

BRIDGE REPLACEMENT
BRFN-014-8(23)--39-34

LETTING DATE
10-17-2023

FLOYD CO.

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Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM

FLOYD COUNTY BRIDGE REPLACEMENT

IA 14 - Flood Creek 3.6 mi S of Co Rd B45

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

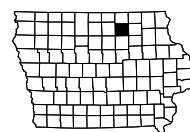
Field Exam Mark-up

TOTAL
26
PROJECT IDENTIFICATION NUMBER
19-34-014-010
PROJECT NUMBER
BRFN-014-8(23)--39-34
R.O.W. PROJECT NUMBER

**Field Exam was held by
Teams Mtg on 5/5/2021**

Attendees included:
 Nick Humpal (DOT)
 David Mulholland (DOT)
 Kevin Smith (DOT)
 Jeremy Weber (DOT)
 Kenneth Howe (DOT)
 Tracy Meise (DOT)
 Mary Kay Solberg (DOT)
 Steven Schroder (DOT)
 Mark Harpole (Shive-Hattery)
 Joe Appel (Shive-Hattery)
 Jenifer Bates (Shive-Hattery)
 Mike Janecek (Shive-Hattery)

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



DESIGN DATA RURAL			
2024	AADT	1,300	V.P.D.
2044	AADT	1,400	V.P.D.
2044	DHV	140	V.P.H.
	TRUCKS	17	%
	Total		
	Design ESALs	--	

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

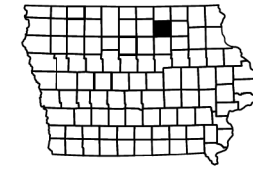
D3 PLAN - June 18, 2021
 D5 PLAN - September 17, 2021
 D4 PLAN - June 20, 2023

PRELIMINARY PLANS

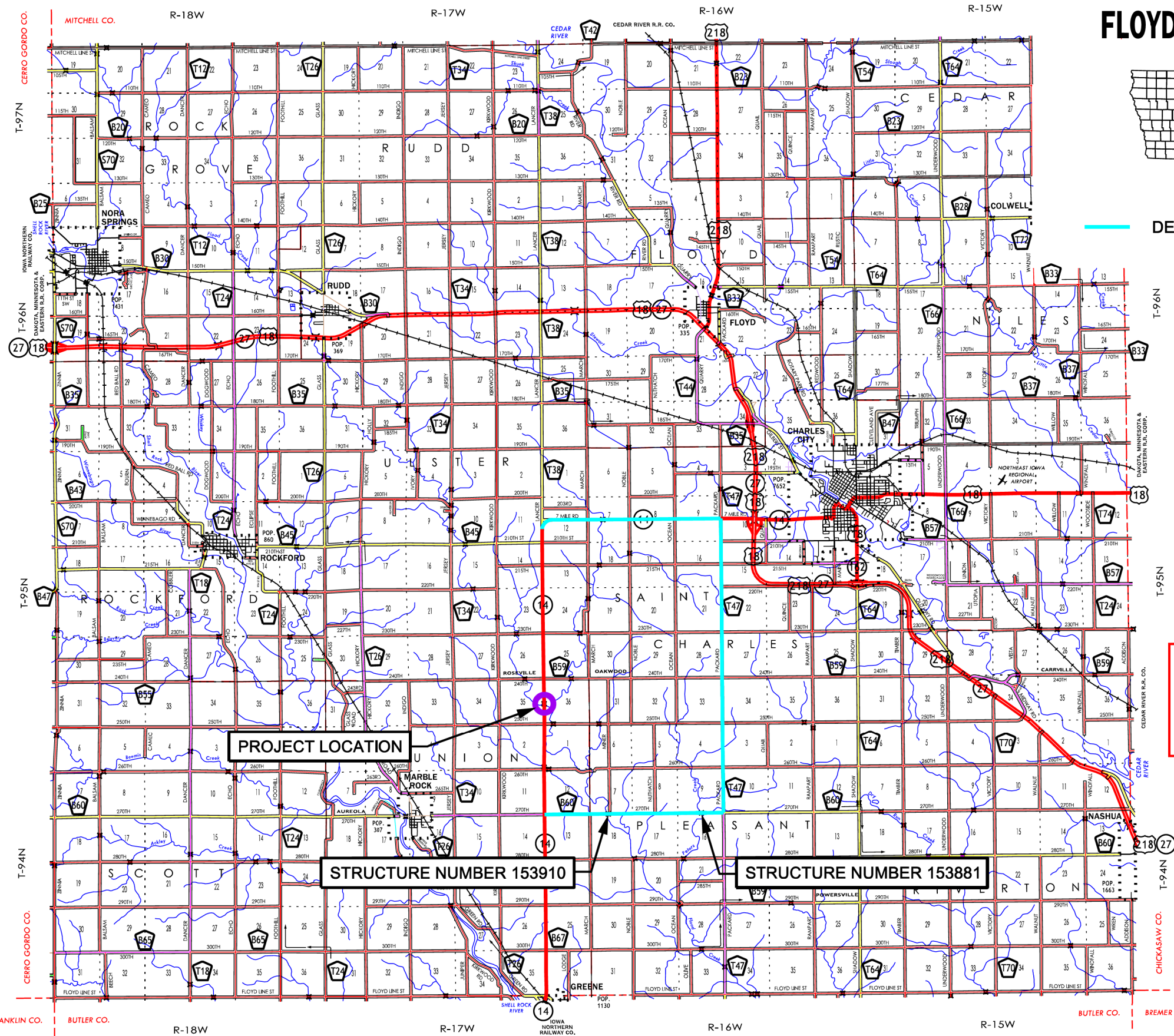
Subject to change by final design.

D2 PLAN - May 14, 2021

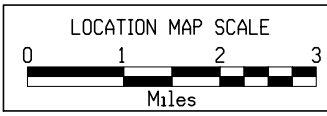
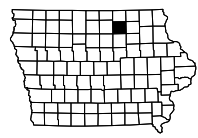
FLOYD COUNTY



— DETOUR ROUTE



Detour route good as shown. District will prepare signing plan and install/maintain signs during construction



Roadway			
PIN Number	19-34-014-010	Submittal Date	5/22/2020
Project Number	BRFN-014-8(23)--39-34		Approval Date
District	District 2	Assistant District Engineer	Nick Humpal
County	FLOYD	or	
Route	IA 14	Office Director	
Location	Flood Creek 3.6 mi S of Co Rd B45		
Work Type	Bridge Replacement		
Segment Manager	John Bartholomew		
Designer	Jenifer Bates		

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 for 4' then 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	5 x 10
Bridge width—new*	Bridge length ≤ 200 ft	design lane widths + effective shoulder widths	40'
	Bridge length > 200 ft	design lane widths + effective shoulder widths	40'
Bridge width—existing*		design lane widths + no less than 2 ft 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	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)

Design year ADT = 1300

[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	6	0		N/A
Turn lanes with curbs	6	See Section 3C-2	6	0		N/A
	Effective Shoulder Width	Paved Width	Effective Shoulder Width	Paved Width		
Climbing Lanes	6	4	4	0		N/A
Two-Lane Highways	Effective Shoulder Width	Paved Width	Effective Shoulder Width	Paved Width		
Routes where bicycles are to be accommodated	10	10				Effective = 8' Paved = 0'
On roadways approaching urban areas (due to increased bike traffic)	10	10	Design year ADT > 2000 vpd	8	0*	
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

Notes:

Requires safety edge

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						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						0.5		
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						24'		

FINAL PROJECT CONCEPT STATEMENT

IA 14 Bridge over Flood Creek 3.6 mi S of Co Rd B45

IOWA DEPARTMENT OF TRANSPORTATION

TO OFFICE: District 2
ATTENTION: E. Jon Ranney
FROM: Jenifer Bates
OFFICE: Shive-Hattery
SUBJECT: Project Concept Statement; (Final, D0)

DATE: July 8, 2020
PROJECT: Floyd County
BRFN-014-8(23)--39-34
PIN: 19-34-014-010

Floyd County
Proj. # BRFN-014-8(23)--39-34
PIN: 19-34-014-010
Maint. No. 3476.9S014
FHWA No. 25040

Jenifer J. Bates, P.E.
515-223-8104

July 8, 2020

This project involves the replacement of the IA 14 bridge (Maint. No 3476.9S014) over Flood Creek 3.6 mi S of Co Rd B45.

A concept review was held virtually on June 18, 2020. Those present included Jacob Page from District 2; Steven Schroder, David Mulholland, Kevin Patel, Brandon Walls, and Mary Kay Solberg from the Iowa DOT and Jenifer Bates, Joe Appel, Larry Sandhaas, and Mark Harpole from Shive-Hattery.

One alternative was considered:

1) Replace the existing bridge with a three span, 150' x 40', continuous concrete slab bridge at an estimated cost of \$1,586,500 (see attached concept for details). Additional right of way does not look like it will be required. Traffic will be maintained using a detour.

Alternative 1 is the preferred alternative due to the site topography, low traffic volumes, existing bridge configuration, safety considerations, and availability of a suitable detour route.

The Draft Project Concept Statement was sent out for review and comment with concerns to be resolved by July 7, 2020. Comments received during the review period have been considered and resolved.

This project is recommended for construction in FY 2024. 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 B. Walls
M. Nop 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 N. M. Miller
C. C. Poole B. Bradley B. E. Azeltine
B. D. Hofer T. D. Crouch S. J. Gent
S. Anderson J. Selmer K. K. Patel
S. Godbold D. R. Claman J. Hauber
A. Abu-Hawash M. E. Khoda K. Olson
S. Neubauer T. Abbett M. Kelly
B. Dolan P. Hjelmstad N. Humpal
M. K. Solberg G. Pavelka R. Loecher
R. Gelhaus J. Bartholomew

SH Project #4202360

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



I. STUDY AREA

A. Project Description

This project involves the replacement of the IA 14 bridge (Maint. No 3476.9S014) over Flood Creek 3.6 mi S of Co Rd B45.

The alternative considered was:

1. Replace existing structure with a three span, 150' x 40', continuous concrete slab bridge using a detour.

Alternative 1 is the preferred alternative due to the site topography, low traffic volumes, existing bridge configuration, safety considerations, and availability of a suitable detour route.

Traffic will be maintained by an off-site detour.

The preliminary project cost is \$1,586,500. (This does not include costs associated with detour.)

B. Need for Project

This is a 124' long by 32' wide two span steel girder bridge which was built in 1947 and overlaid in 1982 and is near the end of its useful life. The top and bottom of the deck has several hollow areas and leaching transverse cracks. There is measured section loss on the exterior beams and the abutment bearings have severe corrosion and pack rust. The bridge was designed for live loads below current standards. This type of superstructure is vulnerable to fatigue cracking in the vicinity of the welded cover plates; therefore, this bridge should be replaced.



SH Project #4202360

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 124' long by 32' wide two span steel girder bridge which was built in 1947 and overlaid in 1982.

IA 14 in the project area was constructed as a 20' PCC pavement in 1944. It was then widened to 24' and resurfaced with HMA in 2011. IA 14 has 5' wide granular shoulders and 3:1 foreslopes.

D. Traffic Estimates

The 2024 construction year and 2044 design year average daily traffic estimates are 1,300 ADT with 17 % trucks and 1,400 ADT with 17 % trucks, respectively.

E. Sufficiency Ratings

IA 14 is classified as an access route and is a maintenance service level C roadway. The federal bridge sufficiency rating is 69.8.

F. Access Control

Access rights will not be acquired for this project.

G. Crash History

During the five-year study period from January 1, 2015 through December 31, 2019, there were 2 property damage only crashes.

II. PROJECT CONCEPT

A. Feasible Alternatives

Alternative #1 - Replace with a bridge

The existing 124' x 26' steel beam bridge will be replaced with a three span, 150' x 40', continuous concrete slab bridge.

The typical cross section adjacent to the bridge will consist of a 24' roadway with 8' effective shoulders (0' paved and 8' granular) and 10:1 for 4' then 6:1/3:1 foreslopes.

This bridge will be constructed on the existing vertical and horizontal alignment. 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 four ends of the bridge.

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

It appears that no right of way will be required for this project.

Traffic will be maintained by an off-site detour.

Bridge Items

	<u>Estimated Costs</u>
New Bridge	\$ 673,500
Cofferdams	\$50,000
Bridge Removal	\$31,900
Revetment	\$33,800
Engineering Fabric	\$2,700
Erosion Stone	\$800
Mobilization - 10%	\$79,300
Contingency - 20%	\$158,600
Bridge Costs	\$ 1,030,600

Roadway Items

Bridge Approaches	\$93,600
Removal of Pavement	\$24,000
Embankment in place, contractor furnished	\$60,000
Excavation Class 10	\$5,000
Guardrail (Includes Removal)	\$52,500
Paved Shoulders for Guardrail	\$42,000
Class 10 for Guardrail Blisters	\$23,600
Bridge End Drains	\$14,000
Clearing and Grubbing	\$20,000
Erosion Control	\$50,000
Traffic Control - 5%	\$21,400
Mobilization - 5%	\$21,400
M & C - 30%	\$128,400
Roadway costs	\$555,900

Project Total

\$1,586,500

Other Alternatives Considered

Based on the hydraulic analysis, a culvert was not an option for this location, so no culvert options were reviewed.

Staged construction would require approximately one foot of grade raise, a wider bridge for stage traffic and since there was a satisfactory detour route identified, this alternative was dismissed. This site is not a good candidate for a runaround due to the existing overhead utilities on the east and the extensive tree clearing that would be required on the west.

B. Detour Analysis

IA 14 will be closed and an offsite detour will be utilized. It is anticipated the detour will be in place for approximately 105 days. The detour would follow Co Rd B60 east from the junction of IA 14 and Co Rd B 60 to Co Rd T47, then north on Co Rd T47 to its junction with IA 14. Out of distance travel is 8 miles. The total distance user cost is anticipated to be \$292,000. The cost for county road maintenance will be \$22,900 as calculated by the Gas Tax Method. Detour signing costs will be \$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 IA 14; 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.

No additional survey is requested at this time.

Right of Way does not appear to be required for this project.

The Location and Environment Bureau review of cultural resources for the project suggests on the condition that no ROW is needed, the project will likely meet the Bureau's Minor Projects program and not require extended consultation with SHPO or other consulting parties.

G. Program Status

Site data has been developed by Shive-Hattery. This project is listed in the 2020-2024 Iowa Transportation Improvement Program, with \$1,300,000 programmed for replacement in FY 2024. 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

Jenifer J. Bates

From: ia@occinc.com
Sent: Tuesday, April 21, 2020 1:41 PM
To: Page, Jason
Subject: Design Information Results for Ticket # 552002926

(ANE) ALLIANT ENERGY
 Contact Name : Alliant Energy Field Engineer Contact Phone: 8002554268 Contact Email: locate_IPL@alliantenergy.com

(FT1) OMNITEL COMMUNICATIONS
 Contact Name : Ryan Flugge
 Contact Phone: 6417492531
 Contact Email: rflugge@omnitel.biz

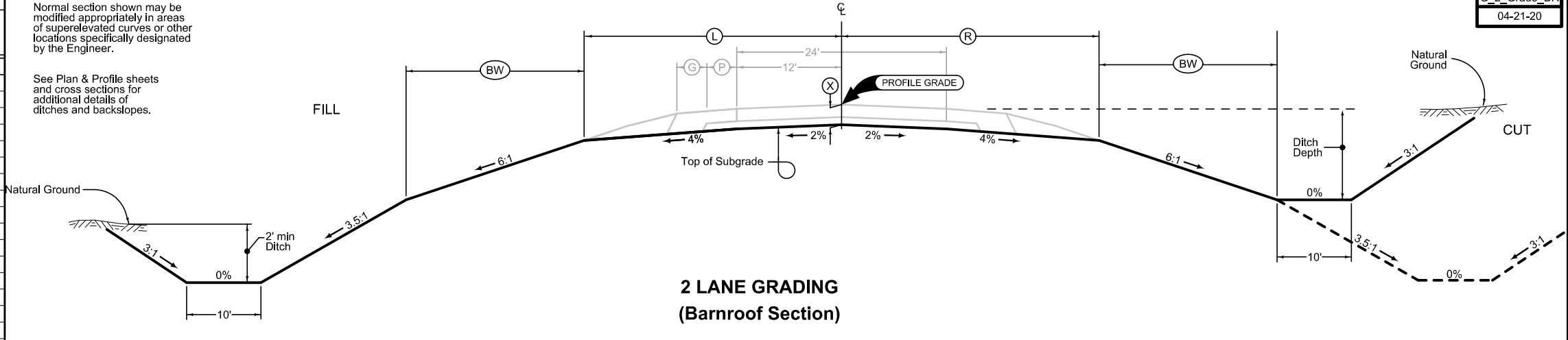
(PN4) BLACK HILLS ENERGY WEB CTY
 Contact Name : Chuck Woods
 Contact Phone: 5153432037
 Contact Email: chuck.woods@blackhillscorp.com

(WINIA) WINDSTREAM COMMUNICATIONS
 Contact Name : LOCATE DESK
 Contact Phone: 8002891901
 Contact Email: LOCATE.DESK@WINDSTREAM.COM

LOCATION		DIMENSIONS			
ROAD IDENTIFICATION	STATION TO STATION	L	R	X	BW
		Feet	Feet	Inches	Feet
IA 14	486+90.32 - 491+21.75	33.60	33.60	24	2.40

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.

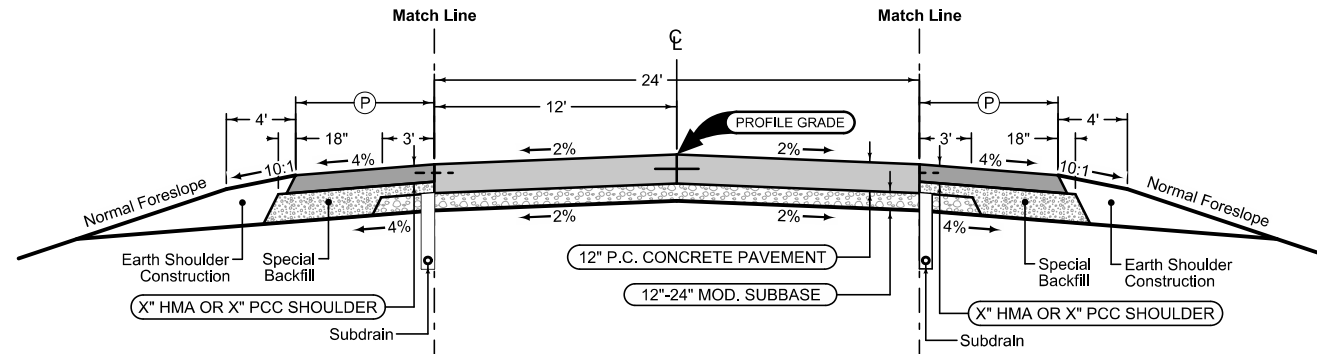


Modify grading to minimize impact to right of way since all work is behind guardrail

Paved Shoulder at Guardrail

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

2_P_Guard_04-21-20		(P)
STATION TO STATION		Feet
487+49.53	489+29.58	VARIES
489+82.58	490+62.50	VARIES



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

2P_04-21-20	
STATION TO STATION	
487+49.53	489+29.58
489+82.58	490+62.50

Paved Shoulder at Guardrail

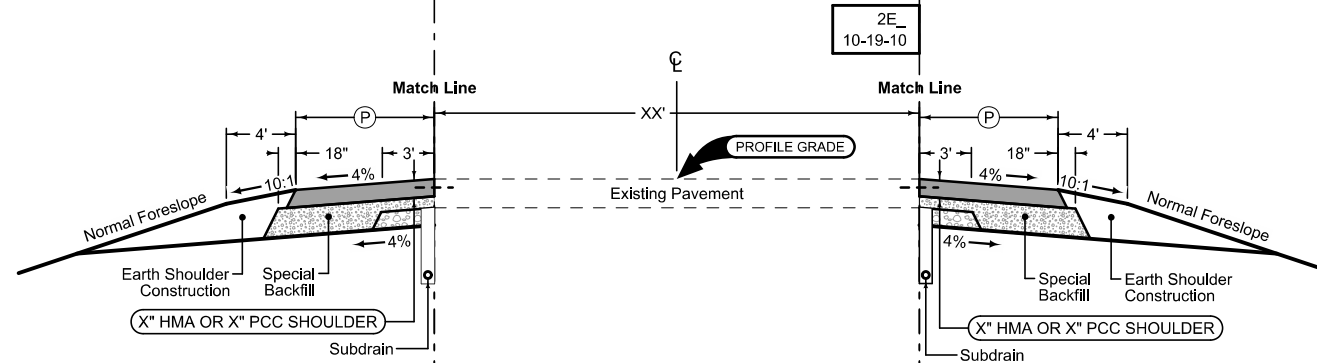
PCC Shoulder Jointing:
 Longitudinal joint: BT-1 or BT-5
 Transverse joints: C at mainline spacing
 HMA Shoulder Jointing:
 Longitudinal joint: B

2_P_Guard_04-21-20		(P)
STATION TO STATION		Feet
487+49.53	489+29.58	VARIES
489+82.58	490+62.50	VARIES

Paved Shoulder at Guardrail

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

2_P_Guard_04-21-20		(P)
STATION TO STATION		Feet
487+15.36	487+49.53	VARIES
490+62.50	491+21.75	VARIES

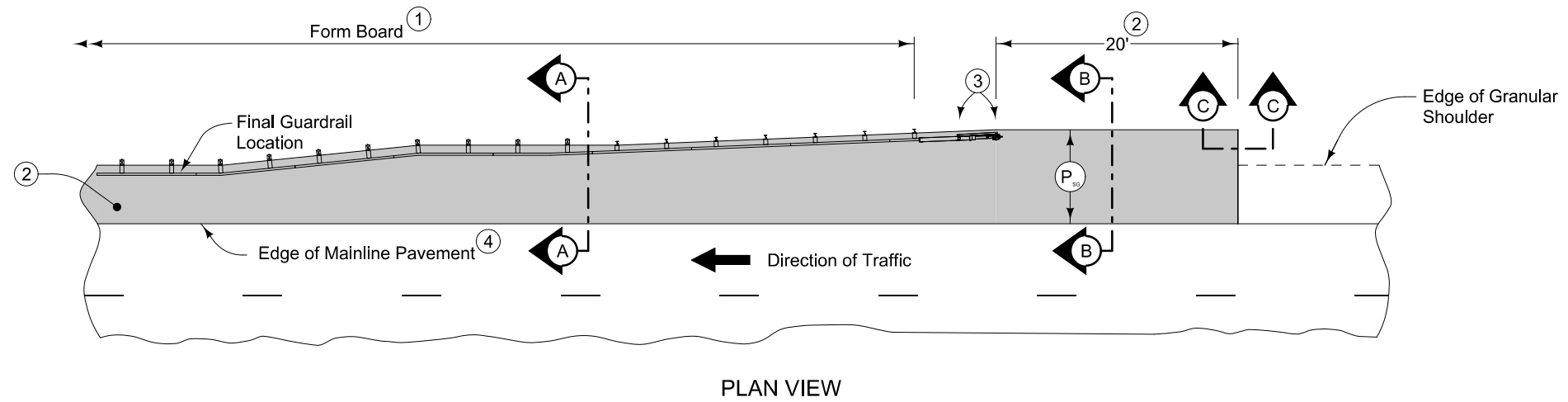


Paved Shoulder at Guardrail

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

2_P_Guard_04-21-20		(P)
STATION TO STATION		Feet
486+90.32	489+29.58	VARIES
490+62.50	490+96.70	VARIES

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



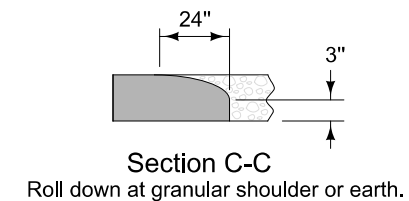
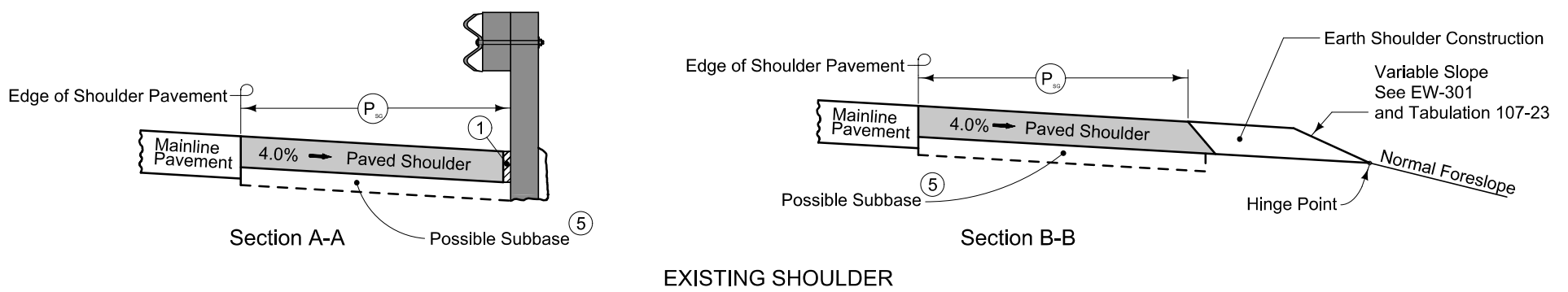
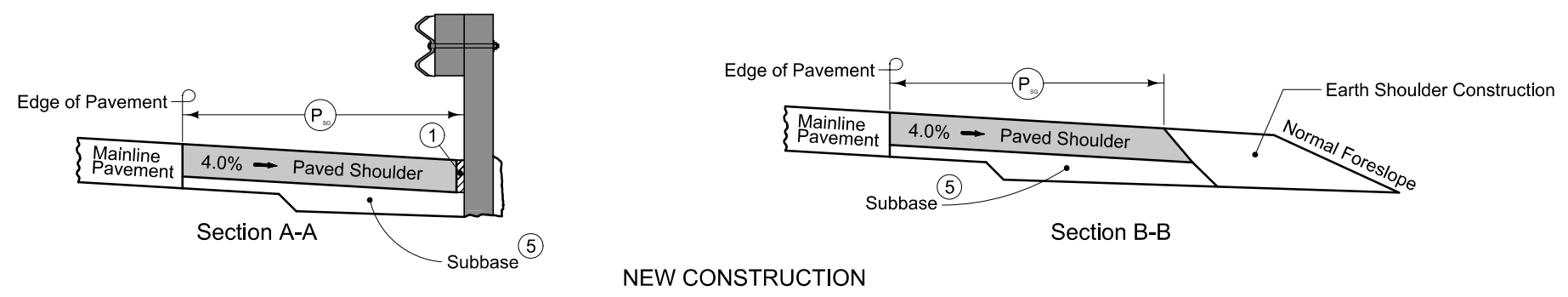
9" HMA Paved Shoulder at guardrail. 8" PCC may be substituted with the following jointing layout:

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-1 joint for PCC shoulder. 'B' joint for HMA shoulder.
- ⑤ Refer to other details in the plan.



PAVED SHOULDER AT GUARDRAIL (GRANULAR SHOULDER ADJACENT TO MAINLINE)

100-1D
10-18-05

PROJECT DESCRIPTION

This project involves the replacement of the IA 14 bridge over Flood Creek, 3.6 miles South of the Co. Rd. B45.

100-0A
10-28-97

**ESTIMATED ROADWAY QUANTITIES
(1 DIVISION PROJECT)**

Item No.	Item Code	Item	Unit	Total	As Built Qty.

105-4
10-18-11

STANDARD ROAD PLANS

The following Standard Road Plans apply to construction work on this project.

Number	Date	Title
BA-200	10-18-16	Steel Beam Guardrail Components
BA-201	04-18-17	Steel Beam Guardrail Barrier Transition Section (MASH TL-3)
BA-202	10-20-15	Steel Beam Guardrail Bolted End Anchor
BA-205	04-19-16	Steel Beam Guardrail Tangent End Terminal (MASH TL-3)
BA-250	10-18-16	Steel Beam Guardrail Installation at Concrete Barrier on Bridge End Post (MASH TL-3)
BR-203	10-17-17	Double Reinforced 12" Approach
DR-303	10-17-17	Subdrains (Longitudinal)
DR-305	04-17-18	Subdrain Outlets (standard Subdrain, Pressure Release and Special)
DR-402	04-17-18	Rock Flume for Bridge End Drain
EC-201	10-16-18	Silt Fence
EC-202	10-21-14	Floating Silt Curtain
EC-204	04-18-17	Perimeter and Slope Sediment Control Devices
EC-301	10-18-16	Rock Erosion Control (REC)
EW-101	10-17-17	Embankment and Rebuilding Embankments
EW-102	10-20-15	Allowable Placement of Unsuitable Soil in Embankments
EW-201	04-19-16	Bridge Berm Grading without Recoverable Slope (Barnroof Section)
EW-301	10-20-15	Guardrail Grading
PM-110	10-16-18	Line Types
PM-420	04-19-11	Two-Lane Roadway with no Turn Lanes (One-Way Stop Condition)
PV-101	10-16-18	Joints
SI-173	04-19-16	Object Markers
SI-211	10-18-16	Object Markers and Delineator Placement with Guardrail
TC-1	04-16-13	Work Not Affecting Traffic (Two-Lane or Multi-Lane)
TC-202	04-21-15	Work Within 15 ft of Traveled Way
TC-252	04-19-16	Routes Closed to Traffic

SURVEY SYMBOLS

- FENO Feno Monument
- CP Control Point
- ▲ PI Tangent Point
- △ SCR Section Corner
- POT Tangent Point
- △ BM Bench Mark
- GR Ground Shot
- WC Wild Card (Misc. Field Shot)
- FO FO1D Fiber Optic Co. 1 - Quality D
- PPA Power Pole Co. 1
- T1 TL1D Telephone Line Co. 1 - Quality D
- TP TPD Telephone Pedestal
- PPB Power Pole Co. 2
- - - - - BL Topo Breakline
- - - - - SNP Unpaved Shoulder
- - - - - SH Paved Shoulder
- - - - - EP Edge of Paved Roads (ML or SR)
- - - - - C Centerline BL of Road (ML or SR)
- - - - - LIN Miscellaneous Line
- BD Bridge Deck
- BCL Bridge Centerline
- SBR Size of Bridge
- - - - - BRG Bridge
- - - - - CON Concrete or A/C Slab
- - - - - CU Back of Curb
- - - - - GU Gutter In Front of Curb
- - - - - ENT Centerline BL of Entrance
- - - - - ENU Edge Unpaved Entrance & Parking
- - - - - ENP Edge Paved Entrance & Park Lot
- - - - - GDL Guard Rail Steel
- DU Centerline Draw or Stream (Up)
- OUT Tile Outlet
- PRO Profile Shot
- - - - - PIP Pipe Culvert
- ↓ PLG Location of General Photo
- - - - - FW Wire Fence
- - - - - BNK Stream Bank
- ▲ RIP Rip-Rap
- - - - - D Centerline Draw or Stream (Down)

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

- FO Omnitel Communications - Quality D
- Power Pole Alliant Energy
- T1 Windstream Communications - 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.	
Yellow	(4)	Highlight for Critical Notes or Features
Red	(3)	Delineates Restricted Areas
Lavender	(9)	Temporary Pavement Shading
Gray, Light	(48)	Proposed Pavement Shading
Gray, Med	(80)	Proposed Granular Shading
Gray, Dark	(112)	Proposed Grade and Pave Shading "In conjunction with a paving project"
Brown, Light	(236)	Grading Shading
Tan	(8)	Proposed Sidewalk Shading
Blue, Light	(230)	Proposed Sidewalk Landing Shading
Pink	(11)	Proposed Sidewalk Ramp Shading

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	
Green	(2)	Existing Ground Line Profile
Blue	(1)	Proposed Profile and Annotation
Magenta	(5)	Existing Utilities
Blue, Light	(230)	Proposed Ditch Grades, Left
Black	(0)	Proposed Ditch Grades, Median
Rust	(14)	Proposed Ditch Grades, Right

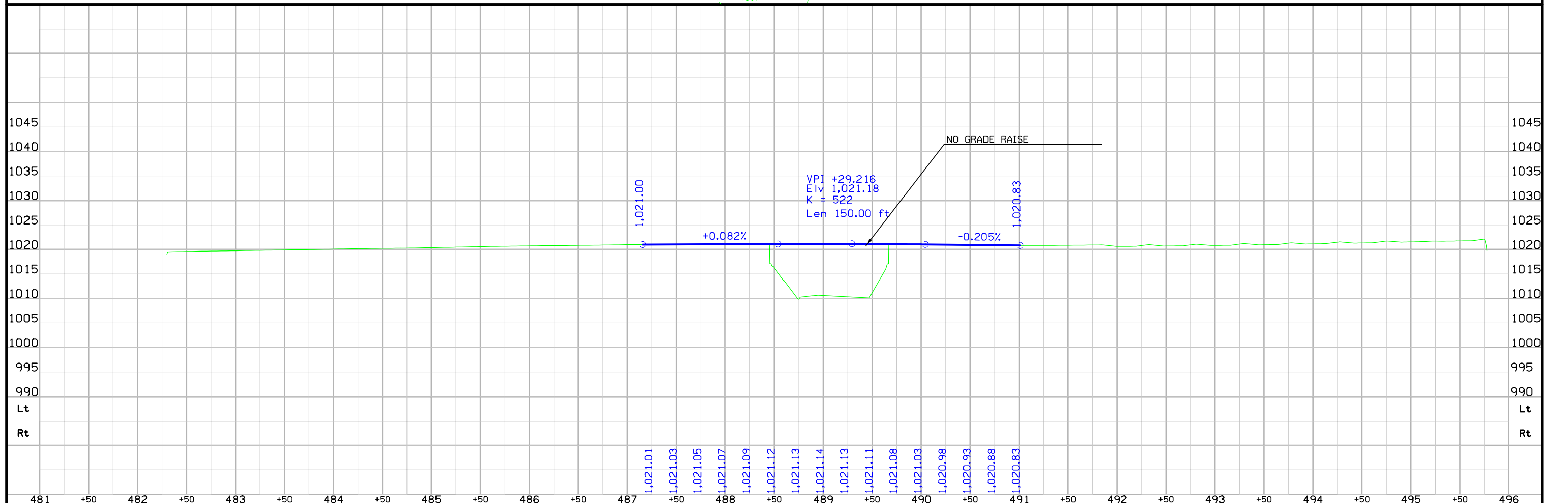
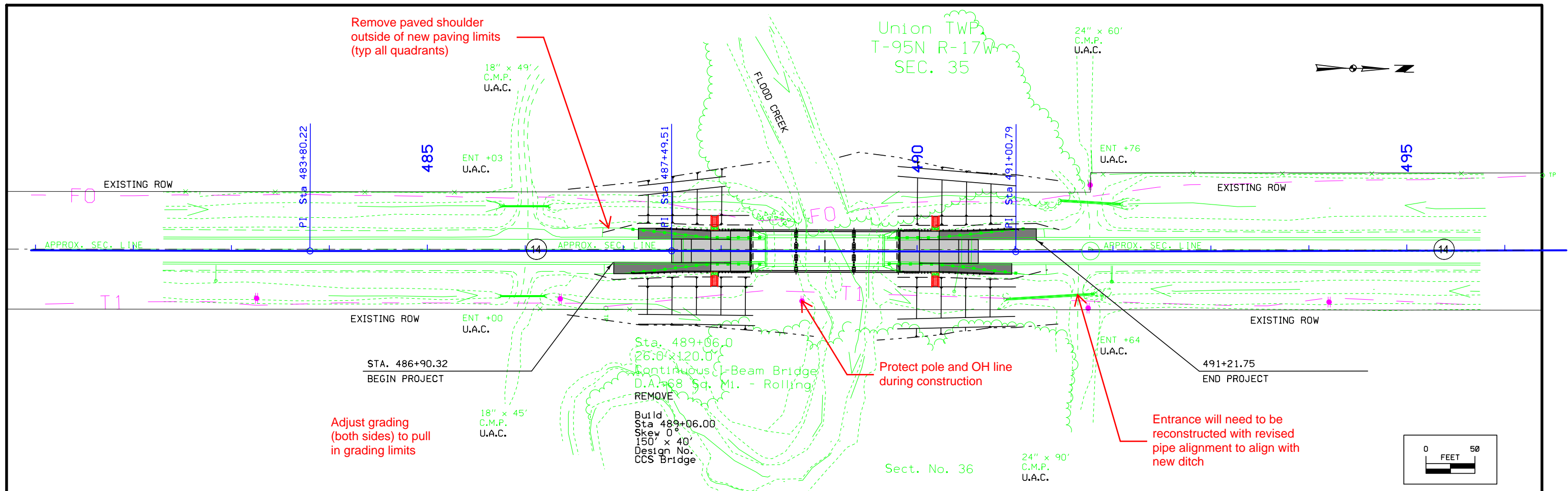
- Reference Point
- Station
- Survey Line
- Section Corner
- Ground Line Intercept
- Saw Cut
- Guardrail
- Trench Drain
- HighTension Cable Guardrail
- Sheet Pile
- Pavement Removal
- Clearing & Grubbing Area

RIGHT-OF-WAY LEGEND

- ▲ Proposed Right-of-Way
- △ Existing Right of Way
- ▲ Existing and Proposed Right-of-Way
- ▲ Easement and Existing Right-of-Way
- Easement (Temporary)
- Easement
- C/A Access Control
- Property Line

PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

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



Survey Information

Floyd County
BRFN-014-8(23)--39-34
Flood Creek 3.6 mi S of Co Rd B45
Bridge-Unspecified
PIN 19-34-014-010
Sap-957.0

General Information

Measurement units for this survey are US survey feet. This survey is for proposed reconstruction of Hwy. 14 bridge over Flood Creek. Project datum and control information is provided by Design Survey Office. This survey request was for the Iowa Hwy. 14 corridor only. This project is a Full Field concept survey.

Vertical Control

Vertical datum for this survey is NAVD88 (Computed using Geoid12b). GRS80 Ellipsoidal Height was computed at project Pts. 141764, 141767, 141772, 340330, 340338 & ROSE by conducting two concurrent 6-hour static observations. Additional benchmarks were placed throughout the project using a GNSS Base-Rover setup relative to Pt. 141767 and Pts. 141764 & 141772. Two observations with a minimum of 4-hours between were collected and used in a weighted average.

This survey observed 2 local area county Control Monuments with published NAVD88 heights to compare to local ground control:

Floyd County GPS Control mark 340330 has a published Elev. of 1053.34
Survey Elev. = 1053.33

Floyd County GPS Control mark 340338 has a published Elev. of 1042.87
Survey Elev. = 1042.86

This survey observed 3 As-Built plan benchmarks to compare to local ground control:

BM 34A Project FA-271E (1) Paving Plan Elev. 1023.66
BM 500 this Survey Elev. = 1016.47

BM 35A Project FA-271E (1) Paving Plan Elev. 1023.35
BM 501 this Survey Elev. = 1016.15

BM 36A Project FA-271E (1) Paving Plan Elev. 1022.42
BM 502 this Survey Elev. = 1015.25

The average vertical difference between these three marks is -7.19' to be applied to as-built plan elevations.

This survey established an additional local benchmark:

BM 503 Survey Elev. = 1021.41

Horizontal Control

The project coordinate system for this survey is Iowa RCS Zone 2 (U.S. Survey Feet). This survey control is relative to IaRTN reference stations. IaRTN Reference Station coordinates are relative to the National Reference Station network datum: NAD83 (2011) for Epoch 2010.00. Coordinates were determined at project Pts. 141764, 141767, 141772, 340330, 340338 & ROSE by conducting 2 concurrent 6-hour static observations. Additional control points were placed throughout the project using a GNSS Base-Rover setup relative to Pt. 141767 and Pts. 141764 & 141772. Two observations with a minimum of 4-hours between were collected and used in a weighted average.

Alignment Information

The horizontal alignment for this survey is a retrace of As-built Plans Project No. FA-271E (1). Survey stationing was equated to the FA-271E (1) bridge plan POT at Sta. 489+06.0 and run back and ahead without equation throughout the survey.

Survey stationing relates to as built plan stationing as follows:

PI Sta. 465+24.6 As-built Plans Project No. FA-271E (1)
Survey PI Sta. 465+24.58

POT Sta. 491+77.4 As-built Plans Project No. FA-271E (1)
Survey POT Sta. 491+77.15

POT Sta. 518+37.6 As-built Plans Project No. FA-271E (1)
Survey POT Sta. 518+38.39

CONTROL POINT VICINITY MAP

This map is a guide to the vicinity of the primary project control points. Primary control is for use with RTK base stations and for RTN validation. Future surveys will use primary project control to establish temporary control as needed for construction or other surveying applications.



HORIZ. DATUM: NAD83(2011) EPOCH 2010.00

VERT. DATUM: NAVD88

1a. Regional Coordinate System Zone 2

Coordinate listing from next sheet will be used with 1aRTN for monument recovery. No other reference ties are given.

HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING

HORIZ. DATUM: NAD83(2011) EPOCH 2010.00

VERT. DATUM: NAVD88

Ia. Regional Coordinate System Zone 2

Point Name	Northing	Easting	Elevation	Feature Code-Description
141764	9737210.869	12483906.630	1014.516	CP - FD ROW RAIL DRILL HOLE IN BALL_SW QUAD OF INTSC IOWA 14 AND 250TH ST_60 FT W OF CTR IOWA 14_54 FT S OF CTR 250TH ST
141767	9738881.626	12483904.908	1015.431	FENO - SET FENO MON 0.3 MI N OF INTSC IOWA 14 AND 250TH ST_51 FT W OF CTR IOWA 14_9 FT E OF ROW FNC
141772	9741234.605	12483886.664	1020.960	FENO - SET FENO MON 0.25 MI S OF INTSC IOWA 14 AND 240TH ST_54 FT W OF CTR IOWA 14_12 FT SE OF ROW FNC
340330	9737243.314	12473439.545	1053.328	CP - FD FLOYD CO GPS CONTROL PT 2000-330 32FT WEST OF CTR JERSEY AVE AND 27FT NORTH OF CTR 250TH ST_FLOYD CO GPS CONTROL 2019 ADJUSTMENT POINT ID 340330
340338	9737116.458	12491469.014	1042.855	CP - FD FLOYD CO GPS CONTROL PT 2000-338 25FT EAST OF CTR MINER AVE AND 115FT SOUTH OF CTR 250TH ST_FLOYD CO GPS CONTROL 2019 ADJUSTMENT POINT ID 340338
ROSE	9741195.926	12468172.376	1086.308	CP - FD NGS FIRST ORDER TRIANGULATION STATION ROSE 0.25MI SOUTH OF 240TH ST AND 33FT EAST OF CTR INDIGO AVE

108-23A
08-01-08

TRAFFIC CONTROL PLAN

- 1) While bridge and approaches are being removed and replaced, traffic on IA 14 shall be maintained via an off-site detour.
- 2) Signage and devices shall be furnished, installed, maintained, and removed by Contractor. See sheet A.1 for proposed detour.

108-25
10-21-14

511 TRAVEL RESTRICTIONS

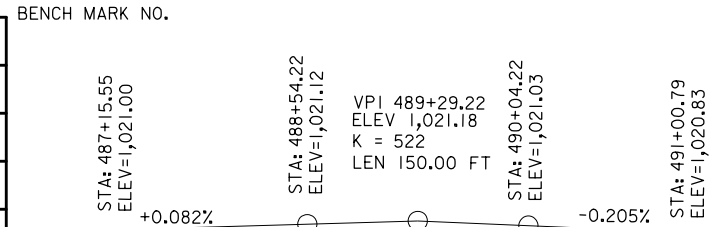
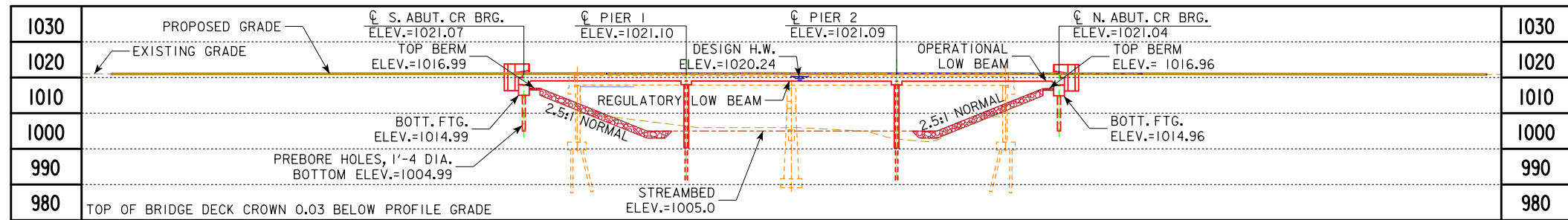
Route	Direction	County	Location Description	Feature Crossed	Object Type	Maint. Bridge No., Structure ID, or FHWA No.	Type of Restriction	Existing Measurement	Construction Measurement	Construction Measurement as Signed	Projected As Built Measurement	Remarks
IA 14	Both	Floyd	No Restrictions Anticipated	None - Detour								

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	



PROPOSED PROFILE GRADE IA 14

UTILITIES LEGEND:

- - FO - - OMNITEL COMMUNICATIONS - QUALITY D
 - - TI - - WINDSTREAM COMMUNICATIONS - QUALITY D
 - POWER POLE ALLIANT ENERGY
- UTILITIES SHOWN ON THIS SHEET ARE FOR INFORMATION ONLY, SEE ROAD DESIGN SHEETS FOR FINAL UTILITY INFORMATION.

HYDRAULIC DATA

DRAINAGE AREA = 68.5 SQ. MI.
 STREAM SLOPE = 4.94 FT./MI.
 AVG. LOW WATER STAGE = 1011.0

Q₅₀ = 7670 CFS
 STAGE = 1020.24 FT.
 REGULATORY LOW BEAM = 1018.71
 BACKWATER = 1.12 FT.
 AVG. BRIDGE VELOCITY = 5.0 FPS

Q₁₀₀ = 8870 CFS
 STAGE = 1020.79 FT.
 OPERATIONAL LOW BEAM = 1018.64
 BACKWATER = 0.81 FT.
 AVG. BRIDGE VELOCITY = 4.56 FPS

Q₂₀₀ = 11240 CFS
 STAGE = 1022.0 FT.
 CALCULATED CHECK SCOUR =

Q₅₀₀ = 11920 CFS
 STAGE = 1021.94 FT.
 CALCULATED CHECK SCOUR =
 ROADWAY OVERTOP = 1017.68

TYPICAL BRIDGE SECTION

LOCATION TRAFFIC ESTIMATE

IA14 OVER FLOOD CREEK	2024 AADT	1300	V.P.D.
T-95N R-17W	2044 AADT	1400	V.P.D.
SECTION 35-36	2044 DHV	140	V.P.H.
UNION TOWNSHIP	FLOYD COUNTY	TRUCKS	17 %

FHWA NO. _____
 BRIDGE MAINT. NO. 3476.9S014
 LATITUDE 43.001083
 LONGITUDE -92.809970

PRELIMINARY

DESIGN FOR 0° SKEW

150'-0 X 40'-0 CONTINUOUS CONCRETE SLAB BRIDGE

45'-6 END SPANS 59'-0 INTERIOR SPAN

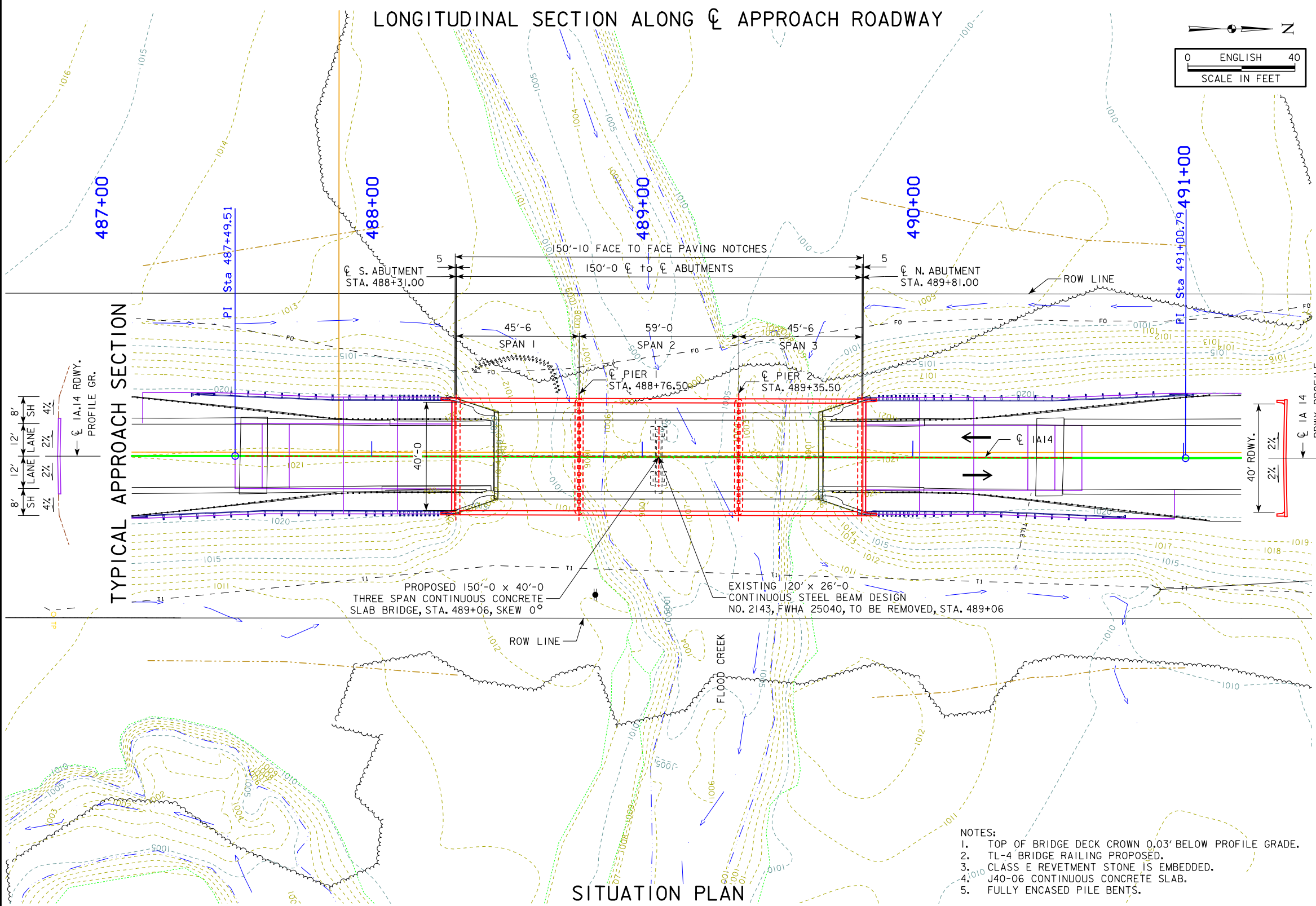
SITUATION PLAN

STATION 489+06 (IA14) MAY, 2021

FLOYD COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION
 DESIGN SHEET NO. 1 OF 2 FILE NO. ? DESIGN NO. ?

LONGITUDINAL SECTION ALONG CL APPROACH ROADWAY



- NOTES:**
- TOP OF BRIDGE DECK CROWN 0.03' BELOW PROFILE GRADE.
 - TL-4 BRIDGE RAILING PROPOSED.
 - CLASS E REVETMENT STONE IS EMBEDDED.
 - J40-06 CONTINUOUS CONCRETE SLAB.
 - FULLY ENCASED PILE BENTS.

SITUATION PLAN

LINE STYLE LEGEND OF CROSS SECTION SHEETS (ROAD)

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

LINE STYLE LEGEND OF CROSS SECTION SHEETS (SOILS)

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

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

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

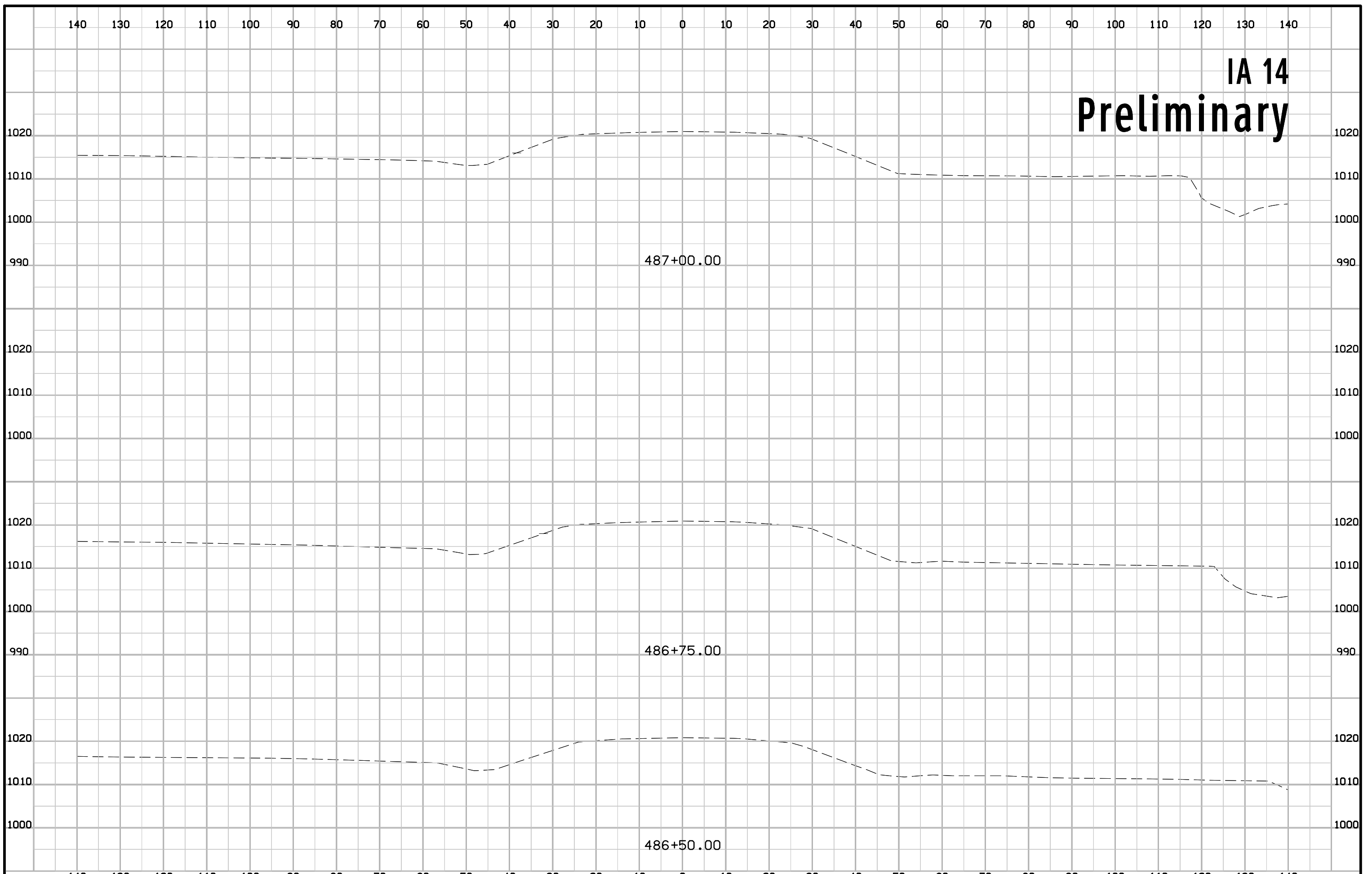
SYMBOL LEGEND OF CROSS SECTION SHEETS

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

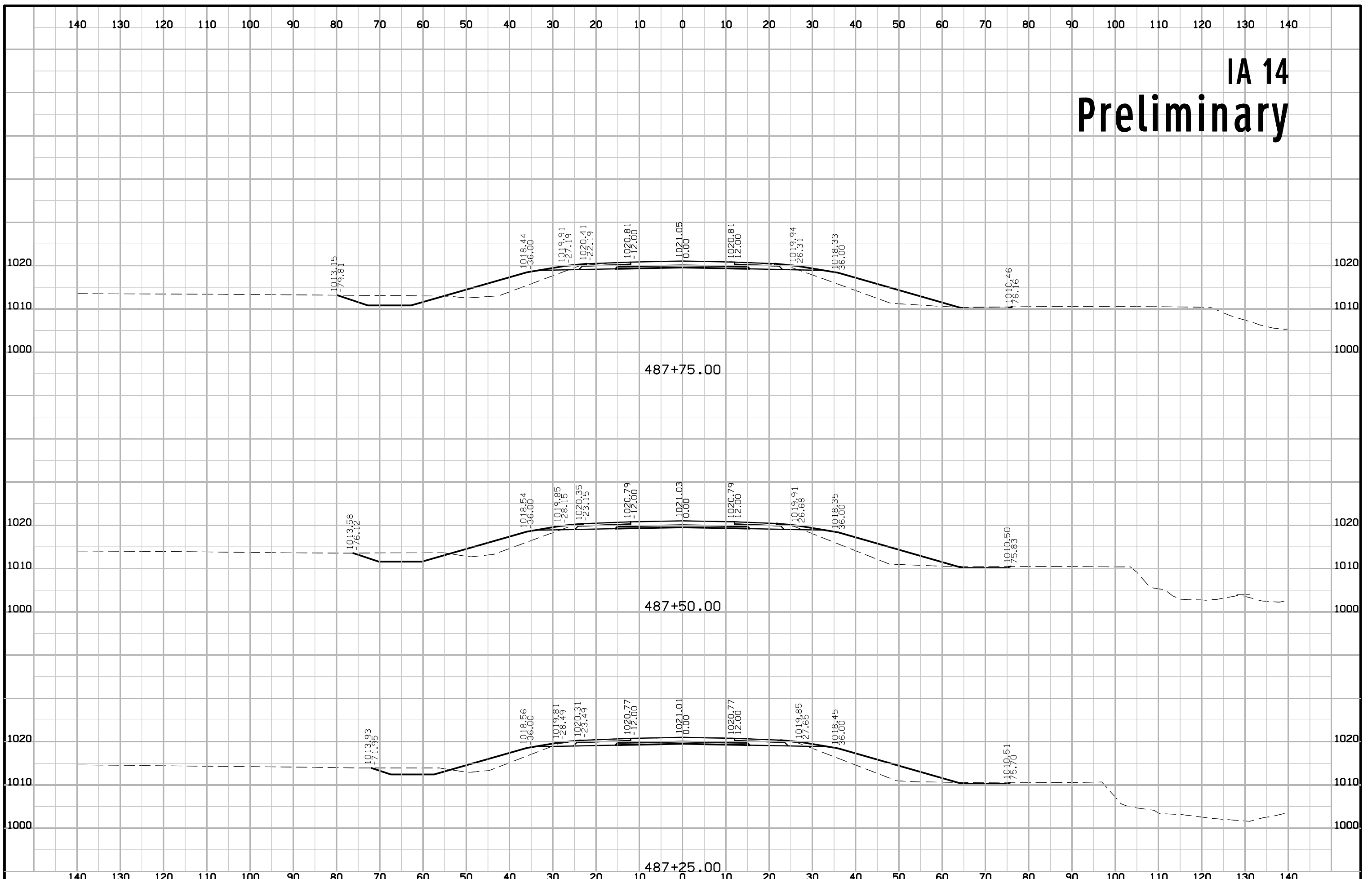
**CROSS SECTION
LEGEND AND SYMBOL
INFORMATION SHEET**

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

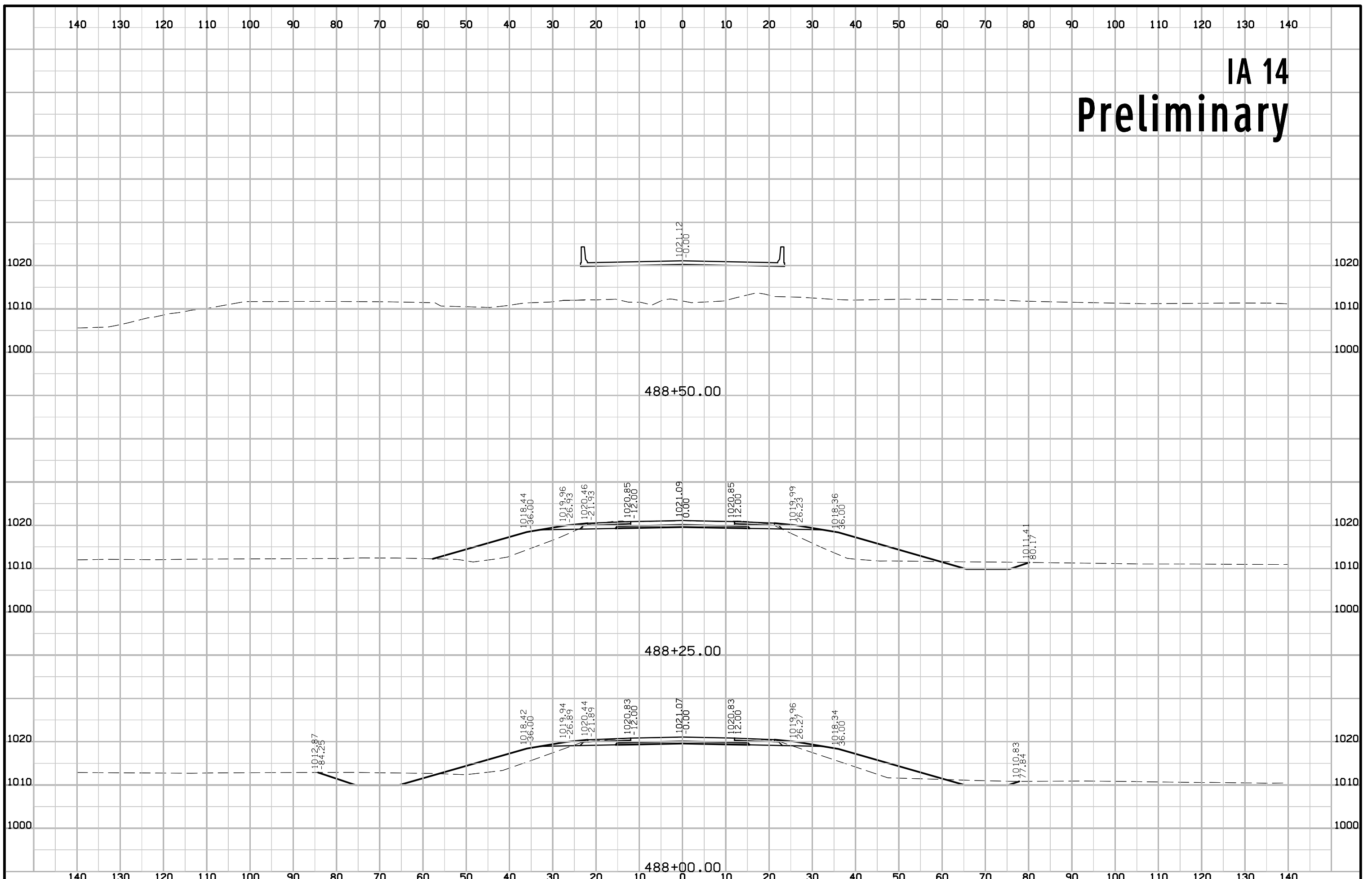
IA 14 Preliminary



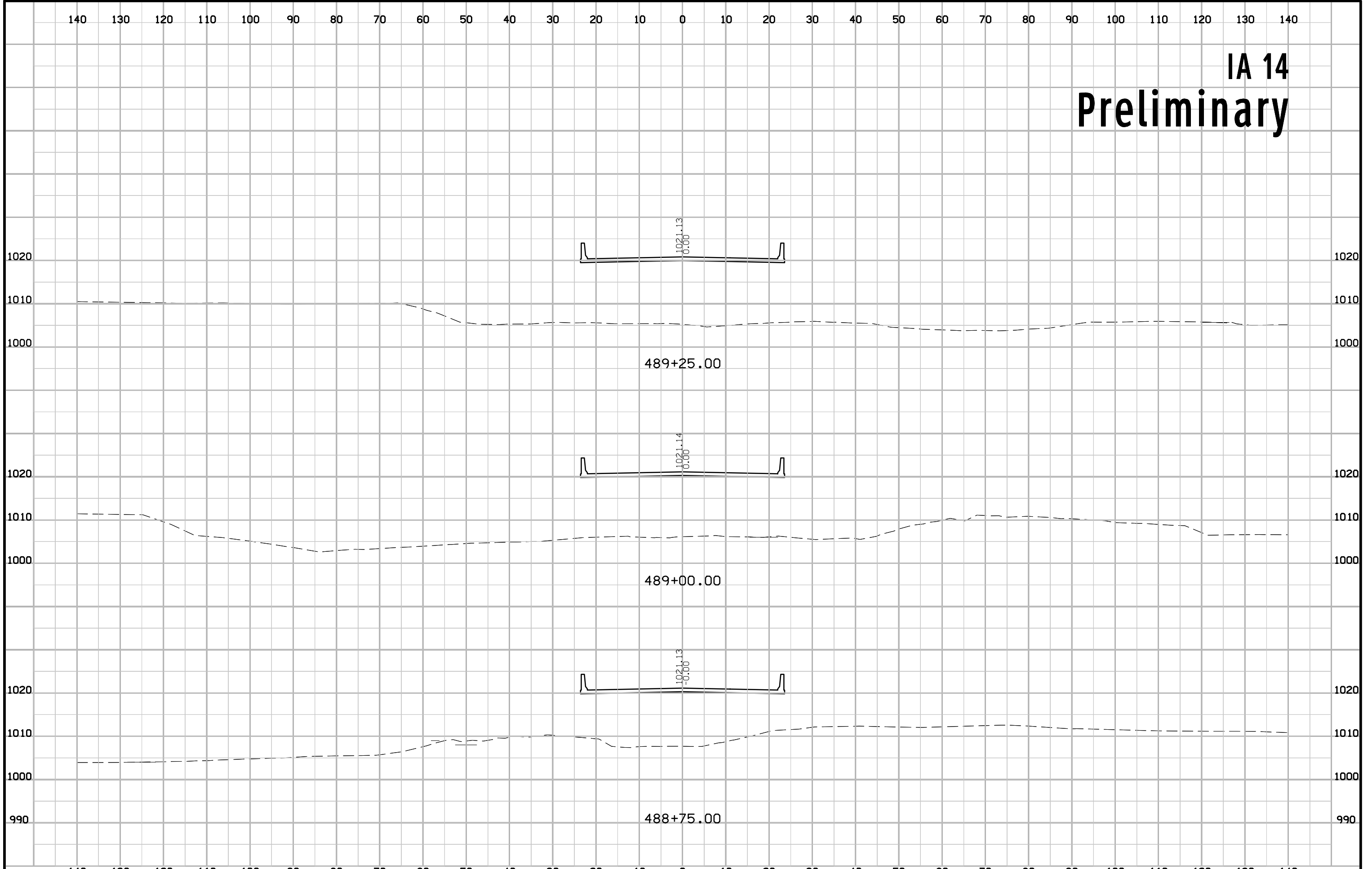
IA 14 Preliminary



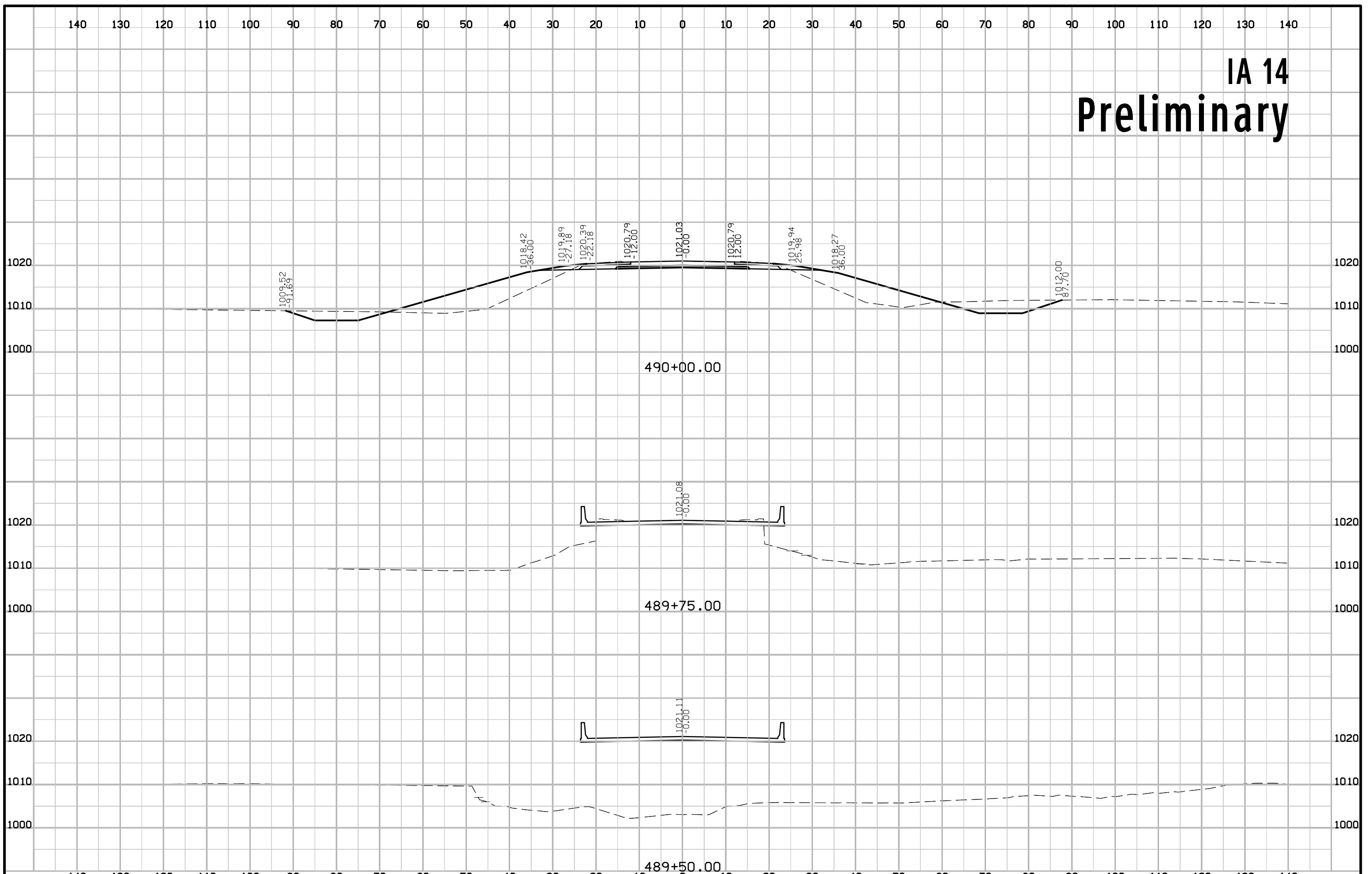
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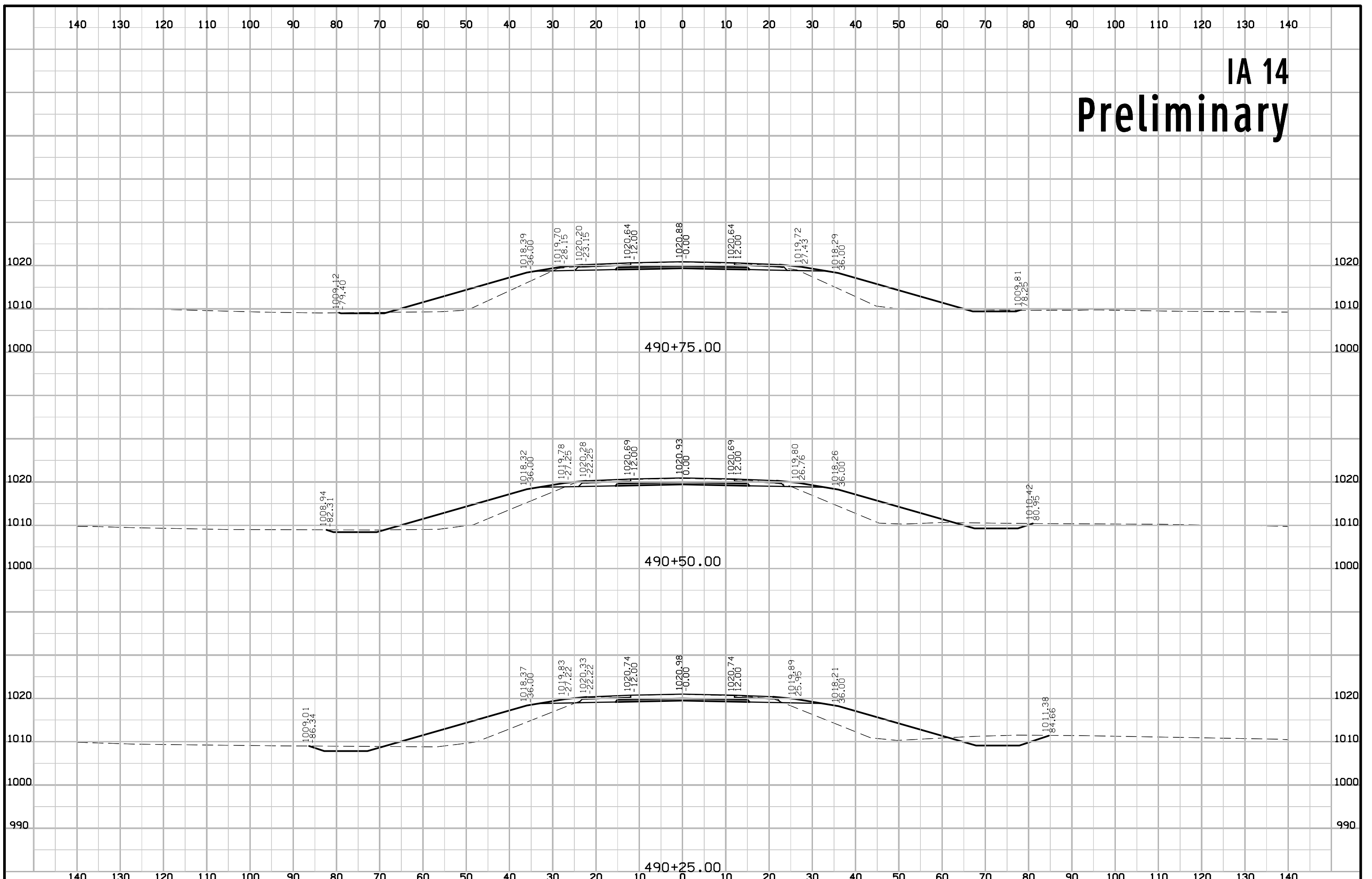
IA 14 Preliminary



IA 14 Preliminary



IA 14 Preliminary



IA 14 Preliminary

