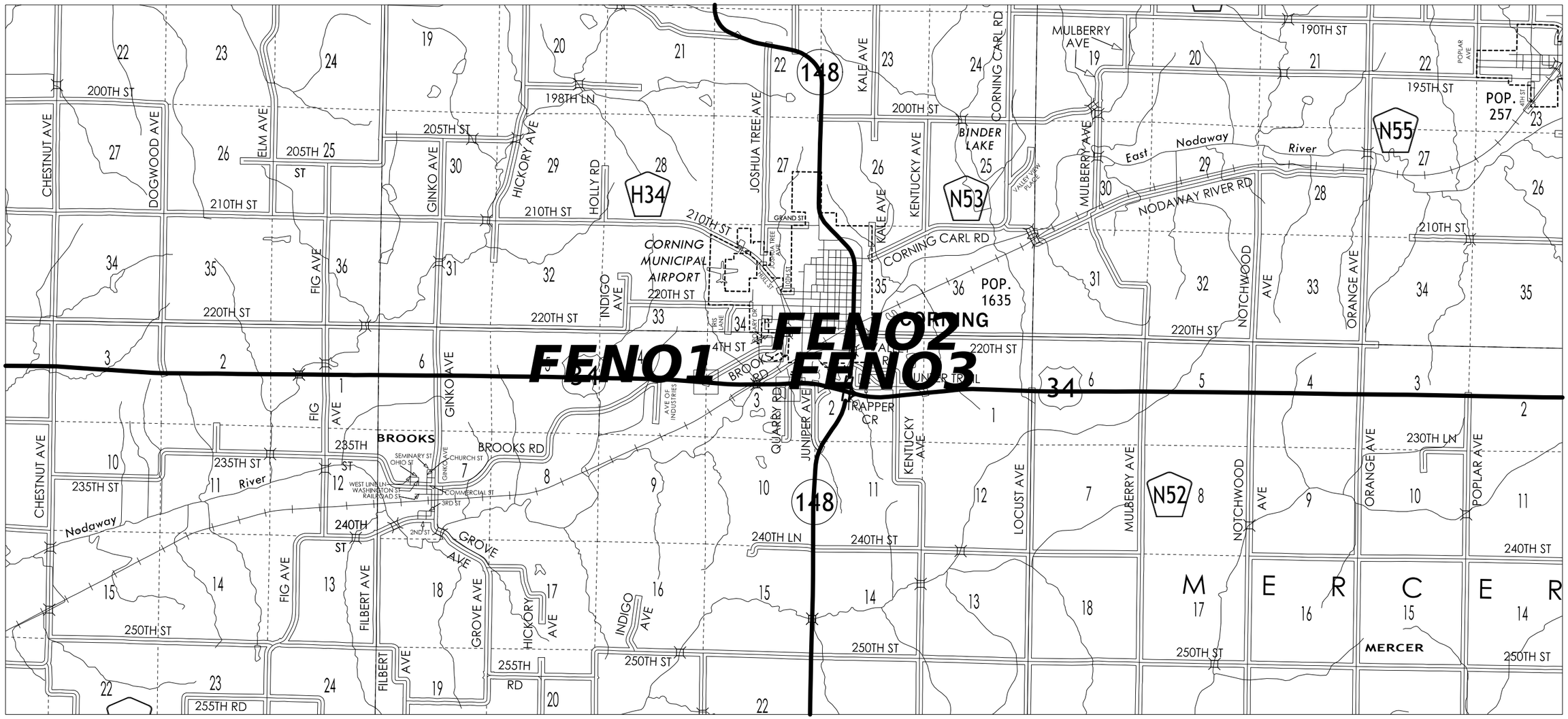
Coordinate values were determined by averaging a minimum of five IaRTN observations with appropriate time spans between on FENO1. The horizontal standard deviation of these observations was less than 0.05'. Additional control points were placed throughout the project using a GNSS Base-Rover setup relative to control point FENO1. A minimum of three observations with appropriate time spans between were collected. The horizontal standard deviation of these observations was less than 0.03'.

Alignment Information

The U.S. 34 alignment for this survey was provided by the Iowa Department of Transportation.

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: 2018

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

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER G.2

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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: 2018

Point Name	Northing	Easting	Elevation	Feature Definition	Description
FENO1	6224606.47	22221777.89	1162.17	FENO	SET FENO MONUMENT, 60'+/- NORTH OF CENTERLINE OF HIGHWAY 34, 40'+/- WEST OF CENTERLINE OF BROOKS ROAD, 12'+/- EAST OF STOP SIGN, 12'+/- WEST OF STREET SIGNS
FENO2	6226176.21	22224934.95	1125.40	FENO	SET FENO MONUMENT, 20'+/- NORTH OF CENTERLINE OF BROOKS ROAD, 25'+/- SOUTH OF FENCE LINE, 60'+/- EAST OF GRAVEL DRIVE AT END OF CURVE
FENO3	6224262.67	22225760.64	1127.91	FENO	SET FENO MONUMENT 15'+/- WEST OF CENTERLINE QUARRY ROAD, 5'+/- NORTH OF SIGN WITH ARROW, 10'+/- EAST OF FENCE LINE AT END OF CURVE

SUPERELEVATION DATA

See PV-300 Series

Road Identification	Circular Curve or Spiral Curve Name	Radius	Superelevation Data			Standard Road Plan	Section A-A	Section B-B	Section C-C	Section D-D	Section E-E	Section F-F	Case A	Case B	Case C	Case S	Case T	Case U	Remarks
			e	L	x														
		FT	%	FT	FT														
U.S. 34	Curve 1	9550	NC	0	0	PV-301													
U.S. 34	Curve 2	15000	NC	0	0	PV-301													
U.S. 34	Curve 3	3820	3.9	96	53	PV-301	517+00.87	517+53.87	518+06.87	518+49.87									

SPIRAL OR CIRCULAR CURVE DATA

Name	Location	ΔSCS	Horizontal Alignment Data													Remarks
			Spiral Data								Curve Data					
			θS	Ls	Ts	Es	Xc	Yc	L.T.	S.T.	ΔC	T	L	R	E	
Curve 1	477+54.97										04°41'47.49"	389.57	778.71	9500	7.980	
Curve 2	512+66.19										01°05'12.82"	142.28	284.55	15000	0.670	
Curve 3	522+83.25	15.8958	1.4999	200	633.38	37.49	199.99	1.75	133.34	66.67	12°53'45.75"	431.72	859.8	3820	24.320	

1

MIDWEST ROCK PRODUCTS INC

BROOKS ROAD

478+20
℄129'±Ex.R/W

478+60
℄137'

478+86
℄136'

479+14
℄124'±Ex.R/W

480+90
℄135'

480+70
℄114'±Ex.R/W

483+80
℄139'

484+25
℄117'

Remove Pipe

BEGIN PROJECT
STA 473+65.40

Sta. 474+23 RT
Type C Entrance

Remove flume

13.8'

10'

Sta. 475+40.93
Install 46 LF of 48" RCP Extension
Skew 30° RT AH
FL LT = 1132.00
FL OTHER = 1131.71
FL OTHER = 1130.56
FL RT = 1129.00

(Extend)

(Abandon)

Sta. 477+37 RT
Type D Entrance

Sta. 477+37 LT
Type D Entrance

(Remove Headwalls LT)

Remove pipe

Sta. 483+7
Install 66' c
and 1 Apro
Skew 7° RT
FL LT = 11
FL OTHER
FL RT = UA

1

MIDWEST ROCK PRODUCTS INC

0 50
FEET

Right of Way Design Information

THIS SHEET INCLUDED
FOR INFORMATION ONLY

ROW Team: FREDRICKSON / CUVA
ROW #: NHSN-034-3(042)--2R-02
Plan Date: 12/17/2024
Color Legend:

- Property Lines
- Temporary Easement
- Permanent Acquisition
- Permanent Acquisition County
- Permanent Acquisition City

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER H.1	

9:35:39 AM 12/17/2024 afredri pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\0203402022\ROW\ROW_02034042.dgn

1

MIDWEST ROCK PRODUCTS INC

484+25
℄117'

491+60
℄162'

492+55
℄88'±Ex.R/W

495+64.53
℄88'±Ex.R/W

3R

BNSF RAILWAY COMPANY

34

Sta. 483+79.06
Install 66' of 60" RCP Extention LT
and 1 Apron
Skew 7° RT AH
FL LT = 1105.50
FL OTHER = 1104.06
FL RT = UAC

1

MIDWEST ROCK PRODUCTS INC

490+05.49
℄193'±Ex.R/W

3R

BNSF RAILWAY COMPANY

494+31.73
℄227'±Ex.R/W

JENNIFER L STARGELL LARKIN

0 50
FEET

Right of Way Design Information
THIS SHEET INCLUDED
FOR INFORMATION ONLY

ROW Team: FREDRICKSON / CUVA
ROW #: NHSN-034-3(042)–2R-02
Plan Date: 12/17/2024
Color Legend:
Property Lines
Temporary Easement
Permanent Acquisition
Permanent Acquisition County
Permanent Acquisition City

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER H.2	

9:35:48 AM 12/17/2024 afredri pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\0203402022\ROW\ROW_02034042.dgn

3R

BNSF RAILWAY COMPANY

2

RICHARD E BLAZEK & DEBORAH A BLAZEK TRUST

503+27±Ex.R/W
℄95'

504+59±Ex.R/W
℄100'

511+22
℄160'

511+95
℄113'

513+80
℄110'±Ex.R/W

Construction Limits

Sta. 505+84
Type D Entrance

12.7'

20'

12.7'

3'

3'

34

Sta. 504+88.85
Install 62' of 36" RCP Extention LT
and 1 Apron
Skew 16° RT AH
FL LT = 1124.74
FL OTHER = 1127.31
FL RT = 1128.51

Sta. 505+28 RT
Proposed Type M Dike
Top Elev = 1130.01

(Extend)

Sta. 510+89.00
Install 8'X8'X54' RCB Extension LT
and 1 Headwall
Skew 17° LT LA
FL LT = 1107.00
FL OTHER = 1108.30
FL RT = UAC

(Remove Headwall

JENNIFER L STARGELL LARKIN

0 50
FEET

Right of Way Design Information

THIS SHEET INCLUDED
FOR INFORMATION ONLY

ROW Team: FREDRICKSON / CUVA
ROW #: NHSN-034-3(042)–2R-02
Plan Date: 12/17/2024
Color Legend:

- Property Lines
- Temporary Easement
- Permanent Acquisition
- Permanent Acquisition County
- Permanent Acquisition City

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER H.3	

9:35:55 AM 12/17/2024 afredri pw:\\NTPwint1.dot.int.lan:PWMain\Documents\Projects\0203402022\ROW\ROW_02034042.dgn

108-23A
08-01-08

TRAFFIC CONTROL PLAN

1. U.S. 34 will remain open to traffic at all times.
2. Lane and shoulder closures shall be per the TC series of Standard Road Plans referenced elsewhere in these plans.
3. Access to individual properties shall be maintained at all times.
4. At least one lane of Loomis Avenue shall be maintained at all times.

108-26A
08-01-08

STAGING NOTES

1A. Maintain traffic on existing U.S. 34. Lane closures may be necessary for construction; limit lane closures to overnight hours only.
   - Construct pavement widening on existing U.S. 34, Sta. 469+24.35 - Sta. 482+15.89 and Sta. 503+40.93 - Sta. 527+00.00

1B. Maintain 2-lane traffic on existing U.S. 34 and pavement widening as constructed suring Stage 1A.
   - Construct bridge, roadway embankment, and paving adjacent to existing U.S. 34

2. Close existing westbound lane using temporary signals per TC-216
   - Construct WB pavement tie-ins on the east and west ends of the project

3. Transition traffic to new pavement / bridge, using new WB lane pavement. Use lane closure with temporary signals per TC-216
   - Construct EB pavement tie-ins on the east and west ends of the project

4. Maintain 2-lane traffic on new pavement / bridge
   - Remove existing bridge
   - Remove existing roadway pavement
   - Grade through existing roadway embankment

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 Shoulder
	Proposed Granular Subbase		Temporary Shoulder
	Proposed Special Backfill		Existing Shoulder Strengthening
	Temporary Barrier Rail		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
Gray, Med	(80)	Proposed Granular Surface Shading
Gray, Med	(80)	Previously Constructed Granular Surface Shading
Blue, Light	(230)	Proposed Pavement Shading
Lavender	(9)	Temporary Pavement Shading
Brown, Light	(236)	Proposed Grading Limits Shading
Pink, Dark	(13)	Proposed MSE or CIP Wall Shading
Red	(3)	Proposed Bridge Shading and Sign Trusses
Black w/Gray, Light Fill	(0,48)	Previously Constructed Structure

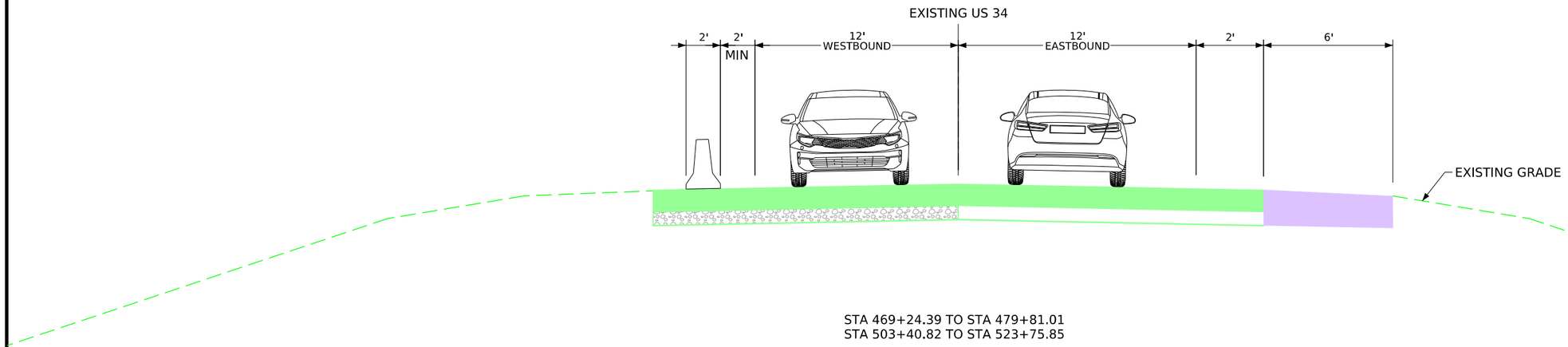
PLAN VIEW PATTERN AND SYMBOL LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS

●	Channelizing Device		Crash Cushion (Temp or Perm)
✕	Drum		Traffic Signal
◘	Temporary Lane Separator		Flagger
◆	Tubular Marker		Temporary Floodlighting
♦	Channelizer Marker		Traffic Sign
△	Concrete Barrier Marker		Type III Barricade
⊰	Delineator		Type A Warning Light
	Temporary Barrier Rail		Direction of Traffic
	Pavement Removal		Safety Closure
	Sand Barrel Layout	1	Lane Identification

NOTE: Device spacing according to Standard Road Plans unless specifically dimensioned.

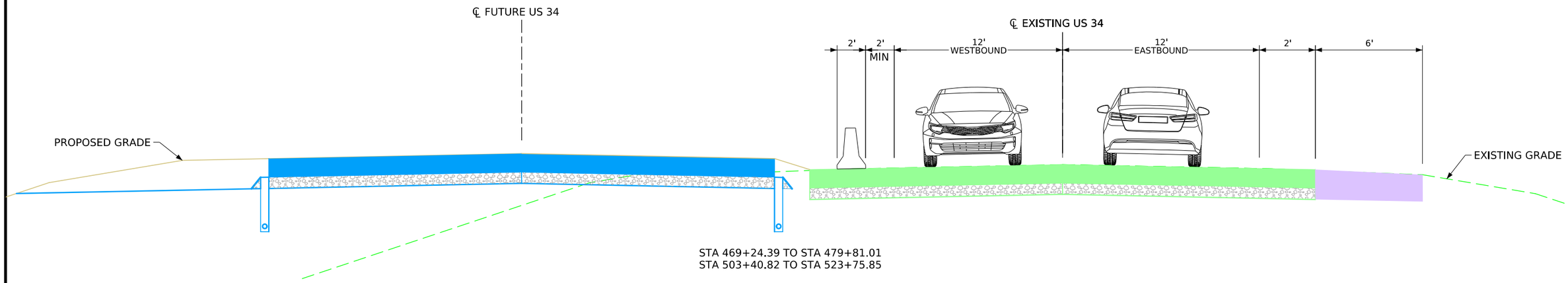
TRAFFIC CONTROL AND STAGING LEGEND AND SYMBOL INFORMATION SHEET

(COVERS SHEET SERIES J)

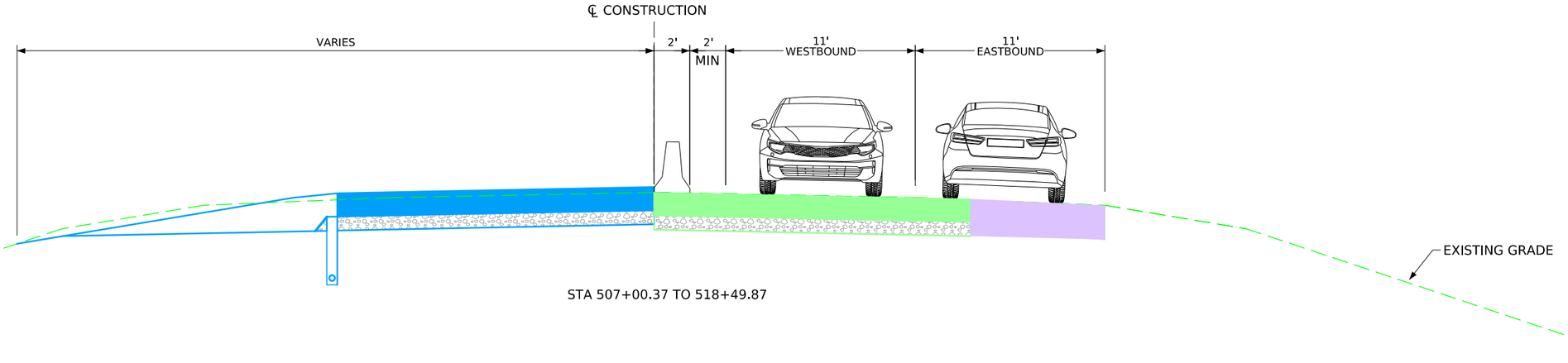


STA 469+24.39 TO STA 479+81.01
STA 503+40.82 TO STA 523+75.85

STAGE 1A



STA 469+24.39 TO STA 479+81.01
STA 503+40.82 TO STA 523+75.85



STA 507+00.37 TO 518+49.87

STAGE 1B

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER J.3	

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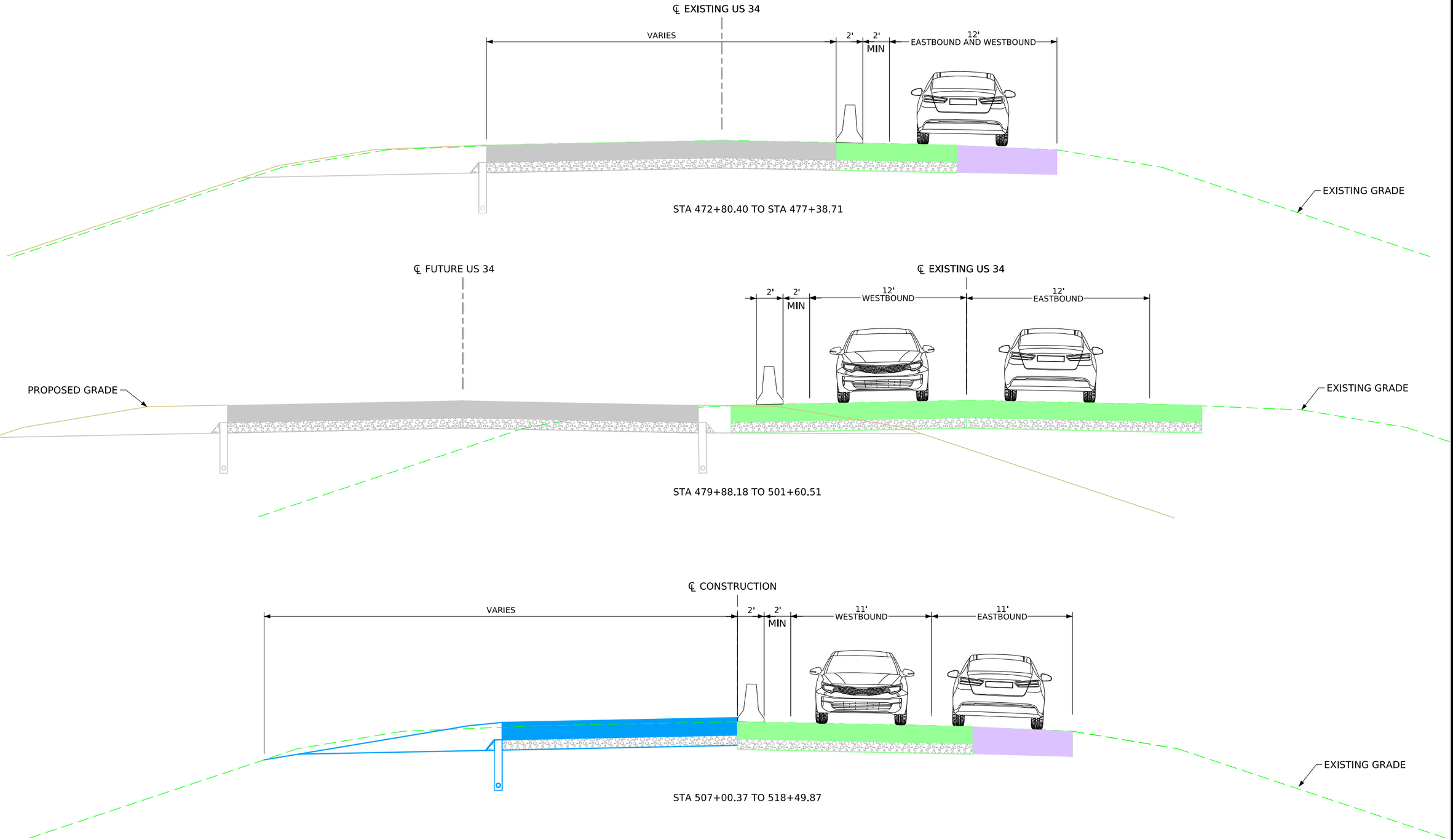

STAGE 2

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER J.4	

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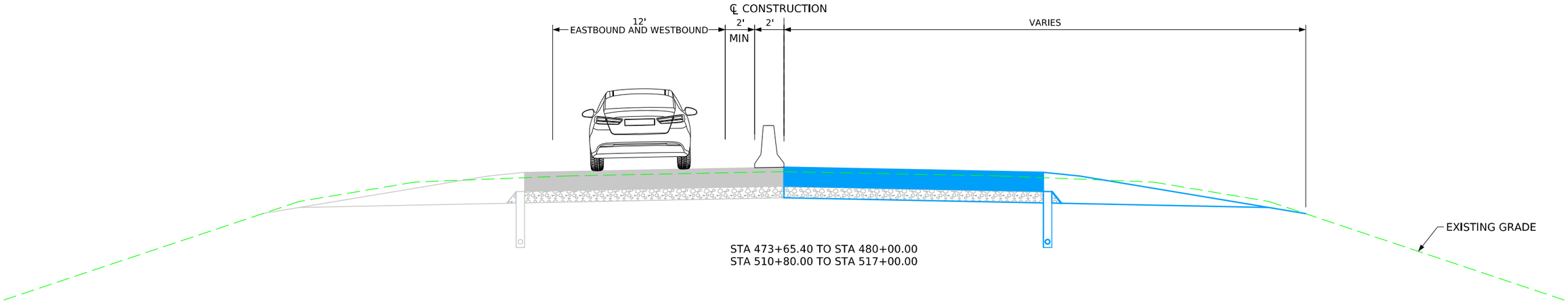
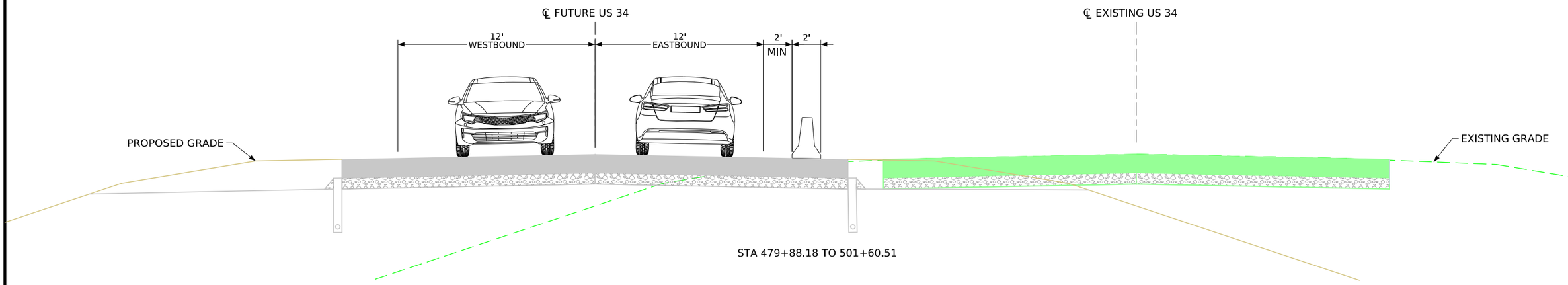


STA 473+65.40 TO STA 480+00.00
STA 510+80.00 TO STA 517+00.00



STA 479+88.18 TO 501+60.51

STAGE 3

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER J.5	

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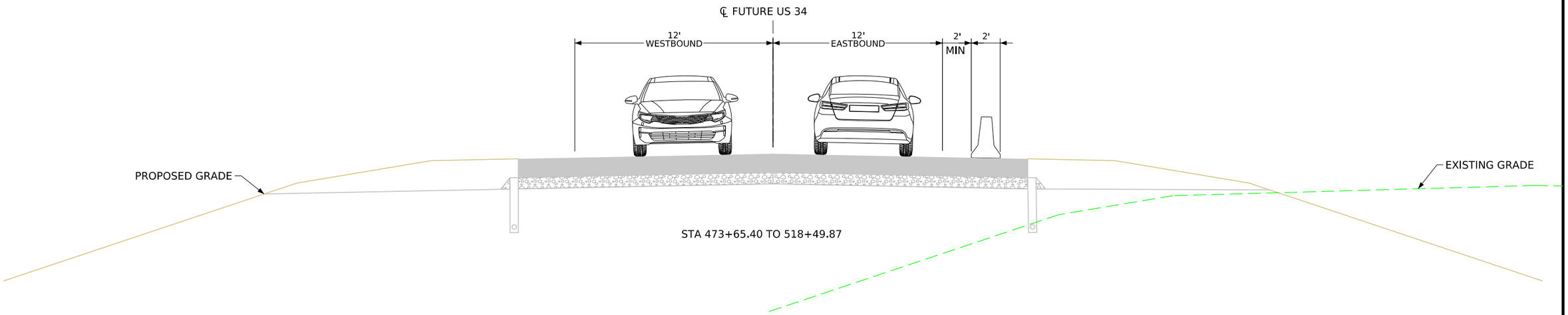

STAGE 4

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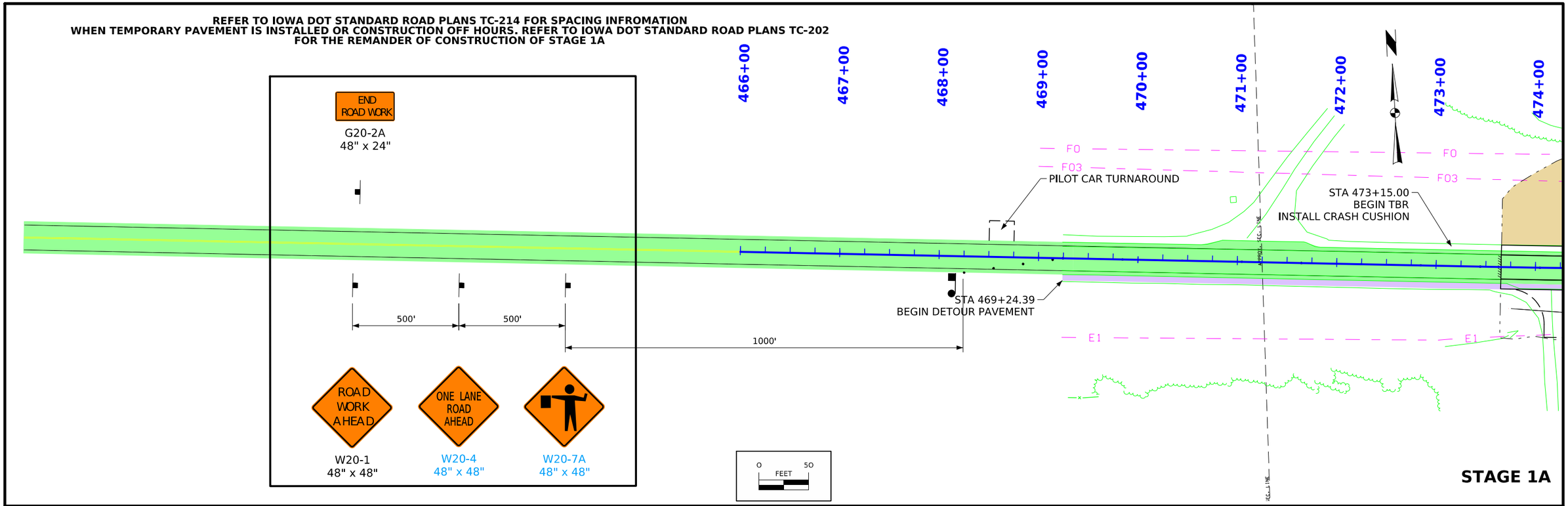
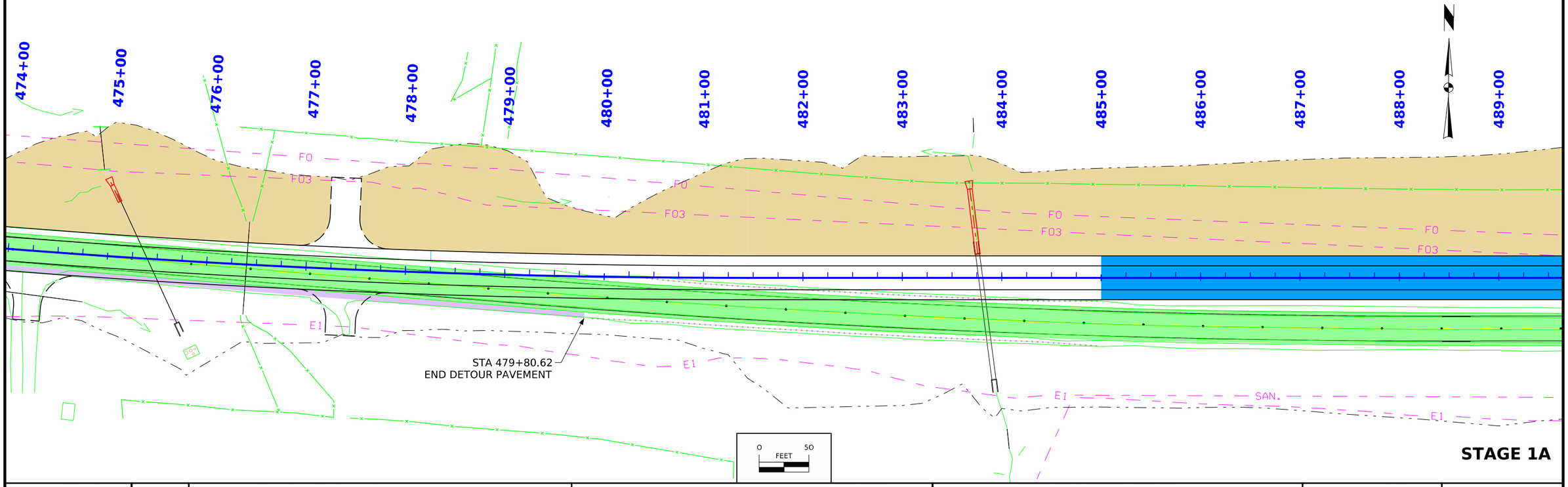
REFER TO IOWA DOT STANDARD ROAD PLANS TC-214 FOR SPACING INFROMATION
WHEN TEMPORARY PAVEMENT IS INSTALLED OR CONSTRUCTION OFF HOURS. REFER TO IOWA DOT STANDARD ROAD PLANS TC-202
FOR THE REMANDER OF CONSTRUCTION OF STAGE 1A



STAGE 1A



STAGE 1A

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER J.7

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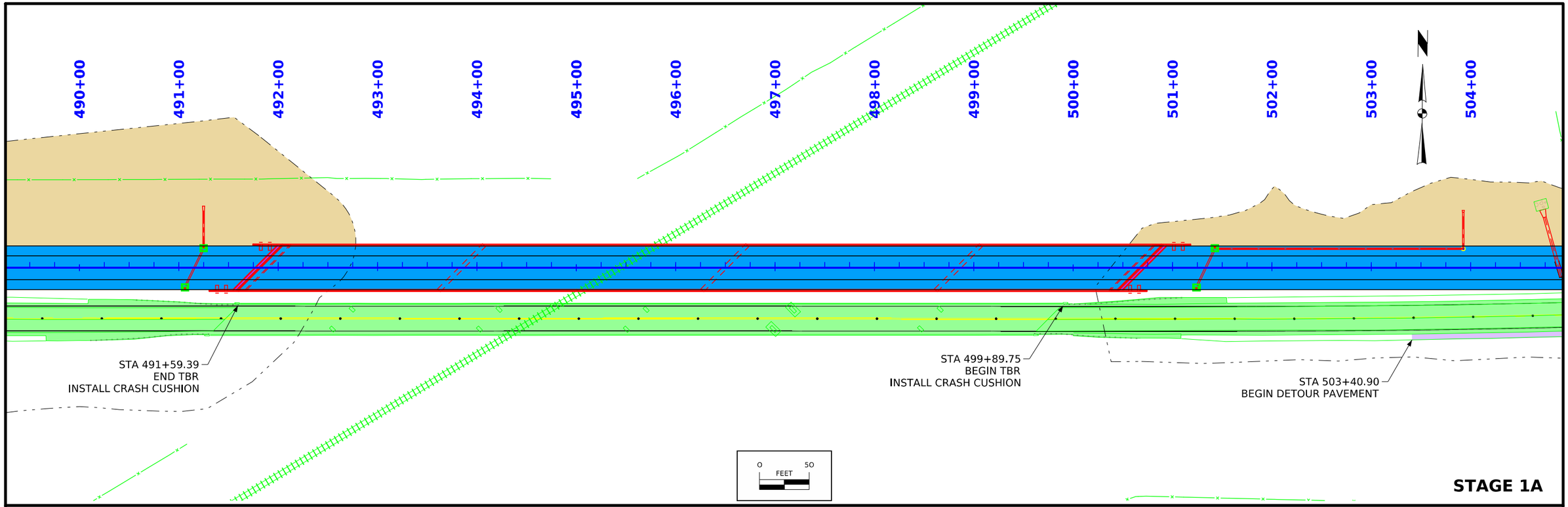

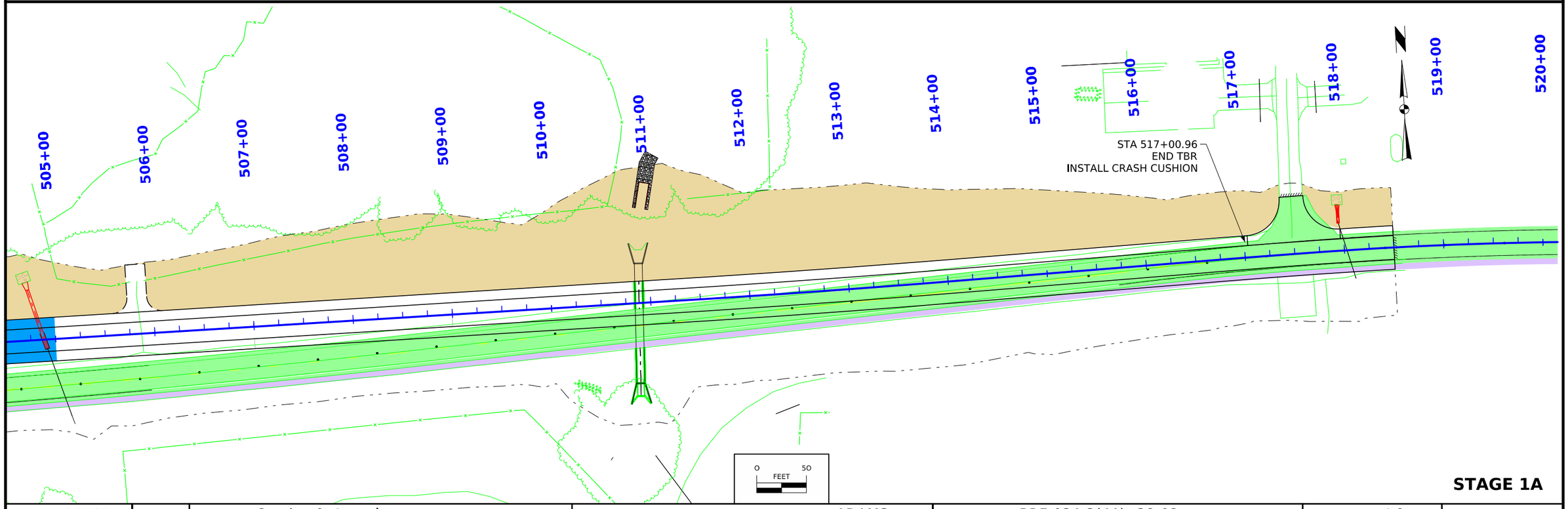

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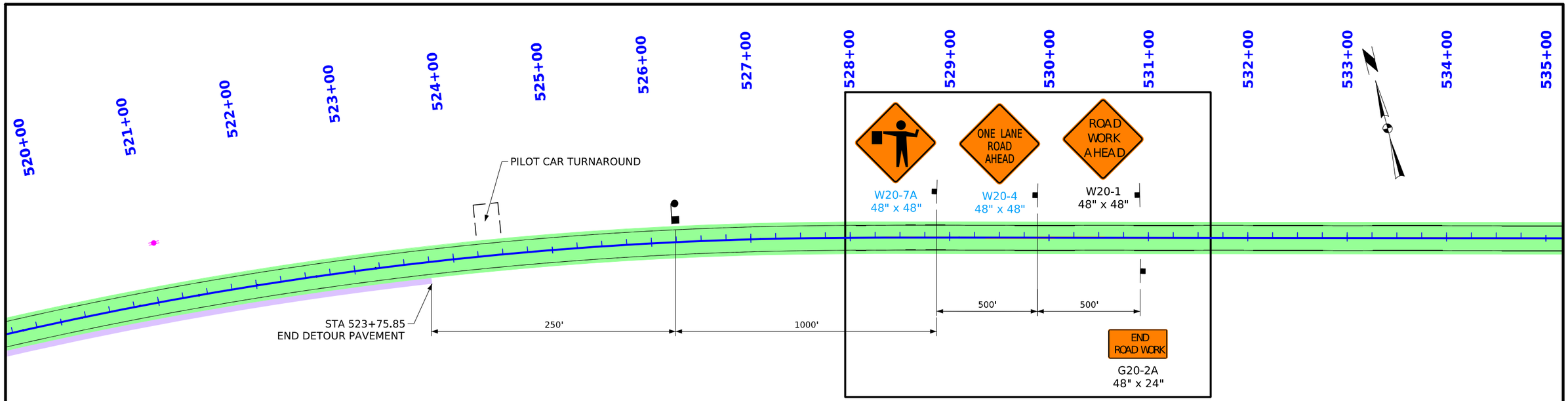
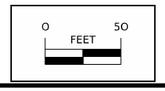


REFER TO IOWA DOT STANDARD ROAD PLANS TC-214 FOR SPACING INFROMATION
WHEN TEMPORARY PAVEMENT IS INSTALLED OR CONSTRUCTION OFF HOURS. REFER TO IOWA DOT STANDARD ROAD PLANS TC-202 FOR THE REMANDER OF CONSTRUCTION OF STAGE 1A



STAGE 1A

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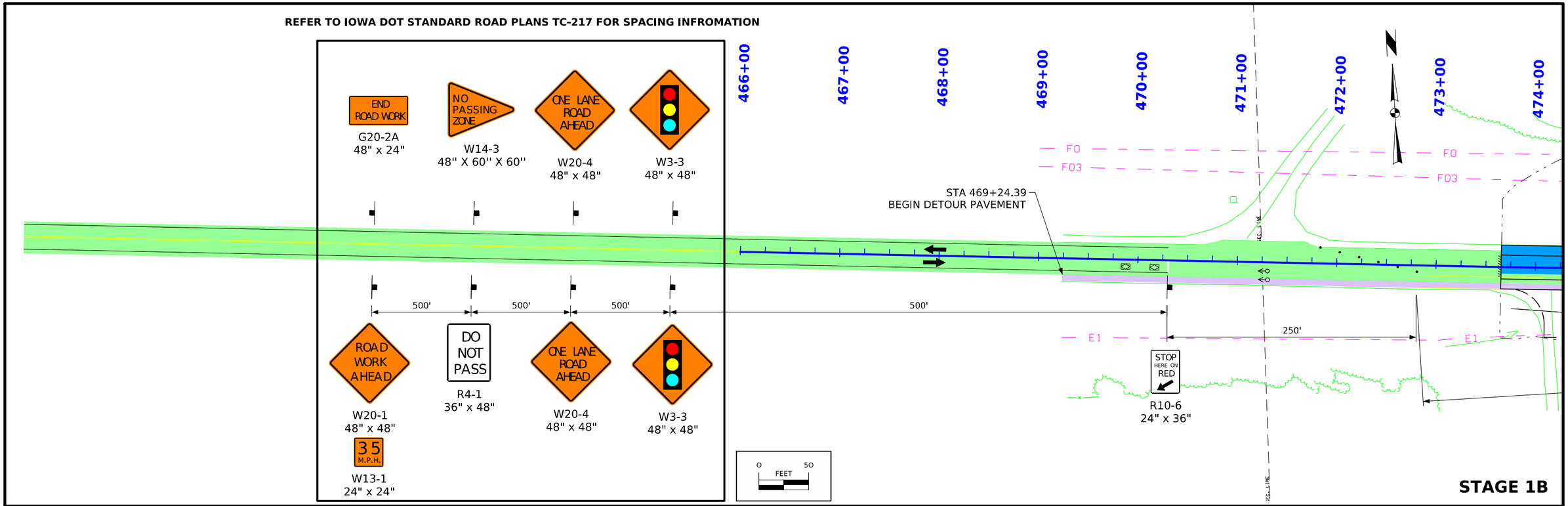
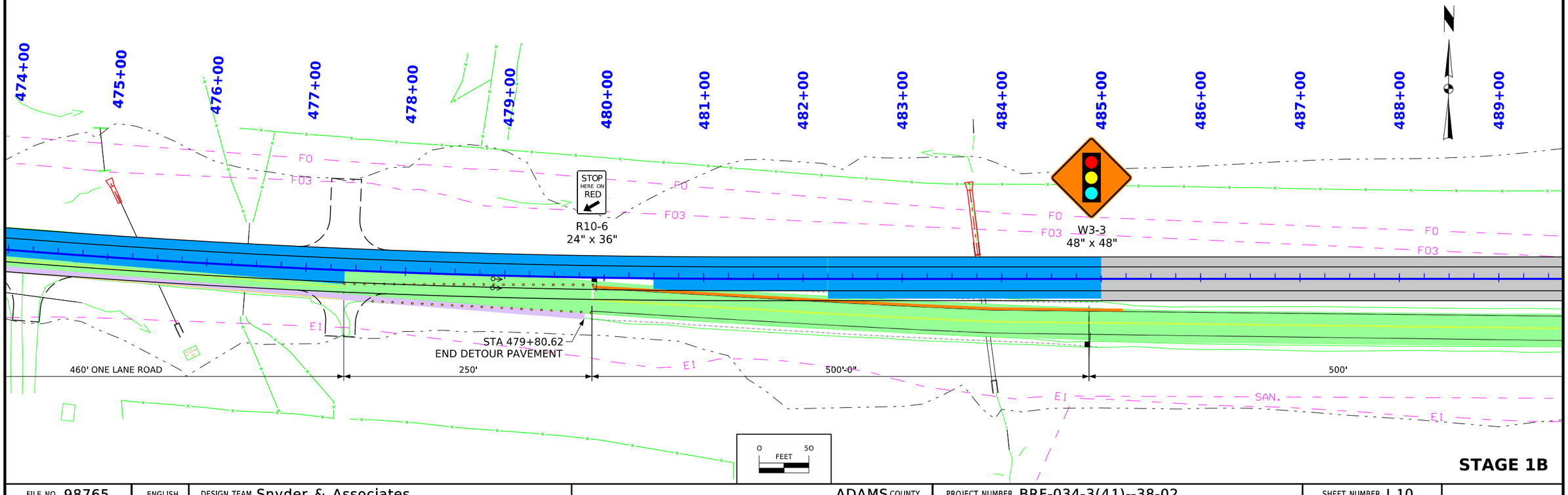
REFER TO IOWA DOT STANDARD ROAD PLANS TC-217 FOR SPACING INFROMATION





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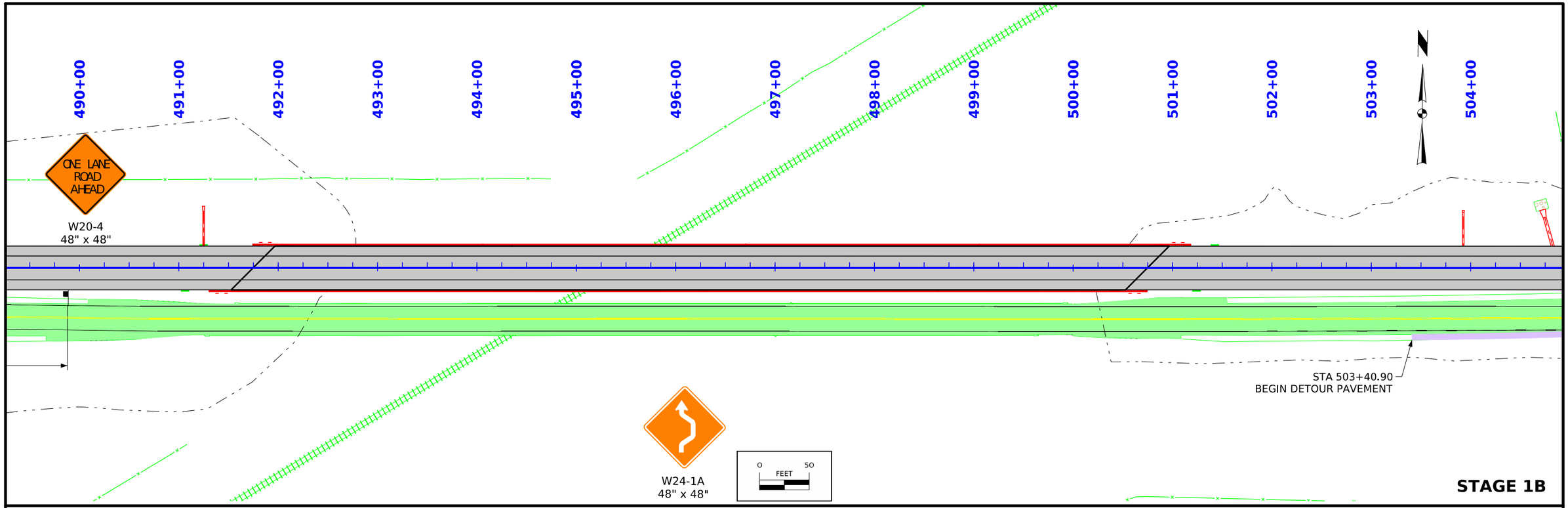

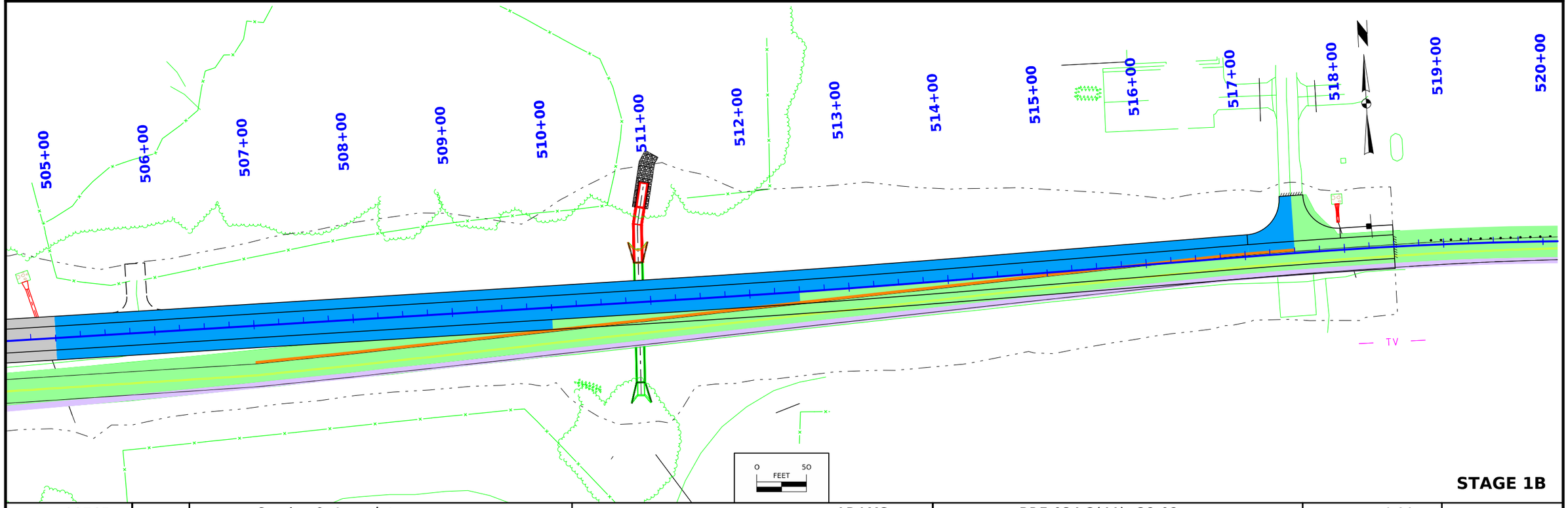

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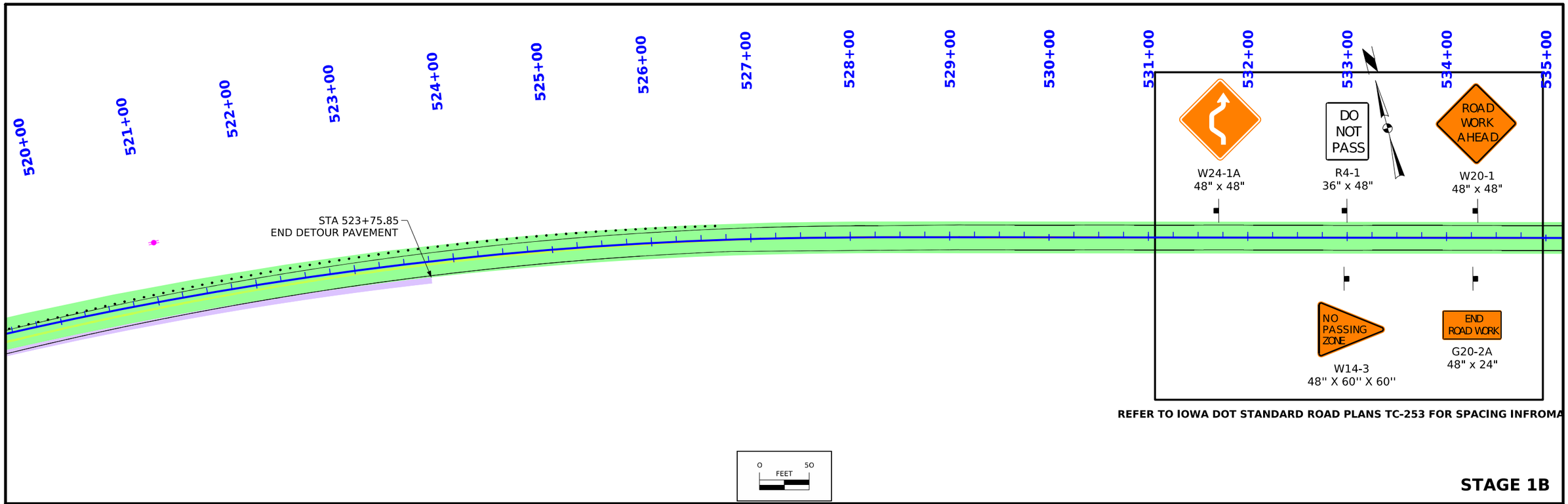

STAGE 1B

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER J.12	

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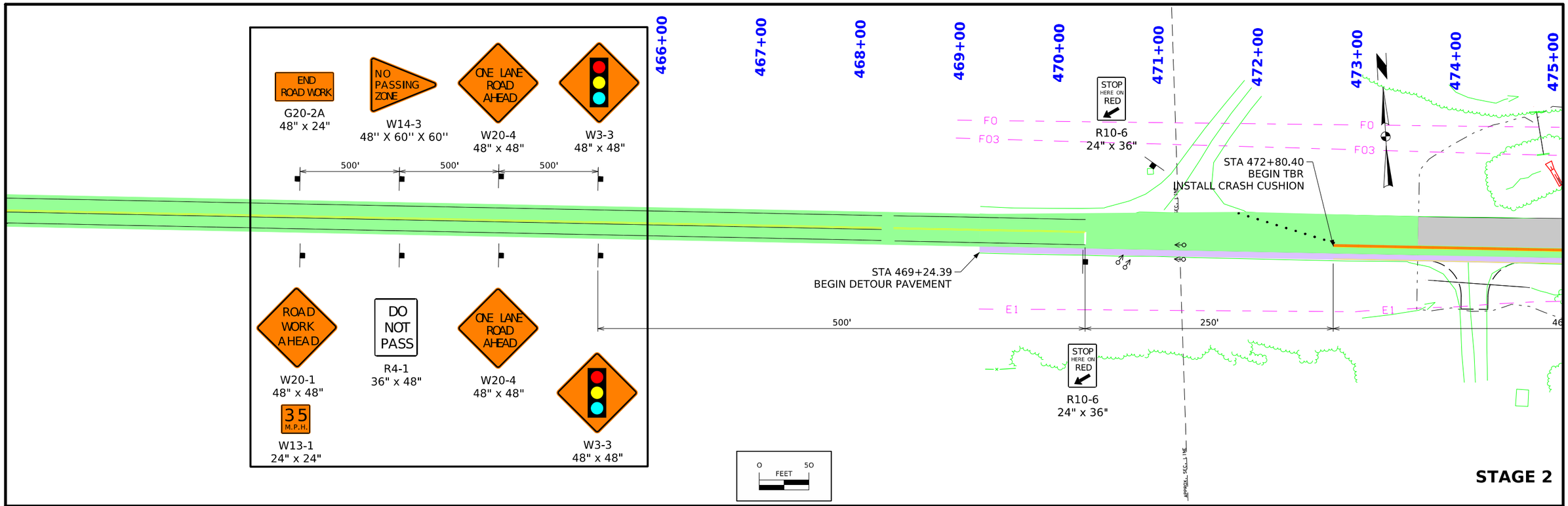

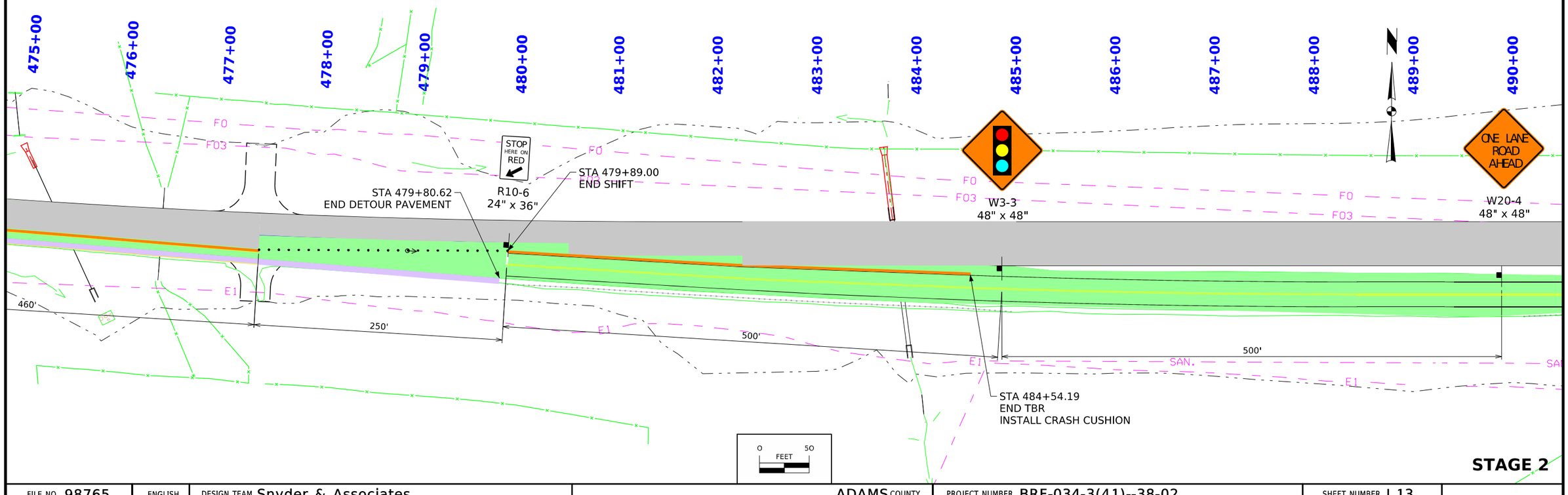

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491+00 492+00 493+00 494+00 495+00 496+00 497+00 498+00 499+00 500+00 501+00 502+00 503+00 504+00 505+00

W24-1A
48" x 48"

500'

STA 501+60.51
BEGIN SHIFT

STA 503+40.90
BEGIN DETOUR PAVEMENT

0 FEET 50

STAGE 2

506+00 507+00 508+00 509+00 510+00 511+00 512+00 513+00 514+00 515+00 516+00 517+00 518+00 519+00 520+00 521+00

STA 507+46.99
BEGIN TBR
INSTALL CRASH CUSHION

STA 507+00.38
END SHIFT

1150'
10' RT Offset

STA 518+80.87
END TBR
INSTALL CRASH CUSHION

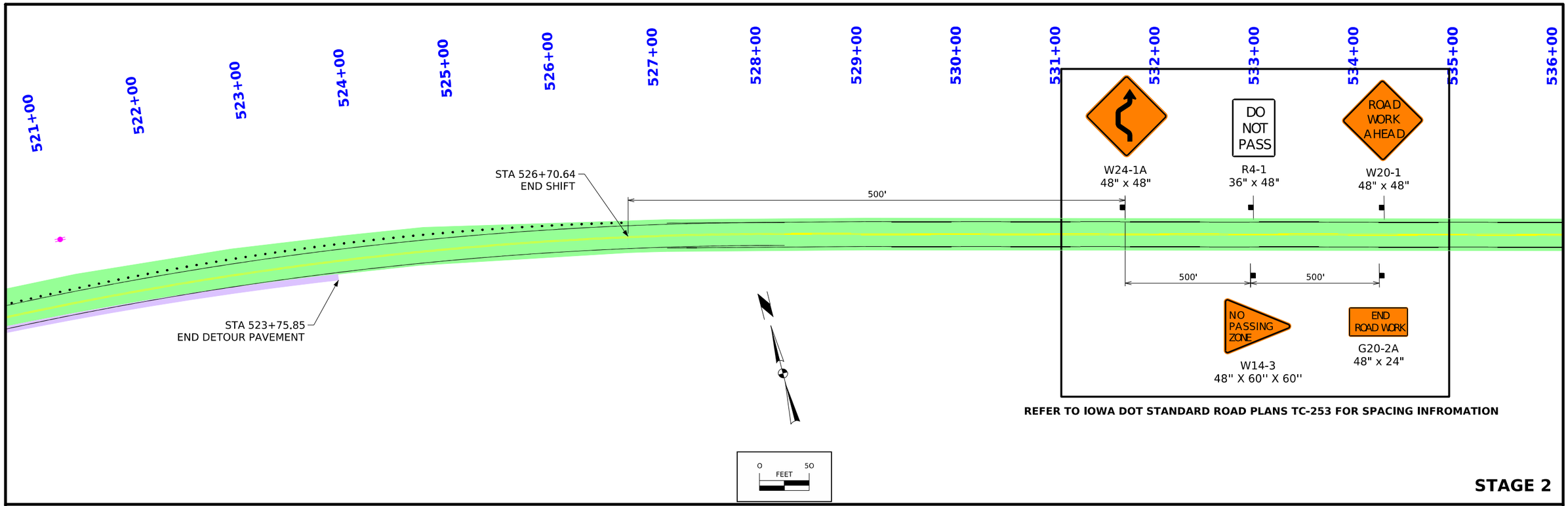
STA 518+49.92
BEGIN SHIFT

0 FEET 50

STAGE 2

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER J.14

12:07:23 PM 9/6/2024 bjohnson pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\0203402022\Design\CADD_Files\Sheet_Files\SHT_02034041Z12_J13toJ15.dgn



REFER TO IOWA DOT STANDARD ROAD PLANS TC-253 FOR SPACING INFROMATION

STAGE 2

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER J.15	

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REFER TO IOWA DOT STANDARD ROAD PLANS TC-217 FOR SPACING INFROMATION

466+00 467+00 +00 +00 470+00 471+00 472+00 473+00 474+00 475+00 476+00 477+00

END ROAD WORK
G20-2A
48" x 24"

NO PASSING ZONE
W14-3
48" X 60" X 60"

ONE LANE ROAD AHEAD
W20-4
48" x 48"

W3-3
48" x 48"

500' 500' 500'

ROAD WORK AHEAD
W20-1
48" x 48"

35 M.P.H.
W13-1
24" x 24"

DO NOT PASS
R4-1
36" x 48"

ONE LANE ROAD AHEAD
W20-4
48" x 48"

W3-3
48" x 48"

FO FO3 E1

500' 250'

STOP HERE ON RED
R10-6
24" x 36"

360' One La

0 50 FEET

STAGE 3

477+00 478+00 479+00 480+00 481+00 482+00 483+00 484+00 485+00 486+00 487+00 488+00 489+00 490+00 491+00 492+00

STOP HERE ON RED
R10-6
24" x 36"

100' 500'

W3-3
48" x 48"

500

ONE LANE ROAD AHEAD
W20-4
48" x 48"

One Lane Road

250'

W3-3
48" x 48"

SAN.

0 50 FEET

STAGE 3

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER J.16

12:07:37 PM 9/6/2024 bjohnson pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\0203402022\Design\CADD_Files\Sheet_Files\SHT_02034041Z12_J16toJ18.dgn

493+00 494+00 495+00 496+00 497+00 498+00 499+00 500+00 501+00 502+00 503+00 504+00 505+00 506+00 507+00

W3-3
48" x 48"

500'

500'

ONE LANE
ROAD
AHEAD

W20-4
48" x 48"

0 50
FEET

W3-3
48" x 48"

STAGE 3

508+00 509+00 510+00 511+00 512+00 513+00 514+00 515+00 516+00 517+00 518+00 519+00 520+00 521+00 522+00

STOP
HERE ON
RED

R10-6
24" x 36"

100'

150'

625' One Lane Road

100'

250'

STOP
HERE ON
RED

R10-6
24" x 36"

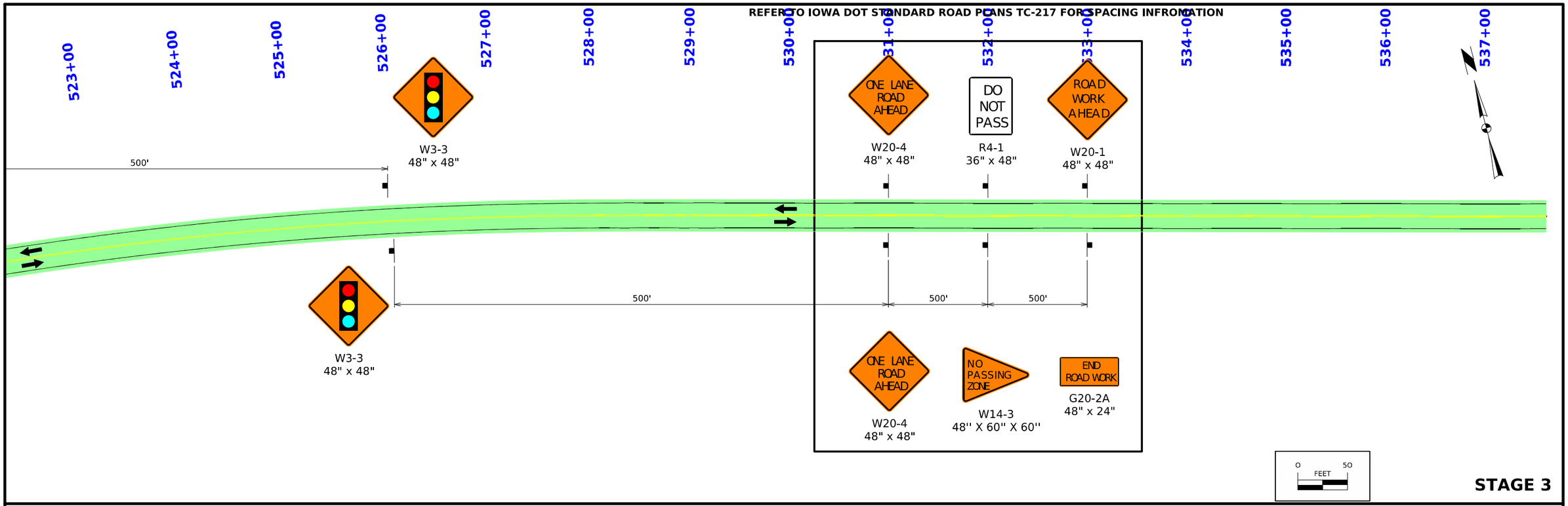
0 50
FEET

STAGE 3

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER J.17

12:07:38 PM 9/6/2024 bjohnson pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\0203402022\Design\CADD_Files\Sheet_Files\SHT_02034041Z12_J16toJ18.dgn

REFER TO IOWA DOT STANDARD ROAD PLANS TC-217 FOR SPACING INFROMATION



STAGE 3

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER J.18	

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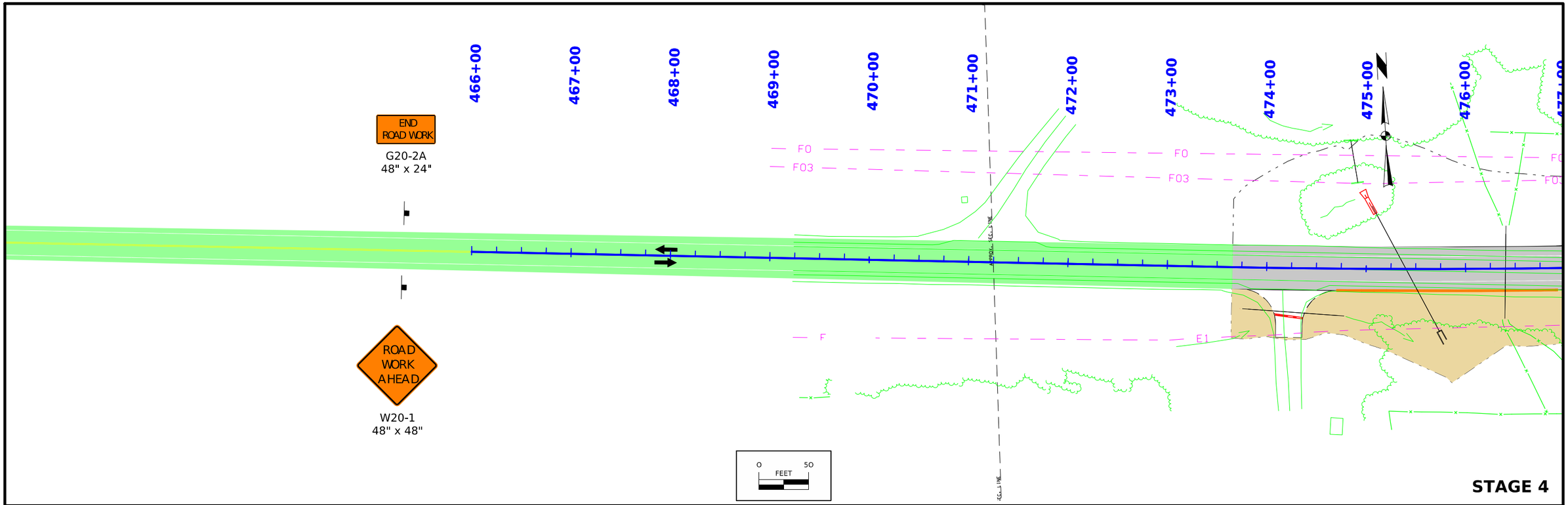

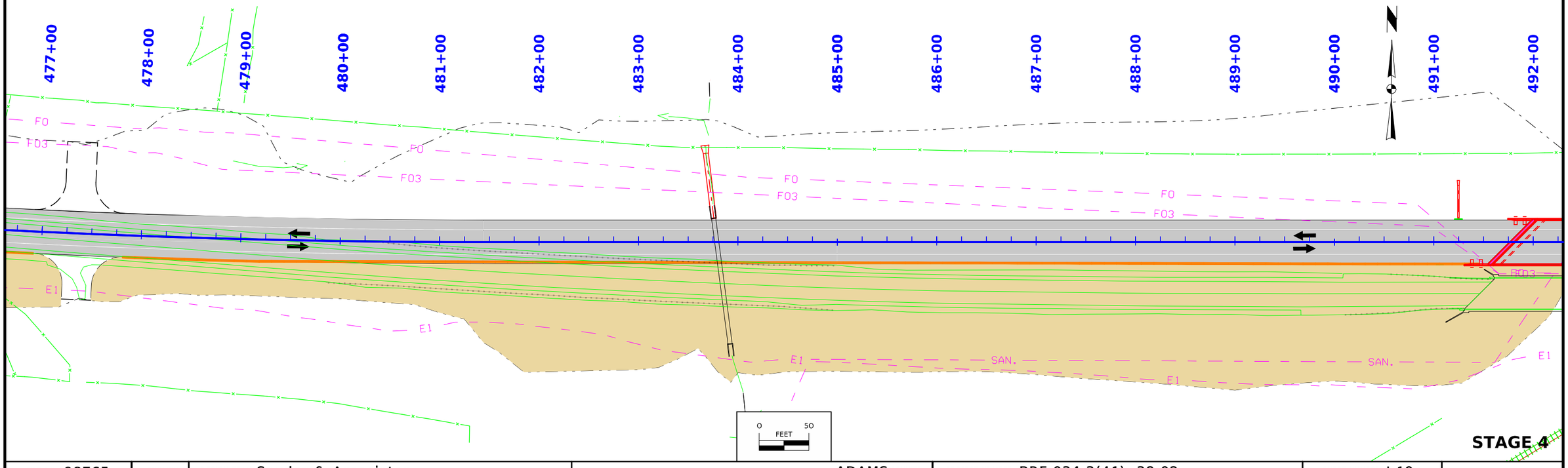

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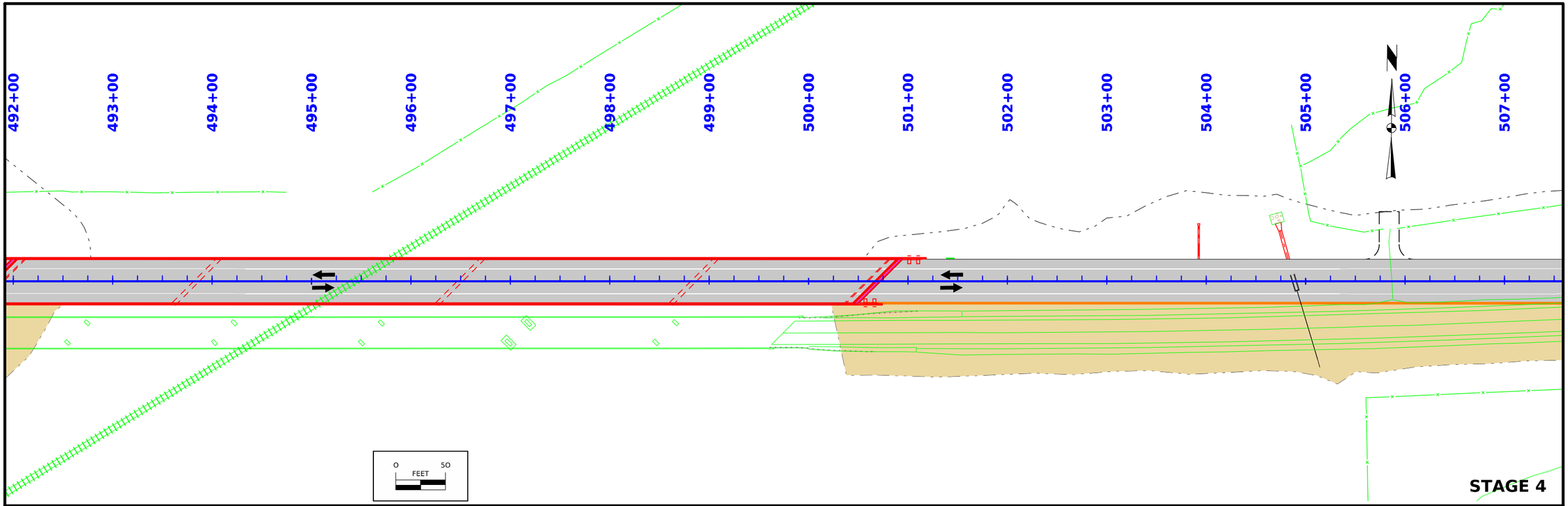
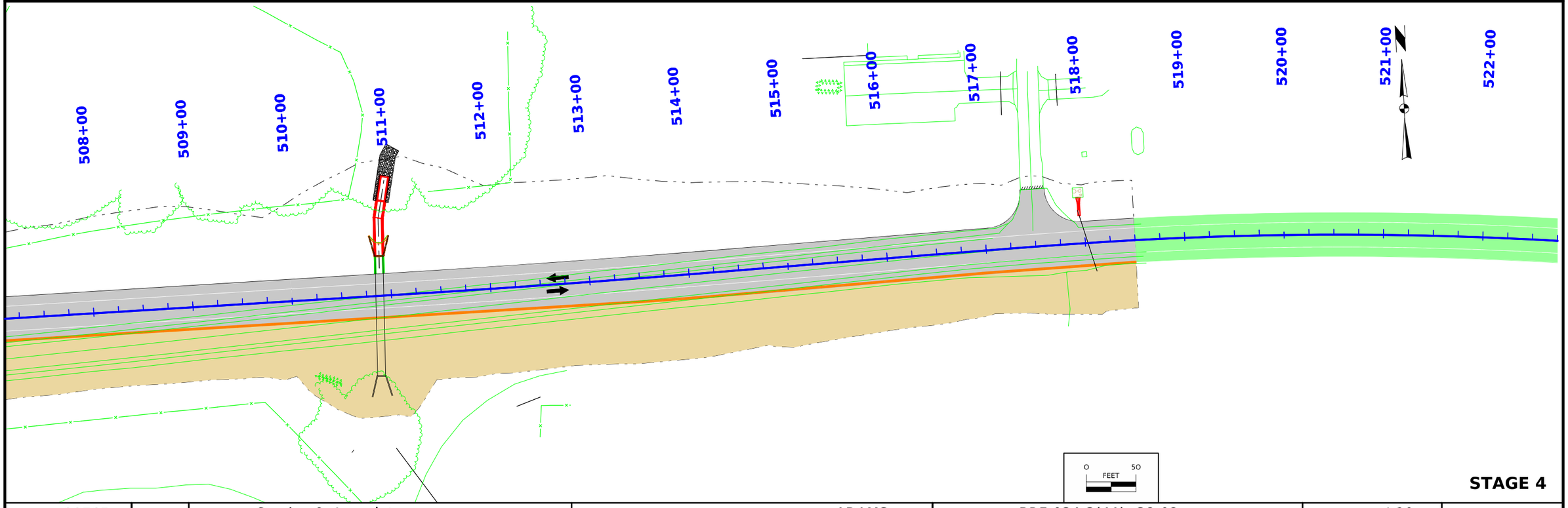
492+00 493+00 494+00 495+00 496+00 497+00 498+00 499+00 500+00 501+00 502+00 503+00 504+00 505+00 506+00 507+00



STAGE 4

508+00 509+00 510+00 511+00 512+00 513+00 514+00 515+00 516+00 517+00 518+00 519+00 520+00 521+00 522+00



STAGE 4

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER J.20

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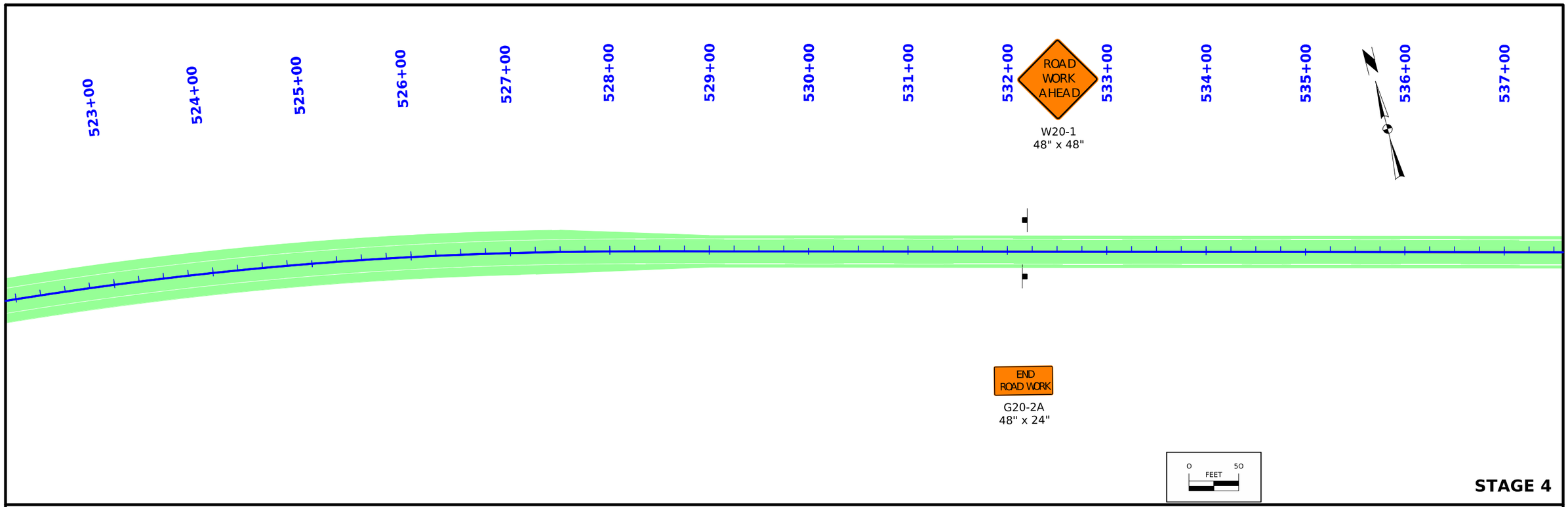

STAGE 4

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER J.21	

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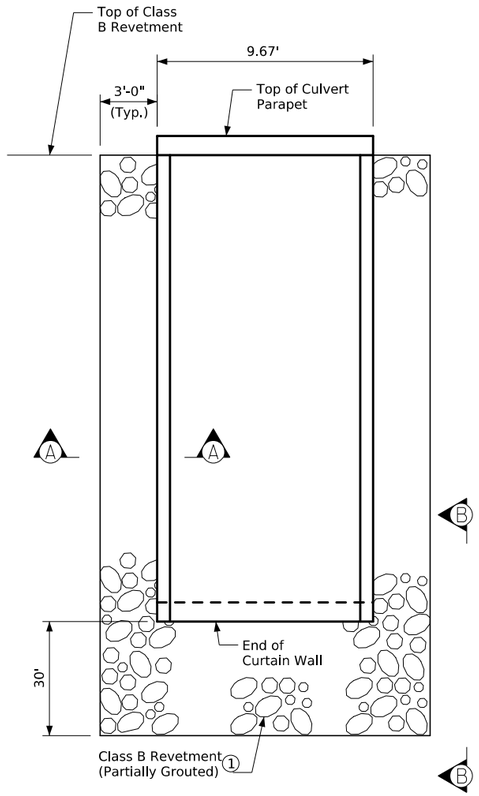
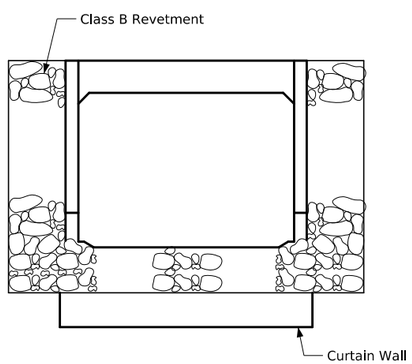
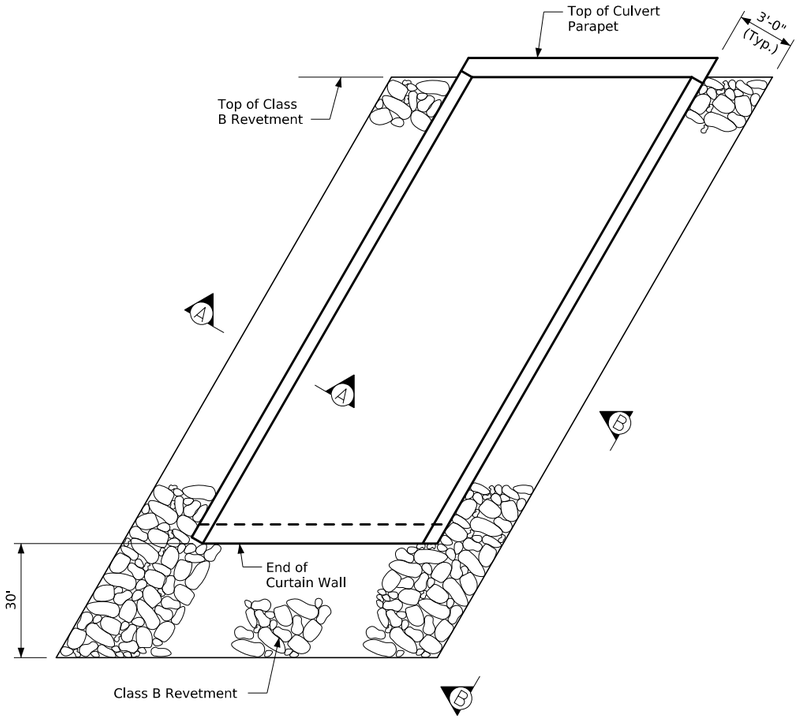


Plan View

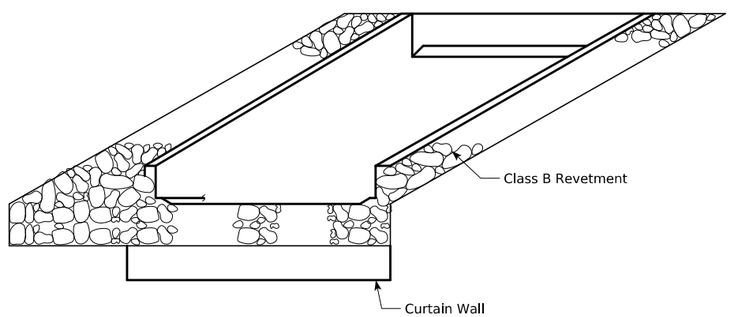


Elevation View

0° Skew Headwalls

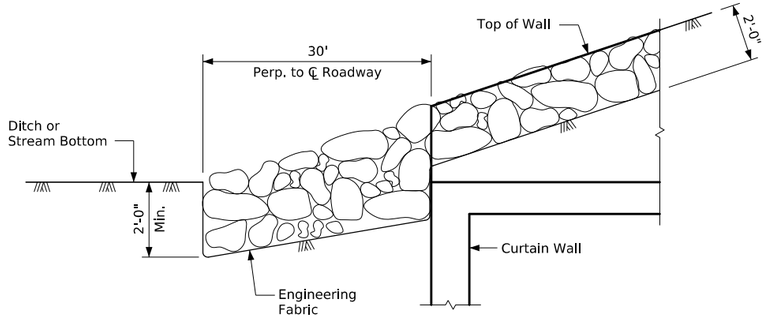


Plan View

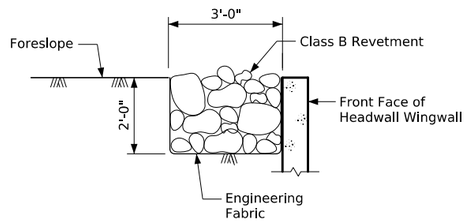


Elevation View

___° Skewed Headwall



View B-B



Section A-A

Typical Details

Construction Notes:

Class B Revetment shall be used and placed according to Article 2507.03, of the Standard Specifications. The engineering fabric shall meet the material requirements in accordance with Article 4196.01,B,3, of the Standard Specifications.

① Partially grout revetment using flowable mortar meeting the requirements of section 2506 of the Standard specification.

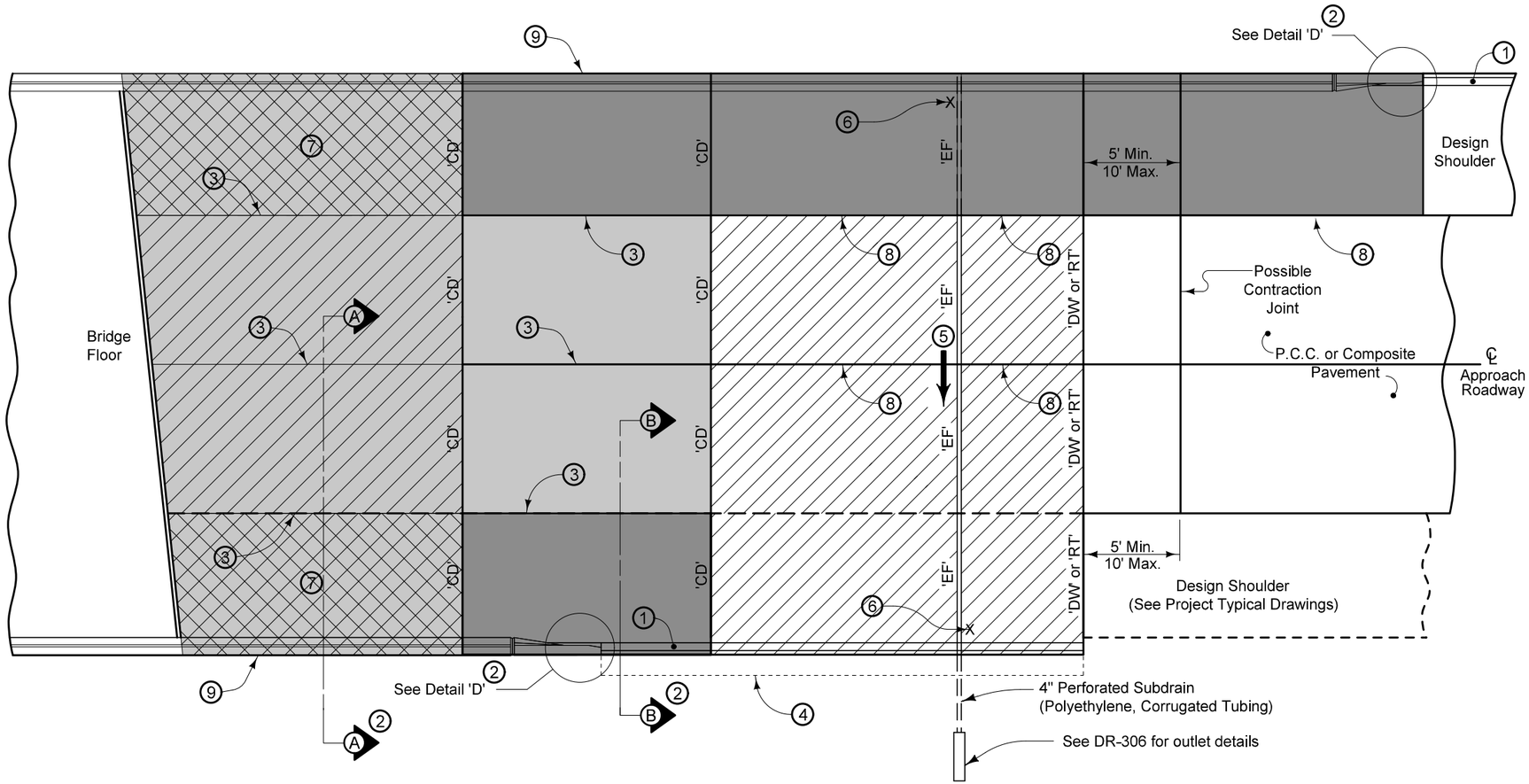
Revetment Protection Details

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. ____ OF ____ FILE NO. _____ DESIGN NO. _____

FILE NO. **98765**	ENGLISH	DESIGN TEAM **Snyder & Associates**	**ADAMS** COUNTY	PROJECT NUMBER **BRF-034-3(41)--38-02**	SHEET NUMBER **U.1**

1:59:11 PM 9/3/2024 dshlain pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\0203402022\Design\CADD_Files\Sheet_Files\SHT_02034041Z12_U01toU03.dgn



PLAN VIEW

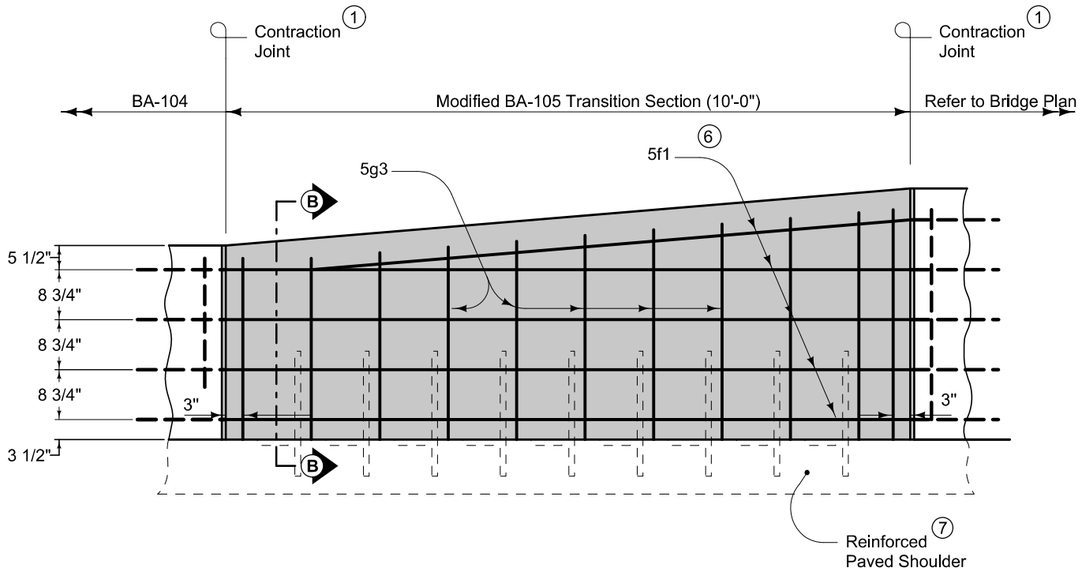
For joint details, see PV-101.

1. Build 4 inch Sloped Curb to end of Double Reinforced Section. Refer to PV-102 for curb and runout details.
2. See BR-203.
3. Longitudinal Joint (PV-101):
   Single Pour - Saw cut joint per Detail B .
   Two Pours - Use 'KS-1' joint (Single Reinforced Section).
   Use 'KS-2' joint (Double Reinforced Section).
4. Polymer Grid and excavation limits of Modified Subbase 2 feet outside of pavement edge. See BR-201, BR-202, BR-203, or BR-204.
5. Slope subdrain to drain.
6. Place an "X" in the plastic concrete near the 'EF' joint at the outside edge of pavement.
7. Refer to Special Detail for double reinforced section with attached barrier rail.
8. L-2 or KT-2 joint.
9. Refer to BA-104 and sheet U.3 for barrier rail information. Refer to BA-107 for end section.

Pay limits for contract item include the following areas:

- Double Reinforced Section with Attached Barrier Rail
- Double Reinforced Section
- Single Reinforced Section
- Non-Reinforced Section
- Refer to BA-106 for Shoulder Information

BRIDGE APPROACH WHERE BARRIER RAIL IS MOUNTED TO SHOULDER



Use Grade 60 epoxy-coated reinforcing bars. Provide 2 inches minimum cover. Anchor all reinforcement to prevent movement. Secure each section at the front, back, and at 3'-6" intervals using a method approved by the Engineer.

(1) Where abutting sections are placed as separate pours, a butt joint may be used. Extend longitudinal reinforcement into the abutting section a minimum of 3 feet.

(3) Fillet all exposed corners with a $\frac{3}{4}$ inch dressed and beveled strip.

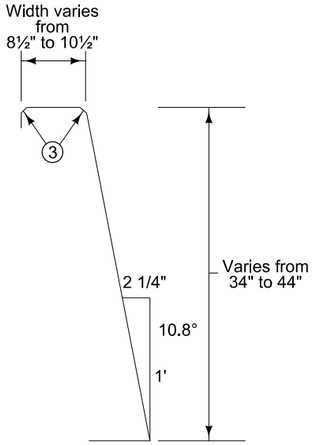
(5) Place barrier markers at 100 foot increments in areas with non-continuous lighting, or 250 foot increments in areas with continuous lighting. Marker color to be the same as adjacent edge line.

(6) When connecting to BA-107, include 6 additional #5 bars embedded a minimum of 3 feet into the BA-105 barrier. Evenly transition rebar over length of transition section.

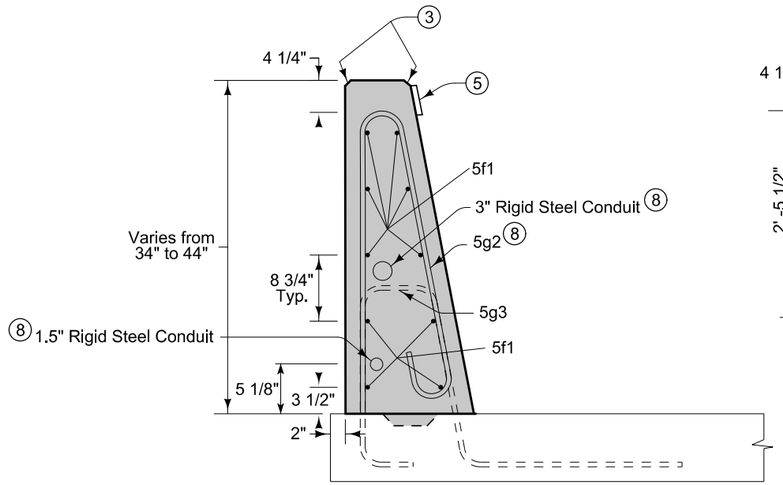
(7) Refer to BA-106 for details of 5g2 bars, 5g3 bars, and reinforced paved shoulder.

(8) Install rigid steel conduit within barrier, match location shown in bridge plans.

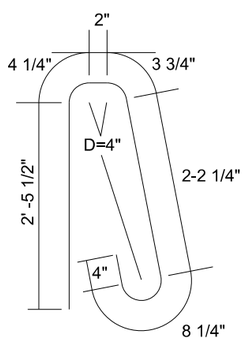
ELEVATION



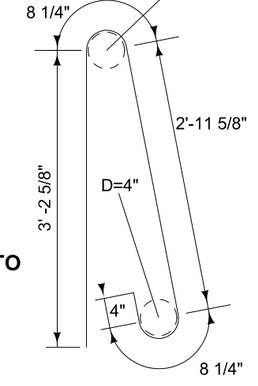
BARRIER FACE



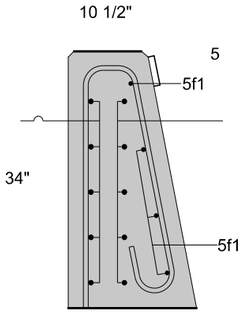
TYPICAL SECTION



TO



5g2 BENT BAR

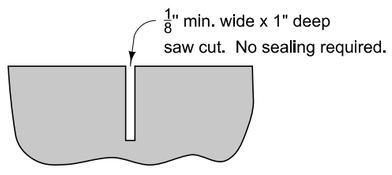


SECTION B-B 6
When attaching to BA-107

REINFORCING BAR LIST for one Transition Section					
Bar	Size	Number of Bars	Length	Weight (lbs.)	Spacing
5g2	5	11	*	84	12"
5f1	5	10	10'-6"	104	—

* Varies from 6'-6" to 7'-10¾"

CONCRETE QUANTITIES for one Transition Section
3.67 cy



SAWED CONTRACTION JOINT
Saw cut top and front face. Saw cut back if exposed.

Possible Contract Item:
Concrete Barrier, BA-105, Modified (Half Section)

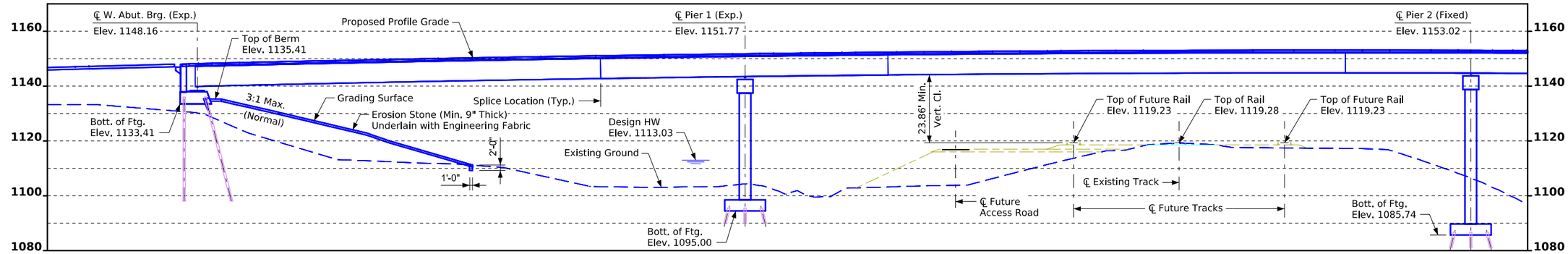
Possible Tabulation:
108-18B

MODIFIED STANDARD ROAD PLAN

BA-105
SHEET 1 of 1

34" TO 44" CONCRETE BARRIER TRANSITION (HALF SECTION)

Control Point: FENO3 Northing 6224262.67 Easting 22225760.64 Elev. 1127.91 Set Feno Monument 15'± West of Centerline Quarry Road, 5'± North of Sign with Arrow, 10'± East of Fence Line at End of Curve



Notes:

This design is for the replacement of the existing 824'-0" x 30'-0 CWPG Bridge, Adams Design No. 462, FHWA No. 013320, Maint. No. 0261.5S034.

Finger plate expansion joint with neoprene trough at both abutments.

Disc bearings at all substructure units with fixed disc bearings at Pier 2.

An Iowa DNR Flood Plain Permit is required. Preliminary Design will submit the application and place the permit in the PW Reulatory_Permits subdirectory folder upon reciept.

Non-standard abutment wing walls.

TL-5 single slope bridge railing proposed.

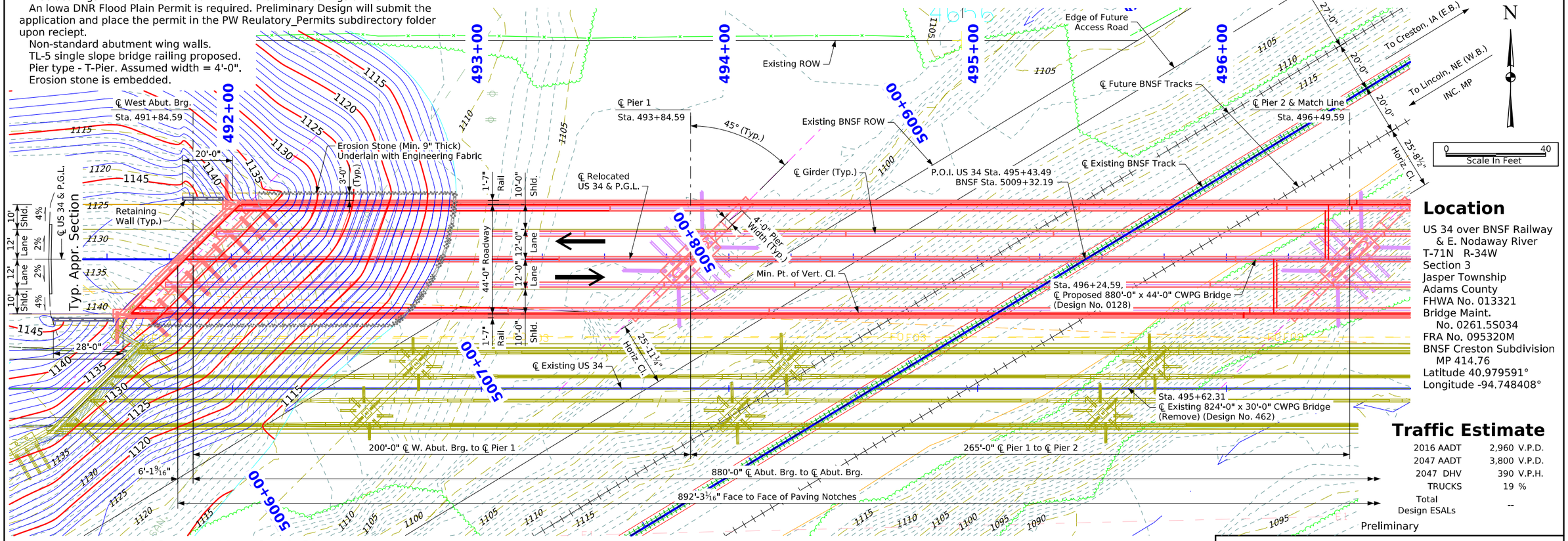
Pier type - T-Pier. Assumed width = 4'-0".

Erosion stone is embedded.

Longitudinal Section Along ℄ Approach Roadway

Top of bridge deck at centerline roadway is 0.03 ft. below the profile grade to account for parabolic crown.

Note: Total wing wall length (bridge wing wall plus retaining wall) is measured from back face of backwall.



Location

US 34 over BNSF Railway & E. Nodaway River
T-71N R-34W
Section 3
Jasper Township
Adams County
FHWA No. 013321
Bridge Maint. No. 0261.5S034
FRA No. 095320M
BNSF Creston Subdivision MP 414.76
Latitude 40.979591°
Longitude -94.748408°

Traffic Estimate

2016 AADT	2,960 V.P.D.
2047 AADT	3,800 V.P.D.
2047 DHV	390 V.P.H.
TRUCKS	19 %
Total Design ESALs	--

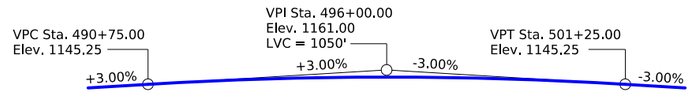
Preliminary

Minimum Vertical Clearance

Overhead Station = 494+53.93, Offset 21.50' Rt.
Overhead Elevation = 1152.11
Depth of Superstructure = 8.38 ft.
Deck Thickness = 8.5 in.
Estimated Haunch = 2 in.
Girder Depth = 90 in.
Max. Live Load Deflection = 0.27 ft.
Underpass Station = 5008+45.02, Offset 29.00' Lt.
Underpass Elevation = 1119.60
Minimum Vertical Clearance = 23.86 ft.

Situation Plan

All dimensions are in feet unless noted otherwise.



Proposed Profile Grade Relocated US 34

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

SHUCK-BRITSON

Design For 45° Skew LA

880'-0" x 44'-0" Continuous Welded Plate Girder Bridge

200'-0" / 180'-0" End Spans — 265'-0" / 235'-0" Interior Span

Situation Plan

STA. 496+24.59 (℄ Relocated US 34)

Turn-in Date: August, 2024

Adams County

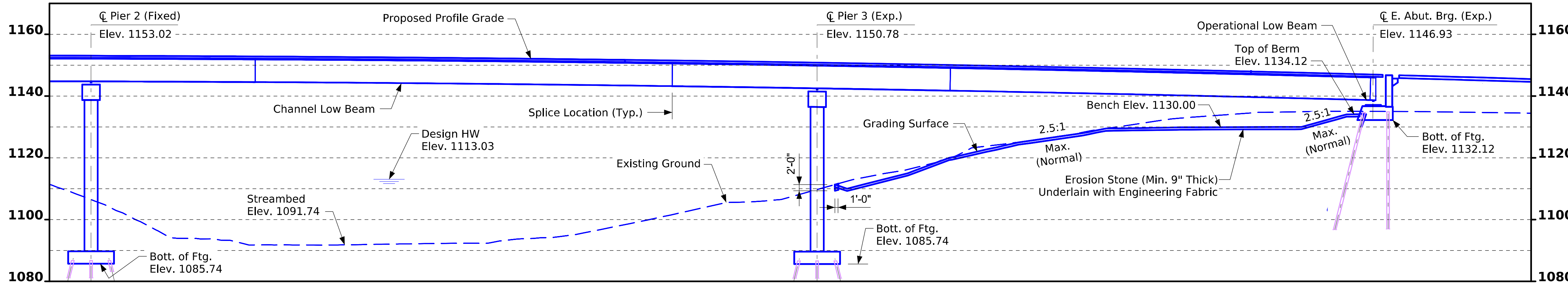
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0128 — Design Sheet No. 1 of 4 — FHWA No. 013321

FILE NO. 32611	ENGLISH	DESIGN TEAM JLH/JAG/CLS 121.1240.01K	Adams COUNTY	PROJECT NUMBER BRF-034-3(041)--38-02	SHEET NUMBER V.1

10:25:20 AM 8/29/2024 csallade pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\0203402022\Bridge\(041)_Bridge Replacement-Steel Girder\SHT_02034041_SBI_0128_013321_Z12.dgn

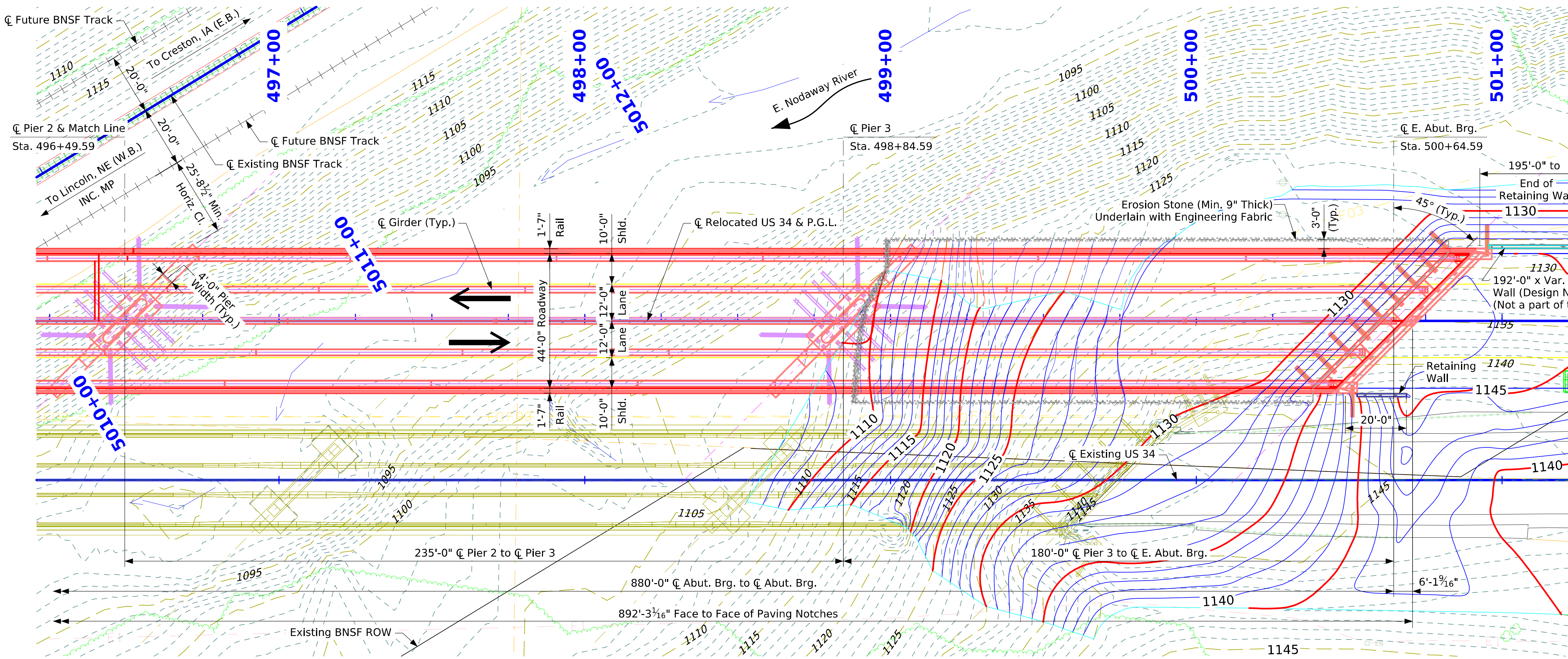
Control Point: FENO3 Northing 6224262.67 Easting 22225760.64 Elev. 1127.91 Set Feno Monument 15'± West of Centerline Quarry Road, 5'± North of Sign with Arrow, 10'± East of Fence Line at End of Curve

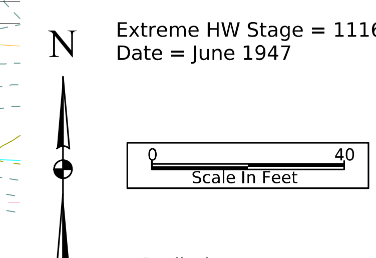


Longitudinal Section Along ℄ Approach Roadway

Top of bridge deck at centerline roadway is 0.03 ft. below the profile grade to account for parabolic crown.

Note: Total wing wall length (bridge wing wall plus retaining wall) is measured from back face of backwall.





Hydraulic Data

RIDB: "NodawayR_E_Adams_36.79"
Drainage Area = 168 Sq. Mi.
Stream Slope (HGL) = 6.7 ft./Mi.
Avg. Low Water Stage = 1094.0

Q_{50} = 18,000 cfs
Stage = 1112.07
Channel Low Beam = 1143.70
Backwater = 0.24 ft.
Avg. Bridge Velocity = 4.9 fps

Q_{100} = 21,200 cfs
Stage = 1113.03
Operational Low Beam = 1137.62
Backwater = 0.36 ft.
Avg. Bridge Velocity = 5.2 fps

Q_{200} = 24,500 cfs
Stage = 1113.92
Calculated Design Scour = 1079.20

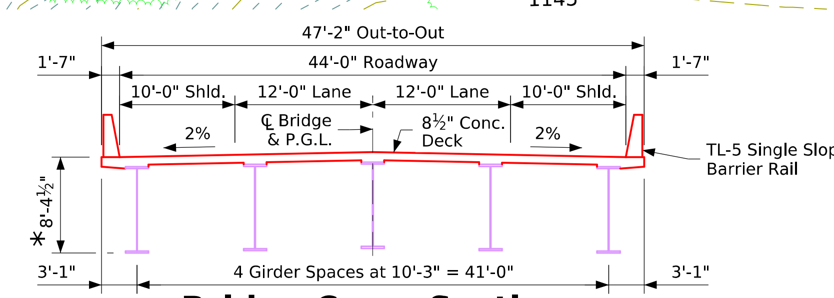
Q_{500} = 28,300 cfs
Stage = 1114.90
Avg. Bridge Velocity = 5.9 fps
Calculated Check Scour = 1078.00

Roadway Overtop 1129.13
Sta. 483+33.05

Extreme HW Stage = 1116.08
Date = June 1947

Situation Plan

All dimensions are in feet unless noted otherwise.



Bridge Cross Section

(Looking East)

* Structure depth of 8.38' assumes 8.5 in. deck, 2 in. concrete haunch, and 90 in. girder depth.

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.

David J. Mulholland — 07-23-2024
Signature — Date

David J. Mulholland
Printed or Typed Name

My license renewal date is December 31, 2024

Pages or sheets covered by this seal: Sheets V.1 - V.3 (Hydraulic Data, Channel Grading and Revetment)

SHUCK-BRITSON

Preliminary

Design For 45° Skew LA

880'-0" x 44'-0" Continuous Welded Plate Girder Bridge

200'-0" / 180'-0" End Spans — 265'-0" / 235'-0" Interior Span

Situation Plan

STA. 496+24.59 (℄ Relocated US 34) — Turn-in Date: August, 2024

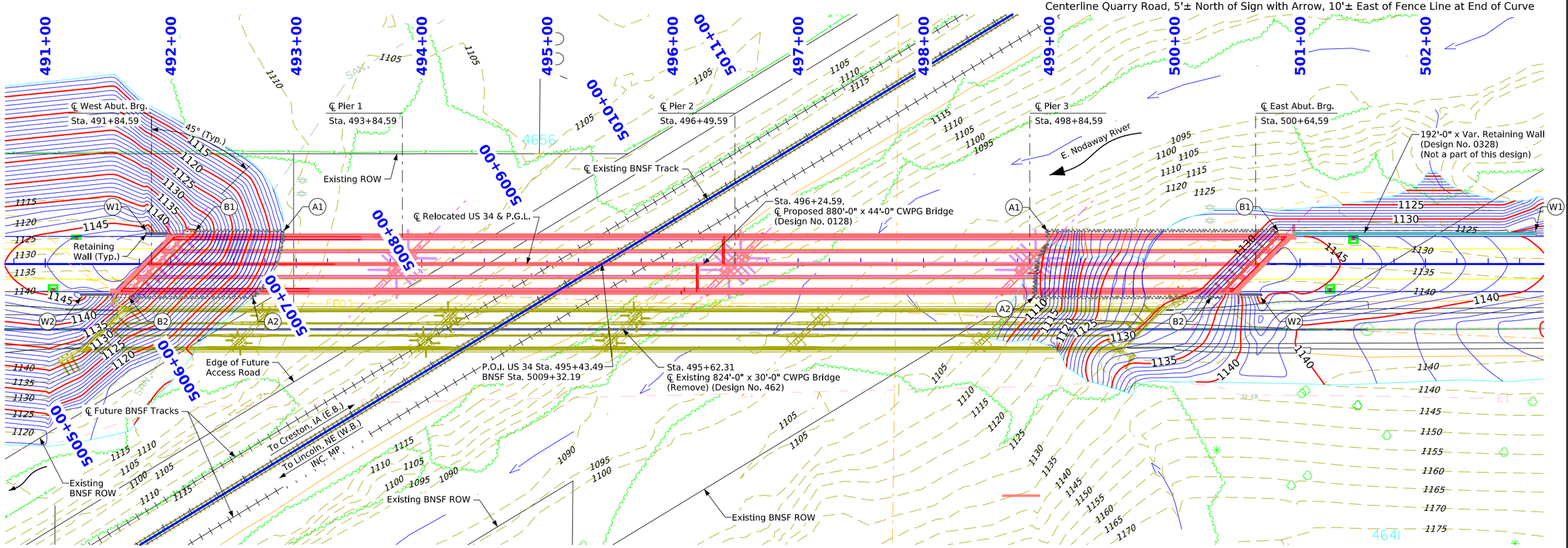
Adams County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0128 — Design Sheet No. 2 of 4 — FHWA No. 013321

FILE NO. 32611	ENGLISH	DESIGN TEAM JLH/JAG/CLS 121.1240.01K	Adams COUNTY	PROJECT NUMBER BRF-034-3(041)--38-02	SHEET NUMBER V.2

Control Point: FENO3 Northing 6224262.67 Easting 22225760.64 Elev. 1127.91 Set Feno Monument 15'± West of Centerline Quarry Road, 5'± North of Sign with Arrow, 10'± East of Fence Line at End of Curve



Berm Slope Location Table

Points	West Abutment			East Abutment		
	Station	Offset	Elev.	Station	Offset	Elev.
A1	492+90.34	26.58' Lt.	1111.18	498+98.37	26.58' Lt.	1108.58
A2	492+65.54	26.58' Rt.	1112.06	498+87.61	26.58' Rt.	1112.03
B1	492+19.84	26.58' Lt.	1135.41	500+82.51	26.58' Lt.	1134.12
B2	491+66.67	26.58' Rt.	1135.41	500+29.34	26.58' Rt.	1134.12
W1	491+80.46	26.58' Lt.	1147.51	502+87.72	26.58' Lt.	1139.78
W2	491+28.46	26.58' Rt.	1146.18	500+68.72	26.58' Rt.	1146.26

Berm slope elevations reflect the grading surface.

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

Utilities Note:

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

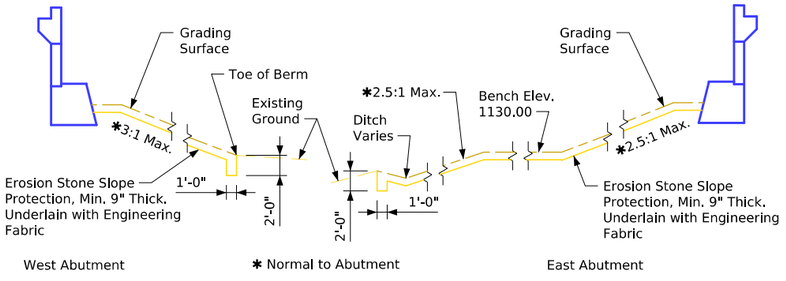
0 80
Scale In Feet

N

Estimated Berm Armoring Quantities

Location	Erosion Stone (Ton)	Engineering Fabric (SY)	CL. 10 Channel Excavation (CY)
Berm Lining - West Abutment	250	620	155
Berm Lining - East Abutment	433	1098	267
Totals	683	1718	422

Excavation Quantity Calculated from Grading Surface.
Erosion Stone Estimated at 1.6 Ton/CY.



Section Thru Embedded Erosion Stone

Preliminary

Design For 45° Skew LA

880'-0" x 44'-0" Continuous Welded Plate Girder Bridge

200'-0" / 180'-0" End Spans — 265'-0" / 235'-0" Interior Span

Site Plan

STA. 496+24.59 (℄ Relocated US 34)

Turn-in Date: August, 2024

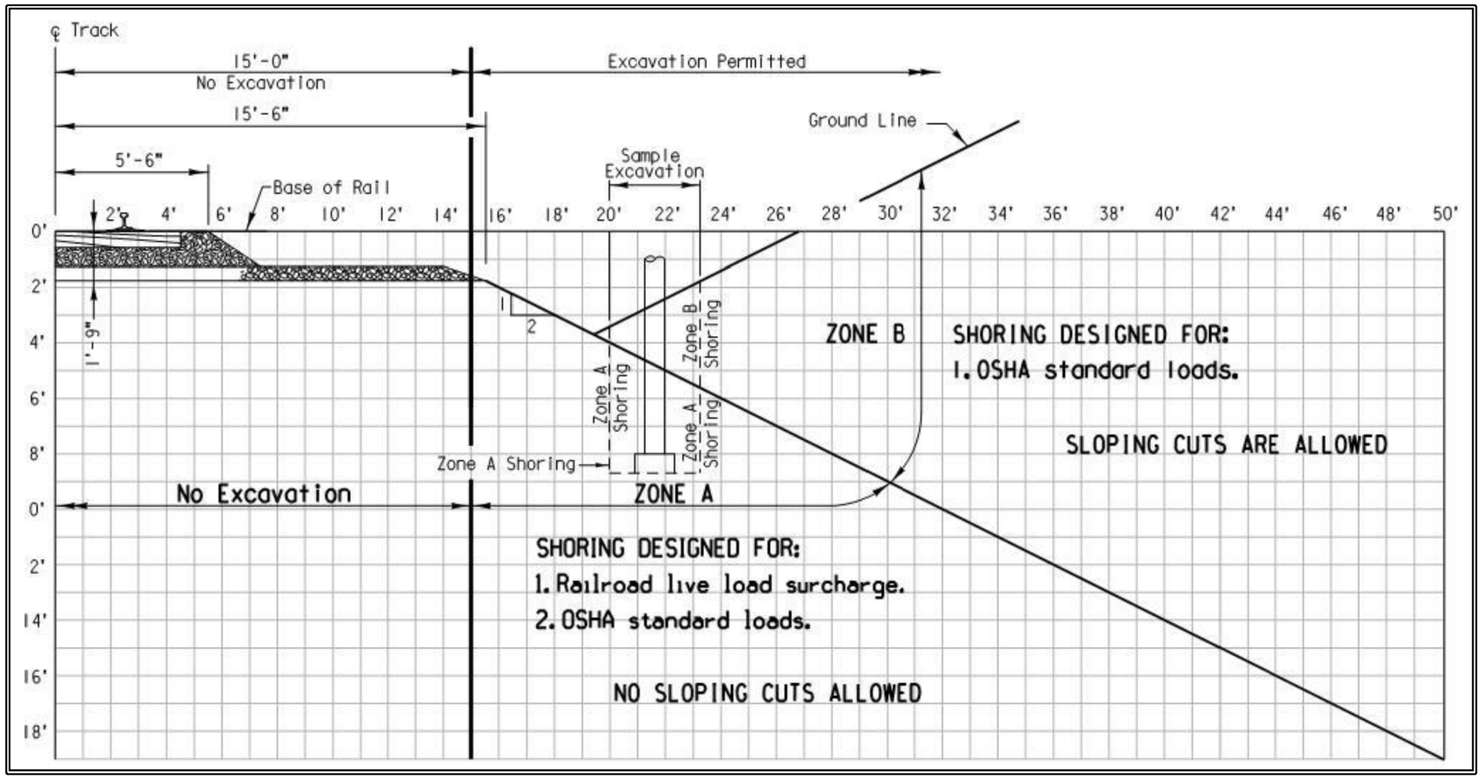
Adams County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0128 — Design Sheet No. 3 of 4 — FHWA No. 013321

FILE NO. 32611	ENGLISH	DESIGN TEAM JLH/JAG/CLS 121,1240,01K	Adams COUNTY	PROJECT NUMBER BRF-034-3(041)--38-02	SHEET NUMBER V.3	

10:25:32 AM 8/29/2024 csallade pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\0203402022\Bridge\(041)_Bridge Replacement-Steel Girder\SHT_02034041_SBI_0128_013321_Z12.dgn



Railroad General Notes:

Railroad review and approval of shoring, erection, demolition, and falsework is required. Allow a minimum of four weeks for the review and approval of each submittal.

The proposed grade separation project shall not increase the quantity and/or characteristics of the flow in the railroad's ditches and/or drainage structures.

The elevation of the existing top-of-rail profile shall be verified before beginning construction. All discrepancies shall be brought to the attention of the railroad prior to construction.

The Contractor must submit a proposed method of erosion and sediment control and have the method approved by the railroad.

All shoring systems that impact the railroad's operations and/or supports the railroad's embankment shall be designed and constructed per current railroad guidelines for temporary shoring.

All demolitions within the railroad's right-of-way and/or demolition that may impact the railroad's tracks or operations shall be in compliance with the railroad's demolition guidelines.

Erection over the railroad's right-of-way shall be designed to cause no interruption to the railroad's operation, enabling the track(s) to remain open to traffic per the railroad's requirements.

All construction phasing that may impact the railroad operations shall be designed to cause no interruption to the railroad's operation, enabling the track(s) to remain open to traffic per the railroad's requirements.

False-work clearances shall comply with minimum construction clearances.

All permanent clearances shall be verified before project closing.

For railroad coordination please refer to the railroad coordination requirements as part of special provisions.

General Excavation Zones

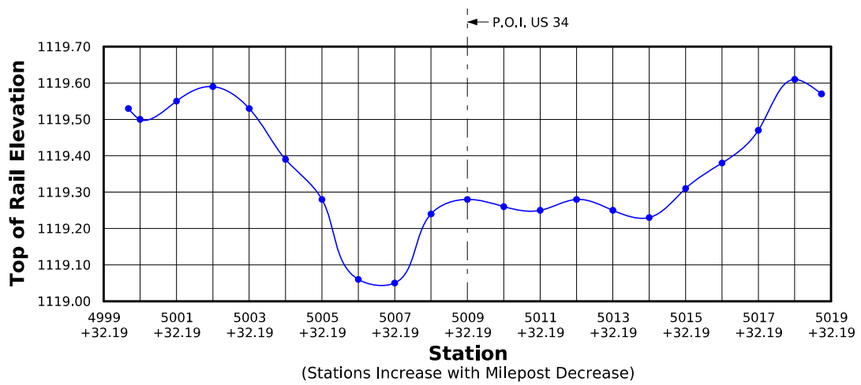
Source: UPRR & BNSF Guideline for Temporary Shoring, 2021

General Shoring Notes:

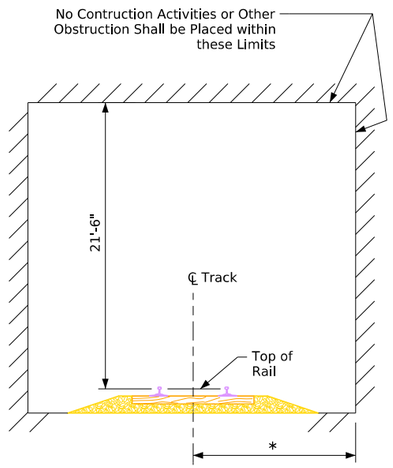
All dimensions are measured perpendicular to track.

Prior to commencing any work, the Contractor shall submit for approval by the Railroad detailed plans indicating the nature and extent of the track protection shoring proposed. The Contractor shall install the temporary shoring system per the approved plans. Design of the temporary shoring system to comply with UPRR & BNSF Guidelines for Temporary Shoring.

For excavations which encroach into Zone A or B, shoring plans shall be accompanied by design calculations. Plans and calculations must be signed and stamped by a Professional Engineer registered in the State of Iowa.



BNSF Track Profile



Minimum Construction Clearance Envelope

(Normal to Railroad)

* 15'-0" for BNSF and 15'-0" for UPRR

Top of Rail Elevations

(Stations Increase with Milepost Decrease)

Main Line

Alignment: Left Rail		Alignment: Right Rail	
Station	Elevation	Station	Elevation
5000+00.00	1119.53	5000+00.00	1119.53
5000+32.19	1119.50	5000+32.19	1119.50
5001+32.19	1119.55	5001+32.19	1119.55
5002+32.19	1119.59	5002+32.19	1119.59
5003+32.19	1119.53	5003+32.19	1119.53
5004+32.19	1119.39	5004+32.19	1119.39
5005+32.19	1119.28	5005+32.19	1119.28
5006+32.19	1119.06	5006+32.19	1119.06
5007+32.19	1119.05	5007+32.19	1119.05
5008+32.19	1119.24	5008+32.19	1119.24
(1) 5009+32.19	1119.28	(1) 5009+32.19	1119.28
5010+32.19	1119.26	5010+32.19	1119.26
5011+32.19	1119.25	5011+32.19	1119.25
5012+32.19	1119.28	5012+32.19	1119.28
5013+32.19	1119.25	5013+32.19	1119.25
5014+32.19	1119.23	5014+32.19	1119.23
5015+32.19	1119.31	5015+32.19	1119.31
5016+32.19	1119.38	5016+32.19	1119.38
5017+32.19	1119.47	5017+32.19	1119.47
5018+32.19	1119.61	5018+32.19	1119.61
5019+05.75	1119.57	5019+05.75	1119.57

(1) ℄ of Mainline US 34 Along Track Stationing is 495+43.49
℄ of Tracks Along Mainline US 34 Stationing is 5009+32.19

Note:
BNSF = Burlington Northern Santa Fe Railroad
UPRR = Union Pacific Railroad

Preliminary

Design For 45° Skew LA

880'-0" x 44'-0" Continuous Welded Plate Girder Bridge

200'-0" / 180'-0" End Spans — 265'-0" / 235'-0" Interior Span

BNSF General Notes and Shoring

STA. 496+24.59 (℄ Relocated US 34) — Turn-in Date: August, 2024

Adams County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0128 — Design Sheet No. 4 of 4 — FHWA No. 013321

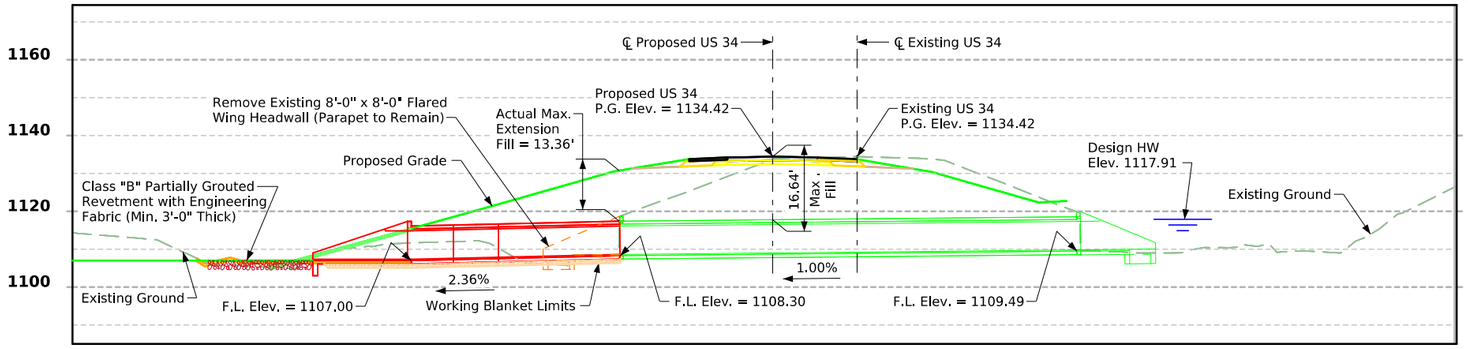
SHUCK-BRITSON

FILE NO. 32611	ENGLISH	DESIGN TEAM JLH/JAG/CLS 121.1240.01K	BNSF & UPRR General Notes & Shoring	Standard Sheet 1067	AdamsCOUNTY	PROJECT NUMBER BRF-034-3(041)--38-02	SHEET NUMBER V.4

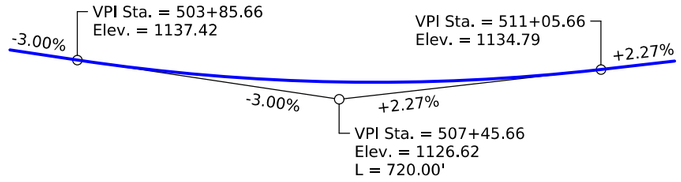
10:25:36 AM 8/29/2024 csallade pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\0203402022\Bridge\(041)_Bridge Replacement-Steel Girder\SHT_02034041_SBI_0128_013321_Z12.dgn

Revised 07-2019: For UPRR, Changed Horizontal Distance of Minimum Construction Clearance Envelope to 15'-0" (Was 12'-0").
Revised 03-2022: Updated "General Excavation Zones" Detail and "General Shoring Notes" to Follow the "UPRR & BNSF Guidelines for Temporary Shoring, 2021".
Issued 12-2008.
MiscellaneousBridges.dgn - 1067 - This Sheet Re-Issued 11-2023, Sheet Format Update.

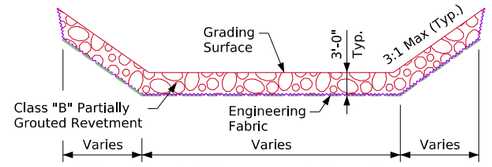
Control Point: FENO3 Northing 6224262.67 Easting 22225760.64 Elev. 1127.91 Set Feno Monument 15'± West of Centerline Quarry Road, 5'± North of Sign with Arrow, 10'± East of Fence Line at End of Curve



Longitudinal Section Along ℄ Culvert



Proposed Profile Grade Relocated US 34



Typical Channel Protection

Anticipated Settlement = X"
Extension Design Fill Height = 17'
NBIS Structure Length = 8.0'

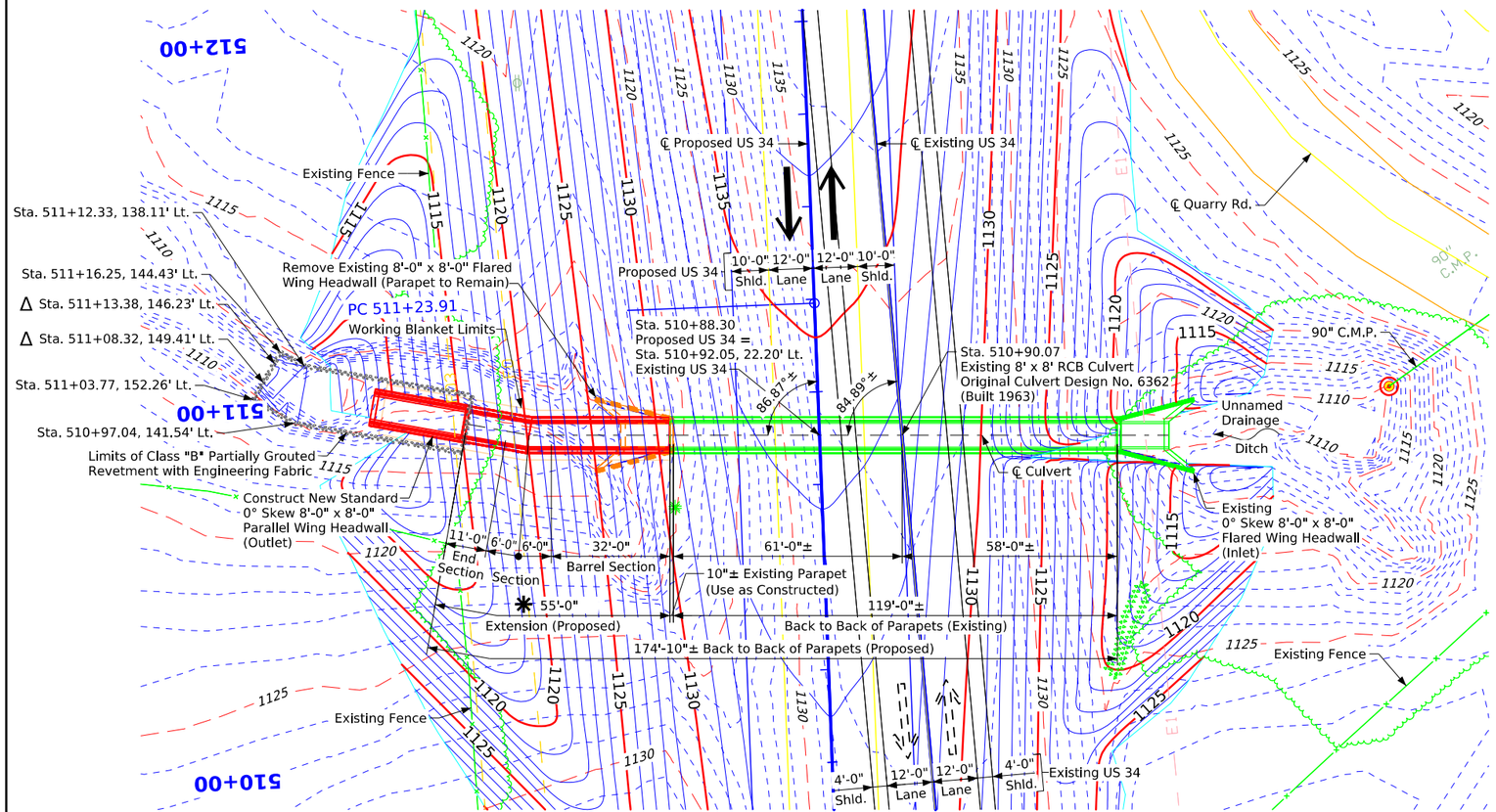
Note:
Reinforced concrete box culvert extensions shall be cast-in-place. Cast-in-place details are intended to accomodate varying as-built conditions of the existing culvert.

Estimated Revetment Quantities Included With Road Plans

Location	Revetment Class "B" (Ton)	Engineering Fabric (SY)	Cl. 10 Channel Excavation (CY)	Grout (CY)
Inlet	---	---	---	---
Outlet	108	115	70	11
Totals	108	115	70	11

Excavation quantity is calculated from grading surface. Excavation quantity is for embedded revetment core out only, and does not include excavation to the grading surface.
The revetment details shown are a modification of Standard Sheet 1092 to accomodate velocities that exceed policy limits.

Δ Top of Revetment / Grading Surface Elev. 1106.00



Situation Plan

Existing US 34 granular shoulder not shown for clarity.

✱ Extension length from front of existing parapet to back of new parapet.

Hydraulic Data

RIDB: "Not Applicable"
Drainage Area = 330.9 Acres (Very Hilly / Mixed Cover)
Stream Slope = 68.6 Ft./Mi.
Q_{50} = 577 cfs
HW Elev. = 1117.91
Exit Velocity = 20.7 fps

Q_{100} = 693 cfs
HW Elev. = 1119.01
Exit Velocity = 21.7 fps

Location

US 34 over unnamed drainage ditch
T-71N R-34W
Section 3
Jasper Township
Adams County
Asset ID No. 900755
Latitude 40.979695°
Longitude -94.743162°

Traffic Estimate

2016 AADT	2,960 V.P.D.
2047 AADT	3,800 V.P.D.
2047 DHV	390 V.P.H.
TRUCKS	19 %
Total Design ESALs	--

0 40 Scale In Feet

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

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.

David J. Mulholland — 07-23-2024
Signature — Date
David J. Mulholland
Printed or Typed Name
My license renewal date is December 31, 2024

Pages or sheets covered by this seal: Sheet V.5 (Hydraulic Data, Channel Grading and Revetment)

Design For 3° Skew (LA) with 10° Bend Section

Single 8' x 8' Reinforced Concrete Box Culvert Extension

Situation Plan

STA. 510+88.30 (CL Relocated US 34)
Turn-in Date: August, 2024

Adams County

IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0228 | Design Sheet No. 1 of 1 | FHWA/Asset 900755

SHUCK-BRITSON

FILE NO. 32611	ENGLISH	DESIGN TEAM JLH/JAG/CLS	Adams COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER V.5

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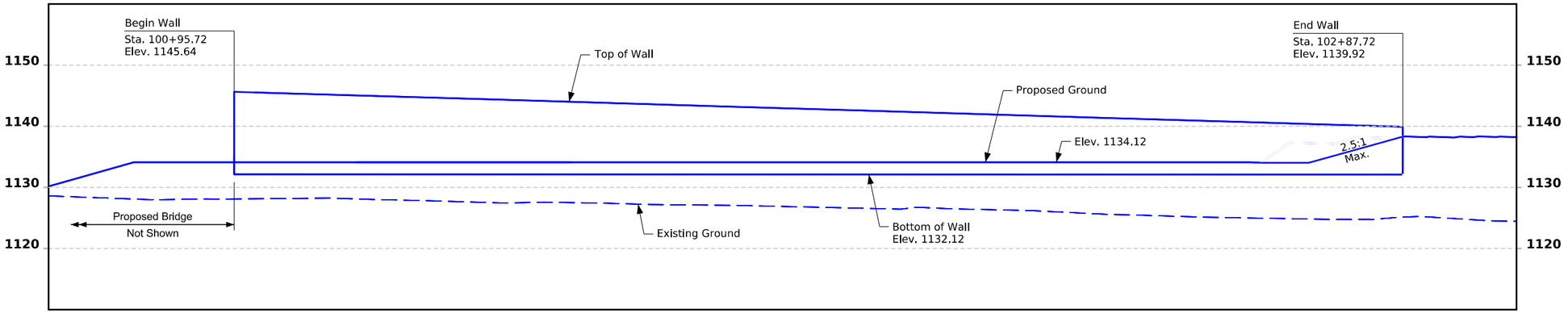
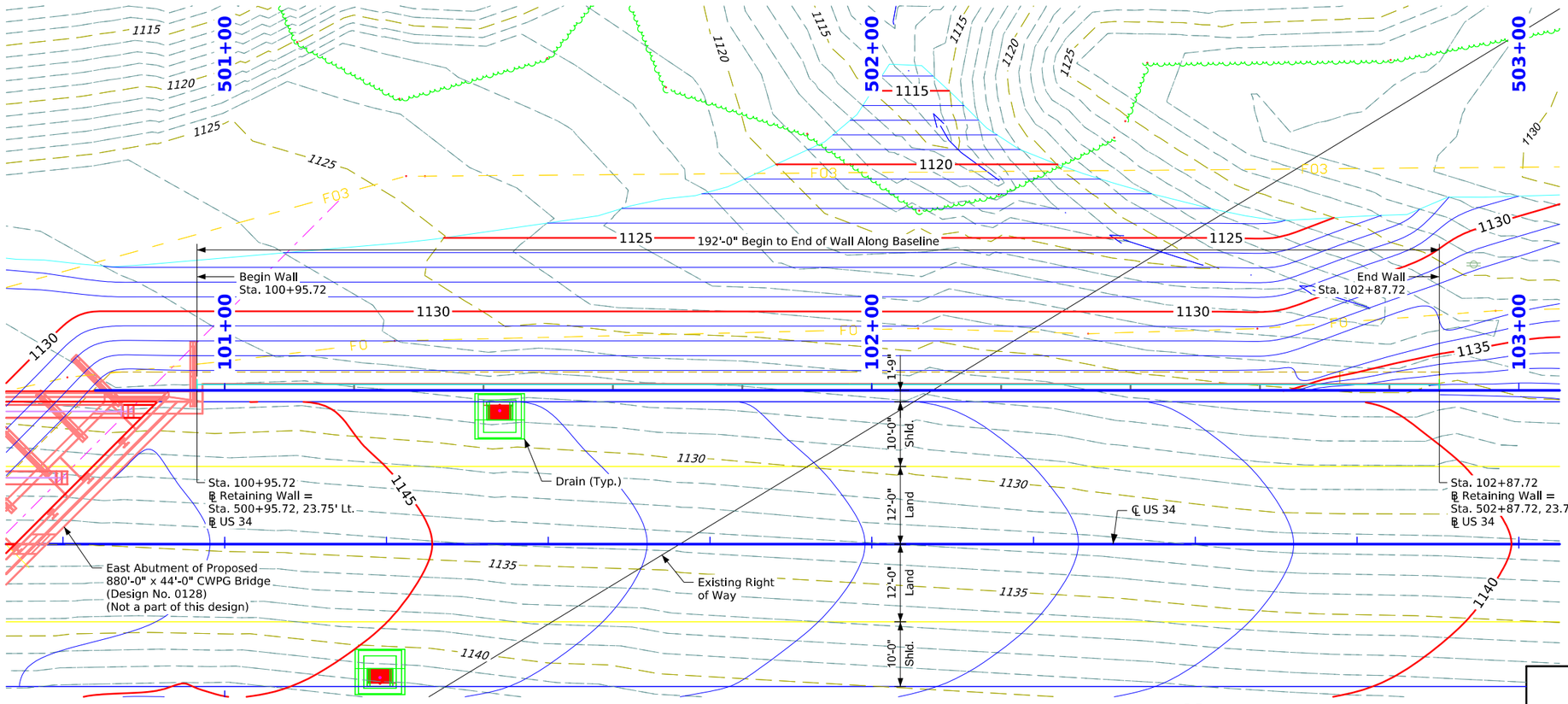
Control Point: FENO3 Northing 6224262.67 Easting 22225760.64 Elev. 1127.91 Set Feno Monument 15'± West of Centerline Quarry Road, 5'± North of Sign with Arrow, 10'± East of Fence Line at End of Curve



Note:
During final design, the economics of constant footing vs. counterforts shall be determined.

Longitudinal Section Along ℄ Retaining Wall

Note: Top of wall is 0.44 feet below the profile grade of US 34.
Counterfort spacing and contraction or expansion joints not shown.

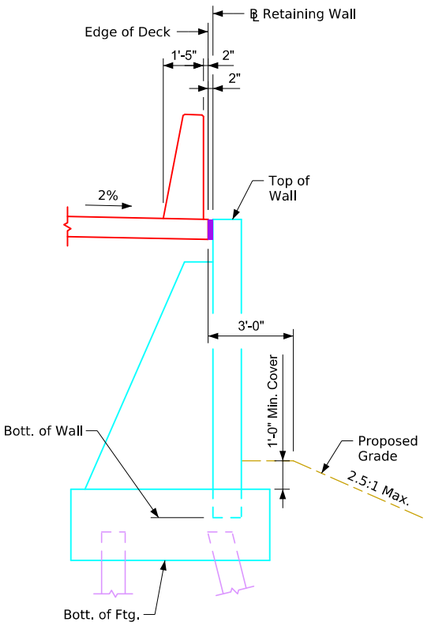


Situation Plan

All dimensions are in feet unless noted otherwise.

N

0 20
Scale In Feet



Typical Section thru Wall

(Counterfort Alternate Shown)

Location

Retaining wall adjacent to US 34
T-71N R-34W
Section 3
Jasper Township
Adams County
Asset ID No. MIS000049
Latitude 40.979714°
Longitude -94.746410°

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

Utilities Note:

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

SHUCK-BRITSON

Design For A
192' x Variable Height Cast In Place Retaining Wall

Situation Plan

STA. 501+91.71 (US 34)
Turn-in Date: August, 2024

Adams County
IOWA DEPARTMENT OF TRANSPORTATION

Design No. 0328 | Design Sheet No. 1 of 1 | Asset ID No. MIS000049

FILE NO. 32611	ENGLISH	DESIGN TEAM JLH/JAG/CLS	Adams COUNTY	PROJECT NUMBER BRF-034-3(041)--38-02	SHEET NUMBER V.6

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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
Concrete	
(0)	Barrier Concrete
(0)	Barrier Concrete Footing
(0)	Curb Gutter
(48)	Flowable Mortar
(0)	Median Concrete
(0)	PCC Pavement
(0)	Sidewalk
Shoulder	
(209)	Shoulder HMA
(0)	Shoulder PCC
(6)	Shoulder Granular
Existing	
(0)	Existing Pavement
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
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 Substrata
(48)	Broken Weathered Substrata
(3)	Core Out Substrata
(203)	Existing Pavement Substrata
(6)	Loam Substrata
(80)	Rock Substrata
(4)	Select Sand Substrata
(3)	Shale Substrata
(10)	Topsoil Substrata
Unsuitable / Waste	
(3)	Unsuitable Type A
(13)	Unsuitable Type B
(11)	Unsuitable Type C
(3)	Waste

NOTES:

Text

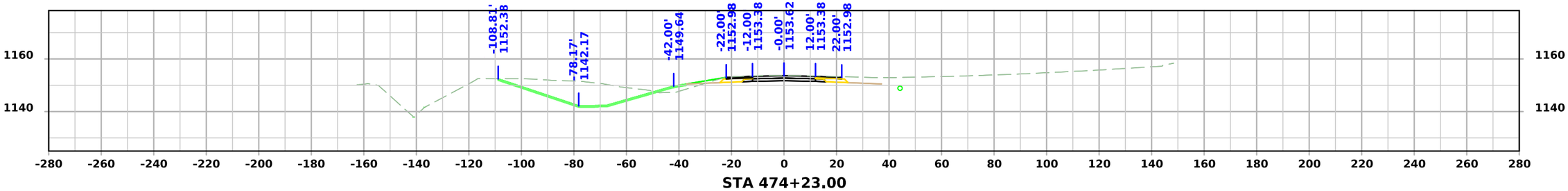
NOTES:

Text

CROSS SECTIONS
LEGEND AND INFORMATION SHEET

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

Highway 34



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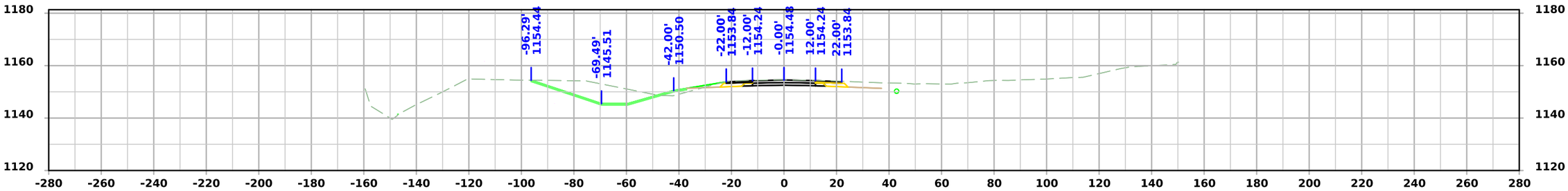

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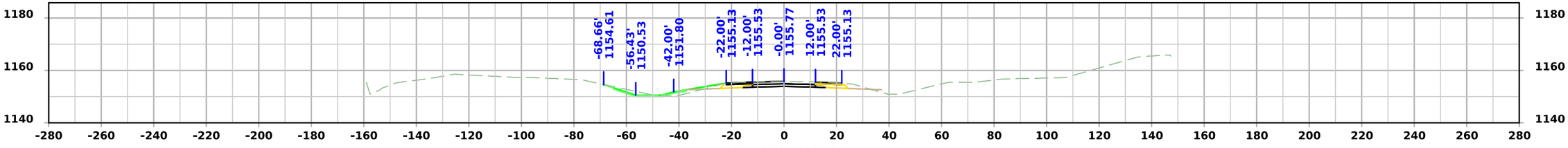

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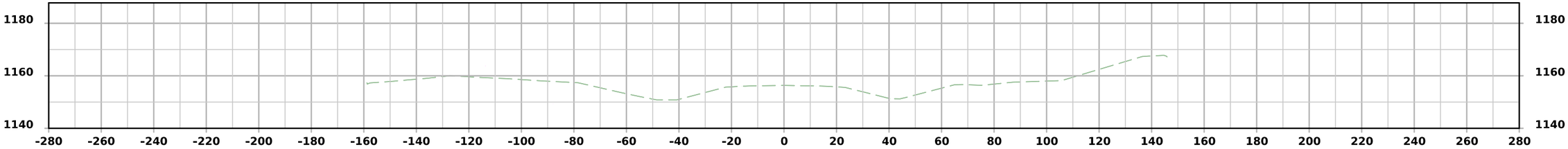

STA 473+50.00

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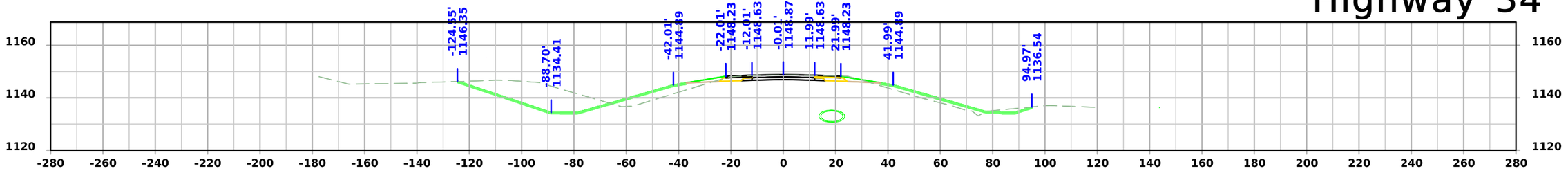
Highway 34



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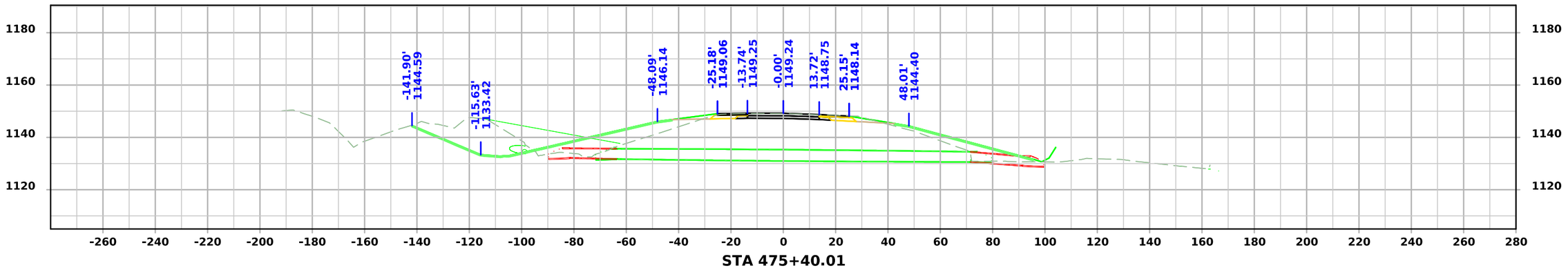

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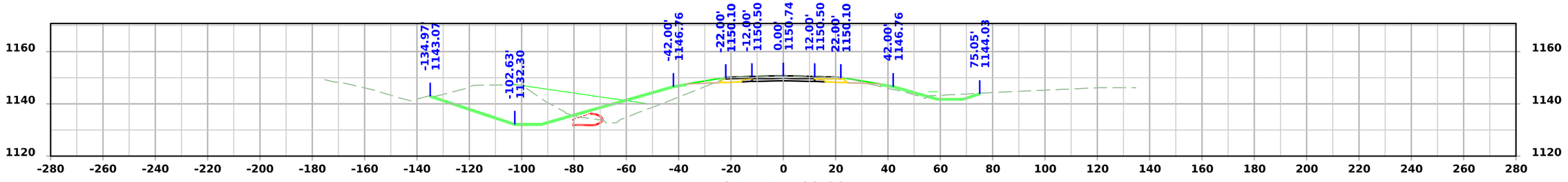

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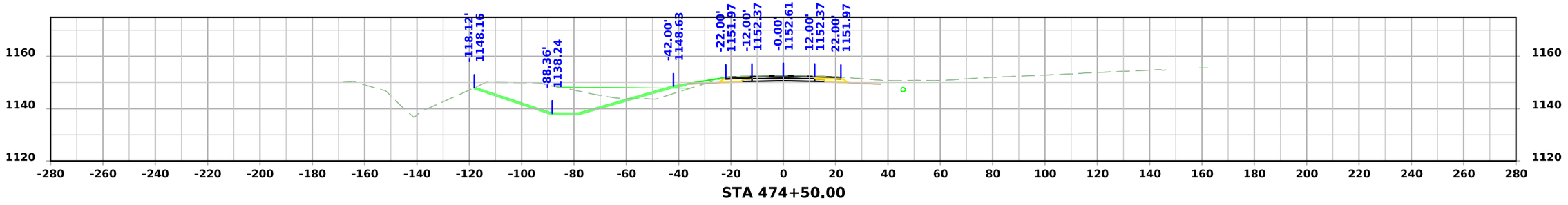

STA 474+50.00

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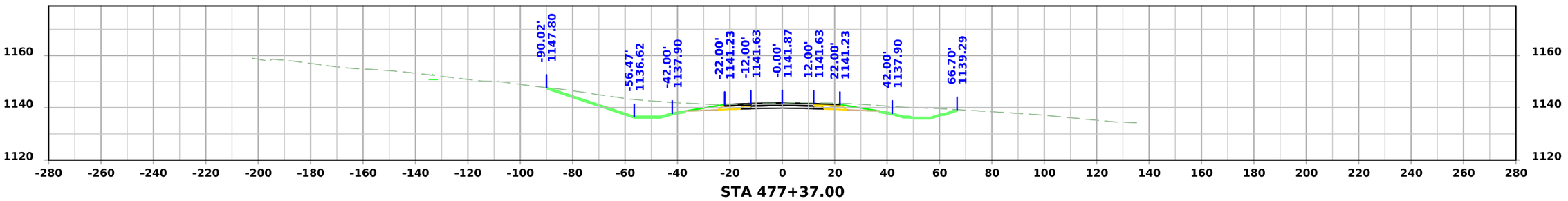
Highway 34



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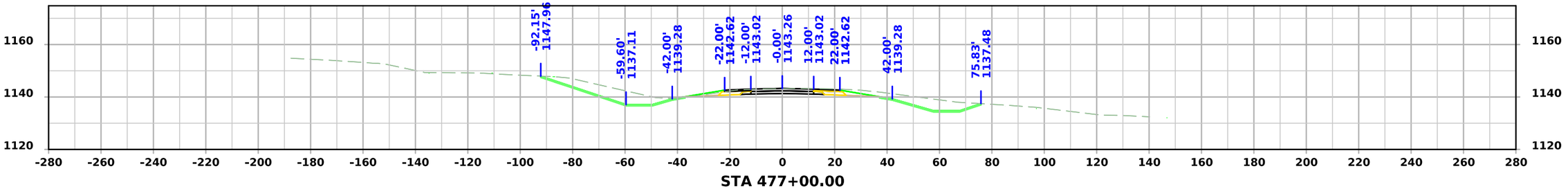

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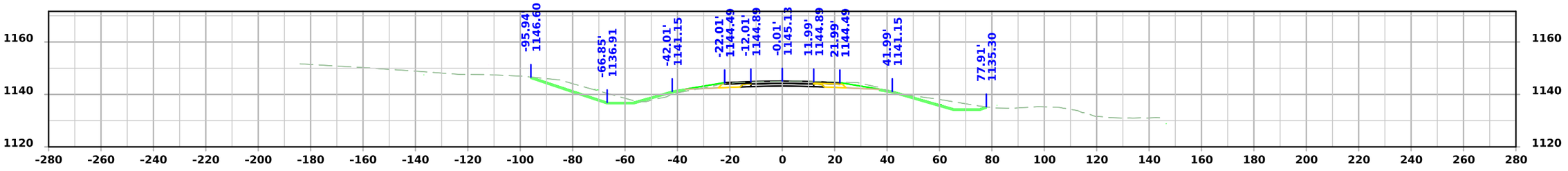

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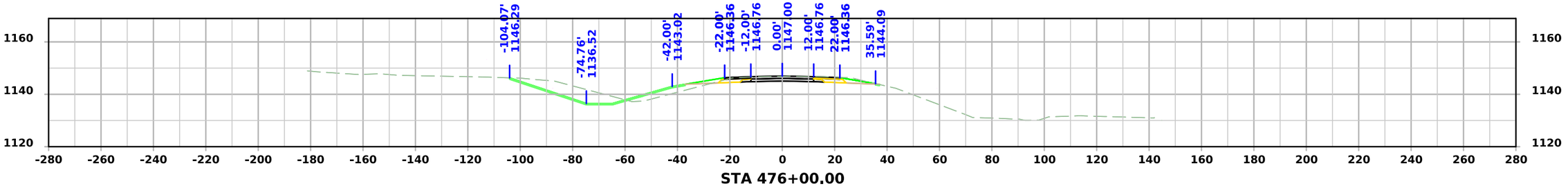

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FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER W.4

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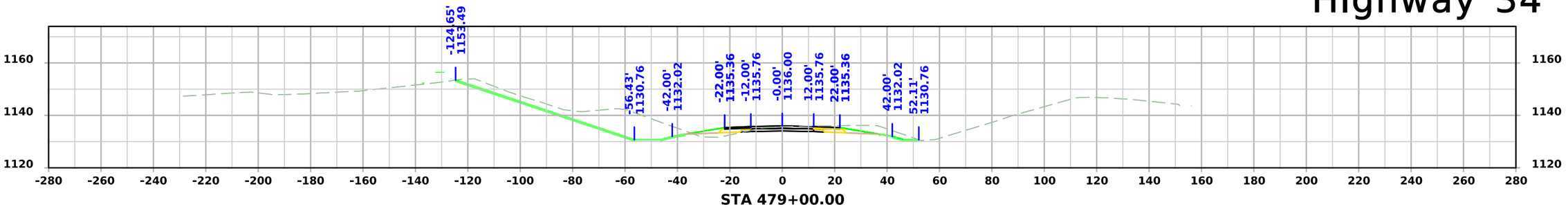
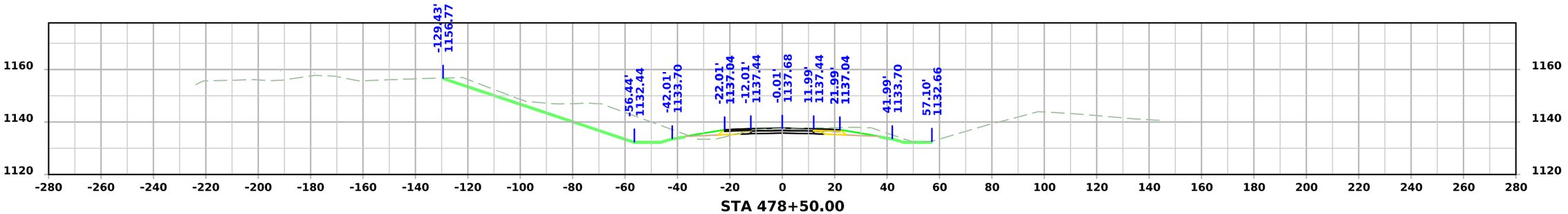
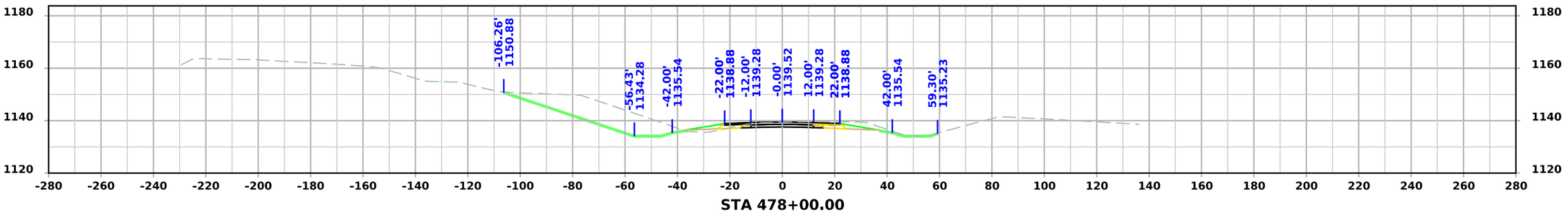
Highway 34



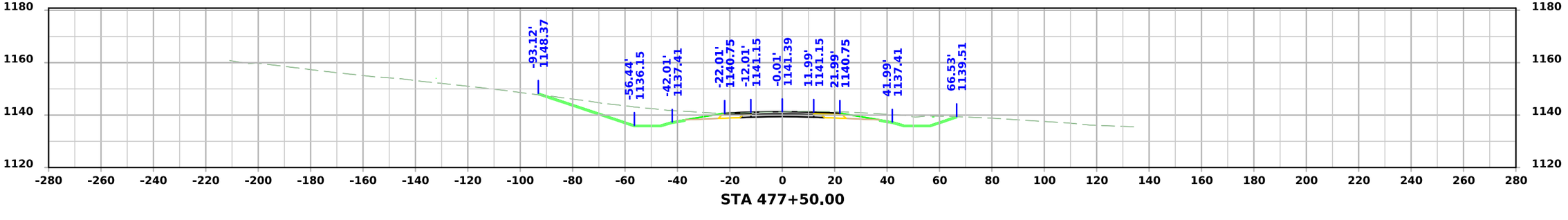
STA 479+00.00



STA 478+50.00



STA 478+00.00

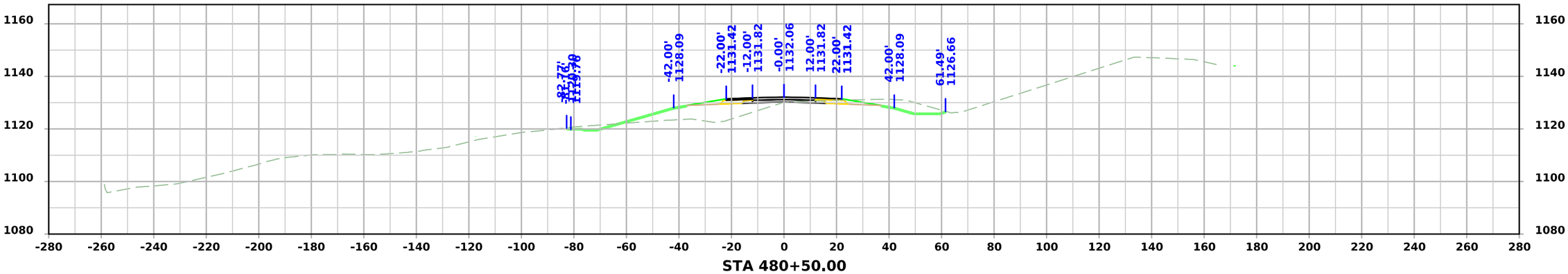


STA 477+50.00

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER W.5

11:54:18 AM 9/6/2024 bjohnson pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\0203402022\Design\CADD_Files\Sheet_Files\SHT_02034041Z12_W02.dgn

Highway 34



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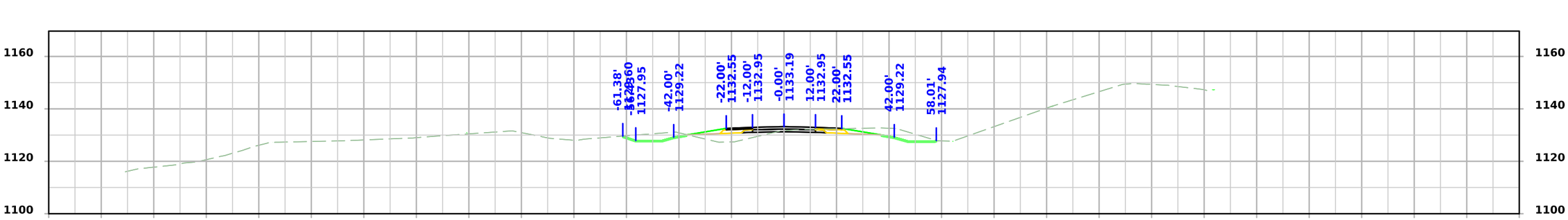

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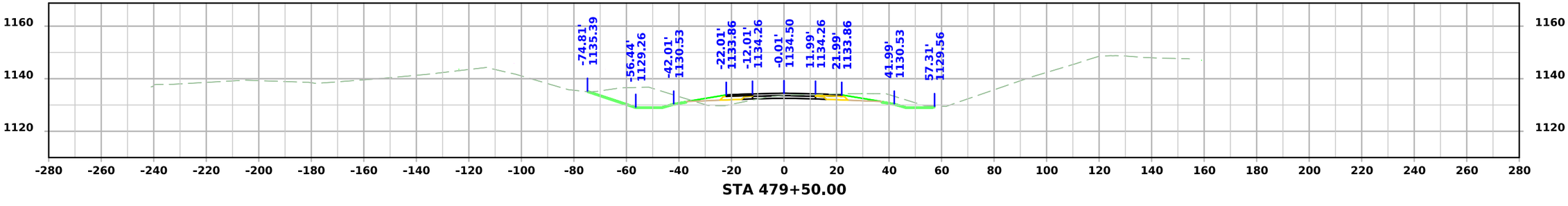
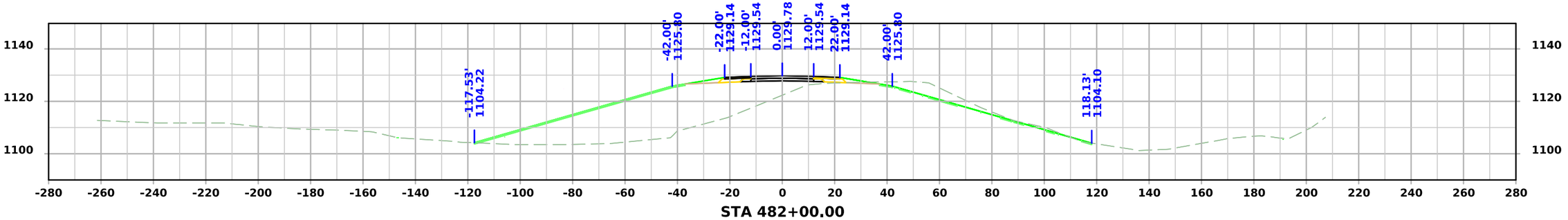


STA 479+50.00

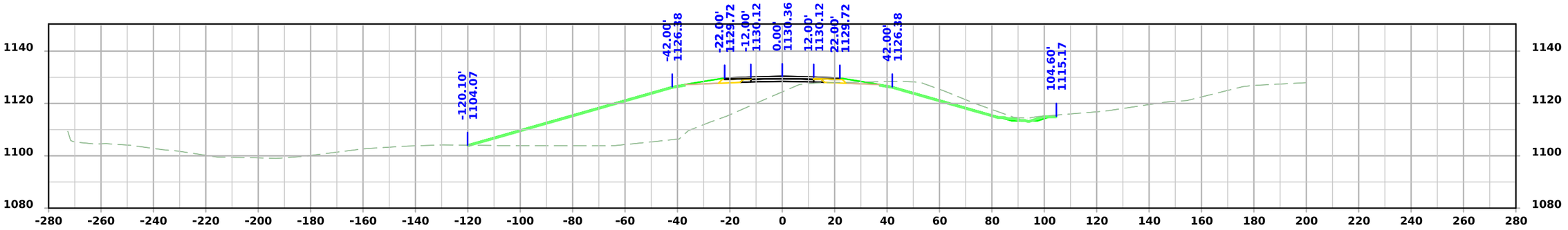
FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER W.6

11:54:19 AM 9/6/2024 bjohnson pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\0203402022\Design\CADD_Files\Sheet_Files\SHT_02034041Z12_W02.dgn

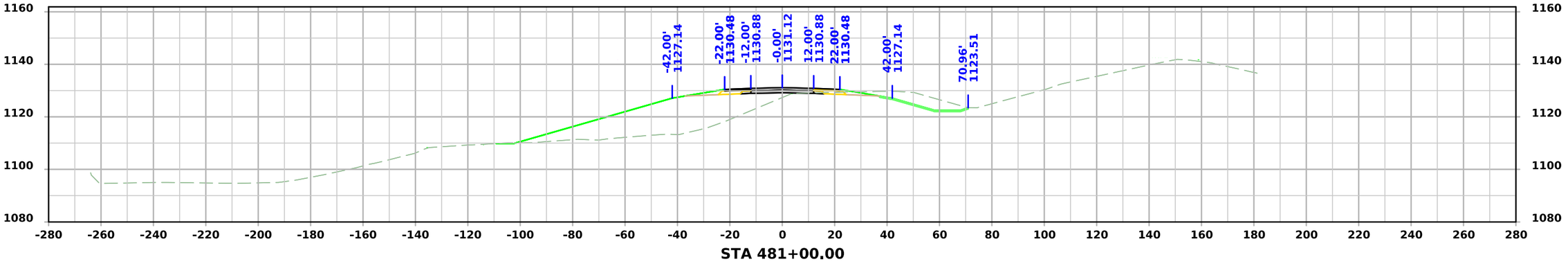
Highway 34



STA 482+00.00



STA 481+50.00

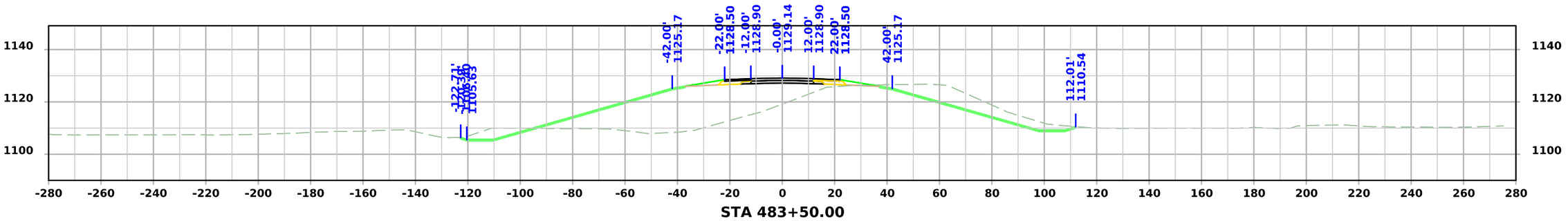


STA 481+00.00

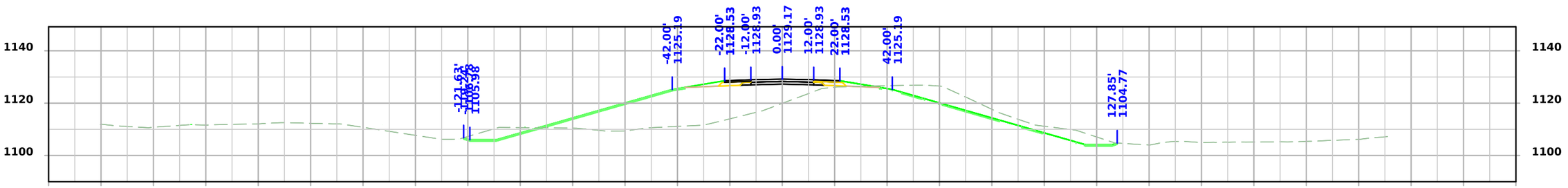
FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER W.7

11:54:20 AM 9/6/2024 bjohnson pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\0203402022\Design\CADD_Files\Sheet_Files\SHT_02034041Z12_W02.dgn

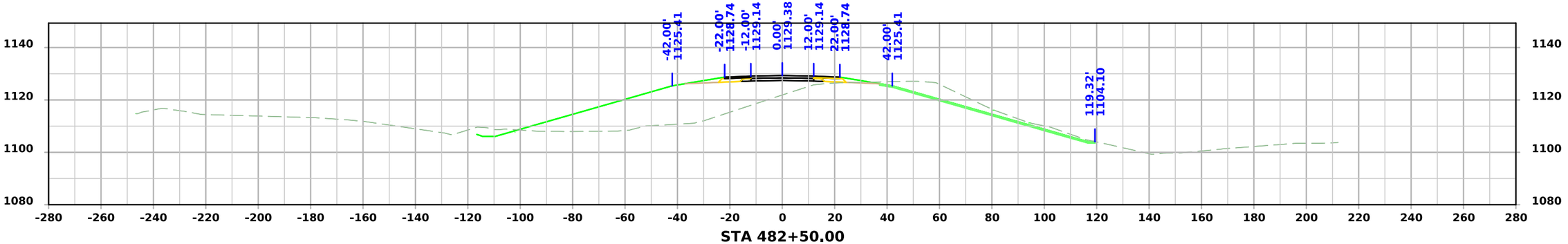
Highway 34



STA 483+50.00



STA 483+00.00

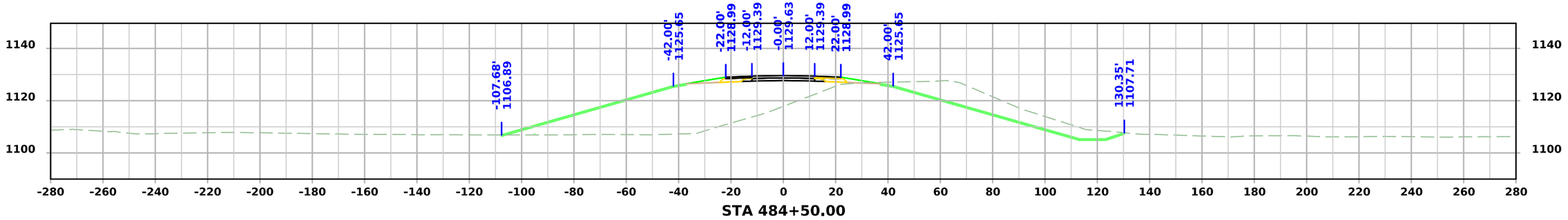


STA 482+50.00

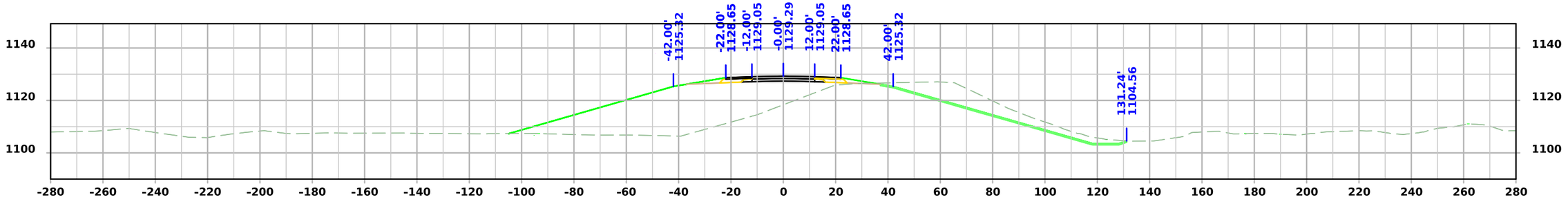
FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER W.8

11:54:21 AM 9/6/2024 bjohnson pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\0203402022\Design\CADD_Files\Sheet_Files\SHT_02034041Z12_W02.dgn

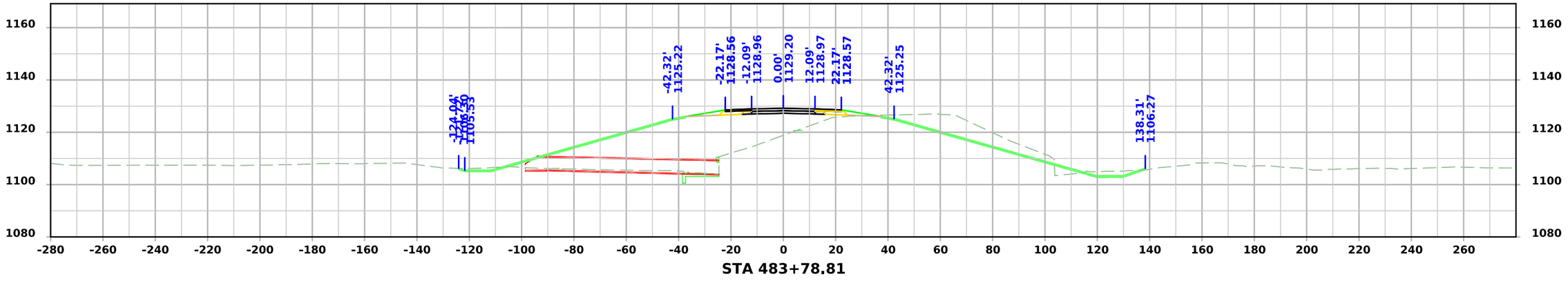
Highway 34



STA 484+50.00



STA 484+00.00

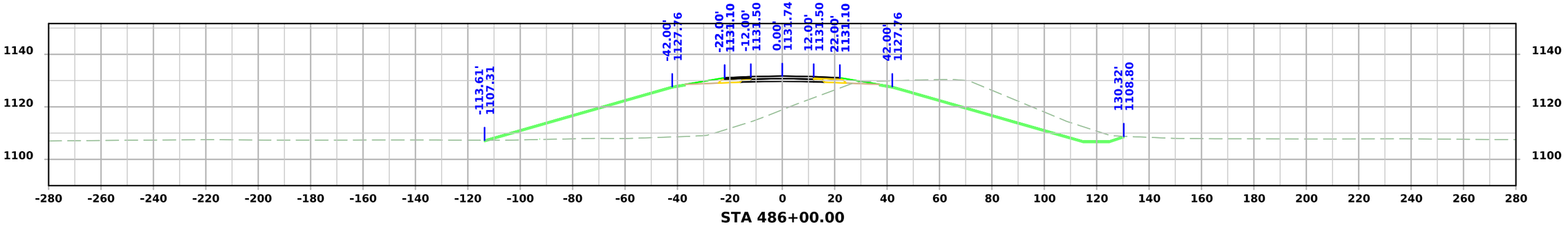


STA 483+78.81

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER W.9

11:54:22 AM 9/6/2024 bjohnson pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\0203402022\Design\CADD_Files\Sheet_Files\SHT_02034041Z12_W02.dgn

Highway 34



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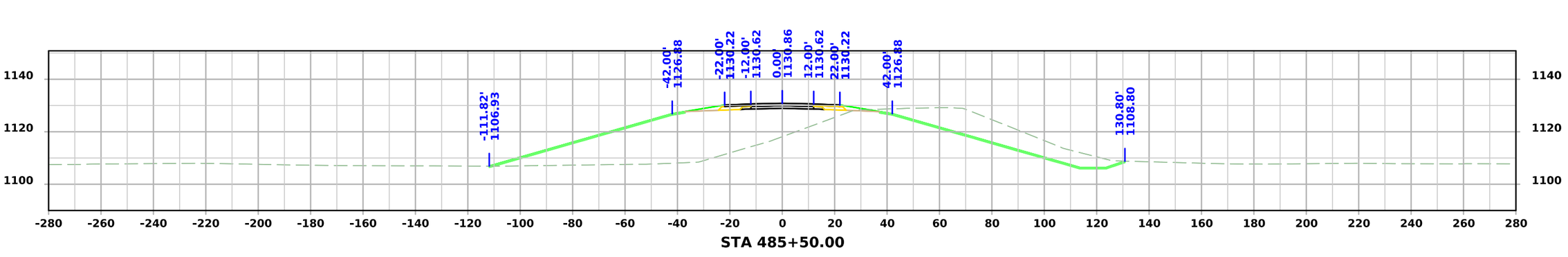

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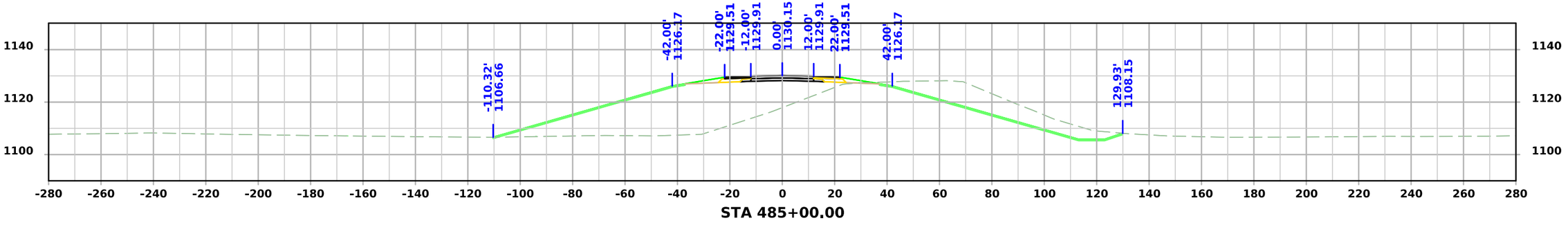

STA 485+00.00

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER W.10

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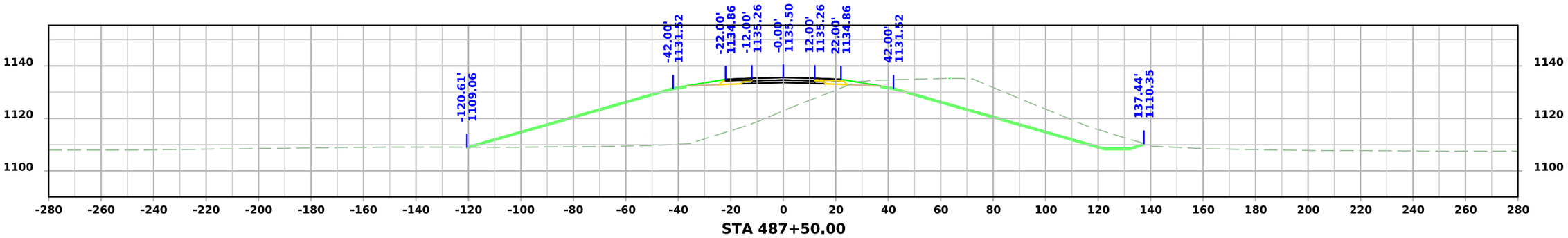
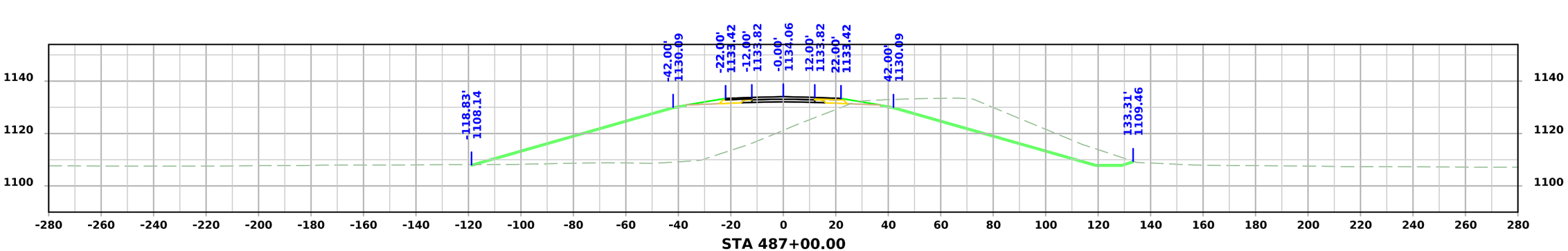
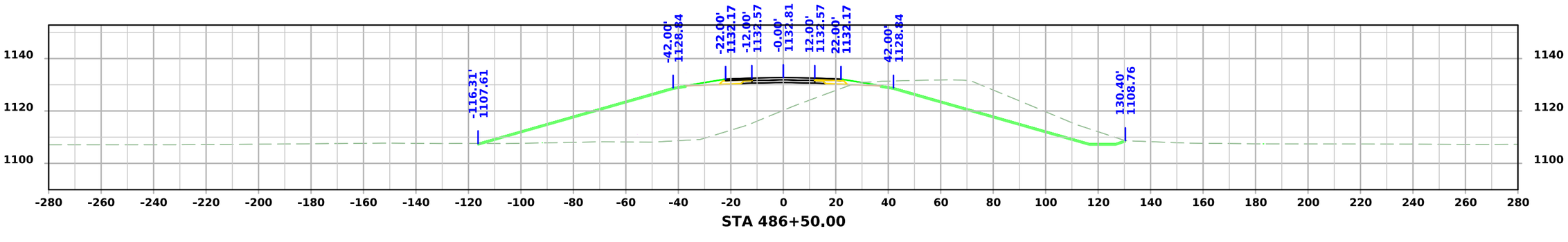
Highway 34



STA 487+50.00



STA 487+00.00

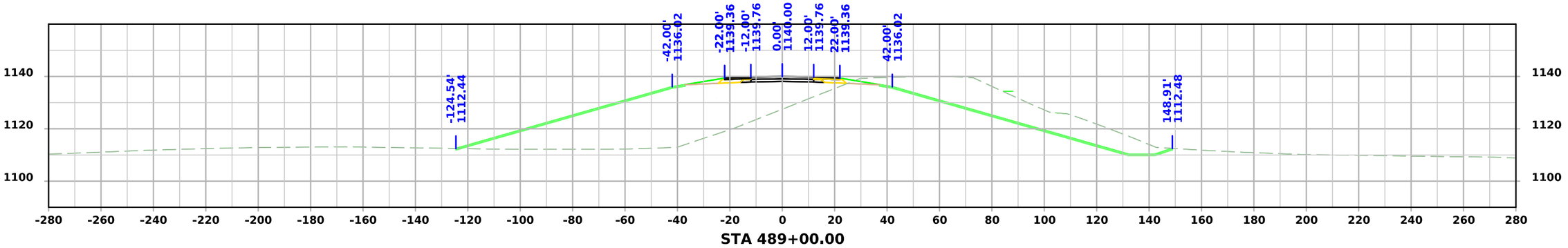


STA 486+50.00

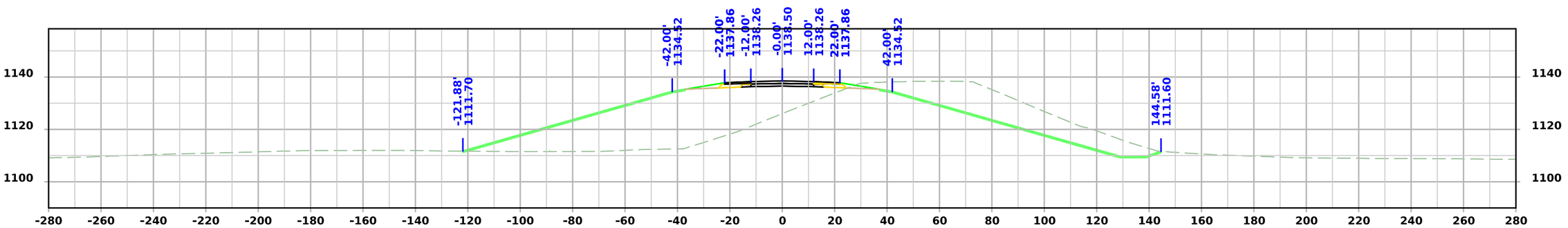
FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER W.11

11:54:24 AM 9/6/2024 bjohnson pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\0203402022\Design\CADD_Files\Sheet_Files\SHT_02034041Z12_W02.dgn

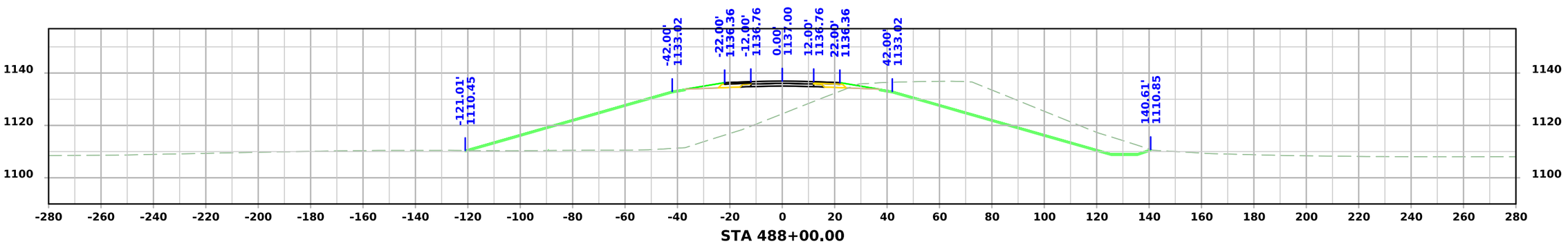
Highway 34



STA 489+00.00



STA 488+50.00

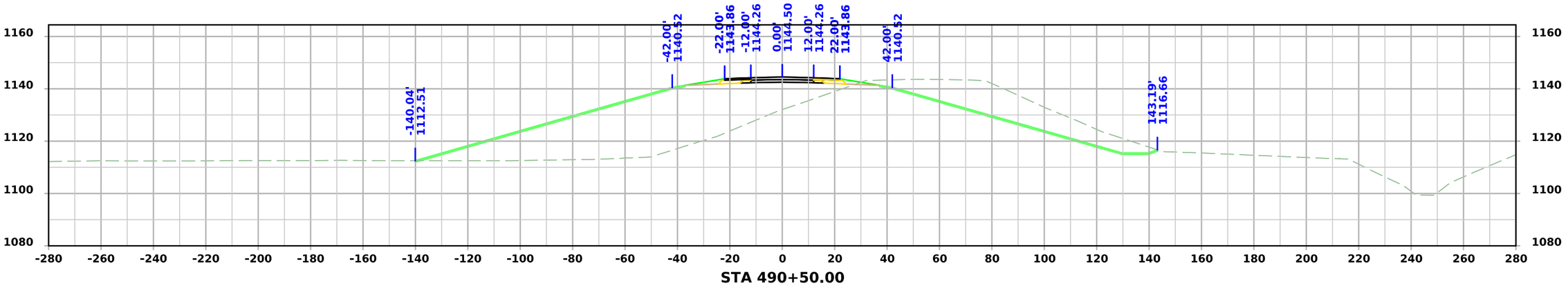


STA 488+00.00

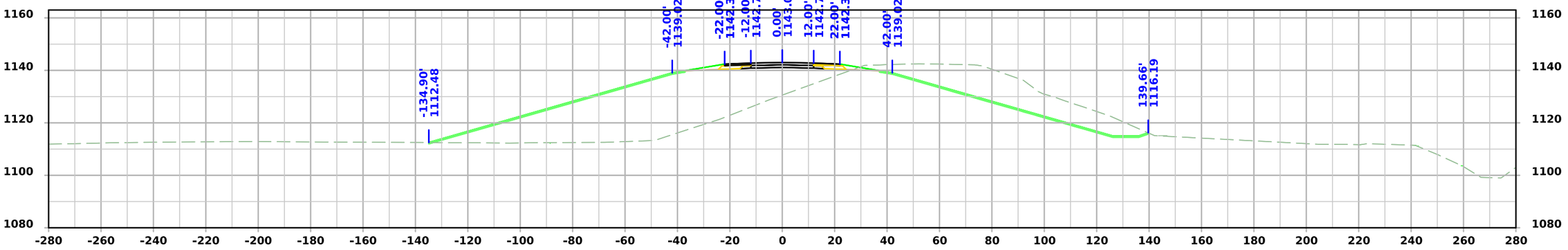
FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER W.12

11:54:25 AM 9/6/2024 bjohnson pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\0203402022\Design\CADD_Files\Sheet_Files\SHT_02034041Z12_W02.dgn

Highway 34



STA 490+50.00



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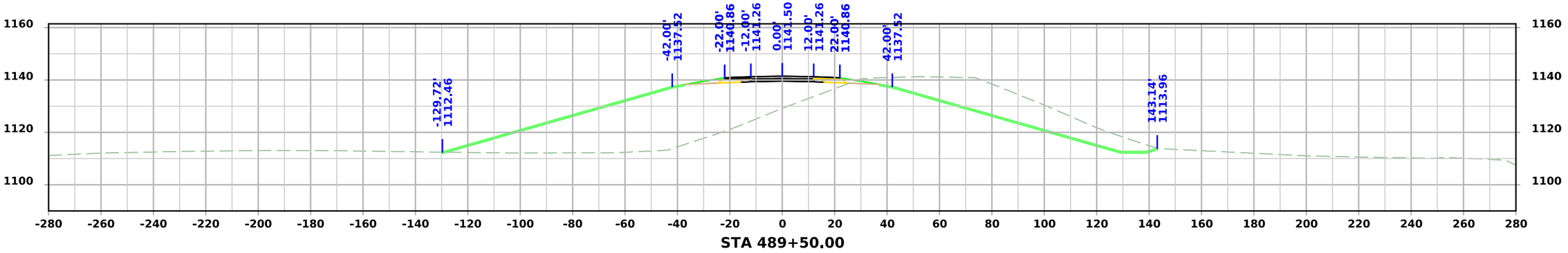

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FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER W.13	

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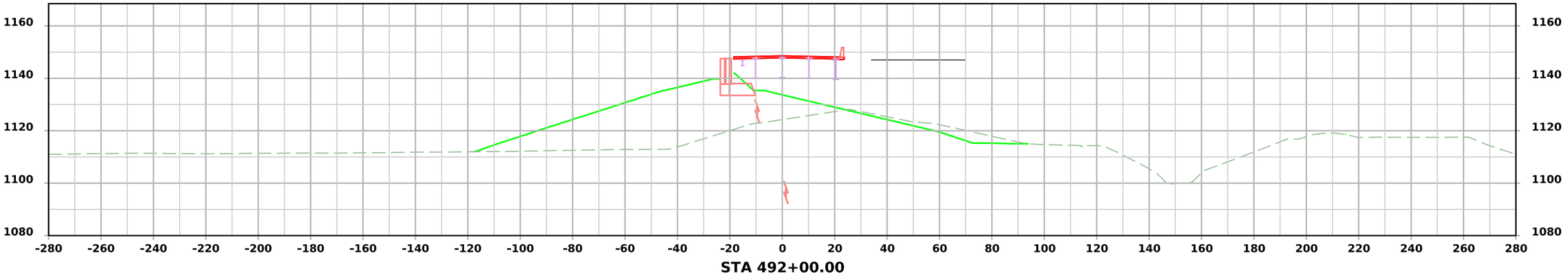
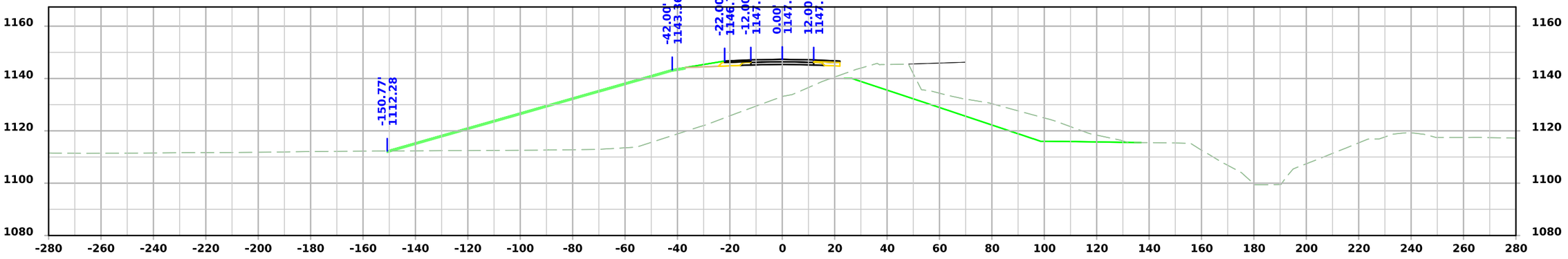
Highway 34



STA 492+00.00



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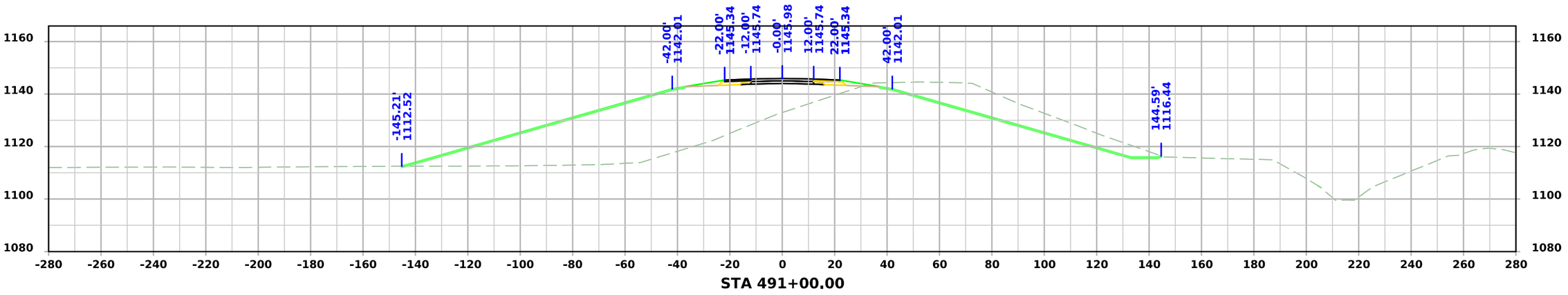
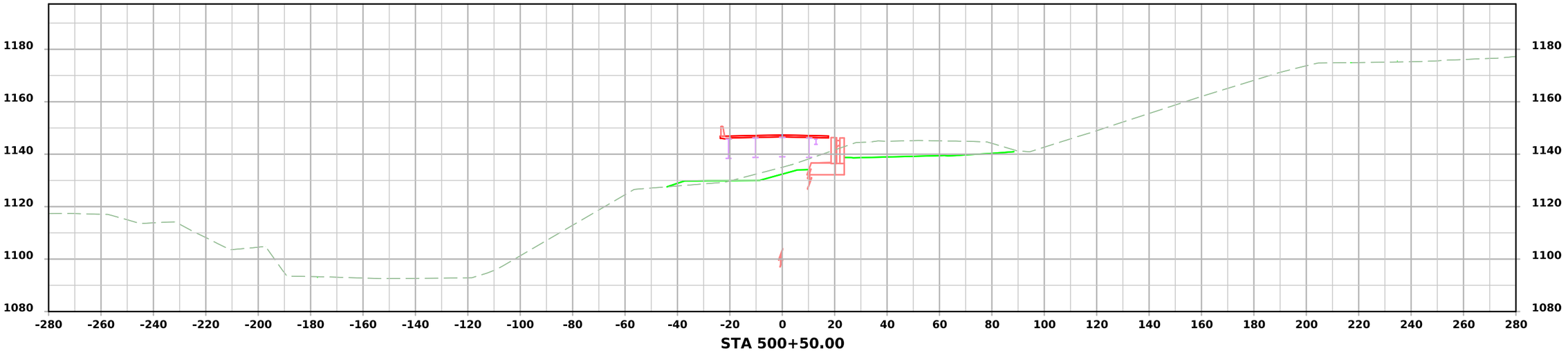


STA 491+00.00

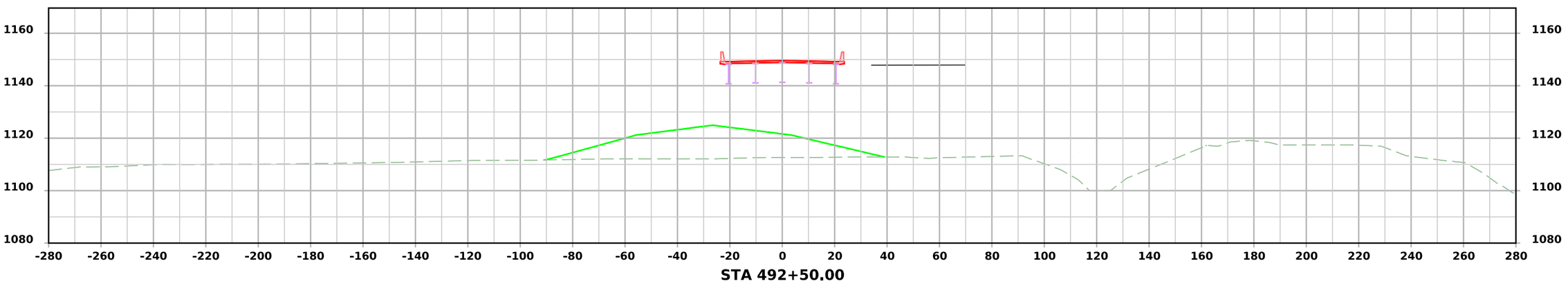
FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER W.14

11:54:29 AM 9/6/2024 bjohnson pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\0203402022\Design\CADD_Files\Sheet_Files\SHT_02034041Z12_W02.dgn

Highway 34



STA 500+50.00



STA 492+50.00

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER W.15

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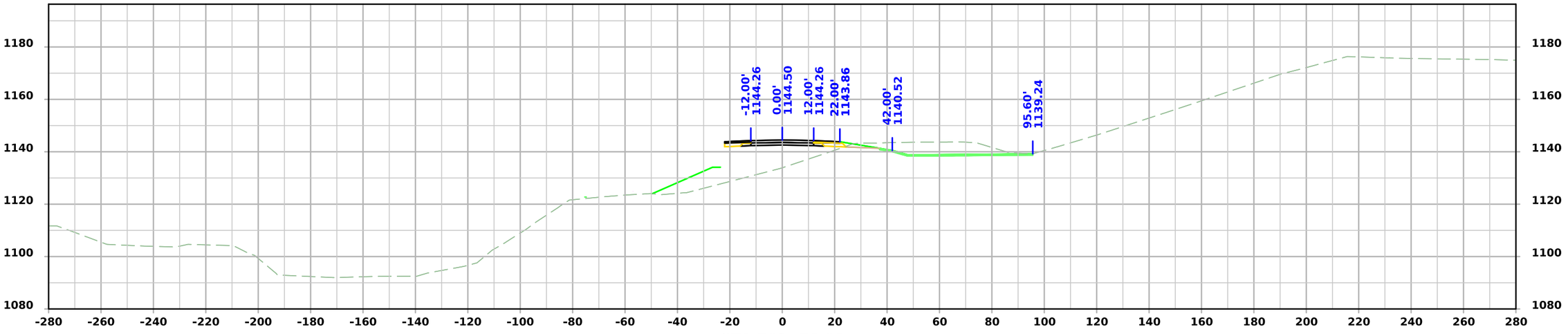
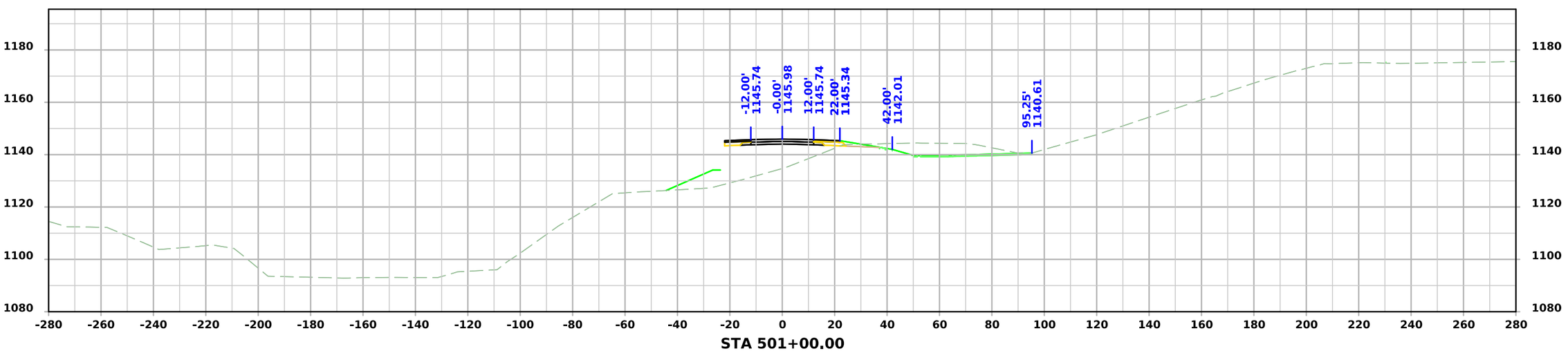
Highway 34



STA 501+50.00

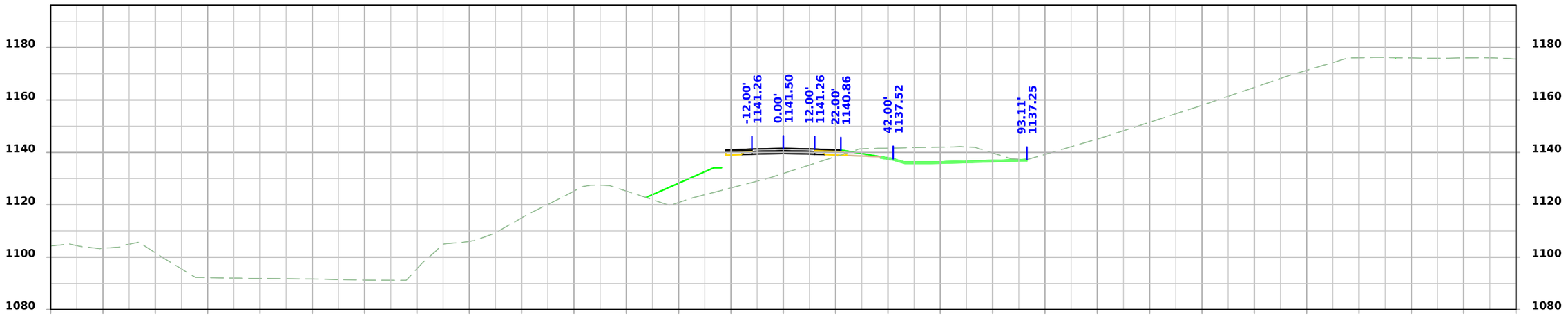


STA 501+00.00

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER W.16

11:54:33 AM 9/6/2024 bjohnson pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\0203402022\Design\CADD_Files\Sheet_Files\SHT_02034041Z12_W02.dgn

Highway 34



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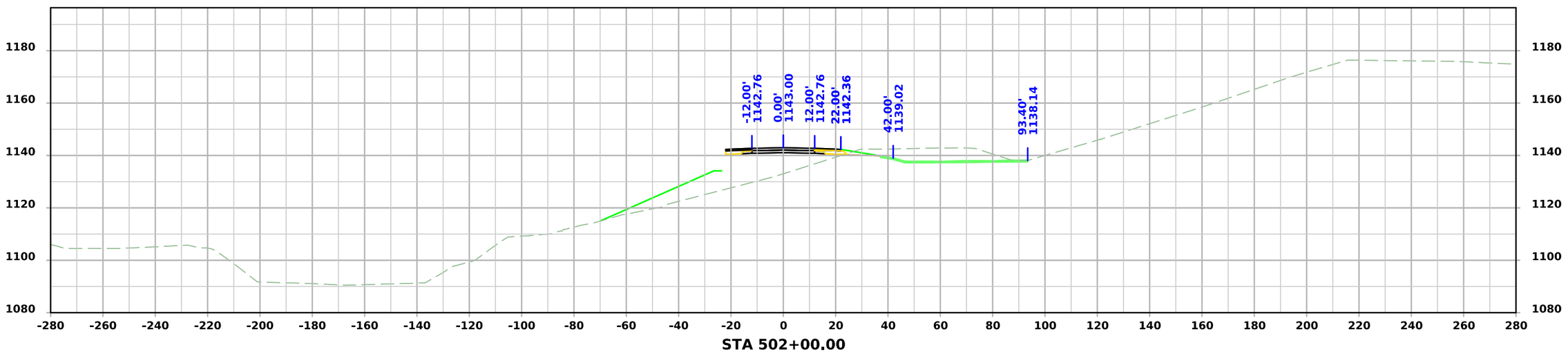
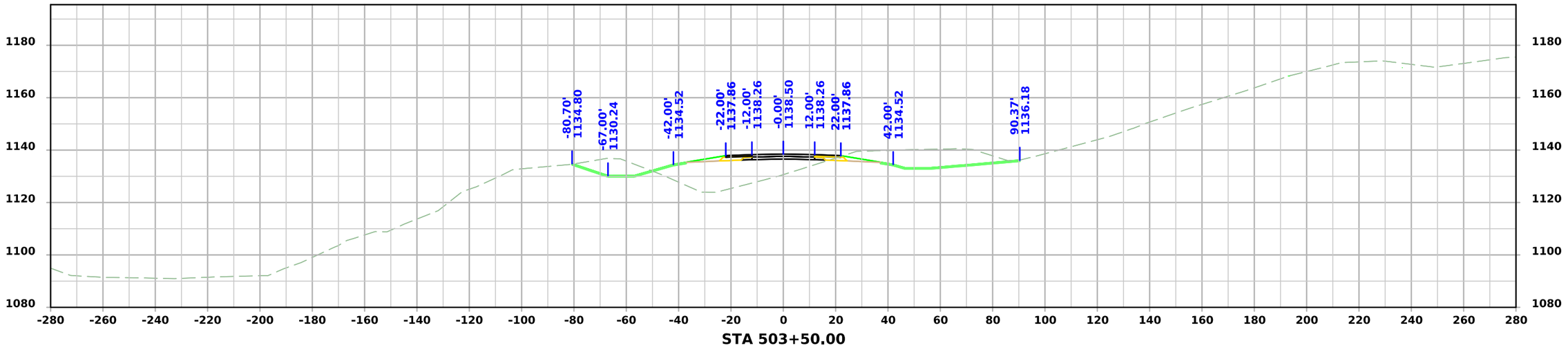


STA 502+00.00

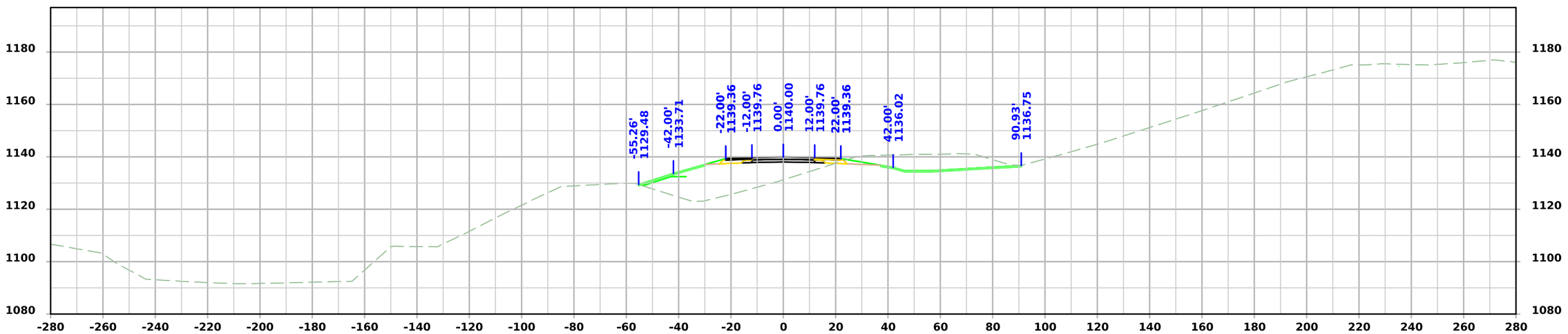
FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER W.17

11:54:34 AM 9/6/2024 bjohnson pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\0203402022\Design\CADD_Files\Sheet_Files\SHT_02034041Z12_W02.dgn

Highway 34



STA 503+50.00



STA 503+00.00

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER W.18

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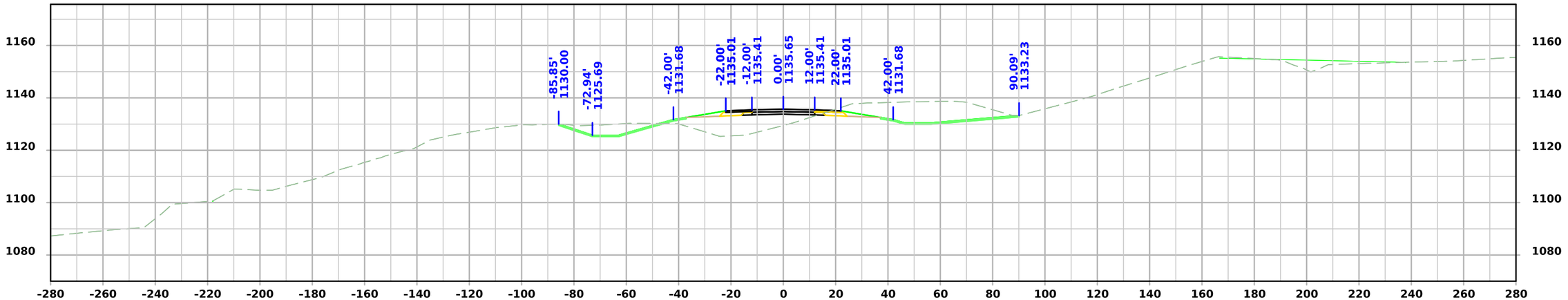
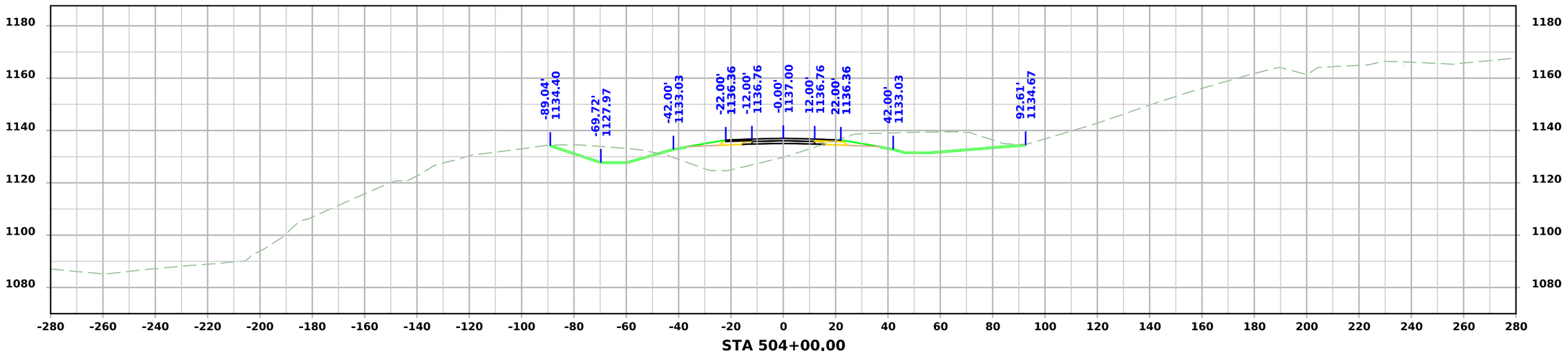
Highway 34



STA 504+50.00

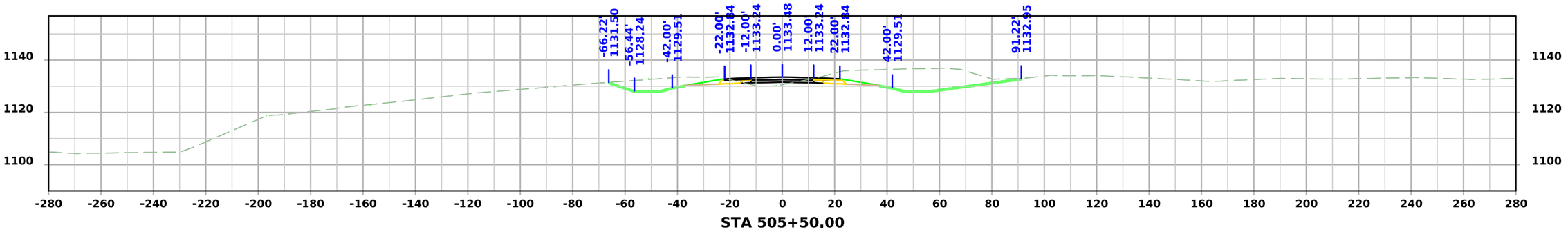


STA 504+00.00

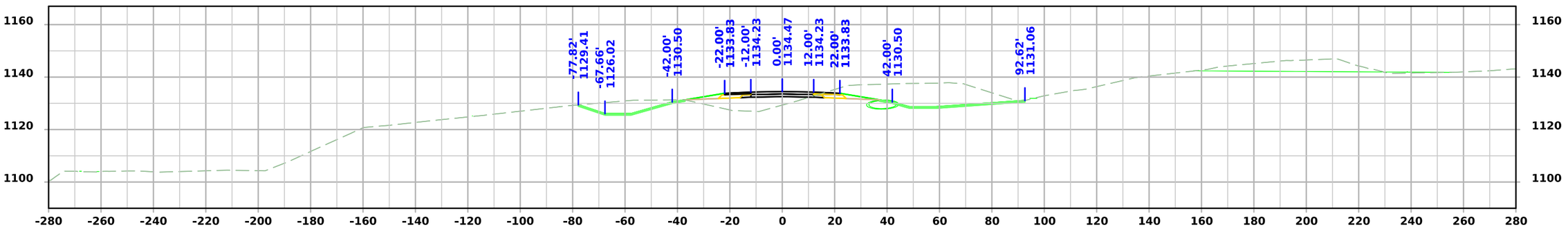
FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER W.19

11:54:36 AM 9/6/2024 bjohnson pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\0203402022\Design\CADD_Files\Sheet_Files\SHT_02034041Z12_W02.dgn

Highway 34



STA 505+50.00



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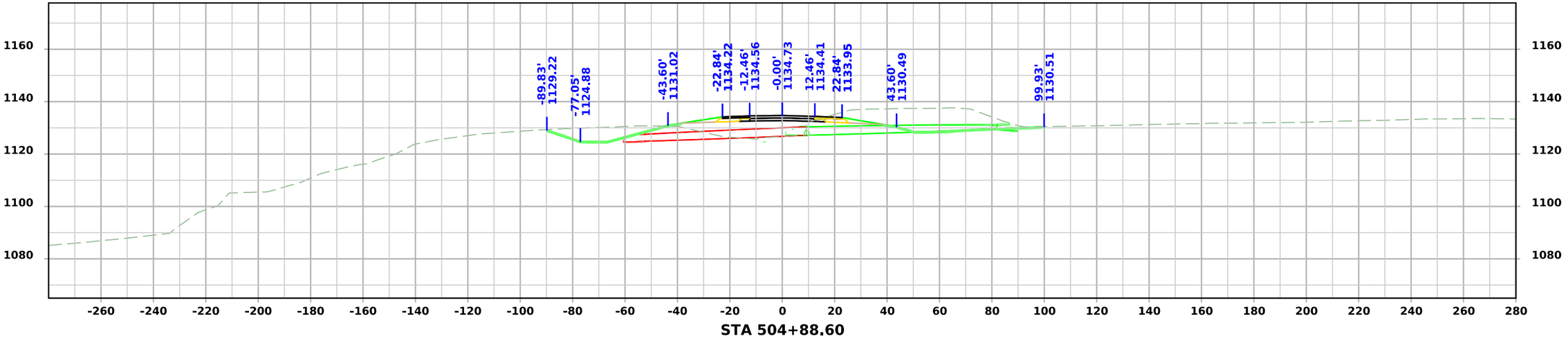

STA 504+88.60

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER W.20

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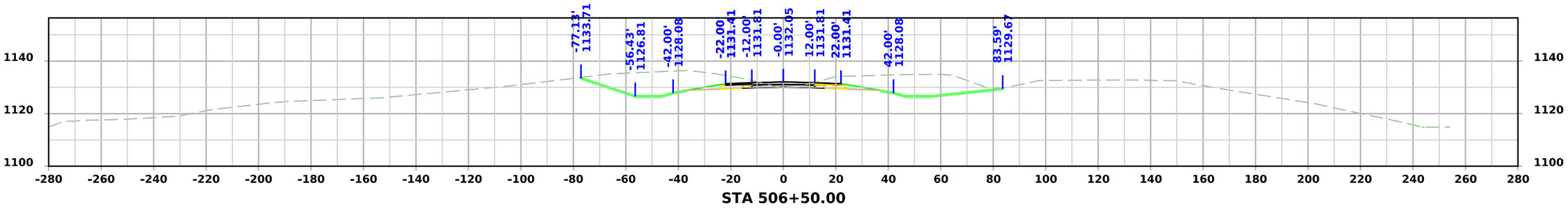
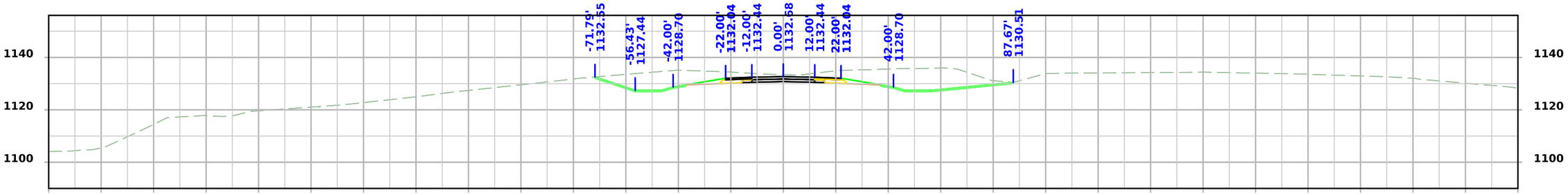
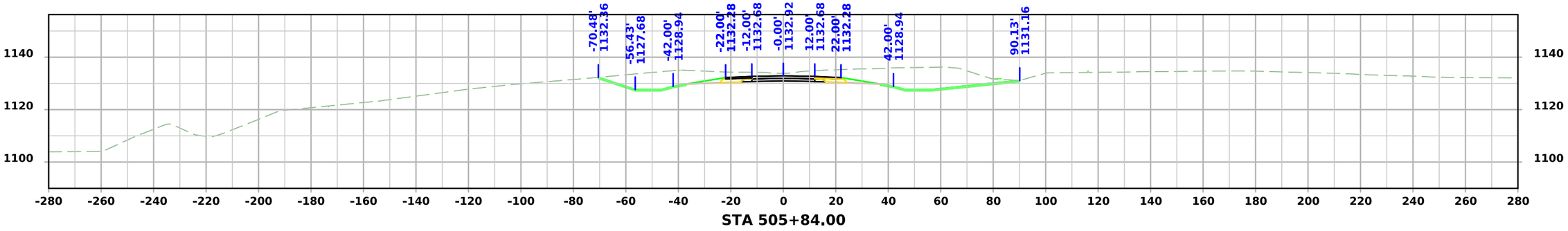
Highway 34



STA 506+50.00



STA 506+00.00

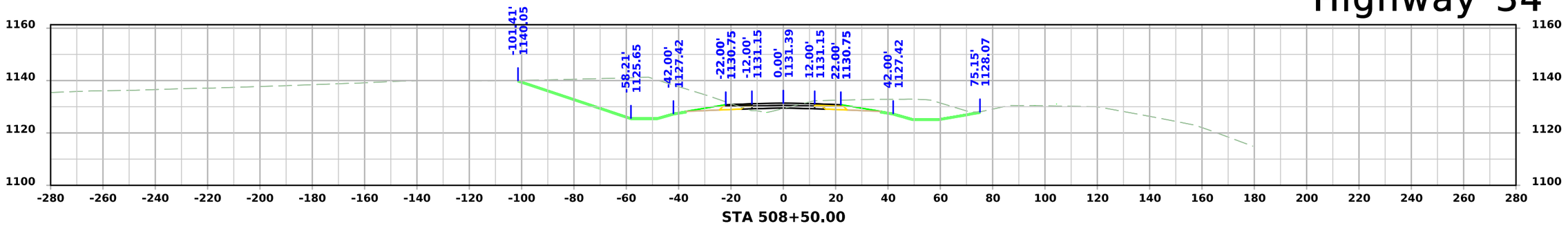


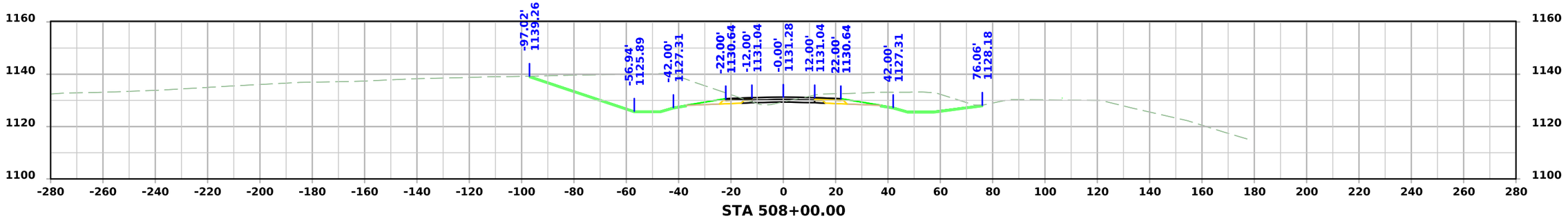
STA 505+84.00

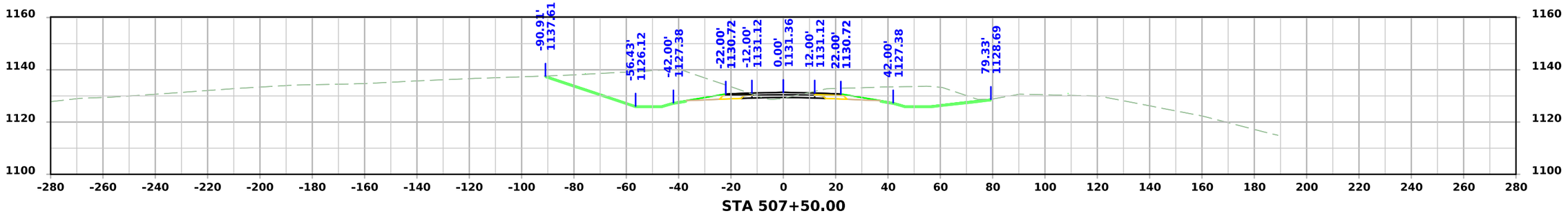
FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER W.21

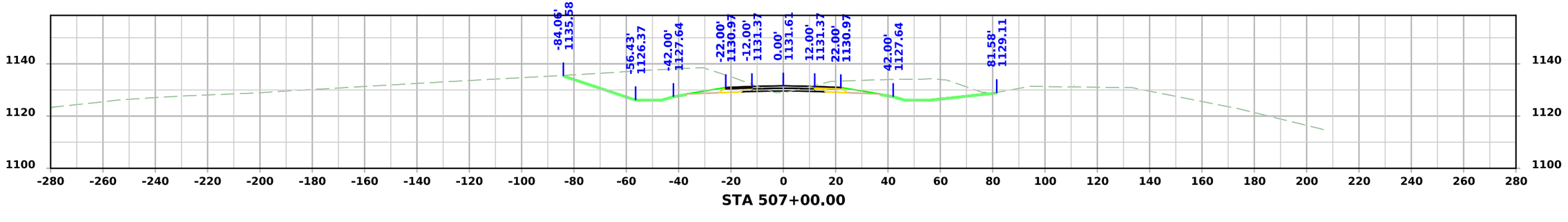
11:54:38 AM 9/6/2024 bjohnson pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\0203402022\Design\CADD_Files\Sheet_Files\SHT_02034041Z12_W02.dgn

Highway 34





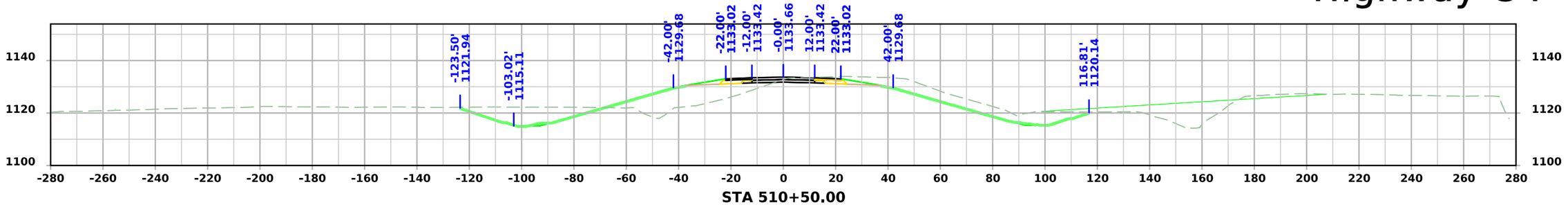




FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER W.22

11:54:39 AM 9/6/2024 bjohnson pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\0203402022\Design\CADD_Files\Sheet_Files\SHT_02034041Z12_W02.dgn

Highway 34



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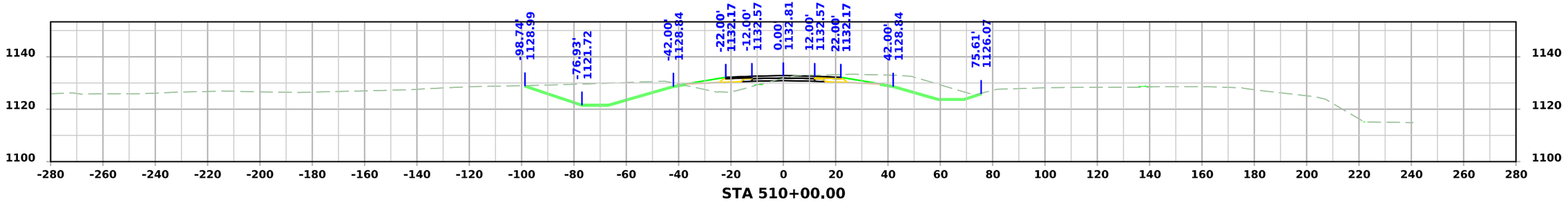

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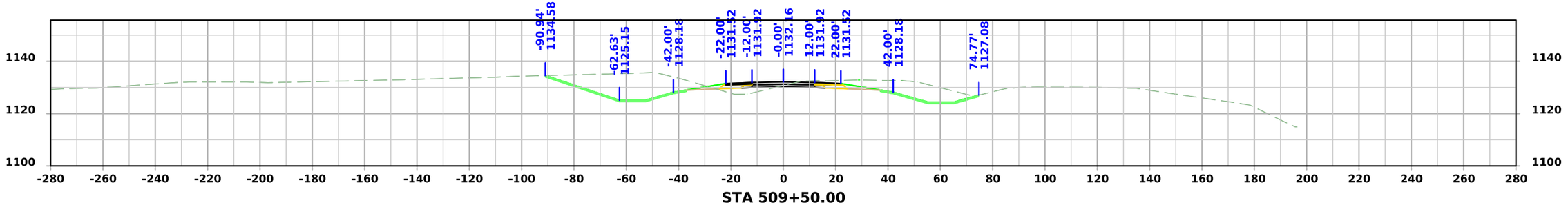

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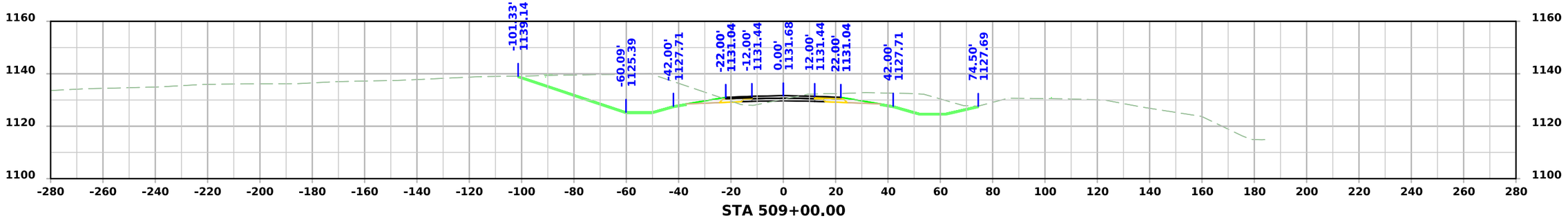
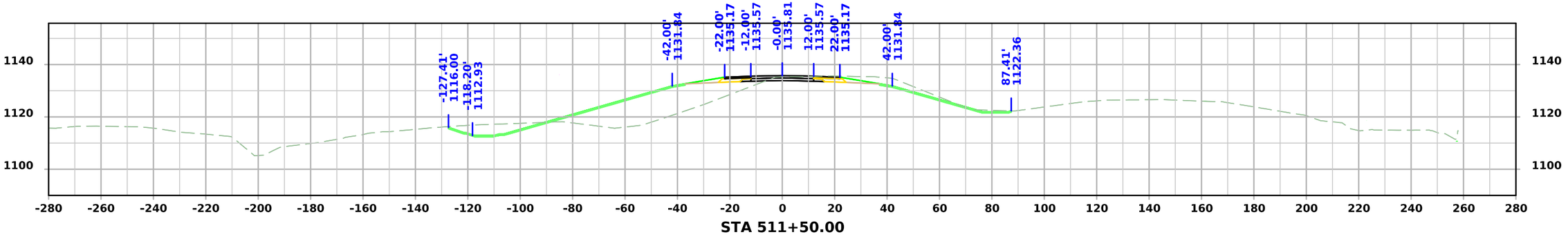


STA 509+00.00

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER W.23

11:54:41 AM 9/6/2024 bjohnson pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\0203402022\Design\CADD_Files\Sheet_Files\SHT_02034041Z12_W02.dgn

Highway 34



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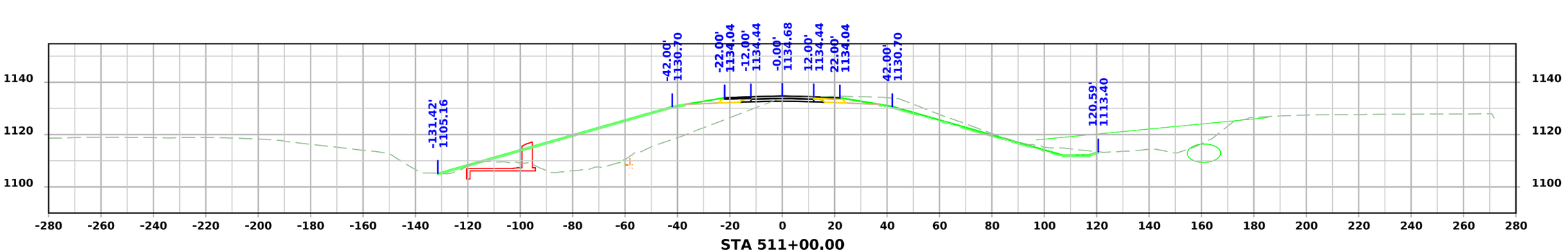

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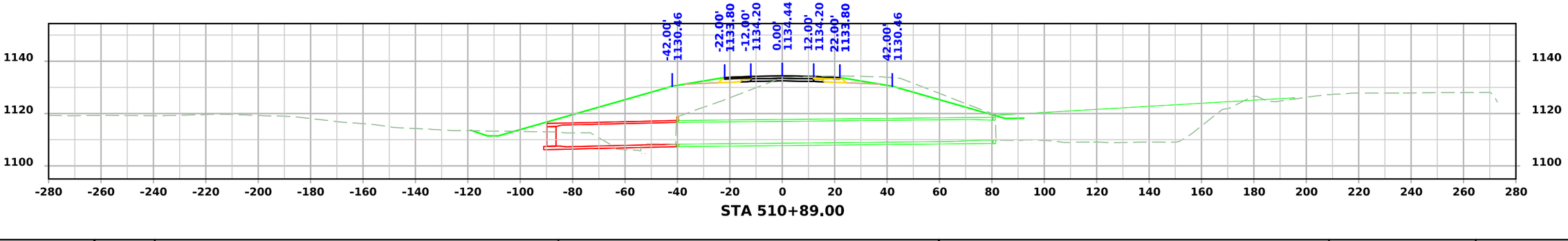

STA 510+89.00

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER W.24

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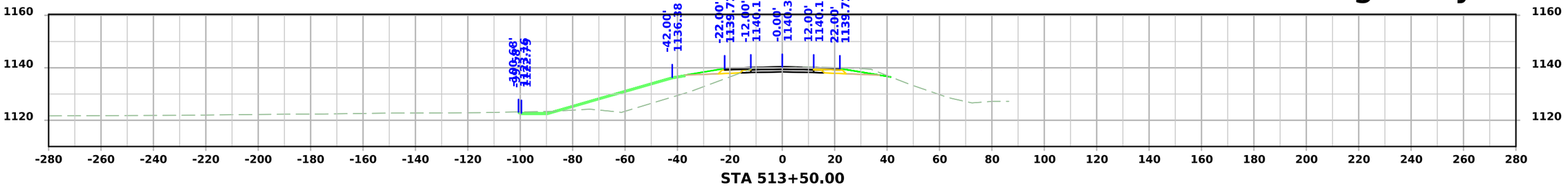
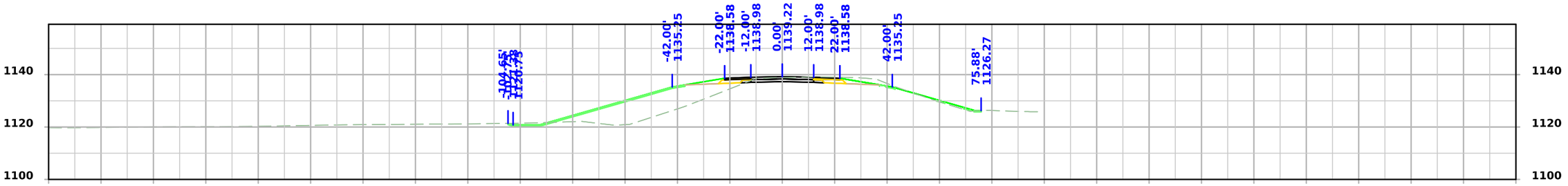
Highway 34



STA 513+50.00



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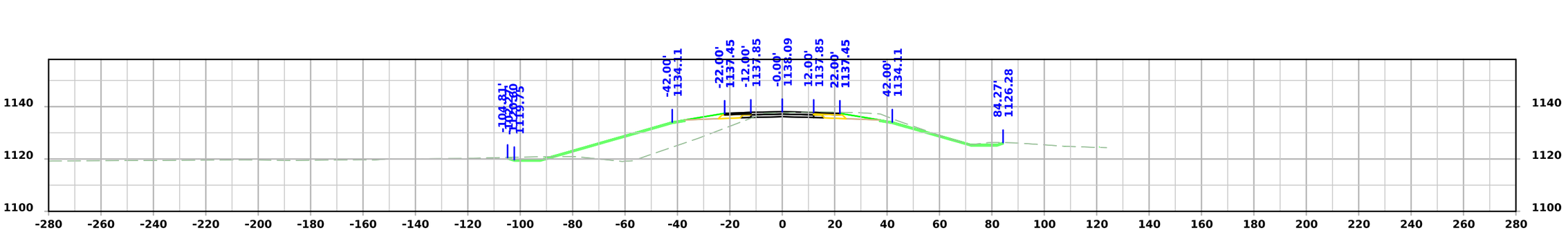
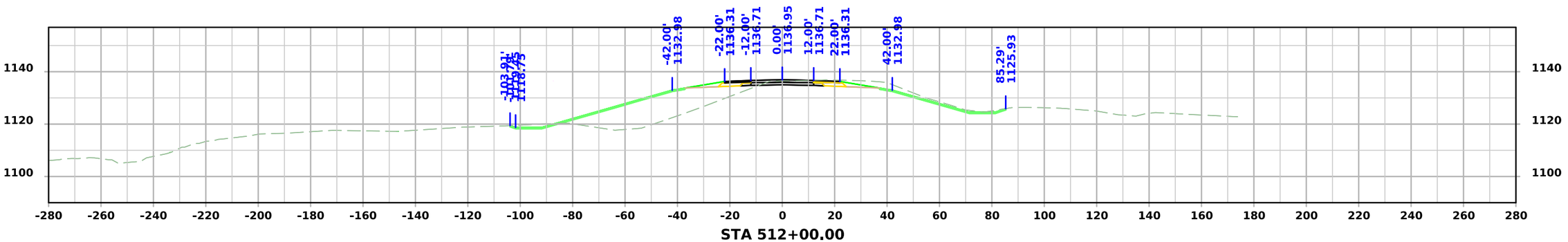


STA 512+50.00



STA 512+00.00

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER W.25

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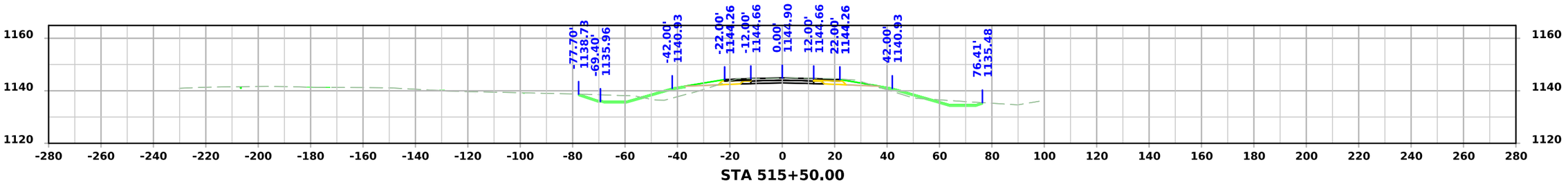
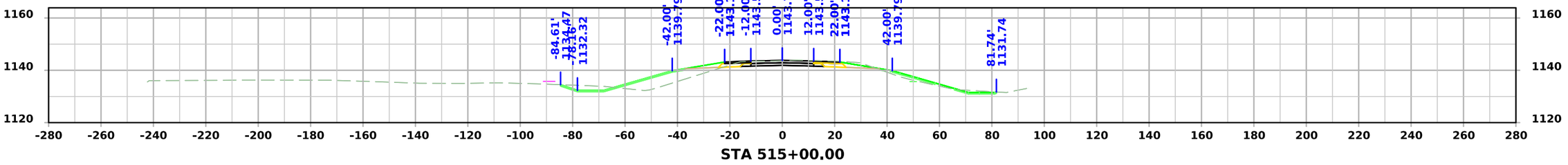
Highway 34



STA 515+50.00



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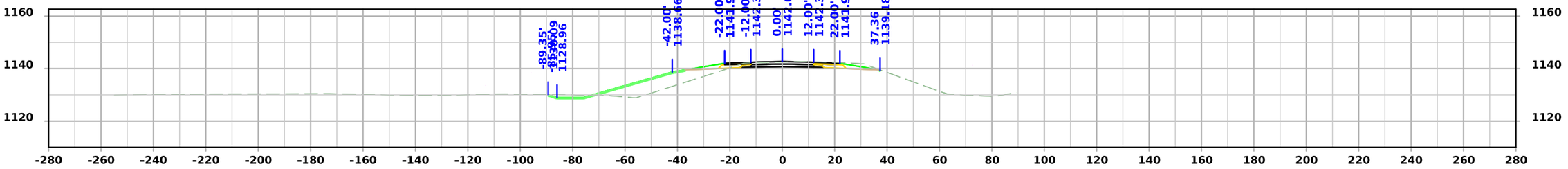
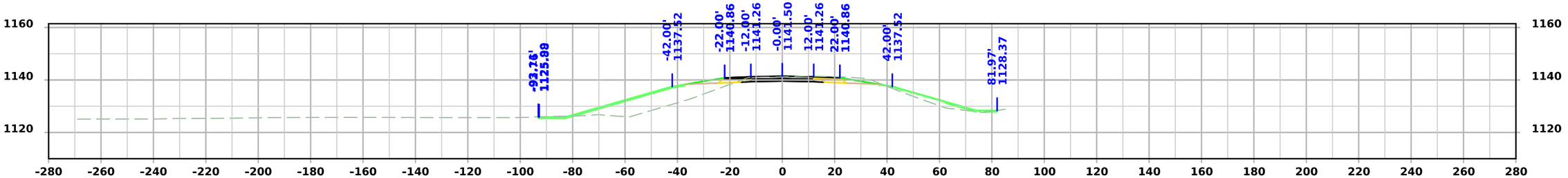


STA 514+50.00

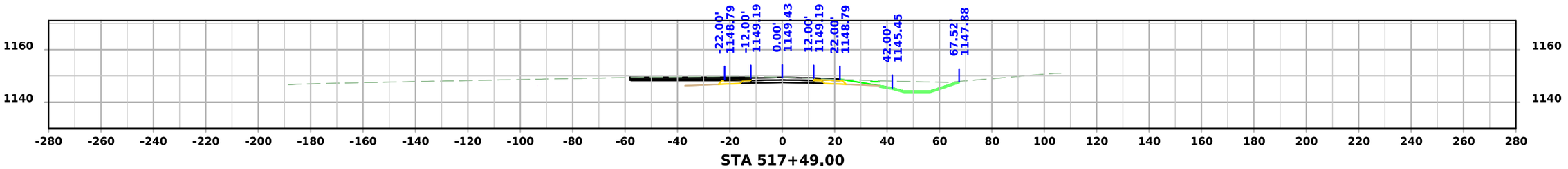


STA 514+00.00

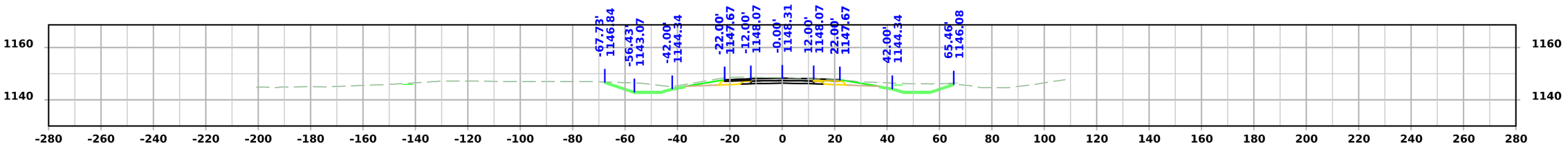
FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER W.26

11:54:44 AM 9/6/2024 bjohnson pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\0203402022\Design\CADD_Files\Sheet_Files\SHT_02034041Z12_W02.dgn

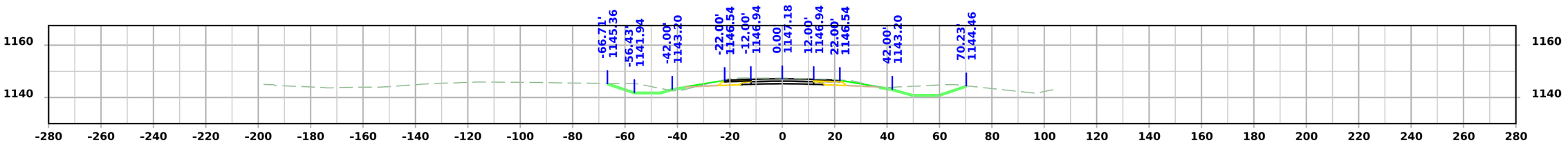
Highway 34



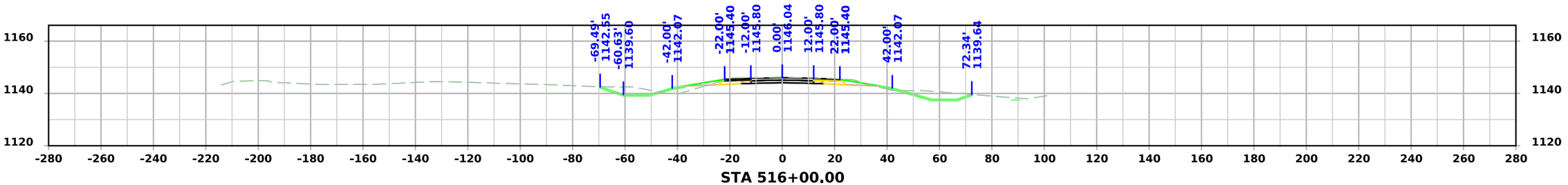
STA 517+49.00



STA 517+00.00



STA 516+50.00

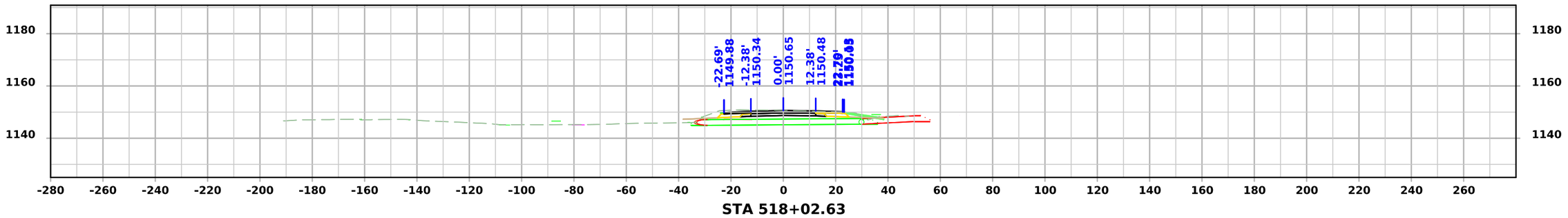


STA 516+00.00

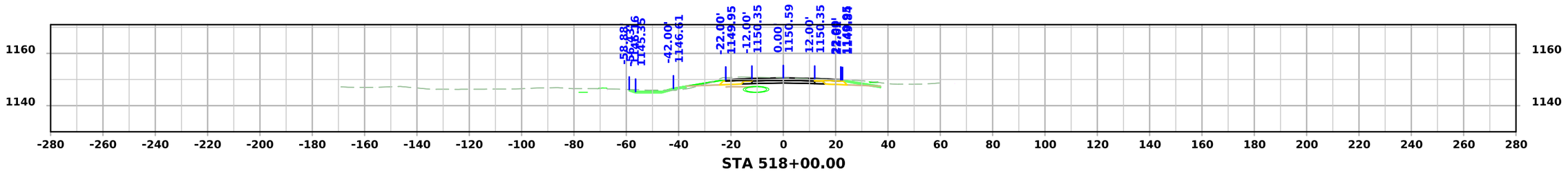
FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER W.27

11:54:46 AM 9/6/2024 bjohnson pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\0203402022\Design\CADD_Files\Sheet_Files\SHT_02034041Z12_W02.dgn

Highway 34



STA 518+02.63



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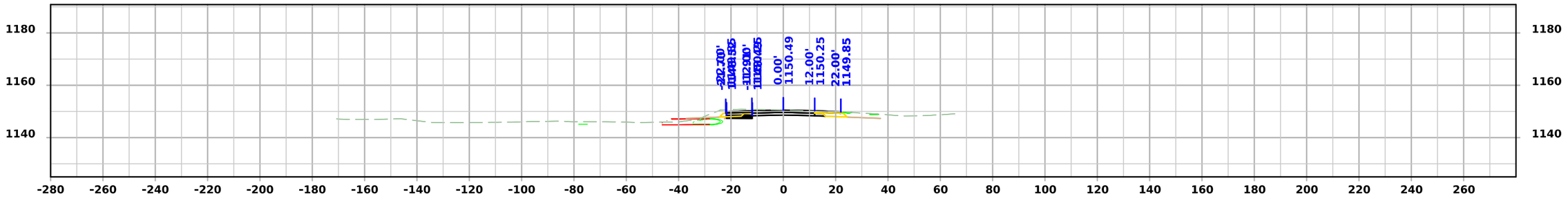
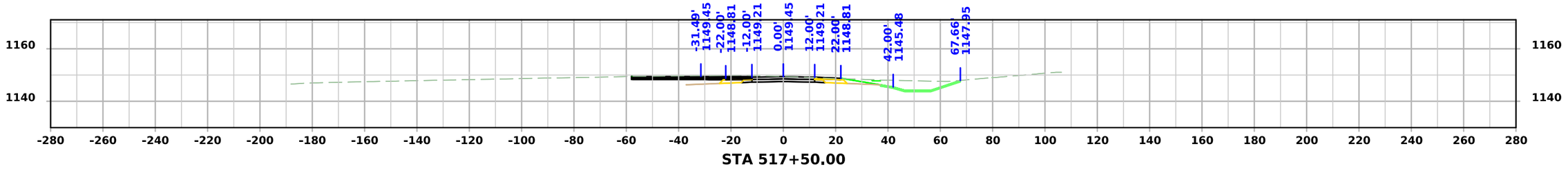


STA 517+95.55



STA 517+50.00

FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER W.28

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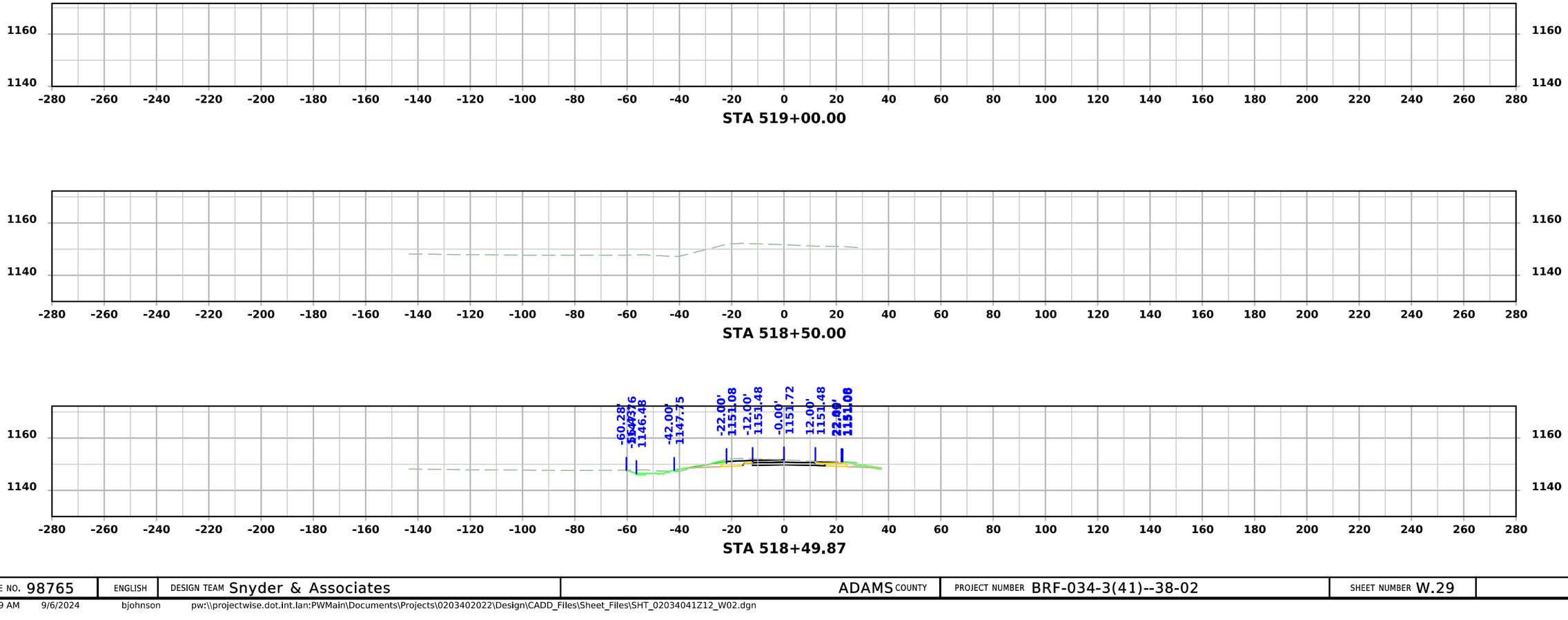
Highway 34



FILE NO. 98765	ENGLISH	DESIGN TEAM Snyder & Associates	ADAMS COUNTY	PROJECT NUMBER BRF-034-3(41)--38-02	SHEET NUMBER W.29

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