



REVISIONS

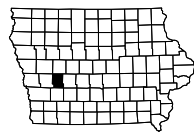
TOTAL

PROJECT IDENTIFICATION NUMBER	21-05-071-010
PROJECT NUMBER	BRF-071-4(57)--38-05
R.O.W. PROJECT NUMBER	NHSN-071-4(58)--2R-05

LETTING DATE
Jan 21, 2026

Bridge Replacement
BRF-071-4(57)--38-05

AUDUBON COUNTY



INDEX OF SHEETS	
No.	DESCRIPTION
A Sheets	Title Sheets
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* A.2	Location Map Sheet
* A.3 - 9	Concept and Criteria
B Sheets	Typical Cross Sections and Details
B.1 - 2	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
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H Sheets	Right-of-Way Sheets
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J Sheets	Traffic Control and Staging Sheets
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J.1	Staging Notes Stage
* J.2 - 3	Stages 1 & 2
V Sheets	Bridge and Culvert Situation Plans
V.1	Bridge and Culvert Situation Plans
W Sheets	Mainline Cross Sections
W.1	Cross Sections Legend & Symbol Information Sheet
W.2 - 7	Mainline Cross Sections
	* Color Plan Sheets

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM AUDUBON COUNTY

Bridge Replacement

Stream 0.6 Mi N of I-80

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

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



D2 VIRTUAL FIELD EXAM
June 27, 2023

ATTENDEES:

Iowa DOT:
Wes Mayberry
Kevin Patel
Kent Nicholson
Jimmy Ellis
Claire Asberry
Marc Solberg
Nicole Cuva
Phil Mescher

Shive-Hattery:
Joe Appel
Mark Harpole
Kent Ellis
Mike Janecek
Cara Lindell
Jack Gepson

DATES UPDATED FROM
MASTERWORKS

D4: 9/24/2025
D5: 12/01/2023
D3: 7/28/2023
B1: 10/27/2023
D2: 6/30/2023

D4 PLAN - Sep 24, 2025
D5 PLAN - Dec 1, 2023
D3 PLAN - July 28, 2023

DESIGN DATA RURAL			
2026	AADT	2457	V.P.D.
2046	AADT	2570	V.P.D.
2046	DHV	270	V.P.H.
	TRUCKS	18	%
	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

PRELIMINARY PLANS

Subject to change by final design.

D2 PLAN - Jul 12, 2023

AUDUBON COUNTY CASS COUNTY IOWA

Prepared By
IOWA DOT

SYSTEMS PLANNING BUREAU
Phone: (515) 239-1664
WWW.IOWADOT.GOV/MAPS



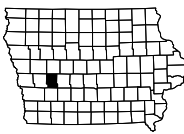
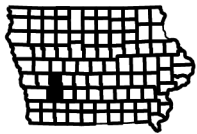
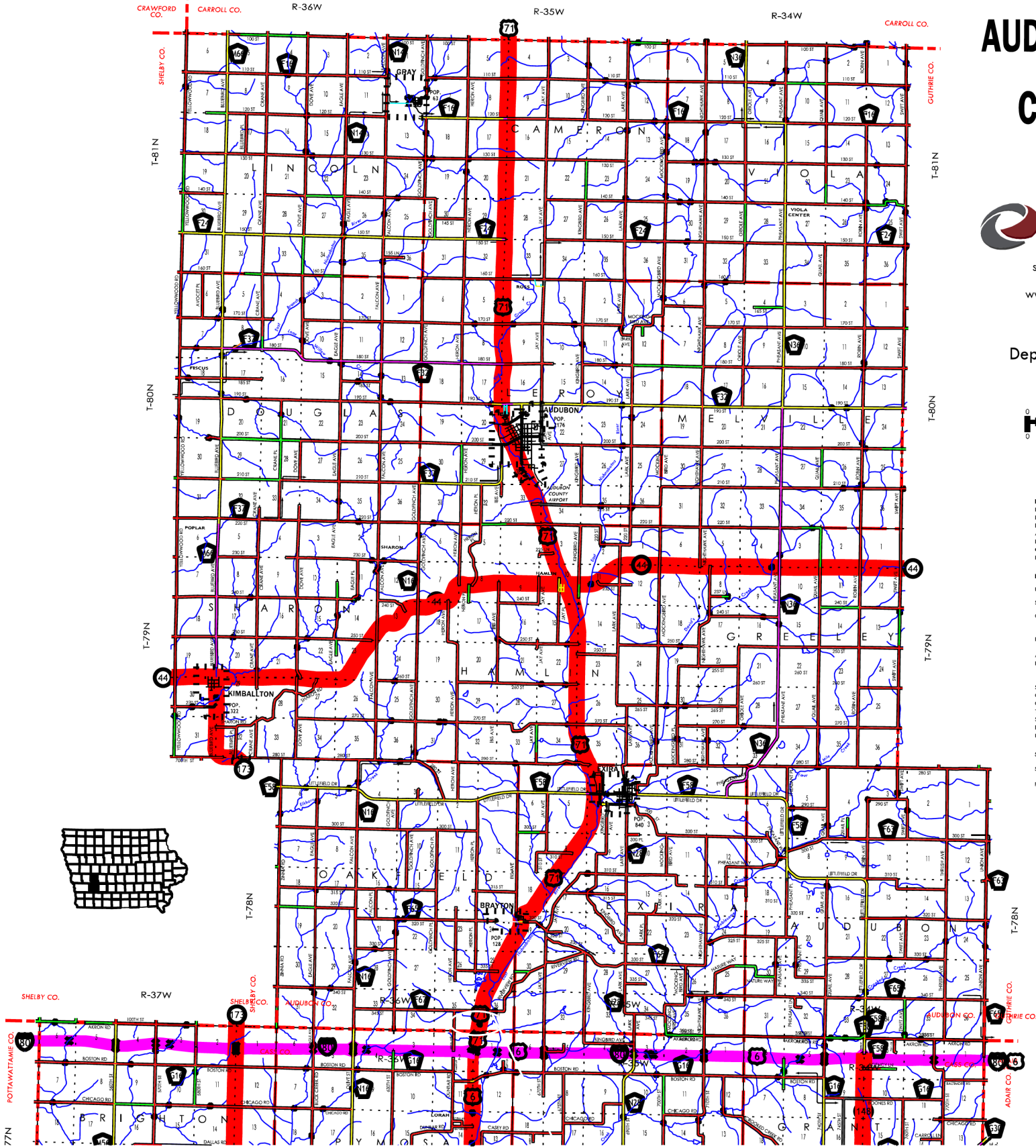
In Cooperation With
**United States
Department of Transportation**

JANUARY 1, 2020



LEGEND

- INTERSTATE HIGHWAY
- PRIMARY HIGHWAY-DIVIDED
- PRIMARY HIGHWAY
- PORTLAND CEMENT CONCRETE ROAD
- ASPHALT ROAD
- BITUMINOUS ROAD
- GRAVEL ROAD
- EARTHEN ROAD
- INTERSTATE HIGHWAY
- UNITED STATES HIGHWAY
- STATE HIGHWAY
- COUNTY HIGHWAY
- RAILROAD
- AIRPORT
- HYDROLOGY
- STATE BOUNDARY
- COUNTY BOUNDARY
- CORPORATE BOUNDARY
- TOWNSHIP LINE
- SECTION LINE
- ROAD NAMES
- UNINCORPORATED PLACE
- STATE PARKS
- STATE INSTITUTIONS
- FEDERAL LAND



IOWA DEPARTMENT OF TRANSPORTATION

TO OFFICE: District 4
ATTENTION: Scott Schram
FROM: Mike Janechek
OFFICE: Shive-Hattery
SUBJECT: Project Concept Statement; (Approval D0)

DATE: October 7, 2022
PROJECT: Audubon County
 BRF-071-4(57)--38-05
 PIN: 21-05-071-010

This project involves the replacement of the Audubon County bridge (Maint. No 0569.0S071) over the stream 0.6 miles north of I-80.

A concept review was held on June 13, 2022. Those present included Wes Mayberry from the District 4 Office; Steven Schroder, Jim Ellis, and Jeremy Vortherms from the Iowa DOT; and Nathan Hardisty, Joe Appel, Mike Janechek, and Mark Harpole from Shive-Hattery.

One alternative was considered:

1. Replace the existing structure with a twin 10' x 12' RCB using staged construction.

Alternative 1 is the preferred option due to eliminating the need for a bridge in this location, eliminating the need for a grade raise, and avoiding the need for a detour during construction.

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

Recipients of this letter should review the attached Draft Project Concept Statement that was developed by Shive-Hattery, Inc. It is requested that you submit any comments or concerns by September 5, 2022. Any comments received during this period will be incorporated into the final concept.

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	K. K. Patel	J. Hauber
	A. Abu-Hawash	M. E. Khoda	K. Olson
	S. Neubauer	J. Vortherms	B. Bradley
	J. Harris	D. Stokes	S. Seivert
	J. Ellis	A. Poole	G. Karssen
	M. Todsens	J. Bartholomew	N. Cuva
	A. Yates	R. Meyer	E. Engle
	M. Hobbs	J. Sallach	J. Ellis
	S. Sersland	J. Garton	O. Lechnowsky
	R. Moraine	D. Redmond	N. Epperson
	M. Solberg	S. Suhr	J. Woodcock
	W. Mayberry	C. Cahill	B. Waltersdorf

SH Project #2142203890

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



PROJECT CONCEPT STATEMENT

US 71 Bridge over a stream 0.6 mi. N of Jct. I-80

Audubon County
 BRF-071-4(57)--38-05
 PIN: 21-05-071-010
 Maint. No.0569.0S071
 FHWA No. 14060

Mike Janechek P.E.
 319-248-3378

October 7, 2022

I. STUDY AREA

A. Project Description

This project involves the replacement of the US 71 bridge (Maintenance No. 0569.0S071) over a stream 0.6 mi. N of Jct. I-80.

The one alternative considered was:

1. Replace the existing structure with a twin 12' x 12' RCB using staged construction.

Alternative 1 is the preferred alternative due to lower construction costs when factoring in the anticipated costs associated with a detour and lesser impacts to the traveling public.

Traffic will be maintained via staged construction with traffic reduced to one lane via the use of temporary traffic signals.

The preliminary project cost is \$1,251,400.

B. Need for Project

This is a 34' X 44' concrete tee beam bridge that was built in 1923 and widened in 1961. An overlay was added in 1987 and has reached the end of its service life. The deck has map cracking, delaminated areas, spalls with exposed steel, and damp areas. The concrete beams have spalling. The abutments have spalls with exposed steel, delamination, and cracks with leaching and rust staining. The bridge was designed for live loads below current standards. Due to its condition, the bridge should be replaced.

SH Project #2142203890

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 34' x 44' concrete tee beam bridge constructed in 1923 and widened in 1961.

US 71 in the project area is 24' wide PCC/AAC composite pavement with 10' effective shoulders (4' wide HMA shoulders, 6' wide granular) and 1.5:1 to 3:1 foreslopes, originally constructed as PCC in 1930. HMA resurfacing was accomplished in 1958, 1991 and 2015.

D. Traffic Estimates

The 2026 construction year and 2046 design year average daily traffic estimates are 2457 ADT with 18 % trucks and 2570 ADT with 18 % 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 80.8.

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 3 crashes including, 0 fatal crashes, 2 personal injury crashes, and 1 personal property crashes. All three crashes were animal related.

II. PROJECT CONCEPT

A. Feasible Alternatives

Alternative #1 - Replace with a culvert using staged construction

The existing 34'x44' bridge and superstructure will be removed and replaced with a twin 12'x12' reinforced box (RCB) placed at a 30-degree left ahead skew.

The typical cross section will consist of a 24' roadway with 10' effective shoulders (6' paved and 4' granular) and 6:1/3.5:1 foreslopes.

The roadway will be reconstructed on the existing horizontal alignment, with minor adjustments being made to the vertical profile to allow for smooth transitions through the project area. The roadway will be reconstructed through the existing EF joint areas. Parallel headwalls will be used for the RCB end sections unless hydraulic design considerations are encountered causing the need for flared head walls. The flow line of the box will be buried 1' below the existing flow line in the channel. This will be reviewed with the Location and Environment Bureau to see if burying the RCB is necessary. This will allow the bottom of the box to silt in and provide a natural bottom for fish passage. The existing ditches will need to be relocated to meet the inlet and outlet flowlines of the new RCB. Class E revetment will be placed at the outlet and evaluated for inlet placement.

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

Right of way appears to be required for this project.

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

The current design concept is based on LIDAR and will be confirmed and adjusted as needed once the topographic survey has been completed.

Bridge Items	<u>Estimated Costs</u>
New Culvert	462,100
Staged Construction – 10%	46,200
Bridge Removal	16,100
Temp Sheet Pile	42,800
Engineering Fabric	1,000
Revetment	10,700
Mobilization - 10%	57,900
M & C - 20%	<u>127,400</u>
Bridge Costs	\$ 764,200

Roadway Items	
Clearing and Grubbing	\$ 10,000
Embankment in place, contractor furnished	\$39,600
Excavation Class 10 Roadway & Borrow	\$12,000
Compaction With Moisture Control	\$3,700
Modified Subbase	\$13,000
Granular Shoulder	\$7,100
Paved Shoulder	\$26,600
Flooded Backfill	\$16,000
PCC Pavement	\$70,500
Removal of Guardrail	\$4,000
Temporary Traffic Signals	\$20,000
Temporary Barrier Rail	\$17,000
Temporary Crash Cushions	\$6,000
Temporary Pavement	\$20,300
Removal of Pavement	\$19,000
Erosion Control	\$25,000
Right of Way	\$25,000
Traffic Control @ 5%	\$20,000
Mobilization @ 5%	\$20,000
M&C @ 30%	<u>\$112,500</u>
Roadway Total	\$487,200

Project Total

\$1,251,400

Other Alternatives Considered

A 70' single span BTB beam bridge is another option to clear the existing abutments. A slight grade raise of about 3" would be required. A three-span continuous concrete slab bridge does not span the existing foundations and stream very well. The bridge cost would be slightly higher than a culvert, and a culvert has less maintenance. The 50-year flood would get into a BT beam bridge without a grade raise of 0.9 feet. The BT beam bridge would require a grade raise of 1.6' to raise the low beam elevation above the 100-year flood. The culvert Alternative #1 performs better hydraulically than the existing bridge.

A possible additional alternative would be to remove the existing US 71 and adjacent trail bridge and construct one RCB through both areas. This would result in the need for trail reconstruction along with geometry revisions to the trail to bring it closer to US 71 as it crosses the new RCB. This option has not been reviewed.

B. Detour Analysis

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

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 intersecting or tied with US 71; therefore, no ADA accommodations are planned in conjunction with this project. An existing trail is located east of US 71.

F. Special Considerations

This will not be a traffic critical project.

The ABC Rating Score of 48 is less than the first stage filter threshold of 50, therefore no further evaluation is considered.

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

Right of Way appears be required for this project.

Once the Location and Environment Bureau has completed their review, comments will be incorporated into the final concept statement.

G. Program Status

Site data has been developed by Shive-Hattery. This project is listed in the 2023-2027 Iowa Transportation Improvement Program, with \$5,000 programmed for right of way in FY 2026 and \$790,000 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.

Following page has a map of the county showing the location of the project area and the anticipated detour route.

Attachment A - Utilities

Audubon County

BRF-071-4(57)--38-05

(ALN) ATLANTIC MUNICIPAL UTILITIES

Contact Name : Junior Hanson

Contact Phone: 7122431395

Contact Email: jhanson@amu1.net

(CTLIA01) CENTURYLINK

Contact Name : SADIE HULL

Contact Phone: 9185470147

Contact Email: sadie.hull@lumen.com

(EK1) MARNE & ELK HORN TELEPHONE

Contact Name : RACHEL HAMILTON

Contact Phone: 7127646161

Contact Email: RACHEL@METCTEAM.COM

(ICN) IOWA COMMUNICATIONS NETWORK

Contact Name : Shannon Marlow

Contact Phone: 8005723940

Contact Email: icnoutsideplantiowaonecall@iowa.gov

(NN5) NORTHERN NATURAL GAS COMPANY

Contact Name : Andrew Messerschmidt

Contact Phone: 4023504758

Contact Email: andrew.messerschmidt@nngco.com

(P10) BLACK HILLS ENGY COUNCIL BLUFF

Contact Name : Chris Dewey

Contact Phone: 7125806028

Contact Email: chris.dewey@blackhillscorp.com

Project 2142203890

shive-hattery.com



Roadway			
PIN Number	21-05-071-010	Submittal Date	08/26/22
Project Number	BRF-071-4(57)--38-05	Approval Date	
District	District 4	Assistant District Engineer	Wes Mayberry, P.E.
County	Audubon	or	
Route	US 71	Office Director	
Location	Stream, 0.6mi N of I-80		
Work Type	Bridge Replacement		
Segment Manager	Wes Mayberry, 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	na
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%	n/a
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	5x10
Bridge width—new*	Bridge length ≤ 200 ft	design lane widths + effective shoulder widths	44'
	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 44'
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

Design Criteria for High Speed Roadways

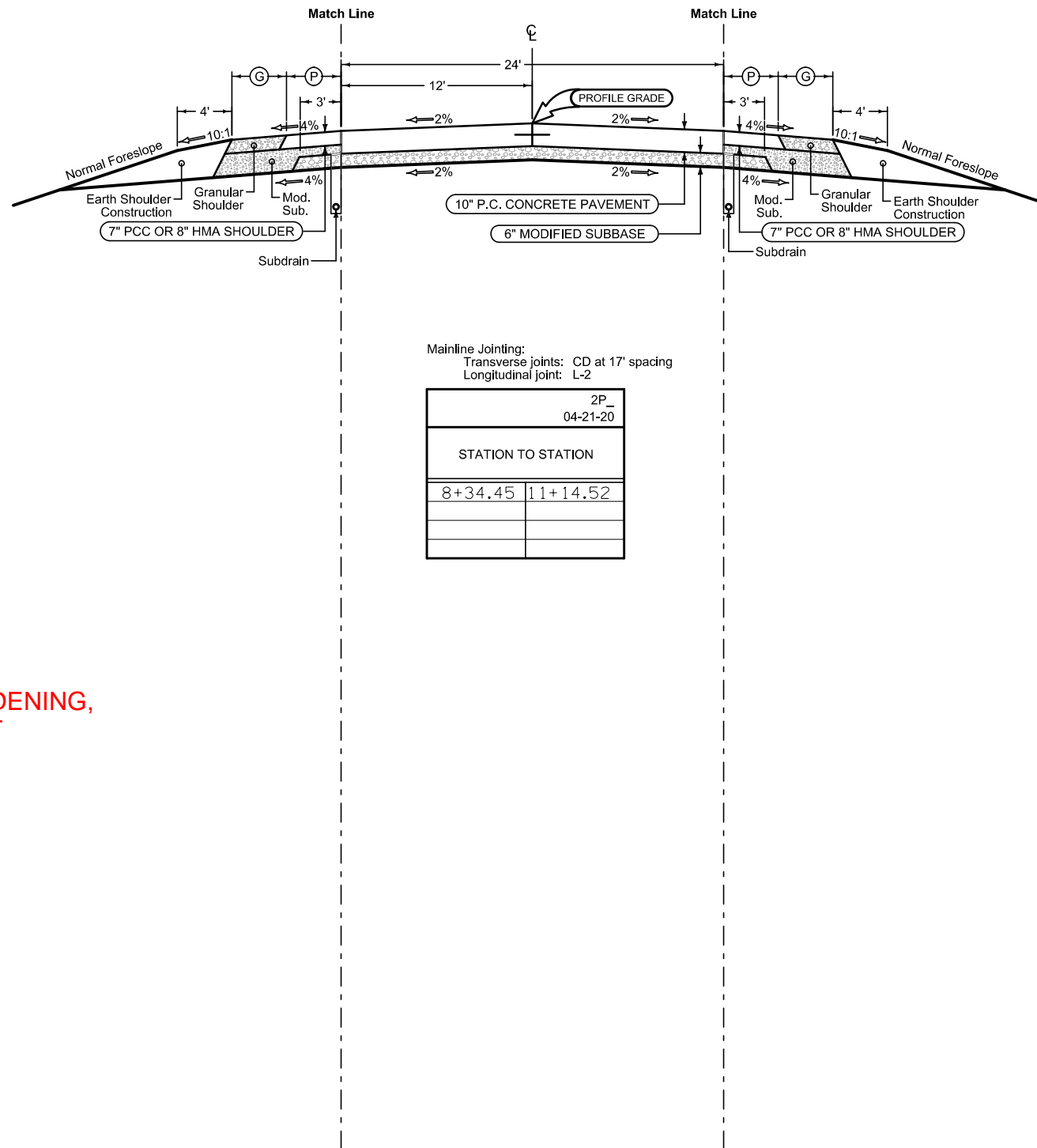
Design Manual Section 1C-1
Last Updated: 04-29-19

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	3%		
	Interstates						5	5	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		

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_ MOD			
STATION TO STATION	(P) Feet	(G) Feet	
8+34.45 11+14.52	6	4	



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

2P_ 04-21-20	
STATION TO STATION	
8+34.45 11+14.52	

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_ MOD			
STATION TO STATION	(P) Feet	(G) Feet	
8+34.45 11+14.52	6	4	

**NOTE PCC FOR
 SHOULDERS, WIDENING,
 TEMP PAVEMENT**

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 SURVEYED UTILITY OWNER SYMBOLS

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

- FO1D1, Quality D
- FO2D2, MARNE ELKHORN - Quality D
- FO3D3, CENTURYLINK - Quality D
- FO4D4, Quality D
- PPA

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

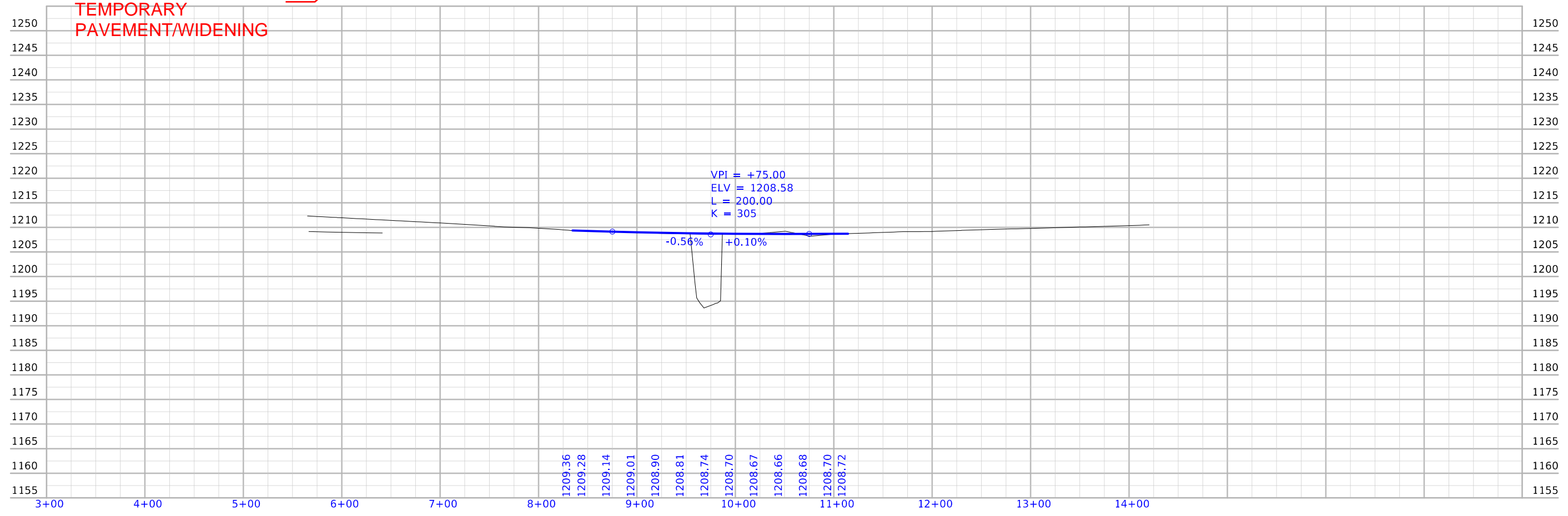
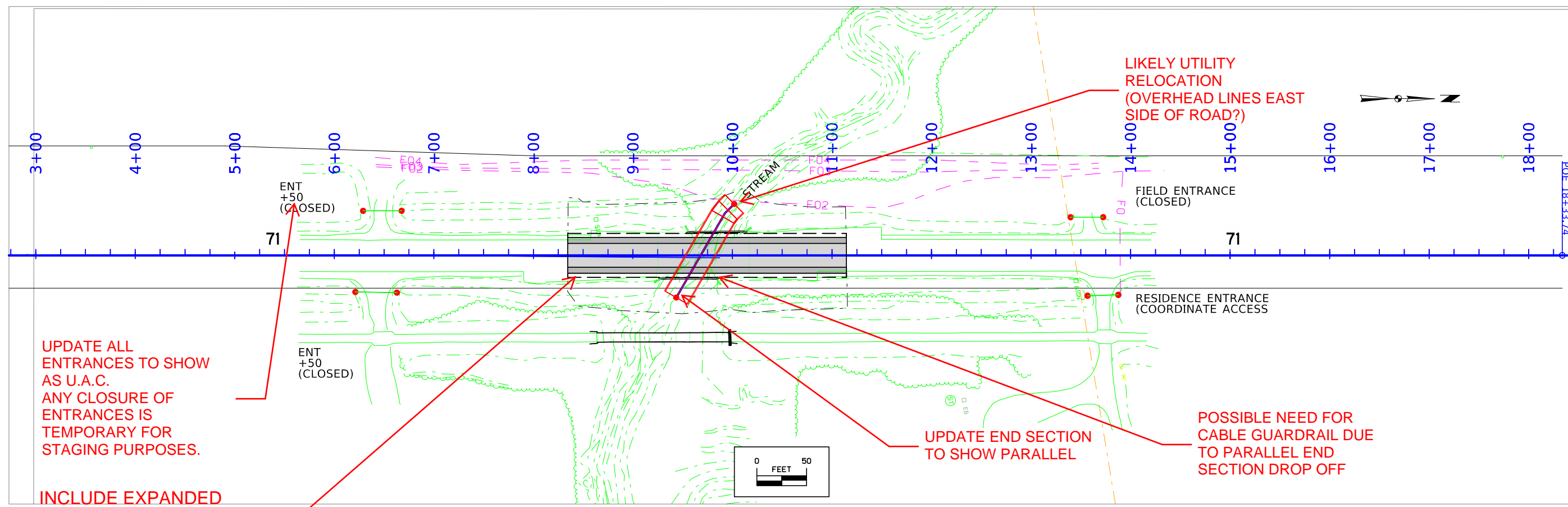
- Reference Point
- Station
- Survey Line
- Section Corner
- Ground Line Intercept
- Saw Cut
- Guardrail
- Trench Drain
- HighTension Cable Guardrail
- Sheet Pile
- Pavement Removal
- Clearing & Grubbing Area

RIGHT-OF-WAY LEGEND

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

PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

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



Survey Information

SURVEY INDEX

County: Audubon
PIN: 21-05-071-010
Project Number: BRF-071-4(57)--38-05
Location: Stream 0.6 mi N of I-80
Type of Work:
Project Directory: 0507101021

Survey Personnel

Murray Berting – PLS
Gavin Gear – Land Survey Technician

Date(s) of Survey

Begin Date 11/28/2022
End Date 03/31/2023

General Information

Measurement units for this survey are US survey feet. This survey is for proposed bridge reconstruction and reconstruction of State Highway 71 0.6 mi North of Interstate 80. 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 stream, State Highway 71 corridor, adjacent trail structure (T-Bone Recreational Trail) and the drainage area.

Project 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 07
(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. HSIPX-071-4(50)-3L-05. Survey stationing was equated to the plan POT at Sta. 2+91.52 and run back and ahead without equation throughout the survey.

Survey stationing relates to as built plan stationing as follows:

POT Sta. 2+91.52 As-built Plans Project No. HSIPX-071-4(50)-3L-05
Survey POT Sta. 2+91.52

POT Sta. 18+33.40 As-built Plans Project HSIPX-071-4(50)-3L-05
Survey POT Sta. 18+33.59

POT Sta. 26+87.26 As-built Plans Project No. HSIPX-071-4(50)-3L-05
Survey POT Sta. 26+87.50

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 07 (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 07 (U.S. Survey Foot)
 VERT. DATUM: NAVD88
 Geoid Model: 2012bu2

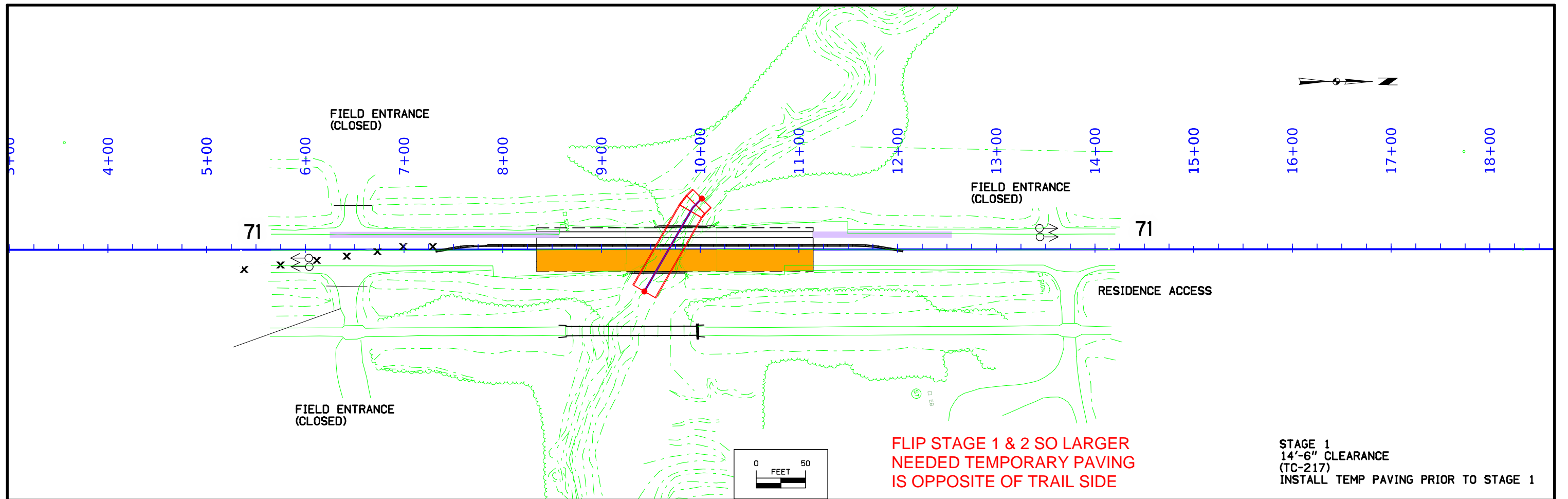
POINT NAME	NORTHING	EASTING	ELEVATION	FEATURE DEFINITION
501	7259155.071	17415201	1214.042333	CP 1/2" IR CONC MON
502	7259046.199	17415183	1214.373	CP 1/2" IR CONC MON
503	7257650.076	17414935	1211.480333	CP 1/2" IR CONC MON
504	7257524.024	17415084	1214.161	CP 1/2" IR CONC MON

TRAFFIC CONTROL PLAN	108-23A 08-01-08
<p>1) While bridge and approaches are being removed and replaced with new RCB, traffic shall be maintained on US 71 at all times by staged construction with temporary signals allowing one lane of traffic. (TC-217)</p> <p>2) Signage and devices shall be furnished, installed, maintained, and removed by Contractor.</p>	

STAGING NOTES	108-26A 08-01-08
<p>Stage 1: Place temporary pavement. Route traffic on US 71 SB lane. Construct culvert outlet and associated paving (including temp paving)</p> <p>Stage 2: Route traffic on US 71 NB lane and temporary pavement. Construct southbound lane and remainder of culvert.</p> <p>Stage 3: With US 71 under normal traffic, cut down shoulders to final width and remove temporary grading on foreslopes.</p>	

511 TRAVEL RESTRICTIONS												108-25 10-21-14
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	AUDUBON	Bridge Over Stream, 0.6 Mi N of I-80	Stream	Bridge		Width			11'-0		

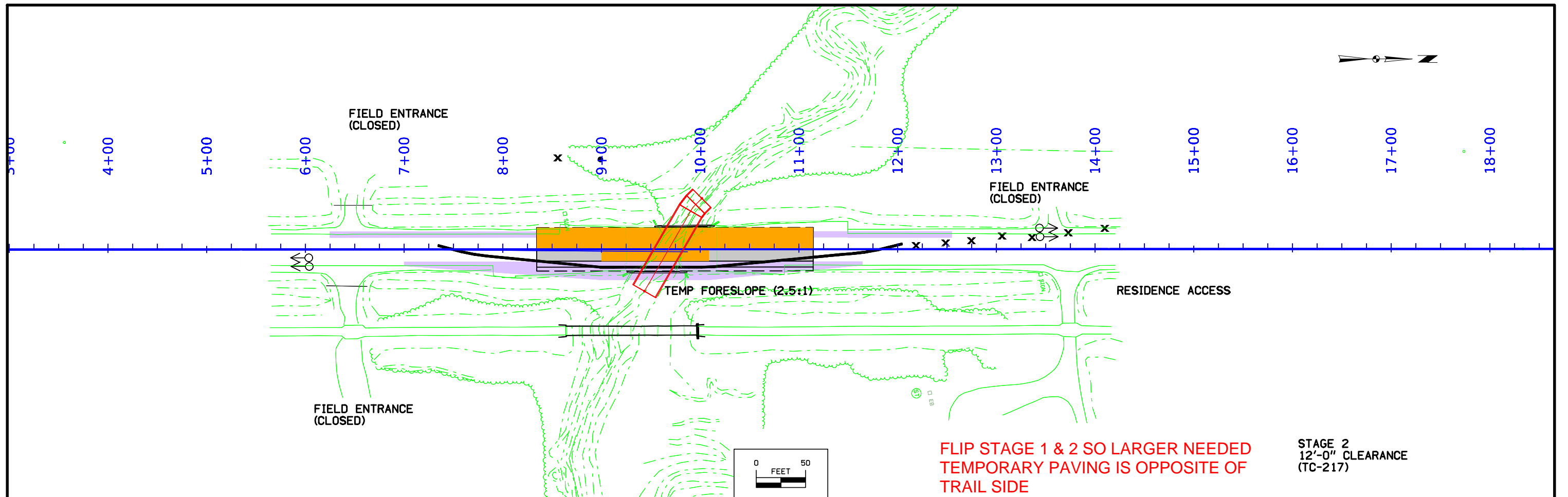
COORDINATED OPERATIONS		111-01 04-17-12
<p>Other work in progress during the same period of time will include the construction of the projects listed. Coordinate operations with those of other contractors working within the same area.</p>		
Project	Type of Work	
None Provided		



FLIP STAGE 1 & 2 SO LARGER
NEEDED TEMPORARY PAVING
IS OPPOSITE OF TRAIL SIDE

STAGE 1
14'-6" CLEARANCE
(TC-217)
INSTALL TEMP PAVING PRIOR TO STAGE 1

UPDATE SHADING TO
REFLECT WHAT IS BEING
CONSTRUCTED.



FLIP STAGE 1 & 2 SO LARGER NEEDED
 TEMPORARY PAVING IS OPPOSITE OF
 TRAIL SIDE

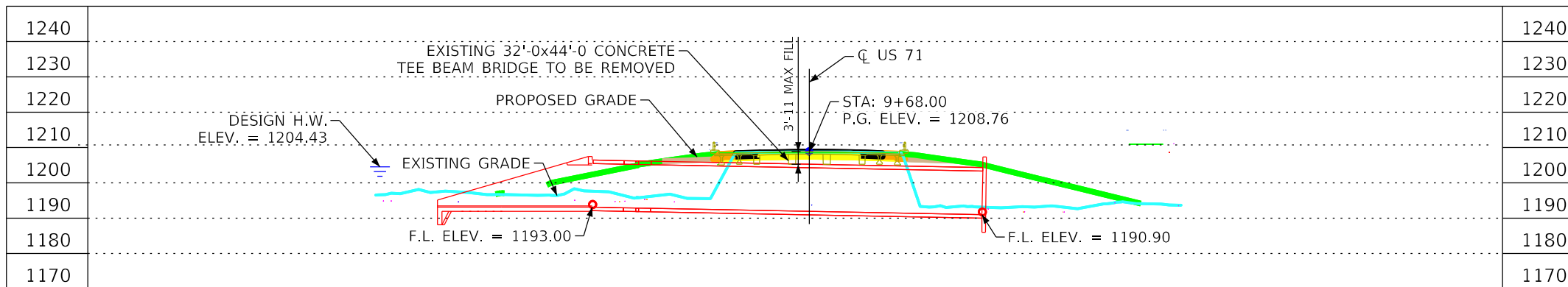
STAGE 2
 12'-0" CLEARANCE
 (TC-217)

UPDATE SHADING TO REFLECT WHAT IS
 BEING CONSTRUCTED.

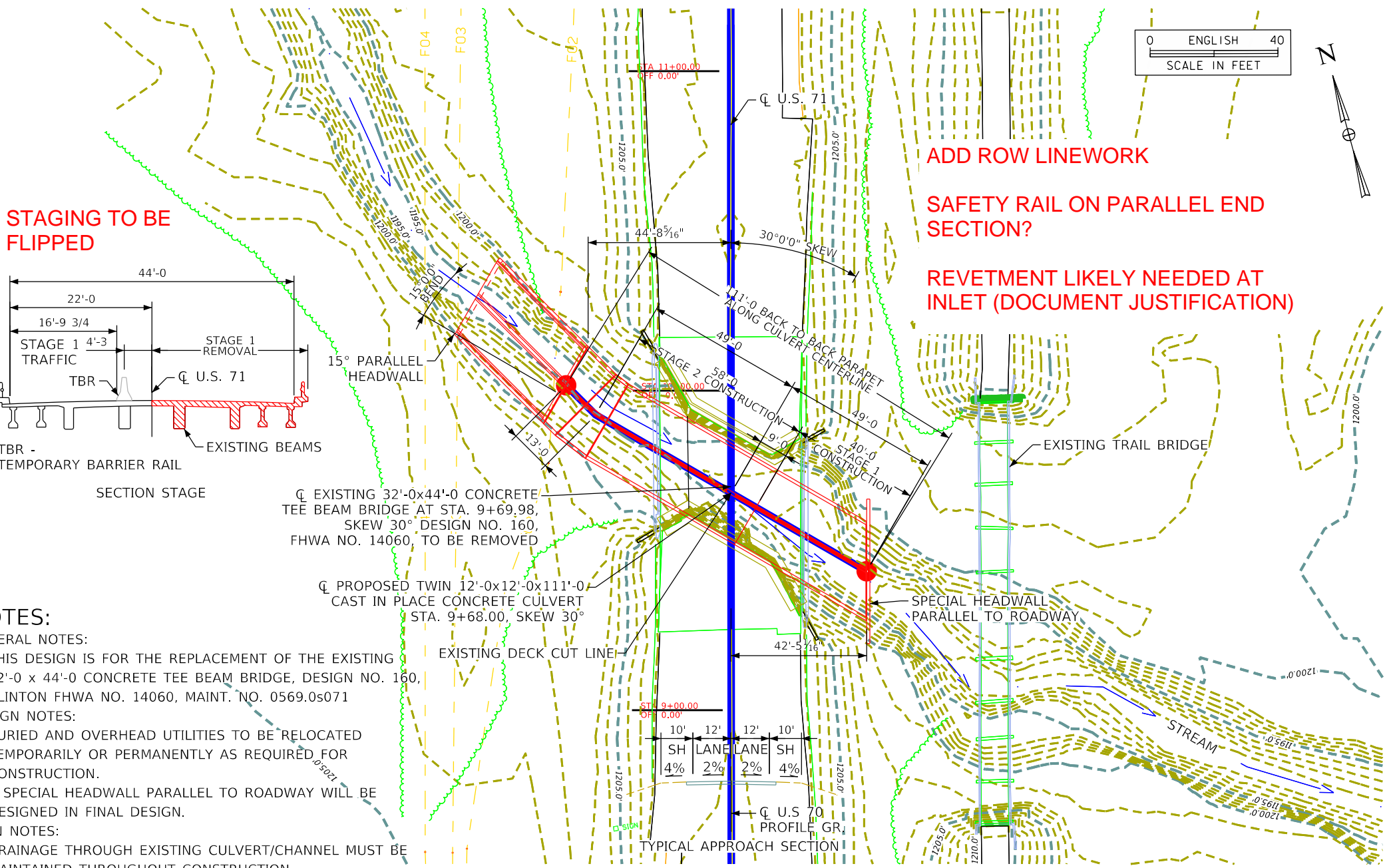
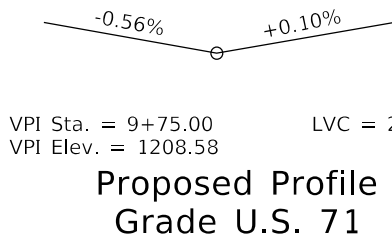
IF SLOPE OF 2.5:1 IS NEEDED, ADD TBR
 TO PROTECT SLOPE.

ADD STAGING TYPICAL SECTION

Control Point:



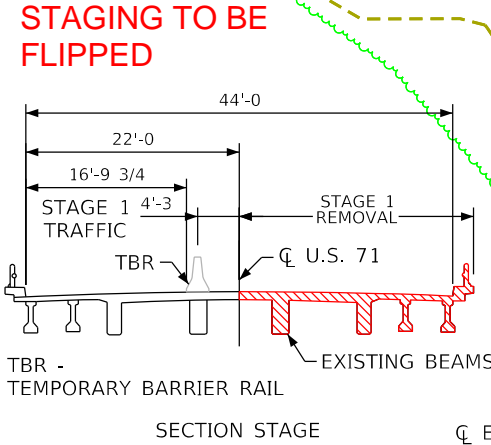
LONGITUDINAL SECTION ALONG \bar{C} CULVERT



SITUATION PLAN

- NOTES:**
- GENERAL NOTES:
1. THIS DESIGN IS FOR THE REPLACEMENT OF THE EXISTING 32'-0 x 44'-0 CONCRETE TEE BEAM BRIDGE, DESIGN NO. 160, CLINTON FHWA NO. 14060, MAINT. NO. 0569.0s071
- DESIGN NOTES:
1. BURIED AND OVERHEAD UTILITIES TO BE RELOCATED TEMPORARILY OR PERMANENTLY AS REQUIRED FOR CONSTRUCTION.
 2. A SPECIAL HEADWALL PARALLEL TO ROADWAY WILL BE DESIGNED IN FINAL DESIGN.
- PLAN NOTES:
1. DRAINAGE THROUGH EXISTING CULVERT/CHANNEL MUST BE MAINTAINED THROUGHOUT CONSTRUCTION.
 2. FLOW LINE OF CULVERT HAS BEEN SET 1 FOOT BELOW STREAMBED.

- ADD ROW LINEWORK
- SAFETY RAIL ON PARALLEL END SECTION?
- REVETMENT LIKELY NEEDED AT INLET (DOCUMENT JUSTIFICATION)



Hydraulic Data

Drainage Area = 1.62 Sq. Mi.
Stream Slope = 71.4 Ft./Mi.

Q₅₀ = 1,690 CFS
HW Elev. = 1204.43

Q₁₀₀ = 2,060 CFS
HW Elev. = 1205.72

Q₅₀₀ = 2,930 CFS
HW Elev. = 1208.40

Roadway Overtop
Sta. 10+45.00
Elev. 1208.66

Utilities Legend

- Symbol - Type
- F02 —
 - F03 —
 - F04 —

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

Location

U.S. 71 over Stream
T-78N R-36W
Section 36
Oakfield Township
Audubon County
FHWA No.
Bridge Maint. No. 0569.0s071
Latitude 41.507244°
Longitude -94.943128°

Traffic Estimate

2026 AADT	2,500	V.P.D.
2046 AADT	2,600	V.P.D.
2046 DHV	270	V.P.H.
Trucks	18	%
Total		
Design ESALs	??,???	

Design For 30° Skew L.A.
TWIN 12'-0x12'-0x111'-0 CAST IN PLACE CONCRETE CULVERT
SITUATION PLAN
STA. 9+68.00 (U.S. 71) JUNE 2023
Audubon County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. ##### Design Sheet No. 001 of 001 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	Grading	
(188)	Revetment Class D	(8)	Behind Curb Cut
(28)	Revetment Class E	(6)	Granular
(12)	Shoulder Special Backfill	(13)	Granular Back Fill
(12)	Special Backfill	(48)	Rock Undercut
(20)	Subbase	(8)	Shoulder Earth Fill
(20)	Subbase Lower	(2)	Side Slopes
(20)	Subbase Upper	(226)	Side Slopes Dressing
(118)	Subgrade Treatment	Substrata	
Asphalt			
(207)	HMA Base Course	(128)	Boulder Substrata
(207)	HMA Interim Course	(48)	Broken Weathered Substrata
(207)	HMA Surface Course	(3)	Core Out Substrata
Concrete			
(0)	Barrier Concrete	(203)	Existing Pavement Substrata
(0)	Barrier Concrete Footing	(6)	Loam Substrata
(0)	Curb Gutter	(80)	Rock Substrata
(48)	Flowable Mortar	(4)	Select Sand Substrata
(0)	Median Concrete	(3)	Shale Substrata
(0)	PCC Pavement	(10)	Topsoil Substrata
(0)	Sidewalk	Unsuitable / Waste	
Shoulder			
(209)	Shoulder HMA	(3)	Unsuitable Type A
(0)	Shoulder PCC	(13)	Unsuitable Type B
(6)	Shoulder Granular	(11)	Unsuitable Type C
(6)	Shoulder Granular	(3)	Waste
Existing			
(0)	Existing Pavement		

NOTES:

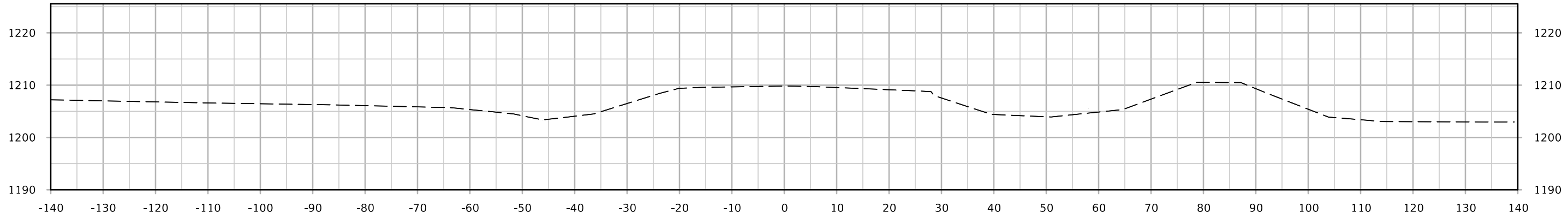
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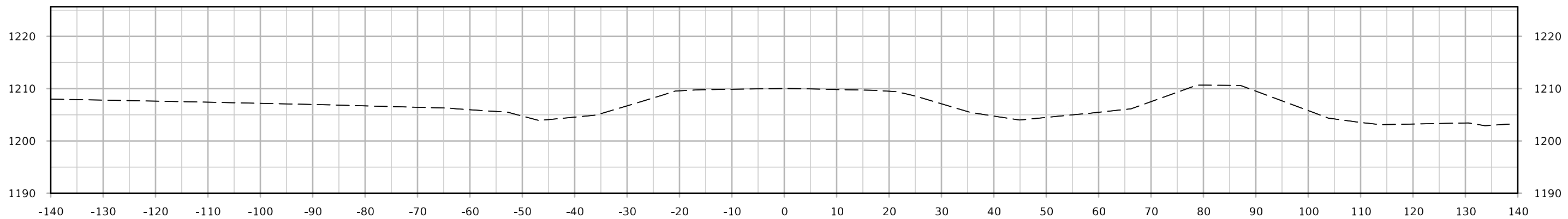
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CROSS SECTIONS LEGEND AND INFORMATION SHEET

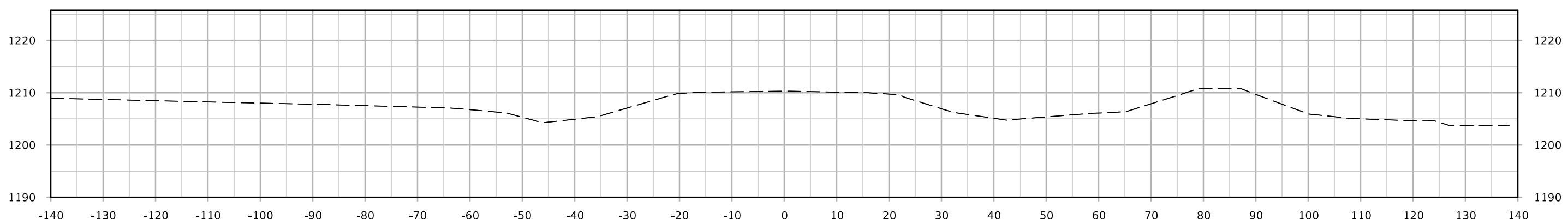
(COVERS SHEET SERIES W, X, Y, & Z)



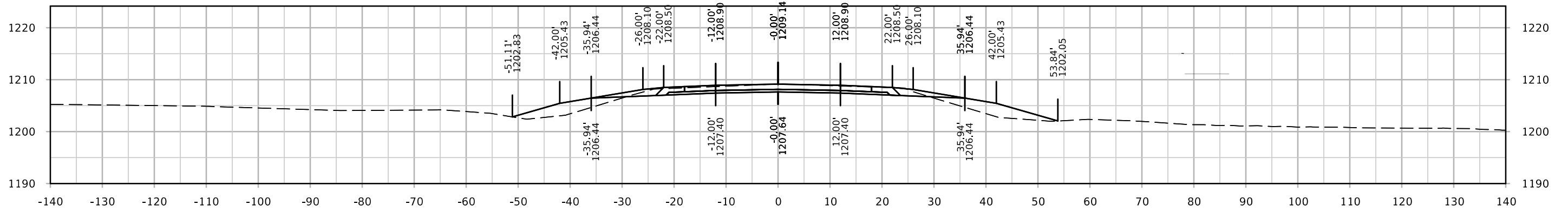
STA. 8+00.00



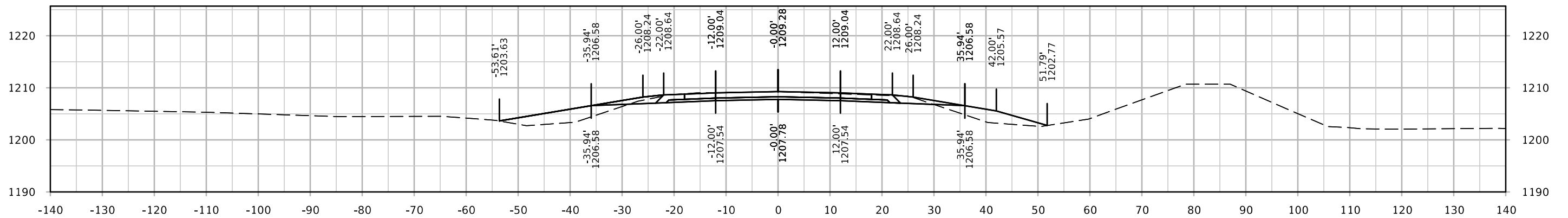
STA. 7+75.00



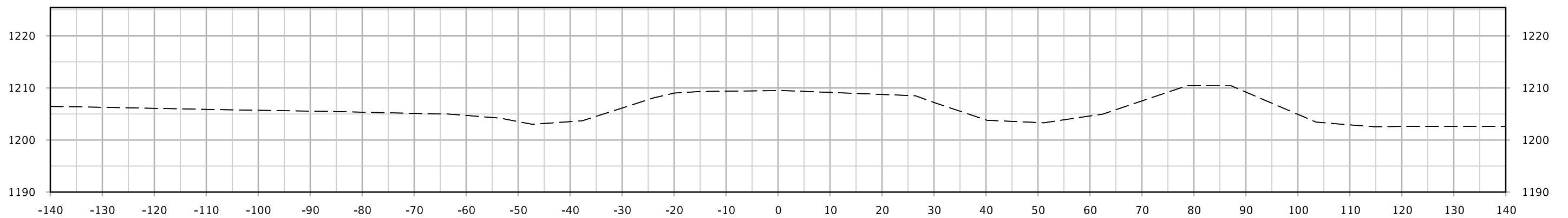
STA. 7+50.00



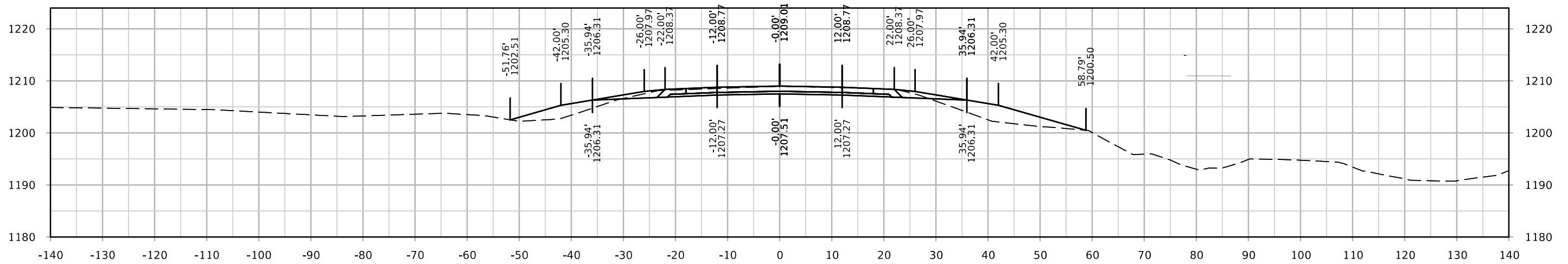
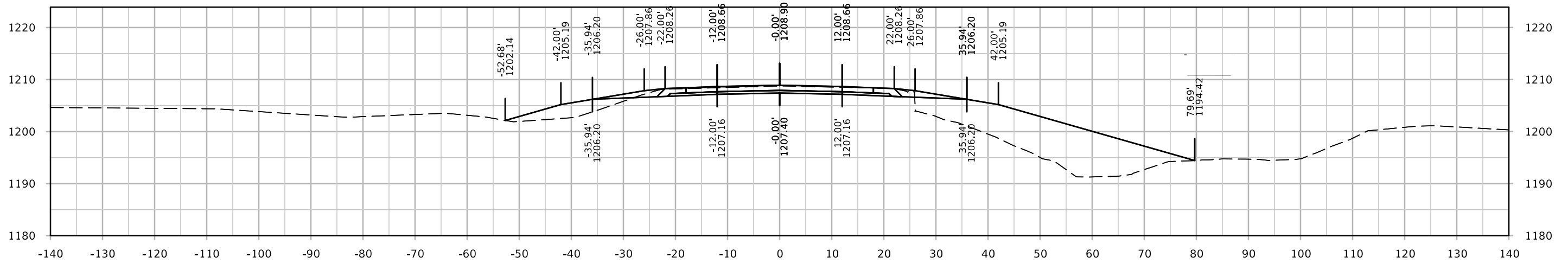
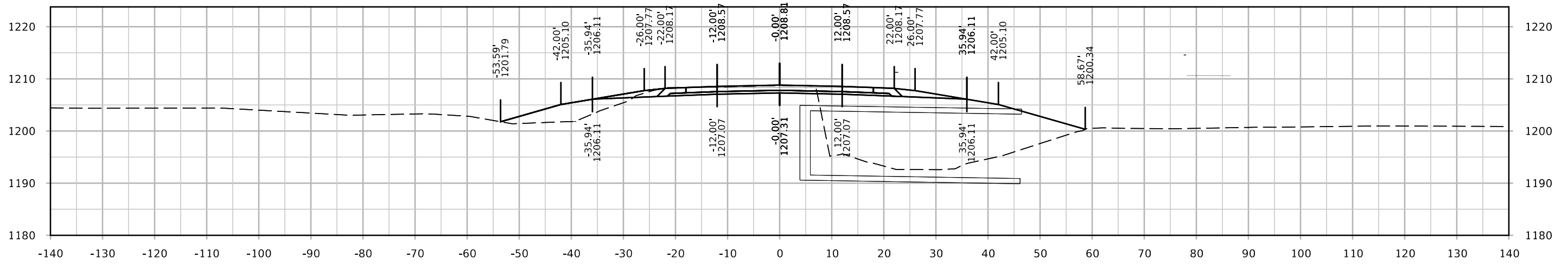
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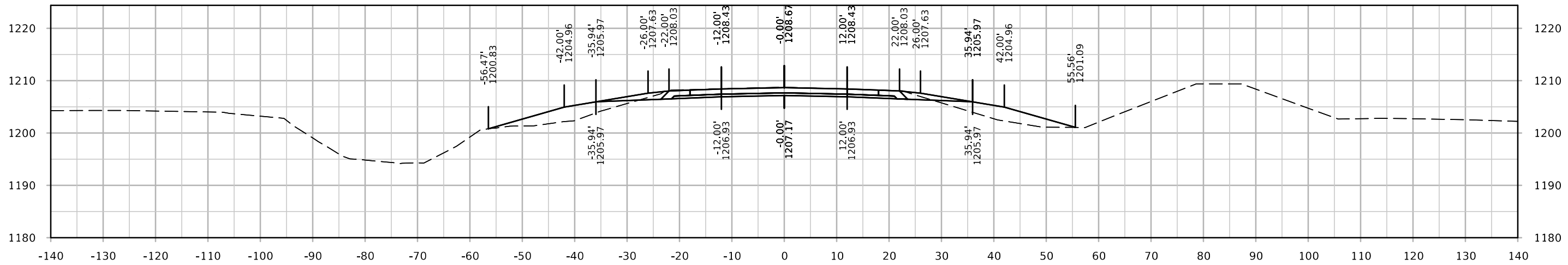


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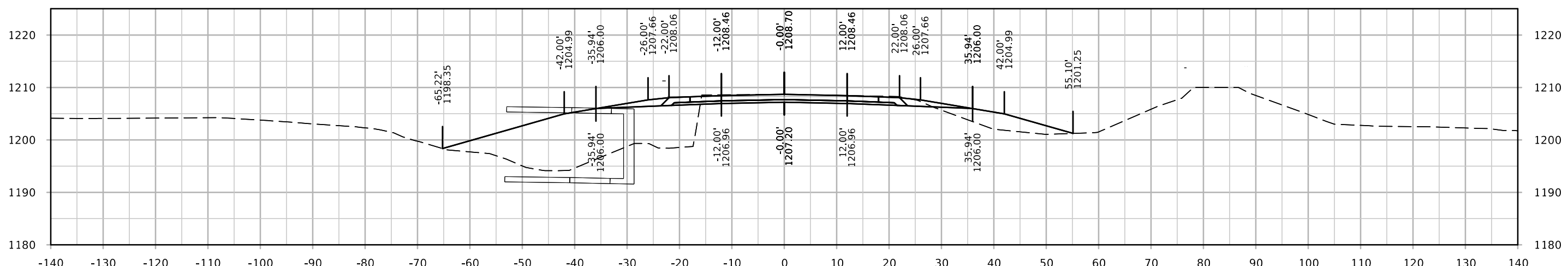


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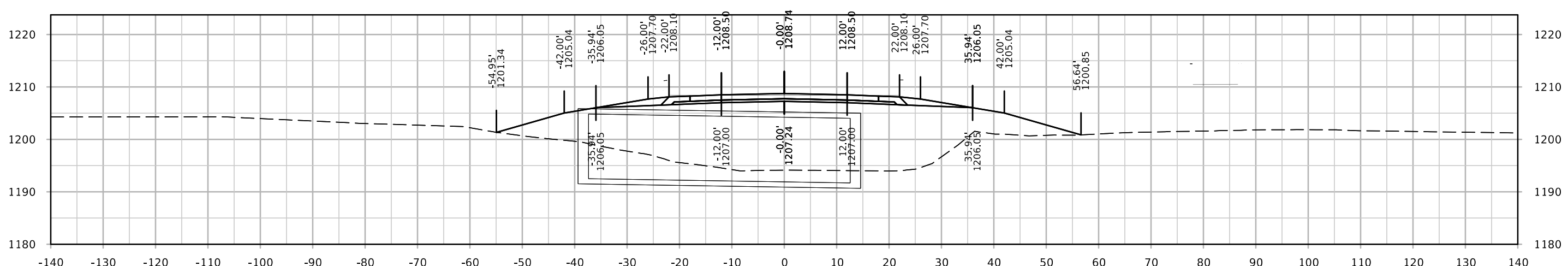




STA. 10+25.00



STA. 10+00.00



STA. 9+75.00

