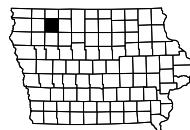


CLAY COUNTY

Bridge Replacement
BRF-071-8(62)--38-21

LETTING DATE
Nov 18, 2025



INDEX OF SHEETS	
No.	DESCRIPTION
A Sheets	Title Sheets
A.1	Title Sheet
A.2	Location Map Sheet
A.3 - 9	Concept Statement and Criteria
B Sheets	Typical Cross Sections and Details
B.1 - 3	Typical Cross Sections and Details
D Sheets	Mainline Plan and Profile Sheets
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2	US 71
G Sheets	Survey Sheets
G.1 - 3	Reference Ties and Bench Marks
J Sheets	Traffic Control and Staging Sheets
J.1	Traffic Control Plan
* J.2 - 4	Staging and Traffic Control Sheets Stage 1 thru 3
V Sheets	Bridge and Culvert Situation Plans
V.1 - 3	Bridge and Culvert Situation Plans
W Sheets	Mainline Cross Sections
W.1	Cross Sections Legend & Symbol Information Sheet
W.2 - 9	Mainline Cross Sections
X Sheets	Side Road Cross Sections
	* Color Plan Sheets



PLANS OF PROPOSED IMPROVEMENT ON THE
PRIMARY ROAD SYSTEM
CLAY COUNTY
Bridge Replacement
Willow River, 3.4 Miles N of N Jct IA 10

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

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



REVISIONS

TOTAL
..
PROJECT IDENTIFICATION NUMBER
21-21-071-020
PROJECT NUMBER
BRF-071-8(62)--38-21
R.O.W. PROJECT NUMBER
NHSN-071-8(63)--2R-21

D2 Virtual Field Exam Meeting: June 7, 2023

Shane Tymkowicz, IDOT
Darwin Bishop, IDOT
Kelly Mulvihill, IDOT
Michael Carlson, IDOT
Phil Mescher, IDOT
Jimmy Ellis, IDOT
Nicole Cuva, IDOT
Kevin Patel, IDOT
Joe Appel, Shive-Hattery
Mark Harpole, Shive-Hattery
Kent Ellis, Shive-Hattery
Jack Gepson, Shive-Hattery

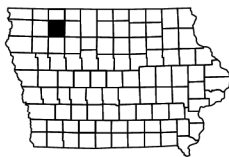
D4 PLAN - Jul 22, 2025
D5 PLAN - Nov 24, 2023
D3 PLAN - Jul 21, 2023

PRELIMINARY PLANS
Subject to change by final design.
D2 PLAN - June 6, 2023

DESIGN DATA RURAL			
20 --	AADT	4,100	V.P.D.
20 --	AADT	4,300	V.P.D.
20 --	DHV	-	V.P.H.
	TRUCKS	15	%
	Total		
	Design ESALs	-	

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

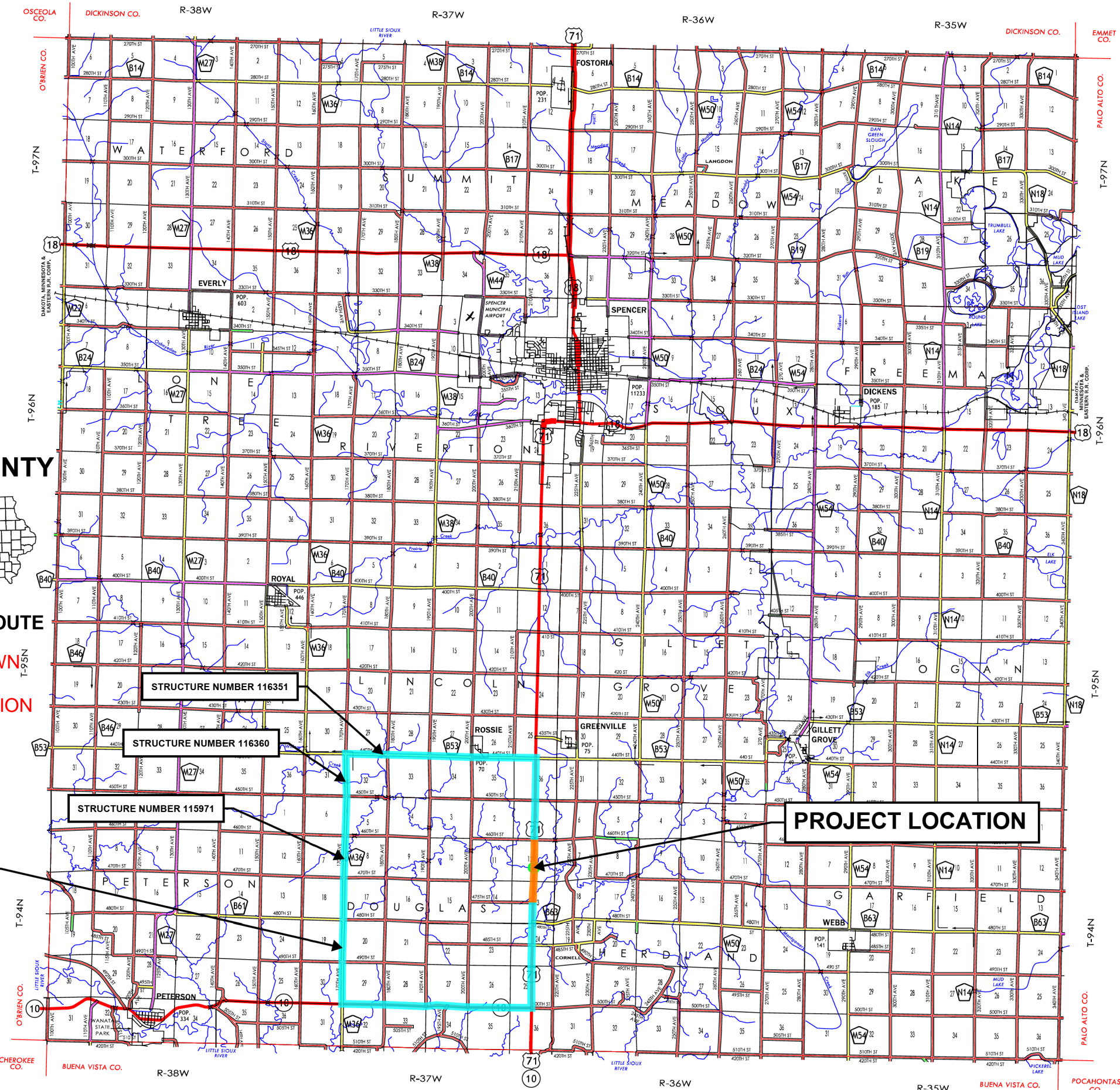
CLAY COUNTY



DETOUR ROUTE

DETOUR ROUTE SHOWN FOR REFERENCE ONLY (STAGED CONSTRUCTION SELECTED)

OUT OF DISTANCE TRAVEL = 17.89 MI



STRUCTURE NUMBER 116351

STRUCTURE NUMBER 116360

STRUCTURE NUMBER 115971

PROJECT LOCATION

IOWA DEPARTMENT OF TRANSPORTATION

TO OFFICE: District 3
ATTENTION: Jessica Felix
FROM: Mike Janecek
OFFICE: Shive-Hattery
SUBJECT: Project Concept Statement; (Final D0)

DATE: September 9, 2022
PROJECT: Clay County
 BRF-071-8(62) --38-21
 PIN: 21-21-071-020

This project involves the replacement of the Clay County bridge (Maint. No 2192.5S071) over Willow River 3.4 miles north of N Jct IA 10.

A concept review was held on June 20, 2022. Those present included Shane Tymkowicz and Laura Sievers from the District 3 Office; Steven Schroder, Jim Ellis, and Kent Nicholson, and Kevin Patel from the Iowa DOT; and Nathan Hardisty, Joe Appel, Mike Janecek, Mark Harpole, and Cara Lindell from Shive-Hattery.

Two alternatives were considered:

1. Replace the existing structure with a 120', three span, continuous concrete slab bridge using staged construction.
2. Replace the existing structure with a 120', three span, continuous concrete slab bridge using a detour.

Alternative 1 is the preferred alternative due to lower construction costs when considering costs associated with the acceptable detour, and reduced traffic impacts during construction.

One lane of traffic in each direction will be maintained via staged construction utilizing temporary traffic signals.

The Draft Project Concept Statement was sent out for review and comment with concerns to be received by August 26, 2022. Comments received during the review period have been considered and resolved

This project is recommended for construction in FY 2026. The Bridges and Structures Bureau will coordinate the plan preparation with the assistance of the Design Bureau and Shive-Hattery.

Cc:	C. Purcell	M. J. Kennerly	K. D. Nicholson
	S. J. Megivern	J. S. Nelson	M. Nop
	S. Majors	M. A. Swenson	R. A. Younie
	K. Brink	D. L. Newell	J. W. Laaser-Webb
	W. A. Sorenson	D. E. Sprengeler	E. C. Wright
	M. E. Ross	A. A. Welch	B. E. Azeltine
	B. D. Hofer	C. C. Poole	S. J. Gent
	S. Anderson	T. Jerman	K. K. Patel
	S. Godbold	D. R. Claman	J. Hauber
	A. Abu-Hawash	M. E. Khoda	K. Olson S. Neubauer
	J. Vortherms	B. Bradley	J. Harris D. Stokes
	S. Seivert	D. Bishop	V. Brewer
	M. Carlson	B. Dolan	T. Huju
	K. Mulvihill	D. Schultz	B. Pusateri
	S. Tymkowicz	L. Sievers	

SH Project #2142203880

Shive-Hattery | 4125 Westown Parkway | Suite 100 | West Des Moines, IA 50266 | 515.223.8104 | shive-hattery.com



DRAFT PROJECT CONCEPT STATEMENT

US 71 Bridge over Willow River

Clay County
 BRF-071-8(62)--38-21
 PIN: 21-21-071-020
 Maint. No. 2192.5S071
 FHWA No. 20390

Mike J. Janecek, P.E.
 319-248-3378

September 9, 2022

I. STUDY AREA

A. Project Description

This project involves the replacement of the US 71 bridge (Maintenance No 2192.5S071) over the Willow River, 3.4 mi N of N Jct IA 10.

The two alternatives considered were:

1. Replace the existing structure with a 120', three span, continuous concrete slab bridge using staged construction.
2. Replace the existing structure with a 120', three span, continuous concrete slab bridge using a detour.

Alternative 1 is the preferred alternative due to relatively high traffic volumes resulting in high out of distance travel costs and detour compensation costs.

The preliminary project cost is \$2,305,100.

B. Need for Project

This is a 70' X 30' continuous concrete slab bridge that was built in 1923. and reconstructed in 1955. An overlay was added in 1985 and has reached the end of its service life. The deck has delamination, hollows, spalls, exposed steel, severe scaling, heavy leaching, and damp areas. The abutments have hollow areas, wide cracking, and heavy leaching. The bridge was designed for live loads below current standards. Due to the overall condition of the bridge, a replacement is recommended.

SH Project #2142203880

Shive-Hattery | 4125 Westown Parkway | Suite 100 | West Des Moines, IA 50266 | 515.223.8104 | shive-hattery.com





C. Present Facility

The existing structure is a 70' x 30' continuous concrete slab bridge constructed in 1923 and widened to its current 30' width in 1955.

US 71 in the project area is 24' wide PCC pavement with 10' shoulders (4' wide PCC, 6' granular) and 3:1 foreslopes, originally constructed in 1931. HMA resurfacing was accomplished in 1962, 1976, and 1993, and a widening in 2013. A 6" PCC overlay was accomplished in 2016.

D. Traffic Estimates

The 2026 construction year and 2046 design year average daily traffic estimates are 4100 with 15% trucks and 4300 with 15% trucks, respectively.

E. Sufficiency Ratings

US 71 is classified as a principal arterial route and is a maintenance service level B roadway.

The federal bridge sufficiency rating is 61.2.

F. Access Control

Access rights will not be acquired for this project.

G. Crash History

During the five-year study period from January 1, 2017 through December 31, 2021, there were 9 crashes including, 0 fatal crashes, 2 personal injury crashes, and 7 personal property crashes.

II. PROJECT CONCEPT

A. Feasible Alternatives

Alternative #1 - Replace with a bridge using staged construction

The existing 70' x 30', continuous concrete slab bridge will be replaced with a 3 span, 120', x 44' continuous concrete slab bridge using staged construction.

The typical cross section adjacent to the bridge will consist of a 24' roadway with 10' effective shoulders (4' paved and 6' granular) and 6:1/3:5 foreslopes. This project will be fully within the guardrail limits, so all shoulders will be paved shoulder at guardrail.

The existing grade will need to be raised a minimum of 8" which will require approximately 57' of roadway reconstruction beyond each approach, this matches the trailing end guardrail paved shoulder limits. New bridge approaches will be constructed. The existing guardrail will be replaced with new guardrail and the shoulders will be paved 20' beyond the ends of the guardrail. Class 10 will be necessary to flatten the existing foreslopes and to construct the new guardrail blisters. Class E revetment will be placed under the bridge for slope protection. New bridge end drains will be constructed on both ends of the bridge.

Apply erosion control and rural seeding and fertilizing to all disturbed areas.

It appears that right of way will be required for this project.

One lane of traffic in each direction will be maintained via staged construction utilizing temporary traffic signals.

<u>Bridge Items</u>	<u>Estimated Costs</u>
New Bridge	\$ 754,100
Stage Construction	\$75,400
Bridge Removal	25,200
Removal of Asbestos	2,500
Revetment	40,100
Engineering Fabric	3,000
Erosion Stone	800
Cofferdams	100,000
Mobilization - 10%	100,100
M & C - 20%	<u>220,200</u>
Bridge Costs	\$ 1,321,400

<u>Roadway Items</u>	
Bridge Approaches	\$185,000
PCC Pavement	\$28,000
Removal of Pavement	\$23,700
Modified Subbase	\$13,000
Embankment in place, contractor furnished	\$70,000
Excavation, Class 10	\$5,000
Guardrail (Includes Removal)	\$53,000
Paved Shoulders for Guardrail	\$30,000
Class 10 for Guardrail Blisters	\$24,000
Bridge End Drains	\$14,000
Clearing and Grubbing	\$10,000
Temporary Pavement	\$43,500

Temporary Barrier Rail	\$27,000
Temporary Traffic Signal	\$22,500
Temporary Crash Cushions	\$6,000
Erosion Control	\$38,000
Right of Way	\$50,000
Wetland Mitigation	\$50,000
Traffic Control - 5%	\$32,000
Mobilization - 5%	\$32,000
M & C - 30%	<u>\$227,000</u>
Roadway costs	\$983,700
Project Total	\$2,305,100

Alternative #2 - Replace with a bridge using a detour

The existing 70' x 30', continuous concrete slab bridge will be replaced with a 3 span, 120',x 44' continuous concrete slab bridge using an off-site detour.

The typical cross section adjacent to the bridge will consist of a 24' roadway with 10' effective shoulders (4' paved and 6' granular) and 6:1/3:5 foreslopes. This project will be fully within the guardrail limits, so all shoulders will be paved shoulder at guardrail.

The existing grade will need to be raised a minimum of 8" which will require approximately 57' of roadway reconstruction beyond each approach, this matches the trailing end guardrail paved shoulder limits. New bridge approaches will be constructed. The existing guardrail will be replaced with new guardrail and the shoulders will be paved 20' beyond the ends of the guardrail. Class 10 will be necessary to flatten the existing foreslopes and to construct the new guardrail blisters. Class E revetment will be placed under the bridge for slope protection. New bridge end drains will be constructed on both ends of the bridge.

Apply erosion control and rural seeding and fertilizing to all disturbed areas.

Right of way appears to be required for this project.

Traffic will be maintained by an off-site detour.

Bridge Items	<u>Estimated Costs</u>
New Bridge	\$ 754,100
Bridge Removal	25,200
Removal of Asbestos	2,500
Revetment	40,100
Engineering Fabric	3,000
Erosion Stone	800
Cofferdams	100,000
Mobilization - 10%	92,600
M & C - 20%	<u>203,700</u>
Bridge Costs	\$1,222,000

Roadway Items	
Bridge Approaches	\$185,000
PCC Pavement	\$28,000
Removal of Pavement	\$15,000
Modified Subbase	\$5,000

Embankment in place, contractor furnished	\$70,000
Excavation, Class 10	\$5,000
Guardrail (Includes Removal)	\$53,000
Paved Shoulders for Guardrail	\$30,000
Class 10 for Guardrail Blisters	\$24,000
Bridge End Drains	\$14,000
Clearing and Grubbing	\$10,000
Erosion Control	\$30,000
Right of Way	\$50,000
Wetland Mitigation	\$50,000
Traffic Control - 5%	\$25,000
Mobilization - 5%	\$25,000
M & C - 30%	<u>\$185,700</u>
Roadway costs	\$ 804,700

Project Total	\$2,026,700
----------------------	--------------------

Other Alternatives Discussed - Replace with a box culvert

Replacing the existing 70' x 30', continuous concrete slab bridge with a triple 12' x 12' RCB was evaluated. This alternative was evaluated for hydraulic performance and was found to not perform as well as the bridge replacement option. Roadway overtopping would occur at approximately the 50-year flood event.

B. Detour Analysis

There will be no off-site detour. Traffic will be maintained via staged construction with traffic reduced down to one lane via the use of temporary traffic signals.

For the detour alternative, US 71 would be closed an offsite detour utilized. It is anticipated that the detour will be in place for approximately 120 days. The detour would follow County Road B53 west to County Road M36, then follow County Road M36 south to IA 10, then follow IA 10 east to US 71. Out of distance travel is 17.9 miles. Out of distance user cost is anticipated to be \$1,900,500. The cost for County road maintenance would be \$73,930 as calculated by the Gas Tax Method. Detour signing costs would be approximately \$10,000.

C. Recommendations

It is recommended that the present structure be replaced, as described in Alternative No. 1.

D. Construction Sequence

It is anticipated that all work on this project will be awarded to one prime contractor. The Bridges and Structures Bureau will coordinate the plan preparation with assistance from the Design Bureau and Shive-Hattery.

E. ADA Accommodations

There are no bike paths or sidewalks adjacent to US 71; therefore, no ADA accommodations are planned in conjunction with this project.

F. Special Considerations

This will not be a traffic critical project.

The ABC Rating Score of 45 is less than the first stage filter threshold of 50, therefore this bridge will not be considered for ABC construction.

No bike path or sidewalk will be required as part of this project.

The existing bridge is scour critical. Scour will be evaluated and considered.

USGS stream gage 06605750 is located at the existing bridge. Coordination with the USGS for removal and re-installation of the gage will be needed.

Right of Way appears to be required for this project.

The Location and Environment Bureau has not reviewed this project at this time. Once their review is completed, comments will be incorporated into the final concept statement. It is likely that a 404 Permit will be required for this project.

G. Program Status

Site data has been developed by Shive-Hattery. This project is listed in the 2023-2027 Iowa Transportation Improvement Program, with \$24,000 programmed for right of way in FY 2026, and \$1,050,000 for replacement in FY 2026. Costs for this project may be eligible for bridge replacement funds. A schedule of events will be developed following approval of the Project Concept.

The following page has a map of the county showing the location of the project area and the anticipated detour route for the detour option.

Attachment A - Utilities

Attachment A: Utilities

Clay County Utilities
BRF-071-8(62)--38-21

(CCR) IOWA LAKES REGIONAL WATER
Contact Name : Kelly Whitacre
Contact Phone: 7122628847
Contact Email: kelly.whitacre@ilrw.org

(CTLIA01) CENTURLINK
Contact Name : SADIE HULL
Contact Phone: 9185470147
Contact Email: sadie.hull@lumen.com

(IL1) IOWA LAKES ELECTRIC COOP
Contact Name : Kay Dahl
Contact Phone: 7123622694
Contact Email: ioc-dir@ilec.coop

SH Project 2142203880 September 9 2022

Project 2142203880

shive-hattery.com



Roadway			
PIN Number	21-21-071-20	Submittal Date	08/12/22
Project Number	BRF-071-8(62)--38-21	Approval Date	
District	District 3	Assistant District Engineer	Shane Tymkowicz, P.E.
County	Clay	or	
Route	US 71	Office Director	
Location	Willow River, 3.4 mi. N of N Jct. IA 10		
Work Type	Bridge Replacement		
Segment Manager	Shane Tymkowicz, P.E.		
Designer	Shive-Hattery		

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

Rural Two-Lane Highways (Rural Arterials)

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

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

Roadway Design Speed (mph) = 60 (*55)

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

Design Criteria for High Speed Roadways

Design Element	Preferred Criteria						Acceptable Criteria						Project Values		
	Design Speed, mph						Design Speed, mph								
	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		
Minimum horizontal curve radius (ft) (Refer to Sections 2A-2 and 2A-3)	Method 5 superelevation and side friction distribution	e _{max} = 6%	833	1060	1330	1660	2040	2500	833	1060	1330	1660	2040	2500	1330
		e _{max} = 8%	--	--	--	--	--	--	758	960	1200	1480	1810	2210	N/A
Minimum vertical curve length (ft) (Refer to Section 2B-1)	crest vertical curves		150	165	180	195	210	225	150	165	180	195	210	225	180
Minimum rate of vertical curvature (K) (Refer to Section 2B-1)	sag vertical curves	roadways without fixed-source lighting	84	114	151	193	247	312	84	114	151	193	247	312	151
		roadways with fixed-source lighting	96	115	136	157	181	206	96	115	136	157	181	206	136
Minimum gradient (%) (Refer to Section 2B-1)	0.5						0.3% with a curb, 0.0% without a curb						0.50%		
Maximum gradient (%) (Refer to Section 2B-1)	Urban roadways	4	3				7	6	6	--	--	--	--	--	
	Rural roadways		5	5	4	4	4	4	4	4	4	4	3%		
	Interstates		5	5	4	4	4	4	4	4	4	4			
Clear zone	See "Preferred Clear Zone" table in Section 8A-2						See "Acceptable Clear Zone" table in Section 8A-2						30		

Design year ADT = 4329

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

Effective Shoulder Width and Type for Two-Lane Highways

Preferred (values shown in feet)			Acceptable (values shown in feet)			Project Values
	Rural Roadways	Urban Roadways		Rural Roadways	Urban Roadways	
Turn lanes with shoulders	6	6	Turn lanes with shoulders	6	0	N/A
Turn lanes with curbs	6	See Section 3C-2	Turn lanes with curbs	6	0	N/A
	Effective Shoulder Width	Paved Width		Effective Shoulder Width	Paved Width	
Climbing Lanes	6	4	Climbing Lanes	4	0	N/A
Two-Lane Highways	Effective Shoulder Width	Paved Width	Two-Lane Highways	Effective Shoulder Width	Paved Width	
Routes where bicycles are to be accommodated	10	10	Design year ADT > 2000 vpd	8	0*	10' (4' paved)
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	Design year ADT between 400 - 2000 vpd	6	0*	
On roadways with design year ADT > 5000	10	6				
On all other NHS	10	6				
On non-NHS routes with design year ADT > 3000	10	6	Design year ADT < 400 vpd	4	0*	
On non-NHS routes with design year ADT < 3000	8	0*				

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

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

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

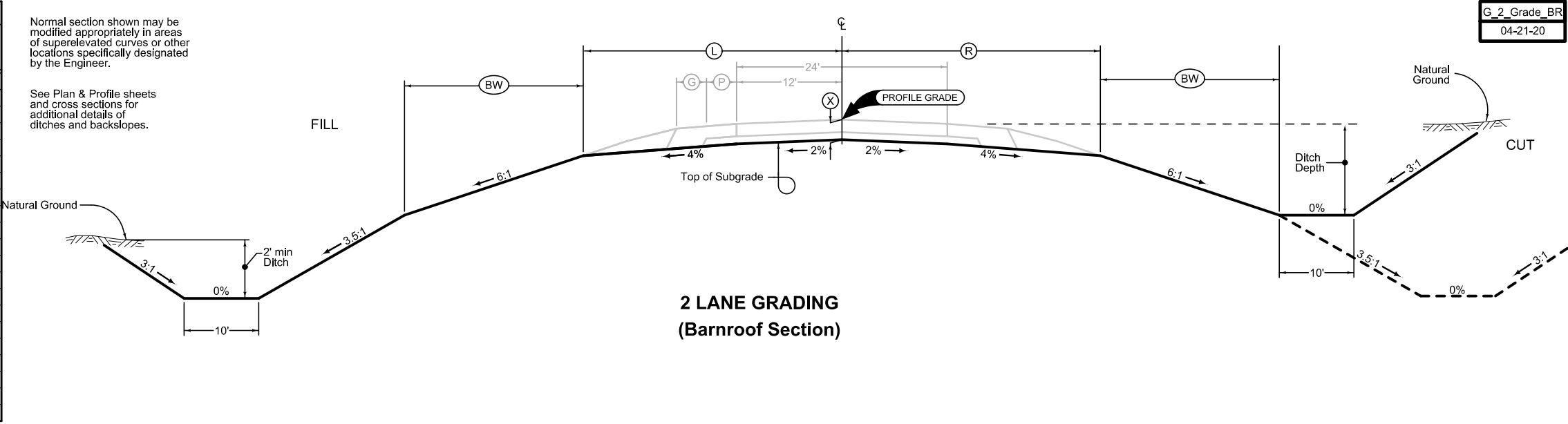
Notes:

Existing Shoulder through Project area is 4' paved. Paved shoulder full width within guardrail limits.

LOCATION		DIMENSIONS			
ROAD IDENTIFICATION	STATION TO STATION	(L) Feet	(R) Feet	(X) Inches	(BW) Feet
US 71	38+47.56 42+22.44			16	

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

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



Paved Shoulder at Guardrail

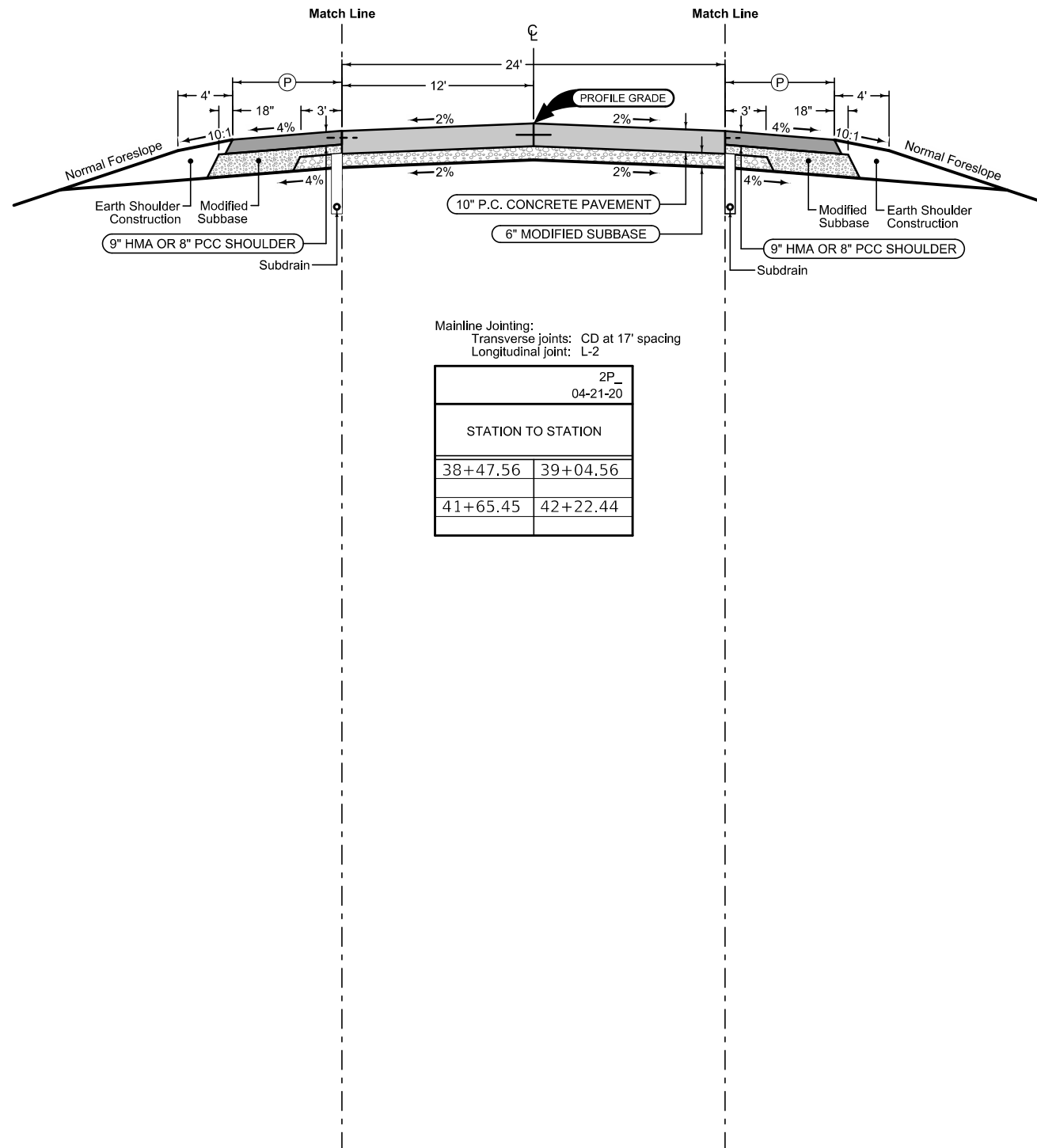
PCC Shoulder Jointing: BT-1 or BT-5
 Longitudinal joint: C at mainline spacing
 Transverse joints: C at mainline spacing
 HMA Shoulder Jointing: B
 Longitudinal joint: B

2_P_Guard_ 04-21-20		
STATION TO STATION		(P) Feet
38+47.56	39+04.56	VAR.
41+65.45	42+47.44	VAR.

Paved Shoulder at Guardrail

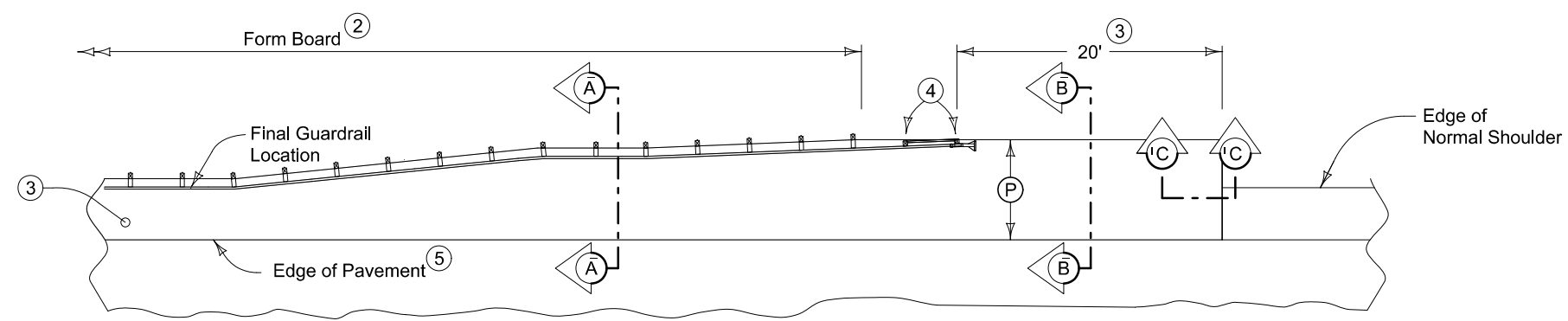
PCC Shoulder Jointing: BT-1 or BT-5
 Longitudinal joint: C at mainline spacing
 Transverse joints: C at mainline spacing
 HMA Shoulder Jointing: B
 Longitudinal joint: B

2_P_Guard_ 04-21-20		
STATION TO STATION		(P) Feet
38+22.56	39+04.56	VAR.
41+65.45	42+22.44	VAR.



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

2P_ 04-21-20		
STATION TO STATION		
38+47.56	39+04.56	
41+65.45	42+22.44	



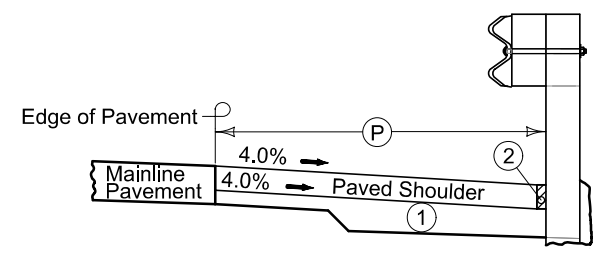
PLAN VIEW

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

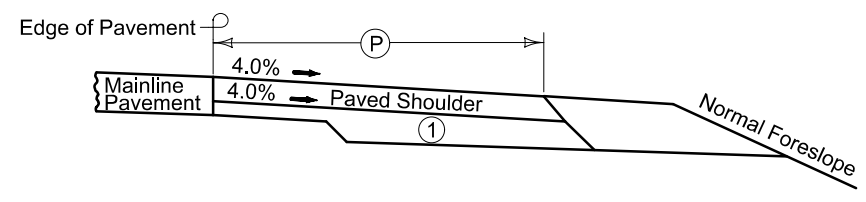
Match mainline pavement joint spacing. When mainline pavement is 8" or greater in thickness, place additional transverse 'C' joints in shoulder at mid-panel of the mainline pavement. Place longitudinal 'C' joint at P/2 from edge of mainline pavement when P is greater than 10' in length. Terminate longitudinal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

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

Refer to Tabulation 112-9 for shoulder quantities.



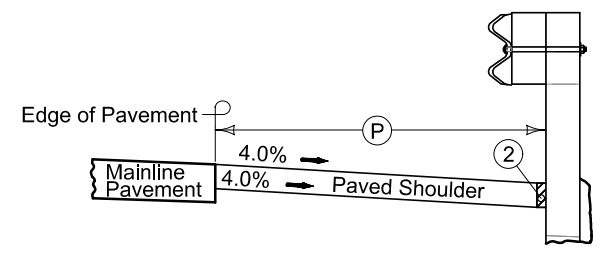
Section A-A



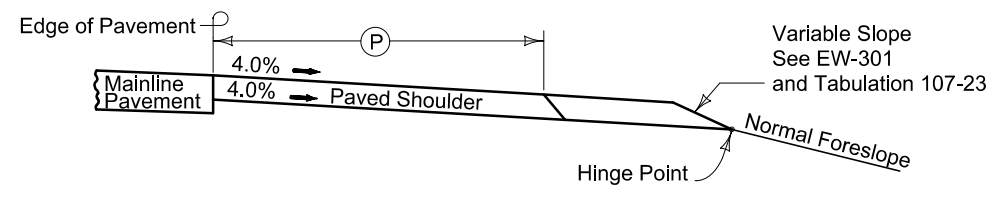
Section B-B

NEW CONSTRUCTION

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

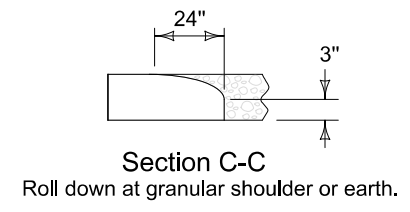


Section A-A



Section B-B

EXISTING SHOULDER



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

PAVED SHOULDER AT GUARDRAIL

SURVEY SYMBOLS

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

FOIDI, CENTURY LINK - 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

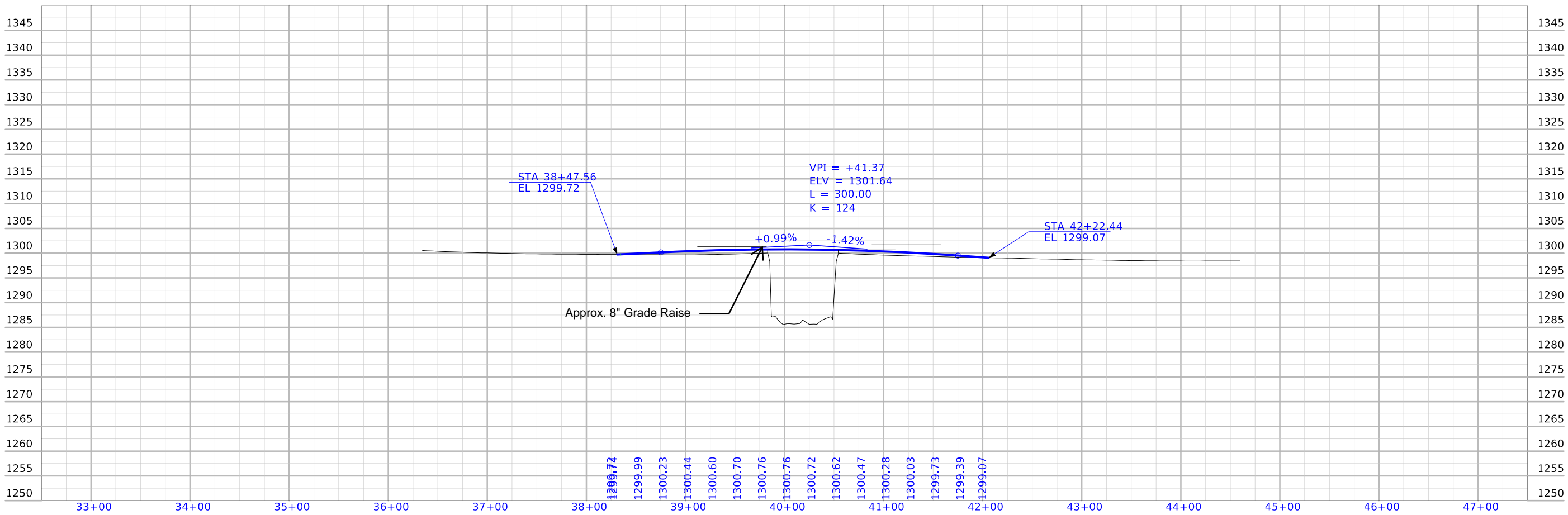
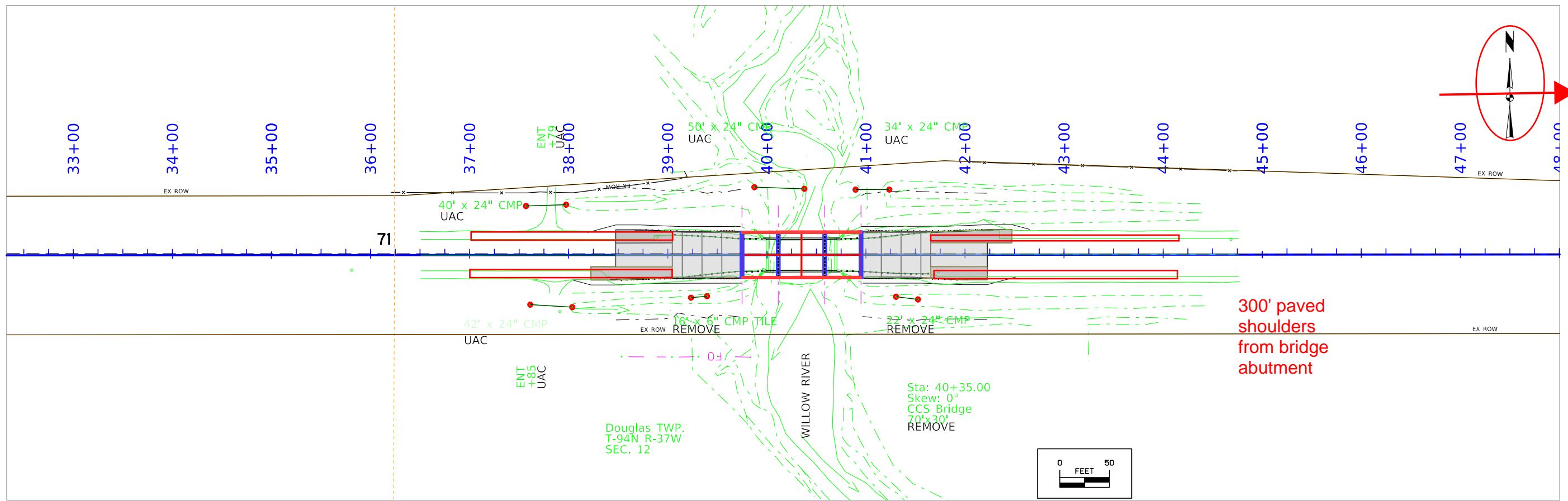
LINEWORK		Design Color No.	
Green	(10)		Existing Ground Line Profile
Blue	(1)		Proposed Profile and Annotation
Magenta	(5)		Existing Utilities
Blue, Light	(230)		Proposed Ditch Grades, Left
Black	(0)		Proposed Ditch Grades, Median
Rust	(14)		Proposed Ditch Grades, Right

- Reference Point
- 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
 - Access Control
 - Property Line

PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

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



Survey Information

SURVEY INDEX

County: Clay
PIN: 21-21-071-020
Project Number: BRF-071-8(62)--38-21
Location: Willow River 3.4 mi N of N Jct IA 10
Type of Work:
Project Directory: 2107102021

Survey Personnel

Murray Berting – PLS
Gavin Gear – Land Survey Technician

Date(s) of Survey

Begin Date 10/06/2022
End Date 03/29/2023

General Information

Measurement units for this survey are US survey feet. This survey is for proposed bridge reconstruction and reconstruction of State Highway 71, over the Willow River. Project datum and control information is provided by Shive-Hattery Inc. This project is a Preliminary Survey. This survey request was for the bridge over the Willow River, State Highway 71 corridor and the Willow River.

Project Control

Vertical Control

Nearby Iowa Real Time Network reference stations were utilized to obtain horizontal and vertical control on primary project control points. (3) three-minute observations were taken with a minimum two-hour time span between and used in a weighted average to obtain final coordinate values. For additional details of the control survey, contact the Preliminary Survey department.

PROJECT DATUM: NAD83(2011) for EPOCH 2010.00 (IaRTN 2019 ADJUSTMENT)
COORDINATE SYSTEM: IOWA REGIONAL COORDINATE SYSTEM ZONE 01
(U.S. SURVEY FOOT)
VERTICAL DATUM: NAVD88
GEOID MODEL: 2012bu2

Alignment Information

The horizontal alignment for U.S. Hwy 71 this survey is a retrace of As-built Plans No. FN-935. Survey stationing was equated to the plan POT at Sta. 215+40 and run back and ahead without equation throughout the survey.

Survey stationing relates to as built plan stationing as follows:

POT Sta. 215+40.0 As-built Plans Project No. FN-935
Survey POT Sta. 215+40.0

POT Sta. 241+57.35 As-built Plans Project No. FN-935
Survey POT Sta. 241+58.70

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 01 (U.S. Survey Foot)

VERT. DATUM: NAVD88 - Geoid Model: 2012bu2

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

HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING
 HORIZ. DATUM: NAD83(2011) for EPOCH 2010.00 (IaRTN 2019 Adjustment)
 Ia. Regional Coordinate System Zone 01 (U.S. Survey Foot)
 VERT. DATUM: NAVD88
 Geoid Model: 2012bu2

POINT NAME	NORTHING	EASTING	ELEVATION	FEATURE DEFINITION
501	9519325.722	11523632	1294.635333	CP 1" GAS PIPE W/ IDOT CAP ROW
502	9517967.878	11523646	1294.032667	CP TPOST @ ROW REF
504	9516255.271	11523656	1308.701	CP 1" GAS PIPE W/ IDOT CAP
505	9515755.198	11523781	1336.049667	CP 1" GAS PIPE W/ IDOT CAP
506	9515955.207	11523806	1337.653333	CP 1" GAS PIPE W/ IDOT CAP
507	9515655.231	11523786	1341.703667	CP 1" GAS PIPE W/ IDOT CAP

108-23A
08-01-08

TRAFFIC CONTROL PLAN

- 1) While bridge and approaches are being removed and replaced, traffic shall be maintained on US 71 at all times by staged construction with temporary signals allowing one lane of traffic. (TC-217)
- 2) Signage and devices shall be furnished, installed, maintained, and removed by Contractor.

108-26A
08-01-08

STAGING NOTES

Stage 1:
Construct temporary pavement at SB shoulders.
Remove and replace east(NB) portion of US 71 roadway, approaches and bridge with traffic shifted to SB lane using temporary signals.

Stage 2:
Remove and replace west half of roadway, approaches and complete bridge structure with traffic shifted to NB lane and temporary pavement using temporary signals.

Stage 3:
Complete approach and roadway to re-establish centerline with US 71 traffic shifted to SB lane using temporary signals.

108-25
10-21-14

511 TRAVEL RESTRICTIONS

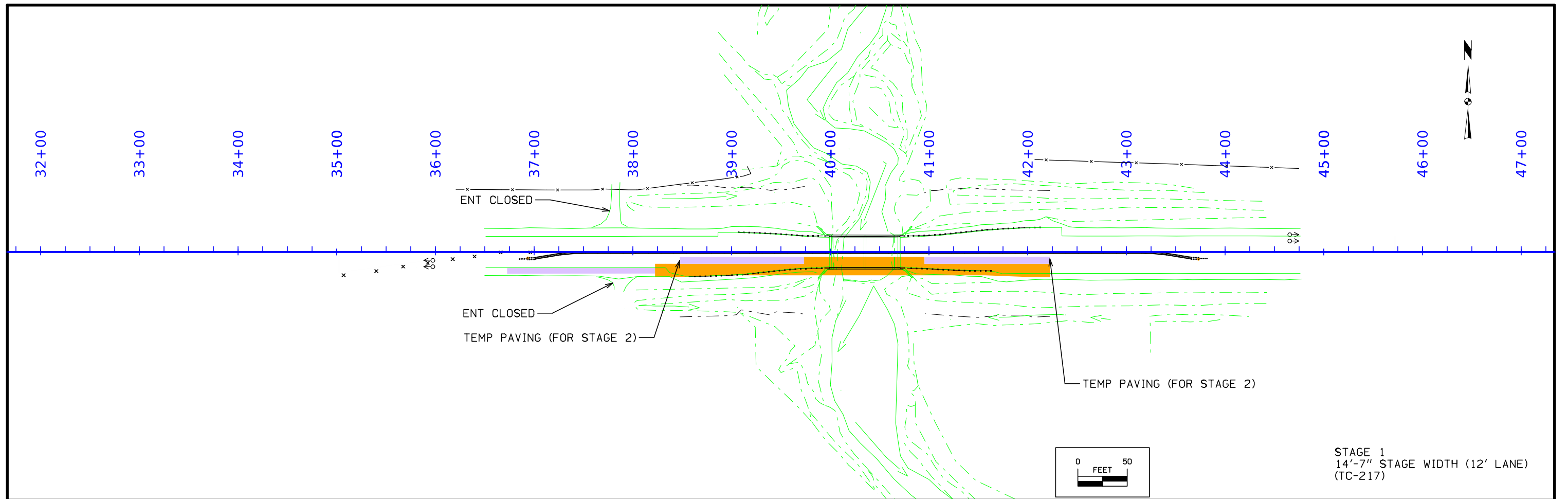
Route	Direction	County	Location Description	Feature Crossed	Object Type	Maint. Bridge No., Structure ID, or FHWA No.	Type of Restriction	Existing Measurement	Construction Measurement	Construction Measurement as Signed	Projected As Built Measurement	Remarks
US 71	Both	CLAY	Bridge over Willow River	Willow River	Bridge		Width					

111-01
04-17-12

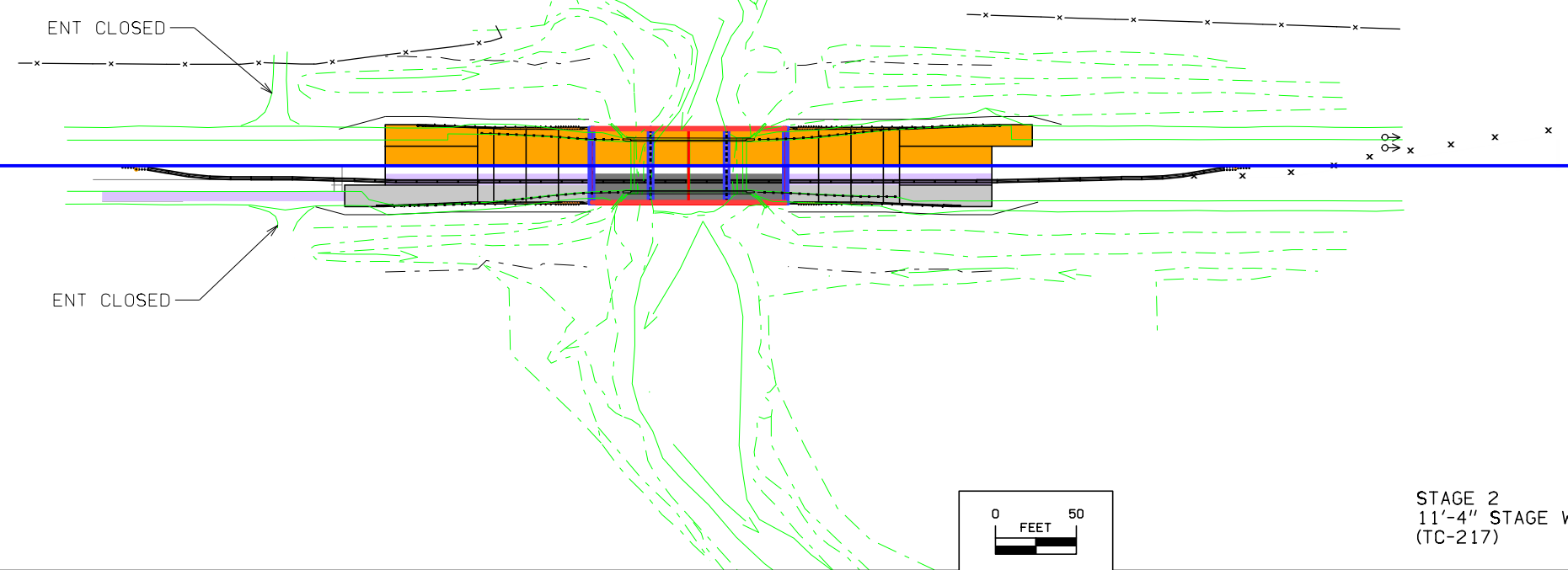
COORDINATED OPERATIONS

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

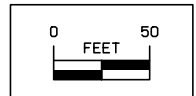
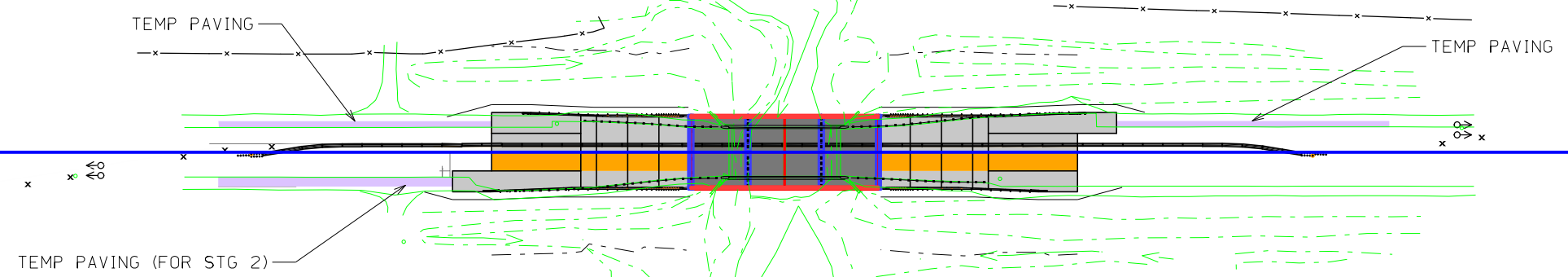
Project	Type of Work
None Provided	



STAGE 1
 14'-7" STAGE WIDTH (12' LANE)
 (TC-217)

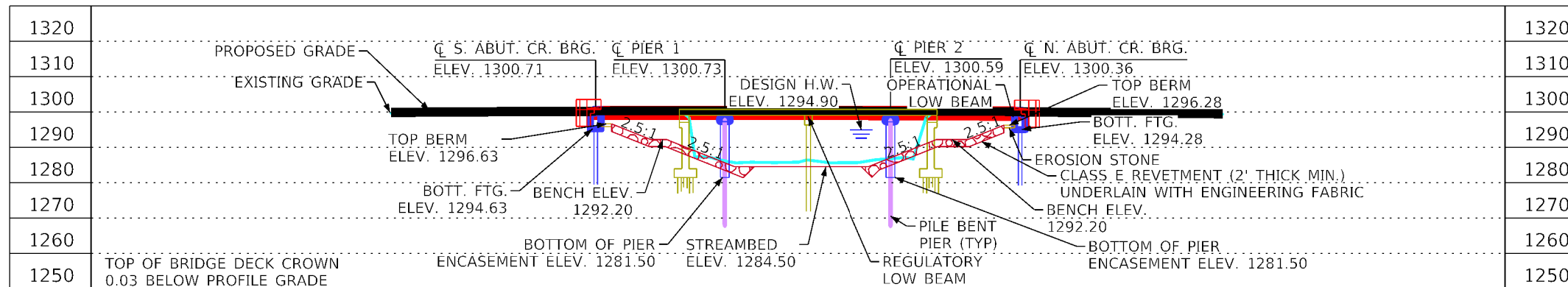


STAGE 2
 11'-4" STAGE WIDTH
 (TC-217)

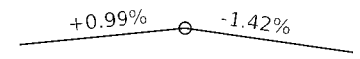


STAGE 3
14'-0" STAGE WIDTH
(TC-217)
(RE-ESTABLISHING CENTERLINE JOINT)

Control Point:



LONGITUDINAL SECTION ALONG \bar{C} CULVERT



VPI Sta. = 40+25.00
VPI Elev. = 1301.64
LVC = 300.00

**Proposed Profile
Grade U.S. 71**

Hydraulic Data

Drainage Area = 81.2 Sq. Mi.
Stream Slope = 5.39 Ft./Mi.
Avg. Low Water Stage = 1284.2

Q_{75} = 3,490 CFS
Stage = 1294.4

Q_{50} = 4,300 CFS
Stage = 1294.9
Regulatory Low Beam = 1298.57
Avg. Bridge Velocity = 6.90 FPS

Q_{100} = 5,210 CFS
Stage = 1295.2
Operational Low Beam = 1298.25
Backwater = 1.32 Ft.
Avg. Bridge Velocity = 8.10 FPS

Q_{200} = 6,200 CFS
Stage = 1295.5
Calculated Design Scour =

Q_{500} = 7,380 CFS
Stage = 1295.7
Avg. Bridge Velocity = 10.48 FPS
Calculated Check Scour =

Roadway Overtop 1298.40
Sta. 36+35.0

Utilities Legend

Symbol - Type

Utilities shown on this sheet are for information only, see road design sheets for final utility information.

Location

U.S. 71 Over Willow River
T-94N R-37W
Section 12
Douglas Township
Clay County
FHWA No.
Bridge Maint. No. 2192.5s071
Latitude 42.972575°
Longitude -95.161392°

Traffic Estimate

2026 AADT	4,100	V.P.D.
2046 AADT	4,300	V.P.D.
2046 DHV	450	V.P.H.
Trucks	15	%
Total		
Design ESALs	??,???	

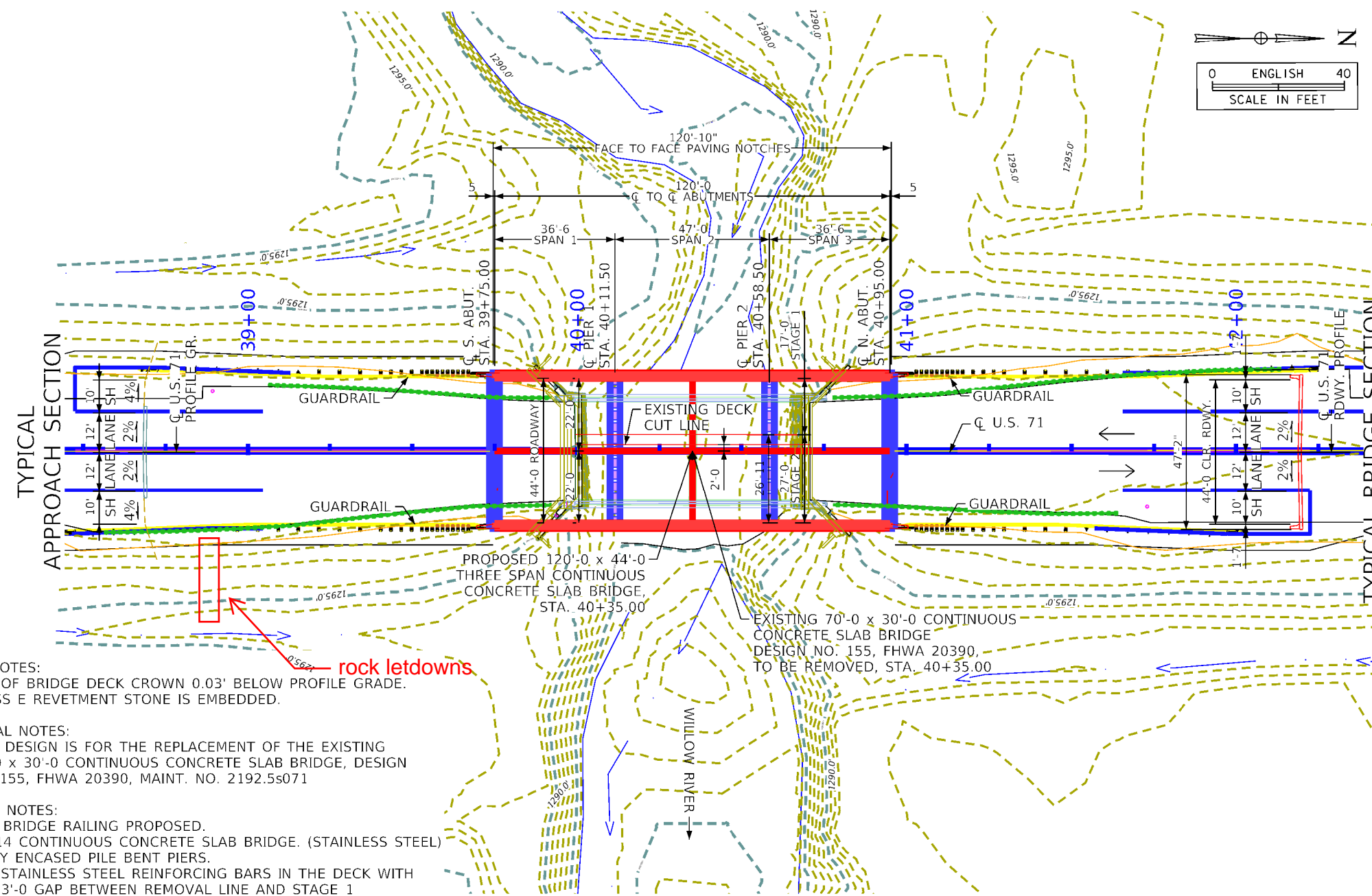
Design For 0° Skew
**120'-0 x 44'-0 CONTINUOUS
CONCRETE SLAB BRIDGE**
36'-6 End Spans 47'-0 Interior Span

SITUATION PLAN

STA. 40+35.00 (U.S. 71) JUNE 2023

Clay County

IOWA DEPARTMENT OF TRANSPORTATION
Design No. ##### Design Sheet No. 001 of 003 FHWA/Asset #####

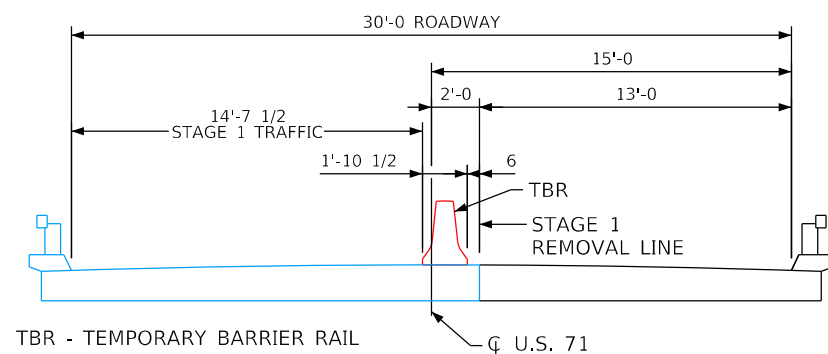


SITUATION PLAN

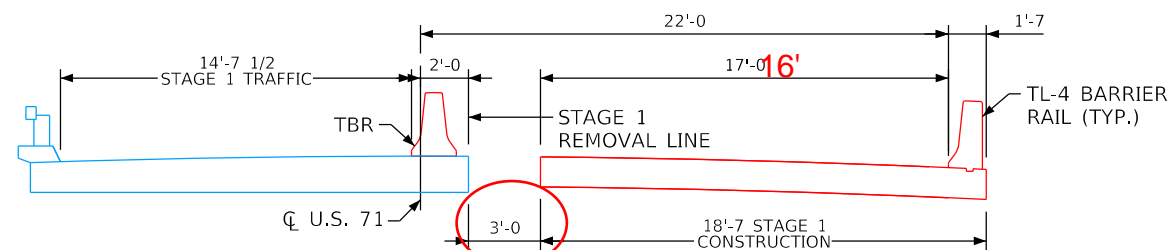
- PLAN NOTES:
- TOP OF BRIDGE DECK CROWN 0.03' BELOW PROFILE GRADE.
 - CLASS E REVETMENT STONE IS EMBEDDED.

- GENERAL NOTES:
- THIS DESIGN IS FOR THE REPLACEMENT OF THE EXISTING 70'-0 x 30'-0 CONTINUOUS CONCRETE SLAB BRIDGE, DESIGN NO. 155, FHWA 20390, MAINT. NO. 2192.5s071

- DESIGN NOTES:
- TL-4 BRIDGE RAILING PROPOSED.
 - J44-14 CONTINUOUS CONCRETE SLAB BRIDGE. (STAINLESS STEEL)
 - FULLY ENCASED PILE BENT PIERS.
 - USE STAINLESS STEEL REINFORCING BARS IN THE DECK WITH THE 3'-0 GAP BETWEEN REMOVAL LINE AND STAGE 1 CONSTRUCTED DECK.
 - STAGE 1 SLAB CONSTRUCTION SHALL REMAIN SHORED DURING STAGE 2 CONSTRUCTION.

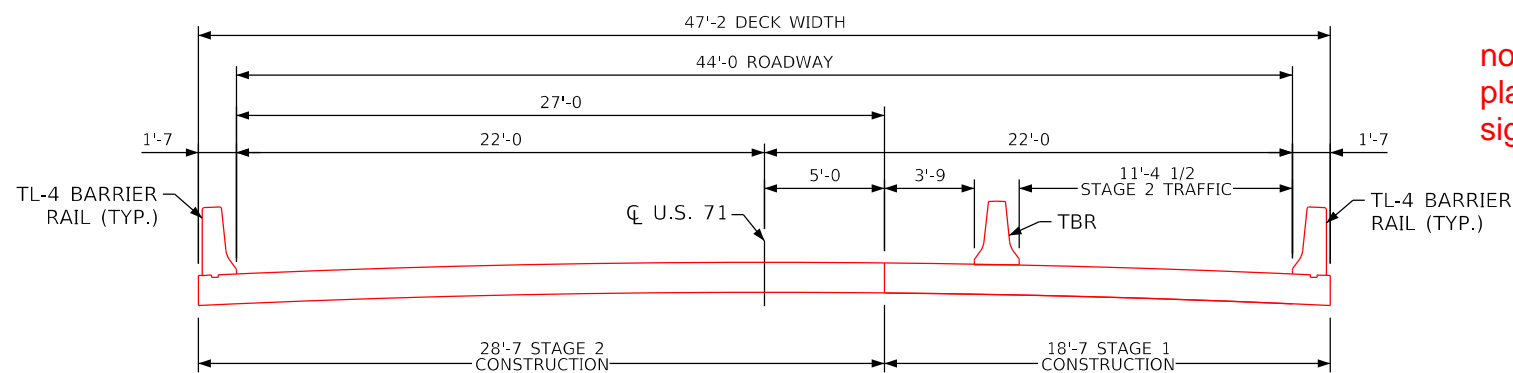


STAGE 1 REMOVAL



STAGE 1 CONSTRUCTION

4' gap desirable
existing pile - review



STAGE 2 CONSTRUCTION

note in field exam plans - wide load signage

Design For 0° Skew
120'-0 x 44'-0 CONTINUOUS CONCRETE SLAB BRIDGE
 36'-6 End Spans 47'-0 Interior Span
STAGE PLAN
 STA. 40+35.00 (U.S. 71) JUNE 2023
Clay County
 IOWA DEPARTMENT OF TRANSPORTATION
 Design No. ##### Design Sheet No. 003 of 003 FHWA/Asset #####

CROSS SECTION VIEW COLOR LEGEND

Design Color No.	Feature	Design Color No.	Feature
Aggregate			
(64)	Choke Stone	(112)	Noise Wall
(42)	Engineering Fabric	(112)	Noise Wall Footing
(8)	Flooded Backfill	(112)	Retaining Wall Back
(92)	Macadam Stone	(112)	Retaining Wall Back Excavate
(20)	Modified	(112)	Retaining Wall Face
(12)	Plowing Shaping	(112)	Retaining Wall Front Excavate
(14)	Porous Backfill	(112)	Retaining Wall Front Footing
(8)	Revetment Class A	(112)	Retaining Wall MSE Gutter
(6)	Revetment Class B	(112)	Retaining Wall Reinforced Earth
(62)	Revetment Class C		
(188)	Revetment Class D	Grading	
(28)	Revetment Class E	(8)	Behind Curb Cut
(12)	Shoulder Special Backfill	(6)	Granular
(12)	Special Backfill	(13)	Granular Back Fill
(20)	Subbase	(48)	Rock Undercut
(20)	Subbase Lower	(8)	Shoulder Earth Fill
(20)	Subbase Upper	(2)	Side Slopes
(118)	Subgrade Treatment	(226)	Side Slopes Dressing
Asphalt			
(207)	HMA Base Course	Substrata	
(207)	HMA Interim Course	(128)	Boulder Substrata
(207)	HMA Surface Course	(48)	Broken Weathered Substrata
Concrete			
(0)	Barrier Concrete	(3)	Core Out Substrata
(0)	Barrier Concrete Footing	(203)	Existing Pavement Substrata
(0)	Curb Gutter	(6)	Loam Substrata
(48)	Flowable Mortar	(80)	Rock Substrata
(0)	Median Concrete	(4)	Select Sand Substrata
(0)	PCC Pavement	(3)	Shale Substrata
(0)	Sidewalk	(10)	Topsoil Substrata
Shoulder			
(209)	Shoulder HMA	Unsuitable / Waste	
(0)	Shoulder PCC	(3)	Unsuitable Type A
(6)	Shoulder Granular	(13)	Unsuitable Type B
		(11)	Unsuitable Type C
		(3)	Waste
Existing			
(0)	Existing Pavement		

NOTES:

Text

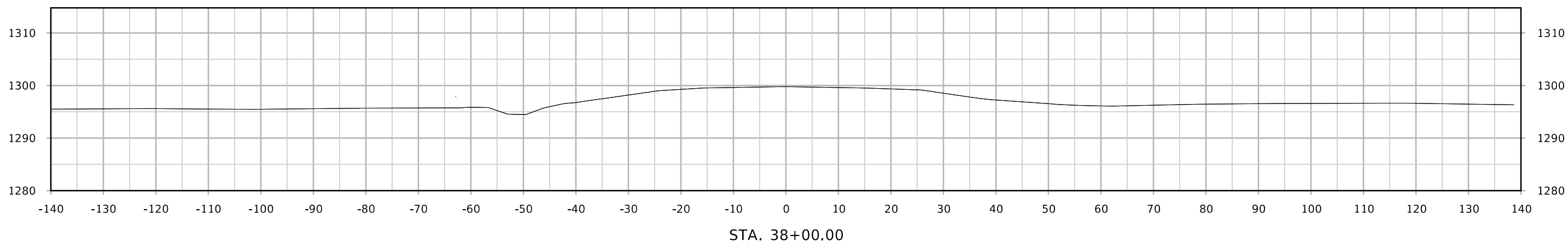
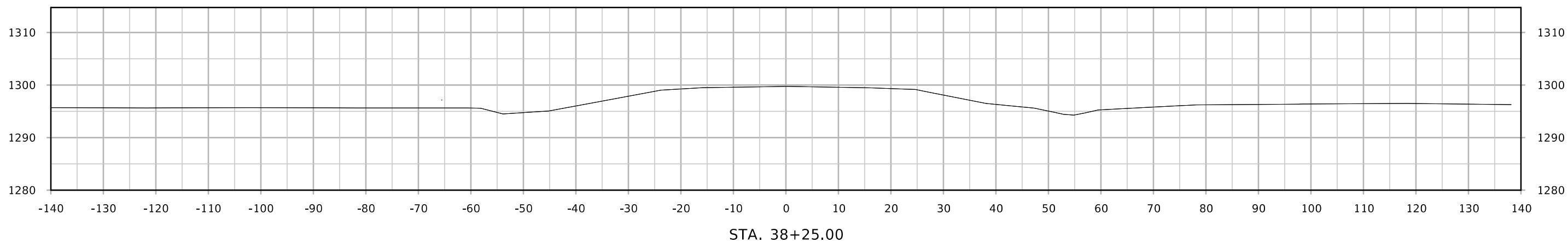
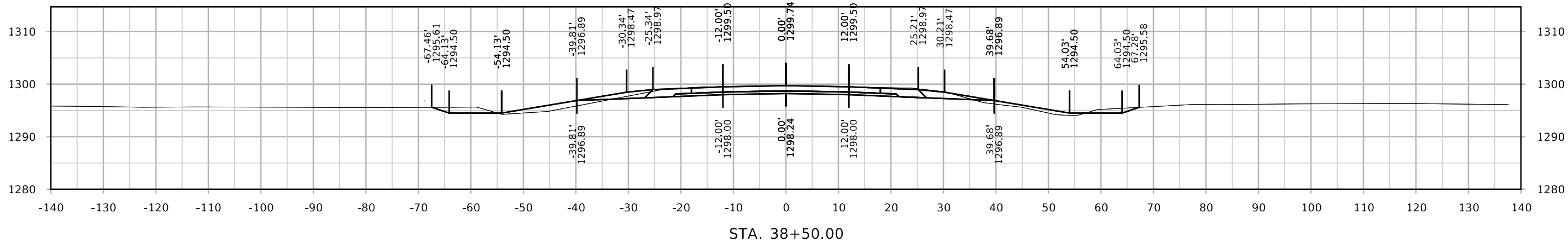
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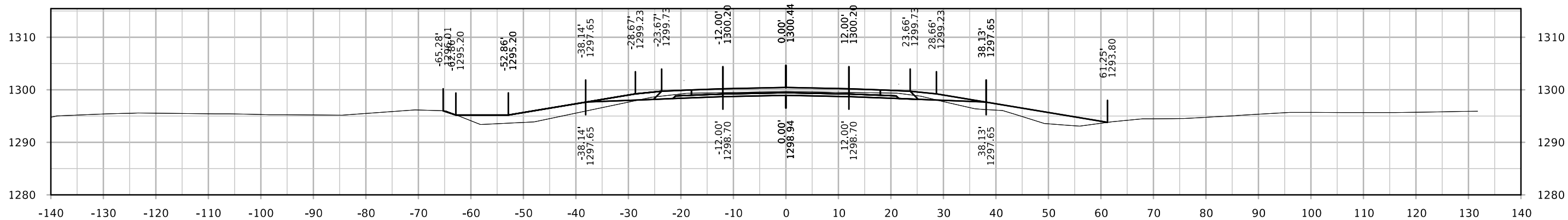
CROSS SECTIONS LEGEND AND INFORMATION SHEET

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

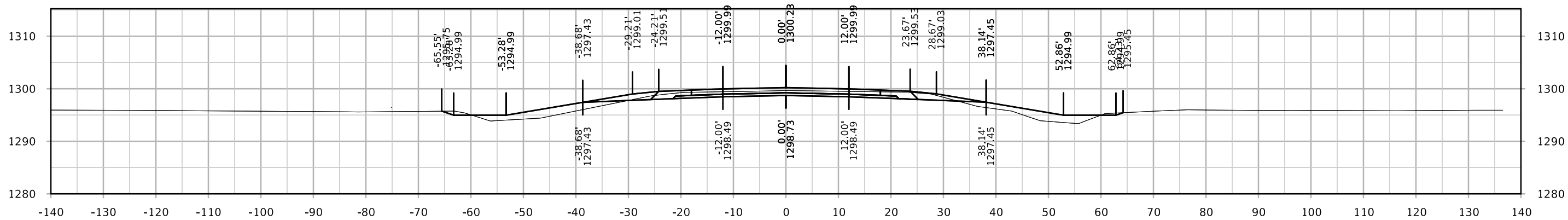
US 71



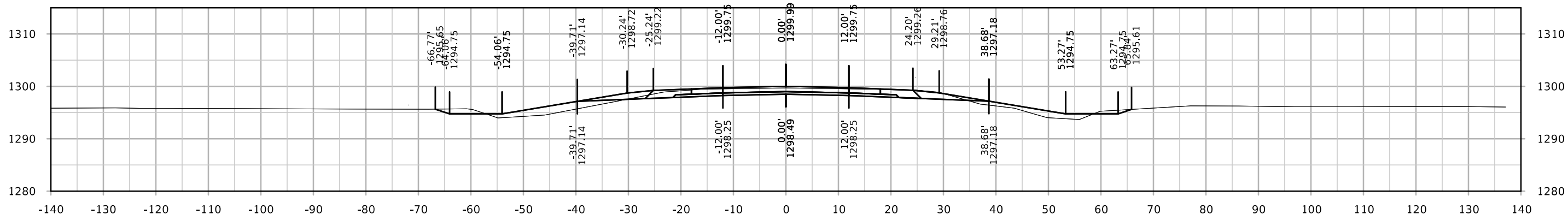
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STA. 39+25.00

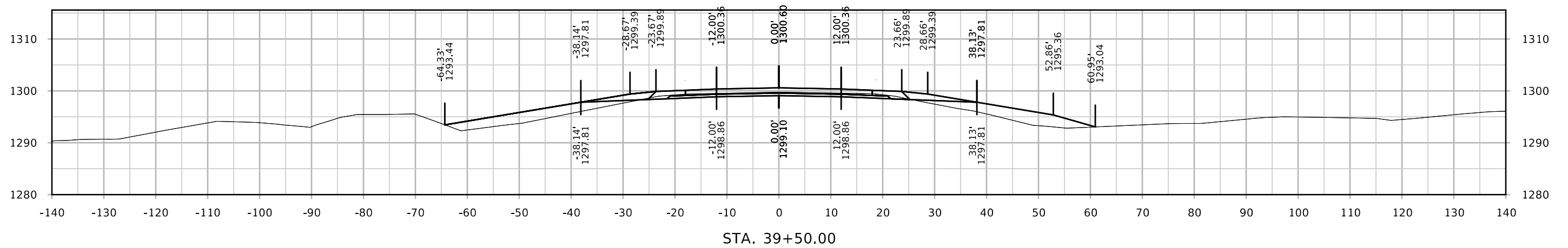
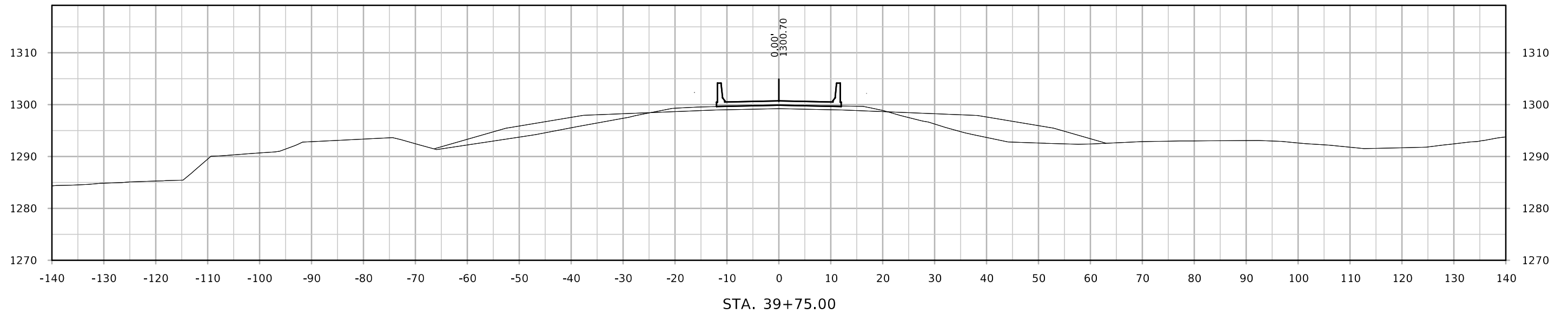
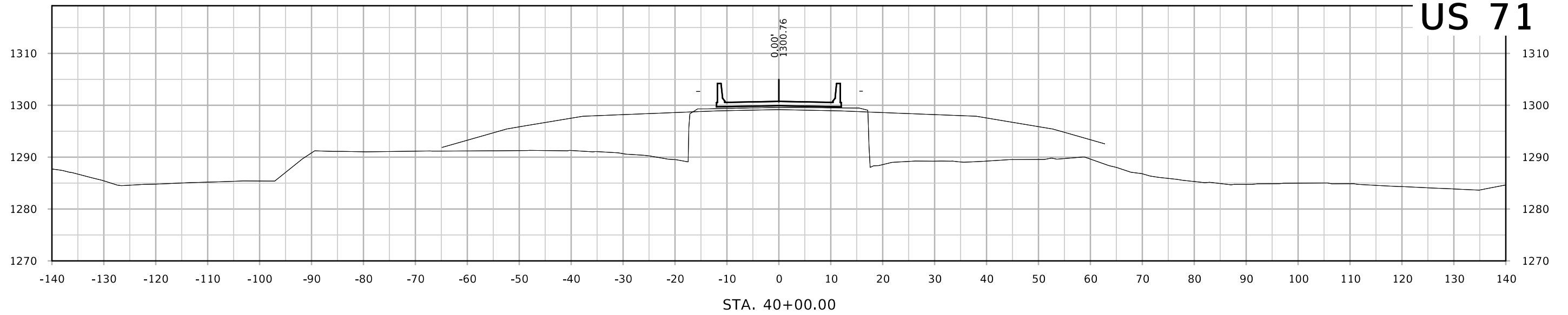


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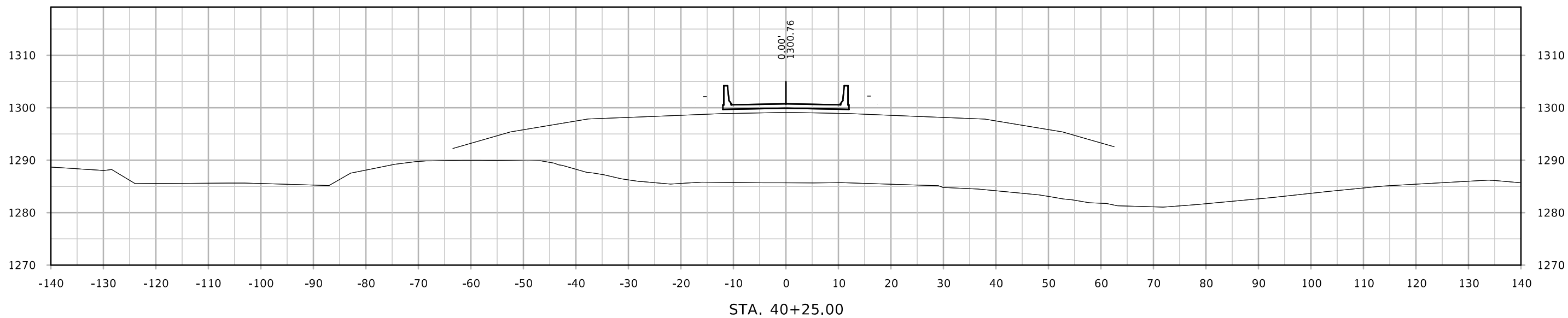
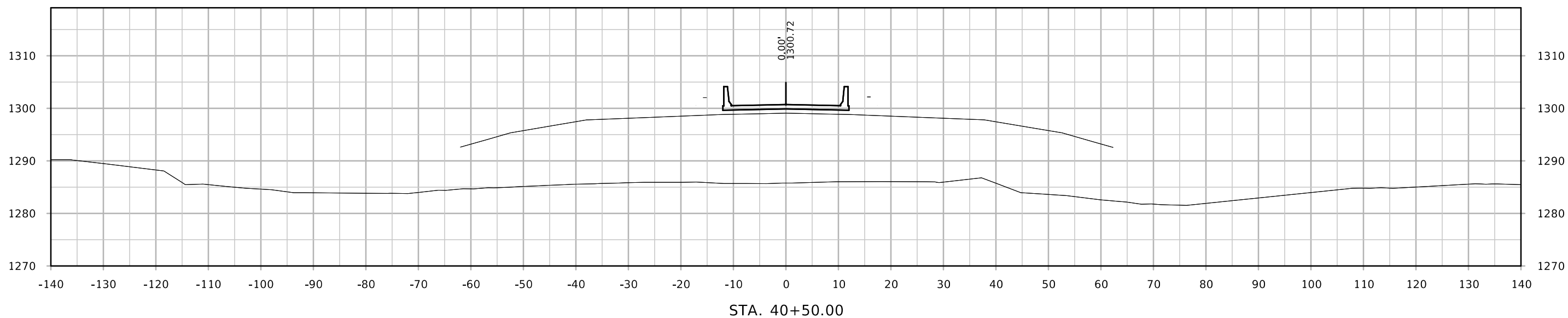


STA. 38+75.00

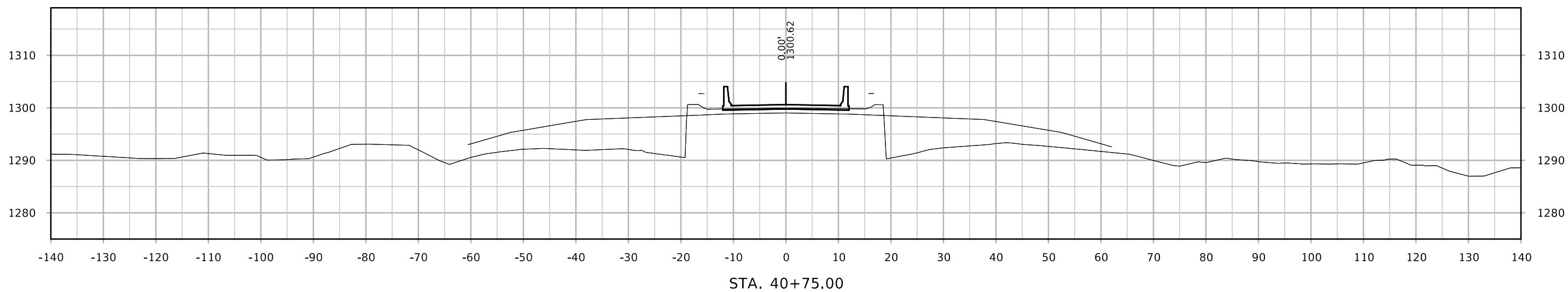
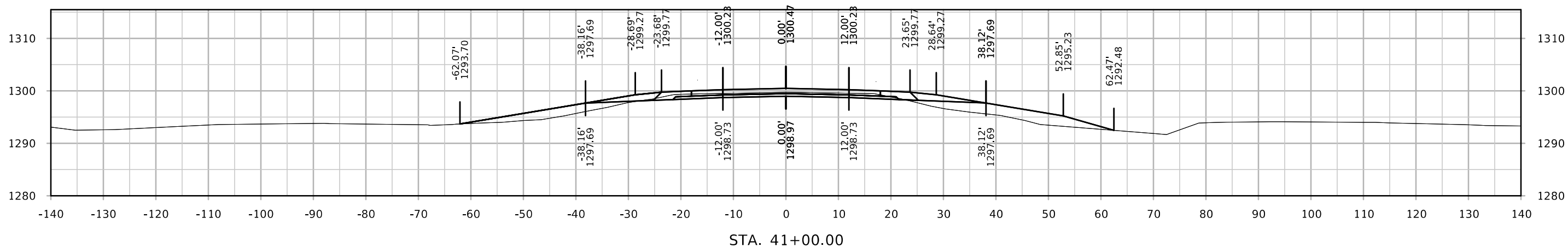
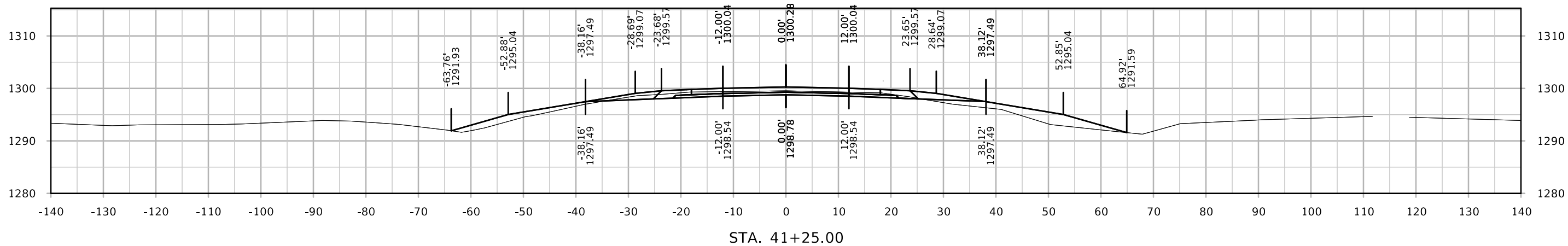
US 71



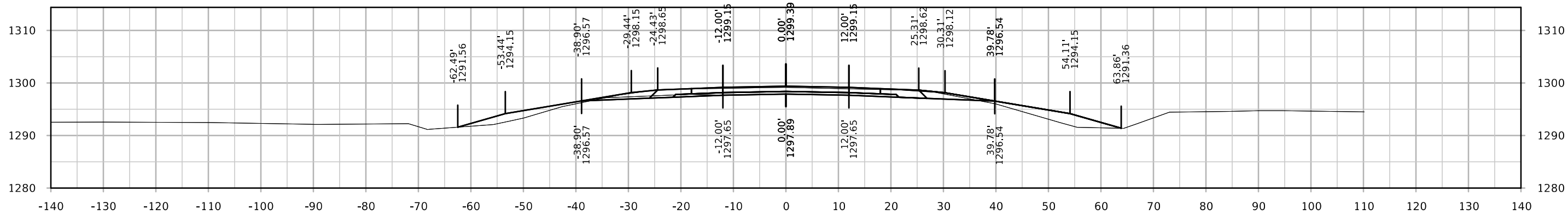
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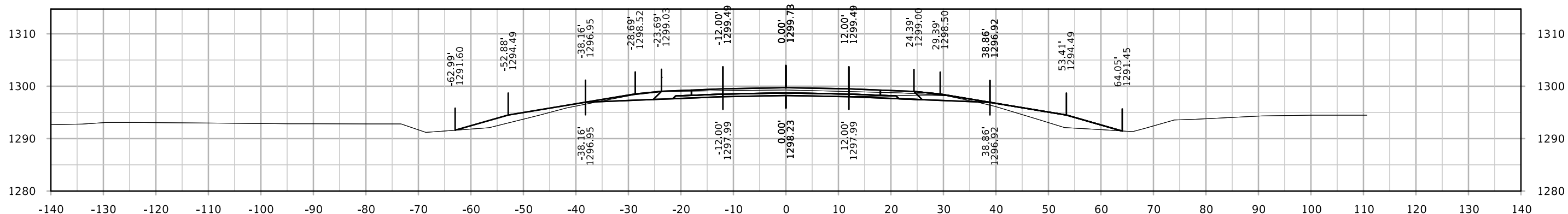
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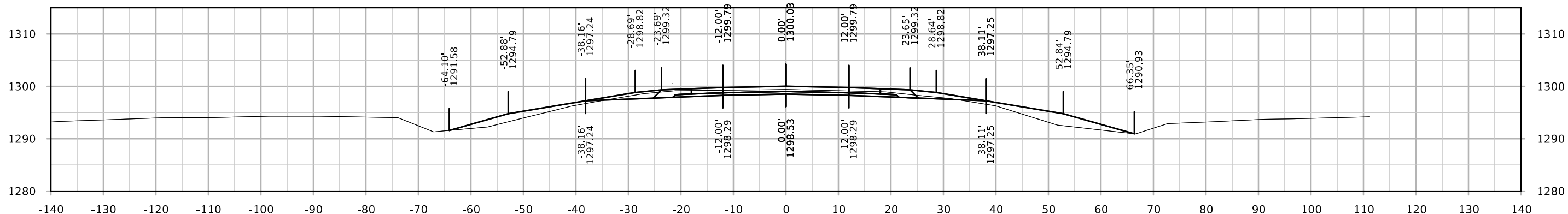
US 71



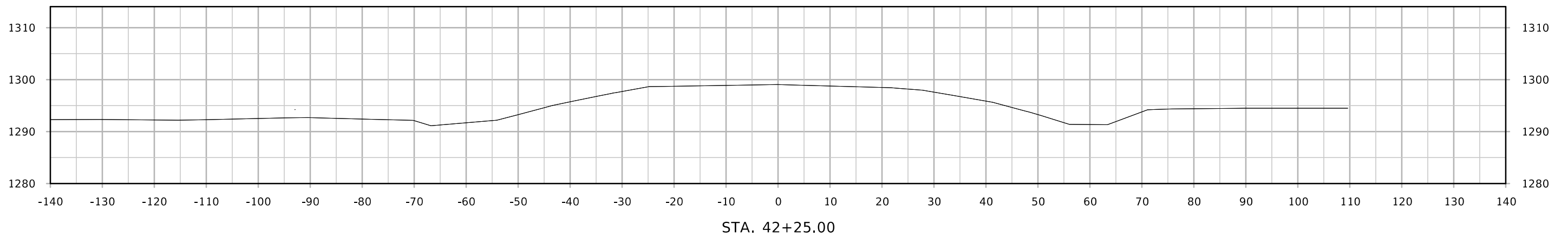
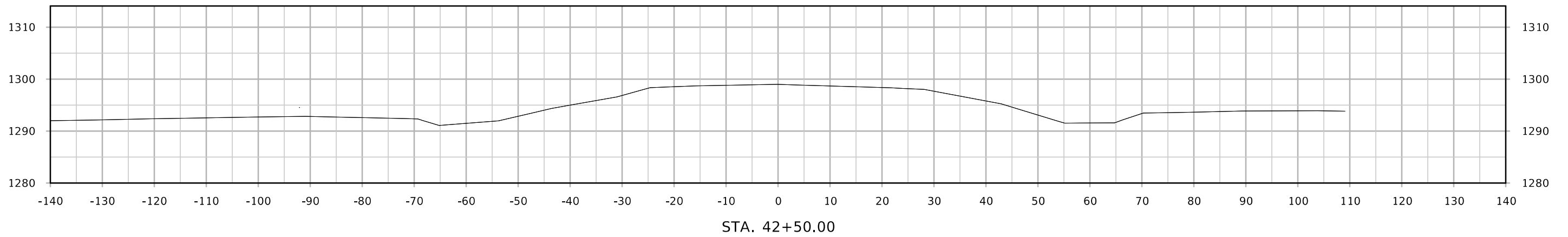
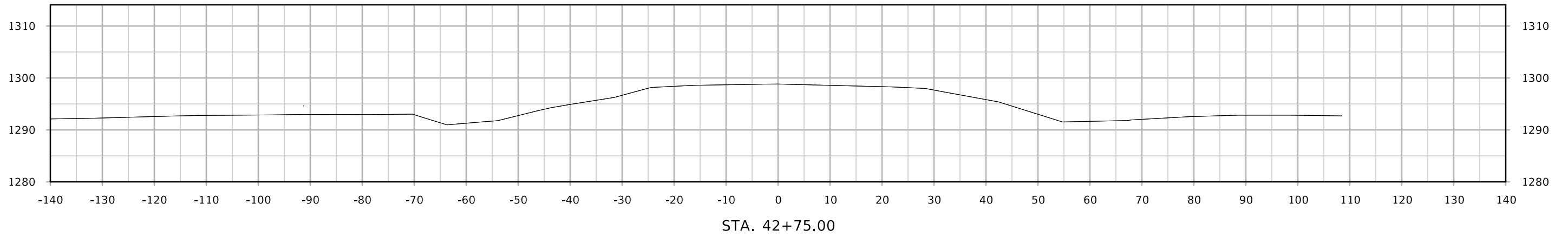
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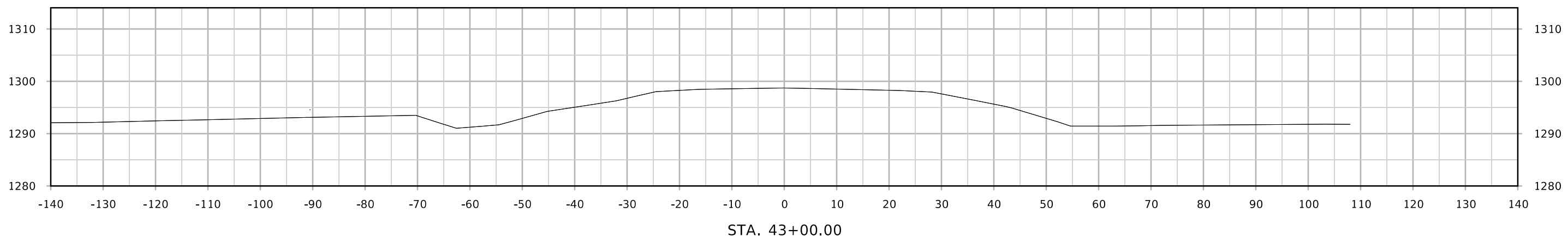


STA. 41+75.00



STA. 41+50.00





STA. 43+00.00