

INDEX OF SHEETS	
No.	DESCRIPTION
A Sheets	Title Sheets
* A.1	Title Sheet
* A.2	Location Map Sheet
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
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G Sheets	Survey Sheets
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J Sheets	Traffic Control and Staging Sheets
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W Sheets	Mainline Cross Sections
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PLANS OF PROPOSED IMPROVEMENT ON THE
PRIMARY ROAD SYSTEM
CLINTON COUNTY
Bridge Replacement
IA 136 Over Elwood Creek 3.1 Mi N of US 61

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
20-23-136-030
PROJECT NUMBER
BRF-136-1(97)--38-23
R.O.W. PROJECT NUMBER

D4 PLAN - June 18, 2024
D5 PLAN - Sept 16, 2022

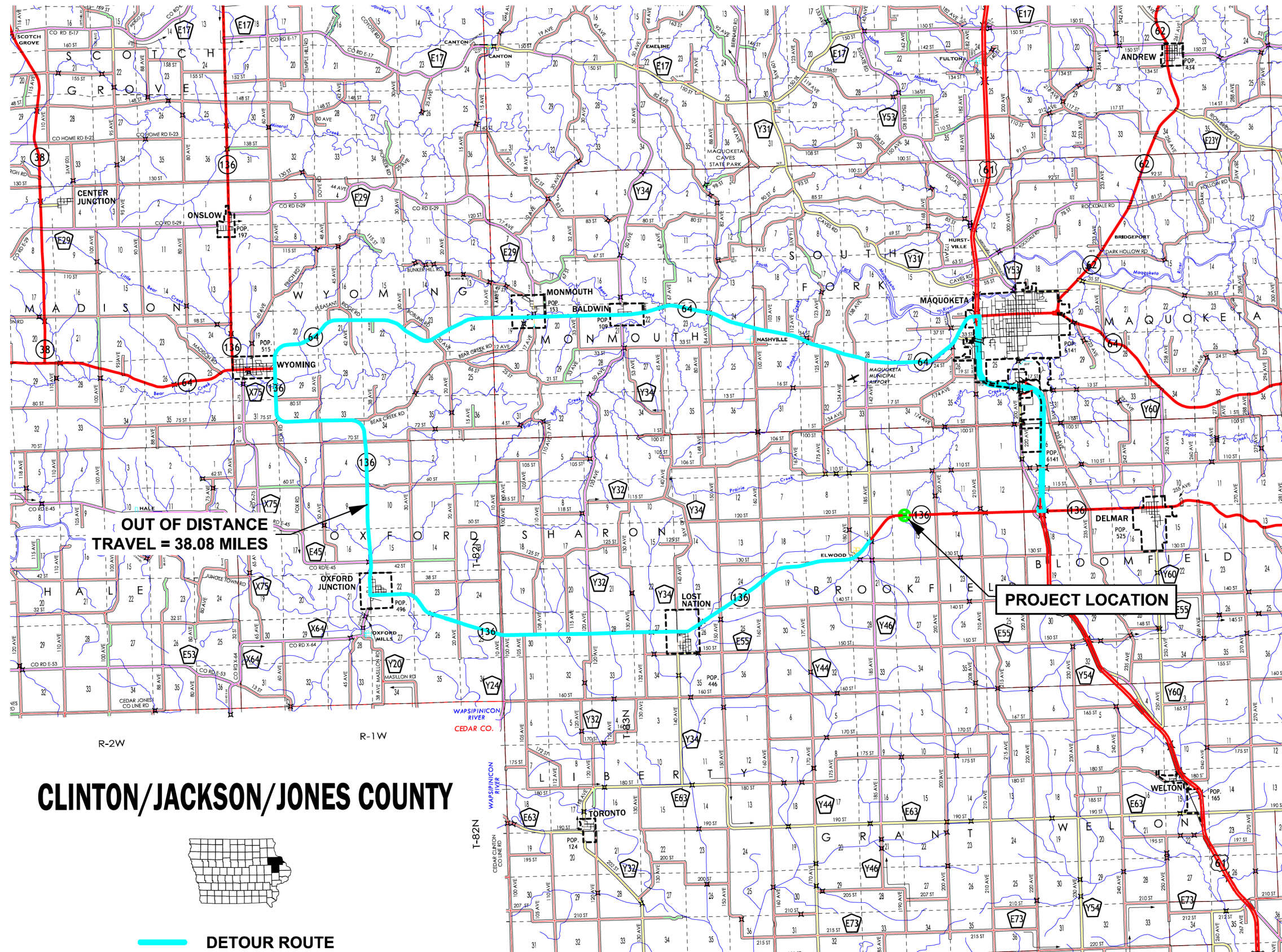
PRELIMINARY PLANS

Subject to change by final design.

D3 PLAN - May 20, 2022

DESIGN DATA RURAL			
2025	AADT	800	V.P.D.
2045	AADT	900	V.P.D.
2045	DHV	--	V.P.H.
	TRUCKS	11	%
	Total		
	Design ESALs	--	

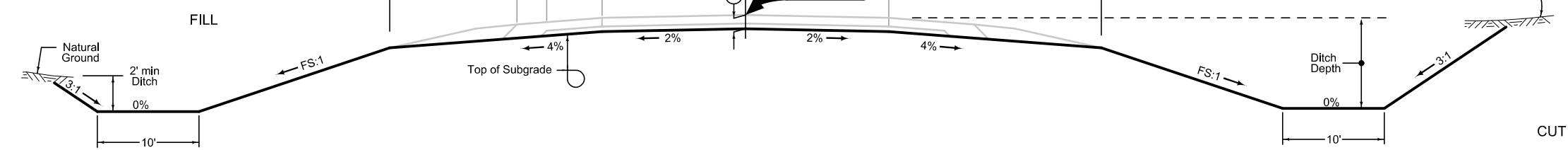
INDEX OF SEALS		
SHEET NO.	NAME	TYPE
A.1	Michael J. Janecek	Primary Signature Block
V.1	Phillipe M. Harpole	Hydraulic Design



LOCATION		DIMENSIONS			
ROAD IDENTIFICATION	STATION TO STATION	(L) Feet	(R) Feet	(X) Inches	FS
IA 136	736+02.75 738+92.75			16	3.5:1

G_2_Grade
04-21-20

ALL GRADING BEHIND GUARDRAIL



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

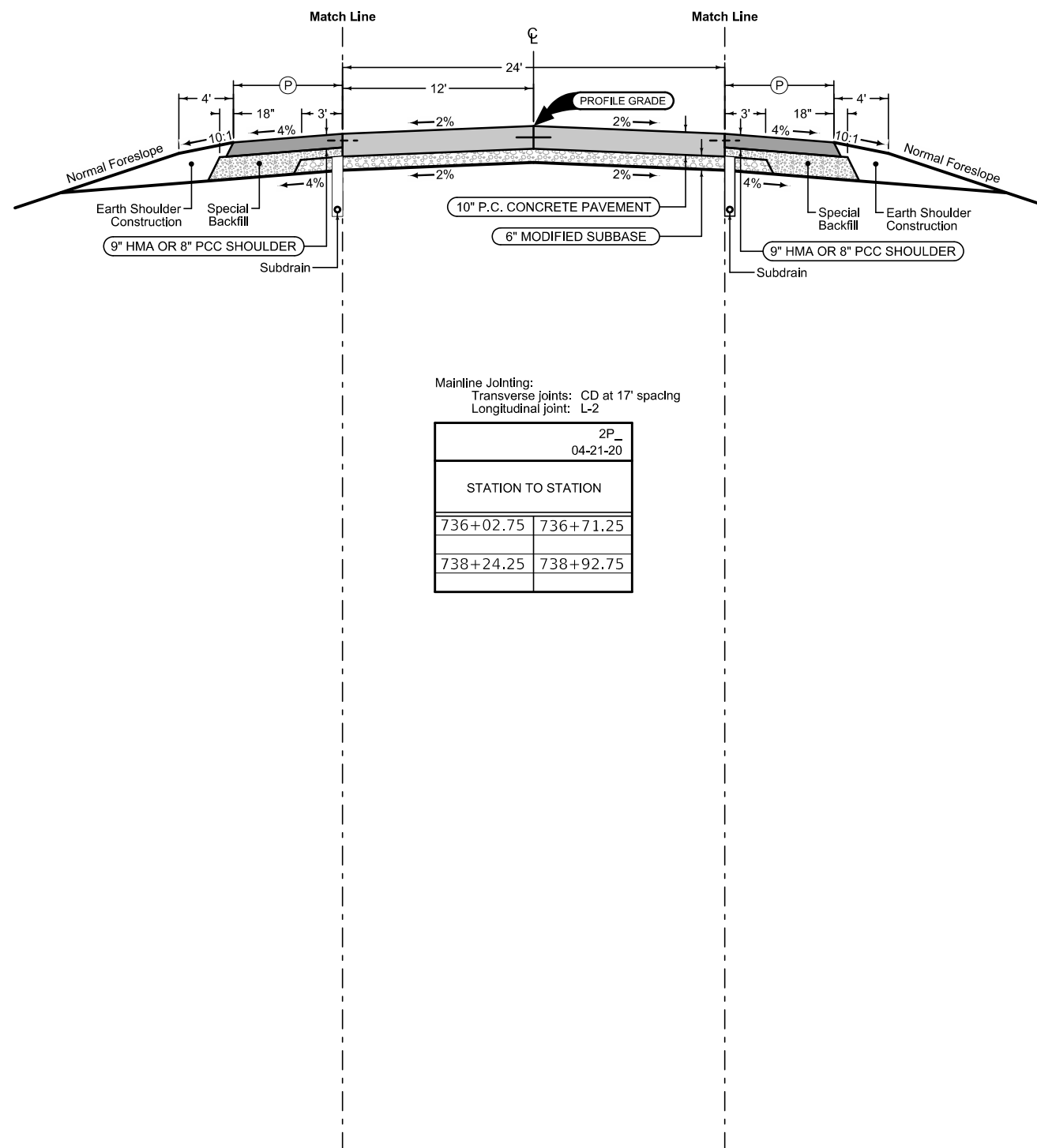
See plan & profile sheets and cross sections for additional details of ditches and backslopes.

2 LANE GRADING

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		
STATION TO STATION		(P) Feet
735+44.14	736+71.25	VAR.
738+24.25	739+76.19	VAR.



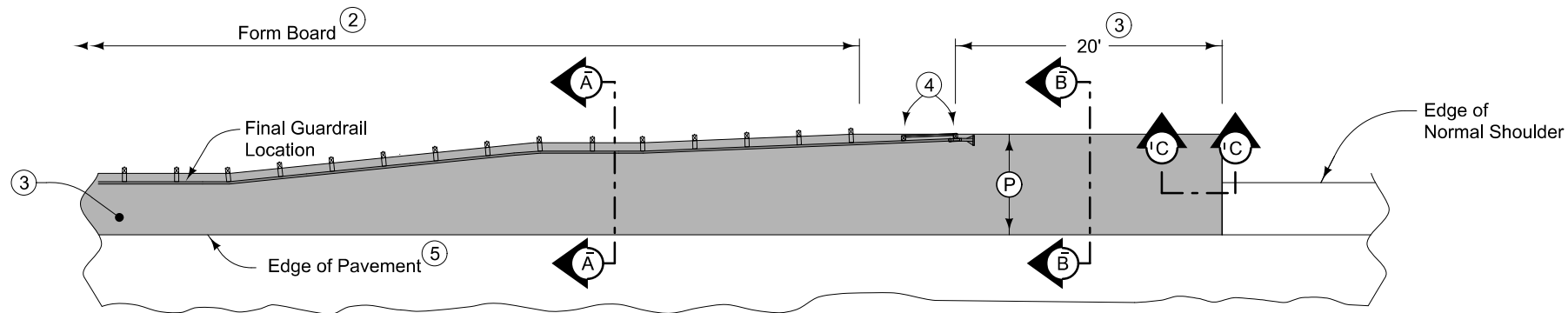
Mainline Jointing:
 Transverse joints: CD at 17' spacing
 Longitudinal joint: L-2

2P_04-21-20	
STATION TO STATION	
736+02.75	736+71.25
738+24.25	738+92.75

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		
STATION TO STATION		(P) Feet
735+18.89	736+71.25	VAR.
738+24.25	739+51.59	VAR.



PLAN VIEW

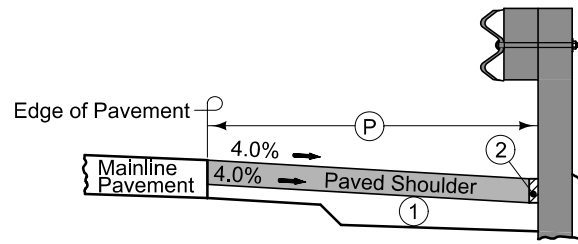
9" HMA Paved Shoulder at guardrail. 8" PCC may be substituted with the following jointing layout:

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

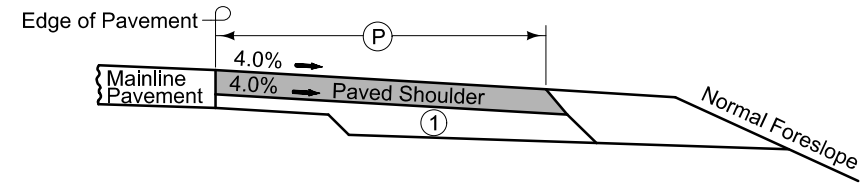
Compaction of HMA is required to face of guardrail post. Hand compaction will be allowed under guardrail. Removal and reinstallation of guardrail will be allowed with no additional payment.

Refer to Tabulation 112-9 for shoulder quantities.

- ① 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.

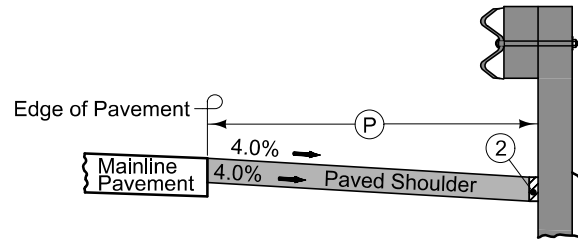


Section A-A

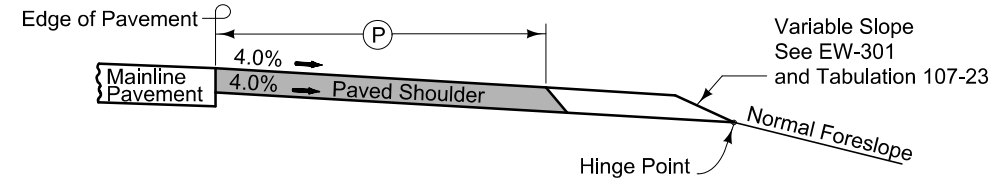


Section B-B

NEW CONSTRUCTION

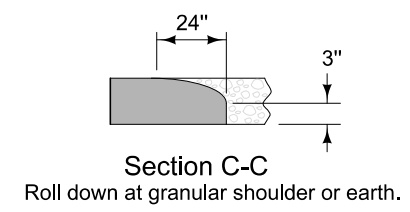


Section A-A



Section B-B

EXISTING SHOULDER



Section C-C

Roll down at granular shoulder or earth.

PAVED SHOULDER AT GUARDRAIL

SURVEY SYMBOLS

- | | | | |
|--|-----------------------------------|--|------------------------------|
| | Interstate Highway Symbol | | Septic Tank |
| | U.S. Highway Symbol | | Cistern |
| | Iowa Highway Symbol | | L.P. Gas Tank (No Footing) |
| | County Road Highway Symbol | | Underground Storage Tank |
| | Evergreen Tree | | Latrine |
| | Deciduous Tree | | Satellite TV Dish |
| | Fruit Tree | | Water Hook Up |
| | Shrub (Bushes) | | Radio Tower |
| | Timber | | Tower Anchor |
| | Hedge | | Guardrail (Beam or Cable) |
| | Stump | | Guard Post (one or two) |
| | Swamp | | Guard Post (over two) |
| | Rock Outcrop | | Filler Pipe |
| | Broken Concrete | | Gas Valve |
| | Revetment (Rip Rap) | | Water Valve |
| | Cemetery | | Speed Limit Sign |
| | Grave | | Mile Marker Post |
| | Cave | | Sign |
| | Sink Hole | | Traffic Signal Control Box |
| | Board Fence | | Rail Road Signal Control Box |
| | Chain Link or Security Fence | | Telephone Switch Box |
| | Wire Fence | | Electric Box |
| | 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) | | |

UTILITY LEGEND

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	(70)		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

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

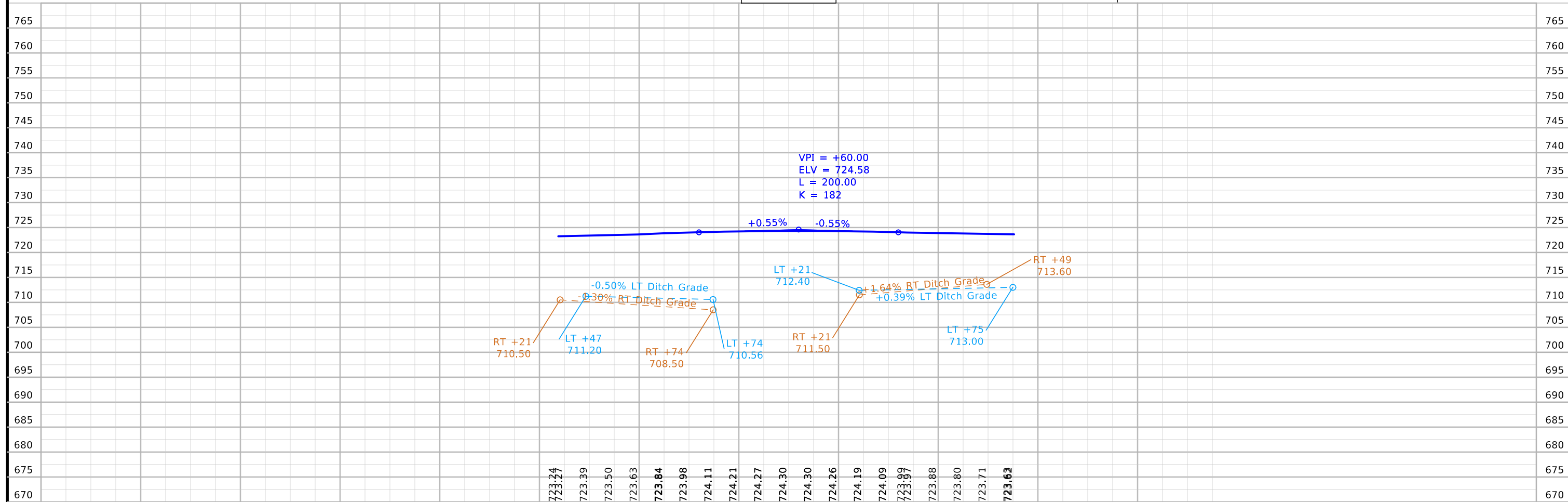
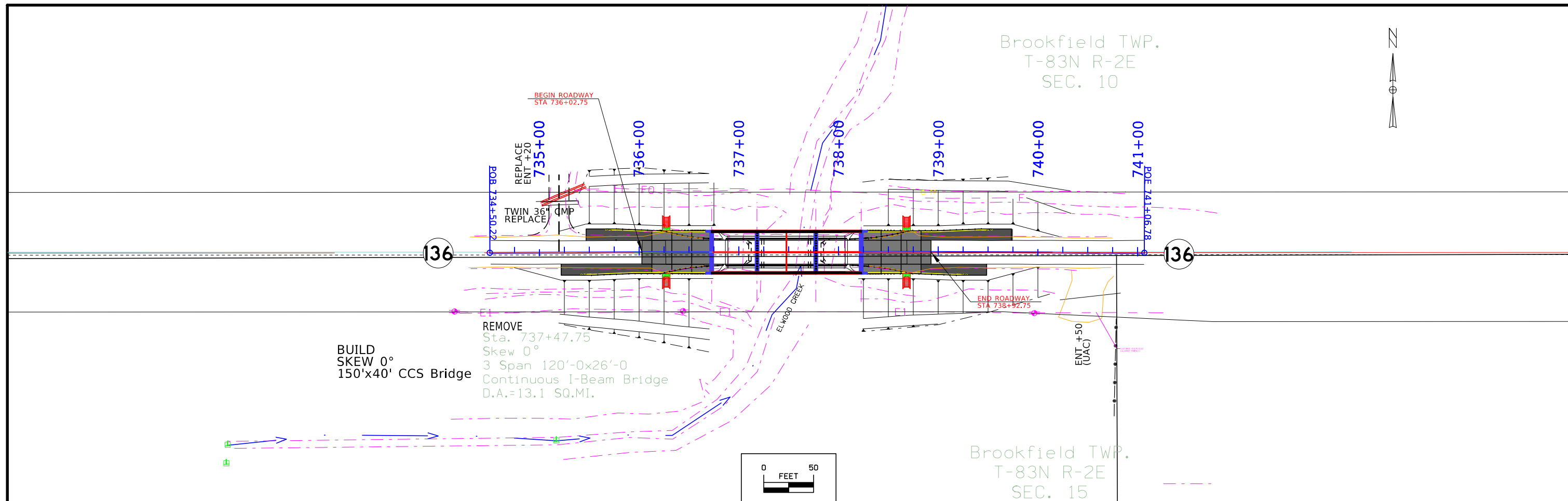
LINEWORK		Design Color No.	
Green	(2)		Existing Ground Line Profile
Blue	(1)		Proposed Profile and Annotation
Magenta	(5)		Existing Utilities
Blue, Light	(230)		Proposed Ditch Grades, Left
Black	(0)		Proposed Ditch Grades, Median
Rust	(14)		Proposed Ditch Grades, Right

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

- ### RIGHT-OF-WAY LEGEND
- -
 -
 -
 -
 -
 -
 -

PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

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



FILE NO.	ENGLISH	DESIGN TEAM IOWA DOT / SHIVE-HATTERY	CLINTON COUNTY	PROJECT NUMBER BRF-136-1(97)--38-23	SHEET NUMBER D.2
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Survey Information

Clinton County
BRF-136-1(97)--38-23
State Highway 136 over Elwood Creek
PIN 20-23-136-030
Sap-766.2

observations with appropriate occupation times. Additional control points were placed throughout the project using a Total Station setup relative to Point 1 and Point 2.

Utility Information

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

A One-call utility locate request (Ticket# 552104697) was made August 02, 2021. The following Companies were listed:

<u>Company (Quality)</u>	<u>Symbol</u>	<u>Remark</u>
Iowa D.O.T	---	Not Affected
Alliant Energy (ASE)	PPA	Power Poles North of IA 136
Lost Nation-Elwood Telephone (LN1)	FOA	Buried Telephone Fiber Optic Line

Following are the list of contacts made in the order they were received:

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

(LN1) LOST NATION-ELWOOD TELEPHONE
Contact Name : Jody Holtz
Contact Phone: 5636782470
Contact Email: jody@lencomm.com

Party Personnel

Murray Berting – Survey Party Chief
Gavin Gear – Assistant Survey Party Chief

Date(s) of Survey

Begin Date 08/23/2021
End Date 10/22/2021

General Information

Measurement units for this survey are US survey feet. This survey is for proposed Bridge reconstruction and reconstruction of State Highway 136, over Elwood Creek. Project datum and control information is provided by Shive-Hattery Inc. This project is a Preliminary DTM Field Survey. This survey request was for the Bridge over Elwood Creek, State Highway 136 Corridor and Elwood Creek.

Vertical Control

IARTN
Vertical datum for this survey is NAVD88 (Computed using Geoid12B). Additional benchmarks were placed throughout the project using a Total Station setup relative to Point 1 and Point 2. Vertical control was verified between control points with check shots by Total Station through multiple setup from various occupation points with a vertical error of less than 0.05 feet.

This survey found a local control benchmark monument (benchmark disc on bridge abutment in NW corner bridge). No vertical information was available at the time field work was completed.

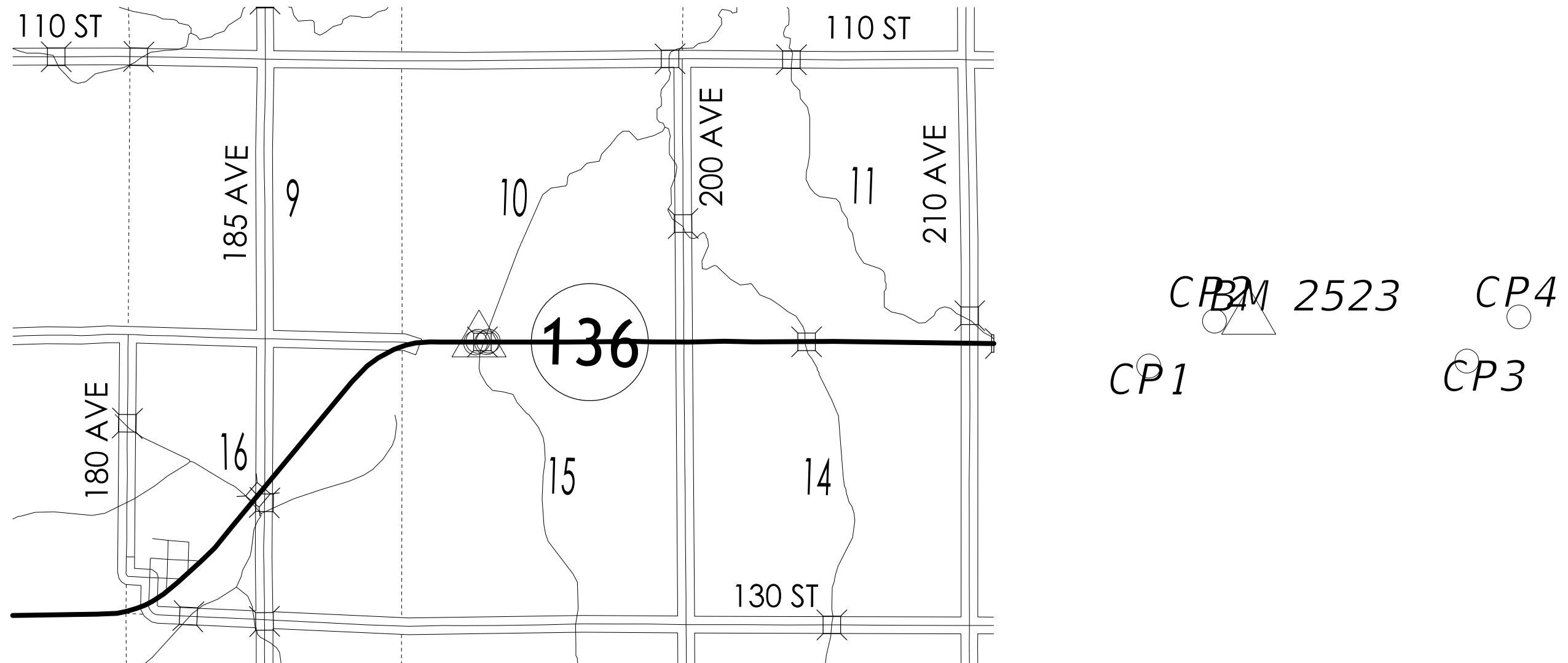
Horizontal Control

(Project Coordinates from Redundant IARTN Observations)

The project coordinate system is modified Iowa Regional Coordinate System Zone 11 (U.S. Survey Feet This survey control is relative to the IARTN reference stations. IARTN Reference Station coordinates are relative to the National Reference Station

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 11

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

1a. Regional Coordinate System Zone 11
Project Control Marks are Bench Marks

POINT NAME	Y	X	Z	FEATURE DEFINITION - DESCRIPTION
1	8239046.714	21449631.27	723.470	CP1 IR (IRON ROD)
2	8239075.722	21449673.96	723.722	CP2 CX (CUT 'X' IN PAVEMENT
3	8239049.989	21449837.67	723.830	CP3 CX (CUT 'X' IN PAVEMENT
4	8239078.666	21449871.26	723.684	CP4 IR (IRON ROD)
2523	8239078.083	21449695.11	727.018	BM DISC

NOTE:

The first two digits in the control point name refer to the county number.
The next 3 digits refer to the highway number.
The next 3 digits refer to the highway milepost.
The last digit refers to the distance from the referenced milepost to the nearest tenth of a mile.

108-26A
08-01-08

STAGING NOTES

Stage 1:
With IA 136 traffic using detour, remove and replace bridge over the stream with a culvert.

Stage 2:
Reopen IA 136 to normal traffic pattern.

108-23A
08-01-08

TRAFFIC CONTROL PLAN

1) While bridge and approaches are being removed and replaced with RCB culvert, IA 136 traffic shall be maintained via an off-site detour. Detours are furnished, maintained and removed by the Contractor. Refer to TC-252 for road closure and advanced signage details.

2) Contractor will furnish, install, maintain, and remove detour signs. All existing signs that conflict with detour shall be covered. These functions shall be included in the Traffic Control Bid Item.

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
			No Travel Restrictions Expected									

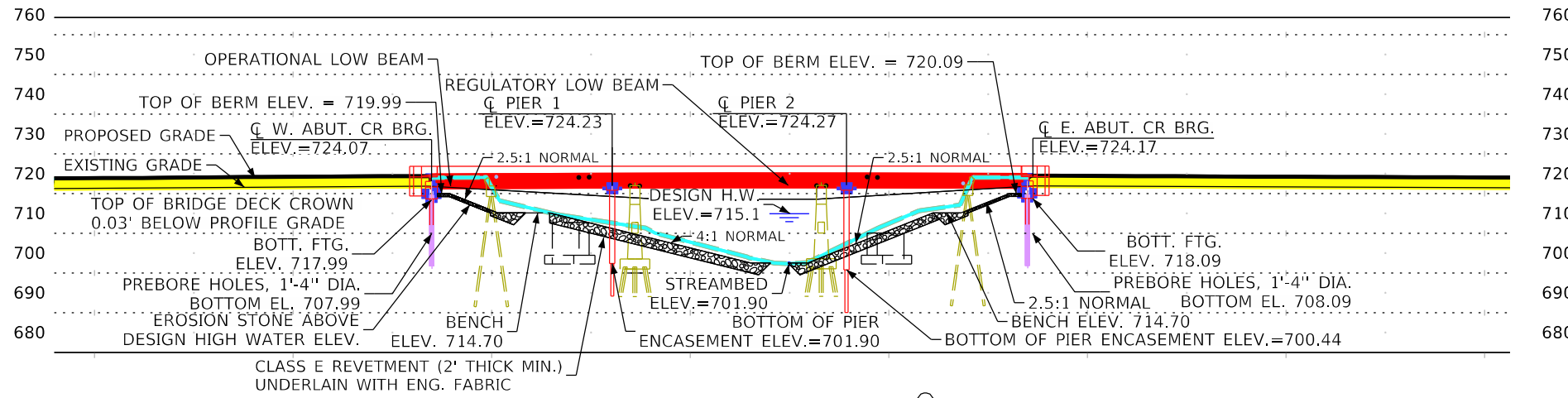
111-01
04-17-12

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

Control Point: POINT NAME 2523, Y=8239078.083, X=21449695.11
Z=727.018 BM DISC



+0.55% -0.55%

VPI = 737+60.00 ELV = 724.58
L = 200.00 K = 182

Proposed Profile Grade IA 136

Utilities Legend:

SYMBOL - TYPE

- TP Power Pole
- F0 Telephone Pedestal
- T1 Fiberoptic Telephone
- E1 Telephone Line
- E2 Electric Line

UTILITIES SHOWN ON THIS SHEET ARE FOR INFORMATION ONLY, SEE ROAD DESIGN SHEETS FOR FINAL UTILITY INFORMATION.

Hydraulic Data

Drainage Area = 12.8 Sq.Mi.
Stream Slope = 22.7 Ft./Mi.
Avg. Low Water Stage = 702.7

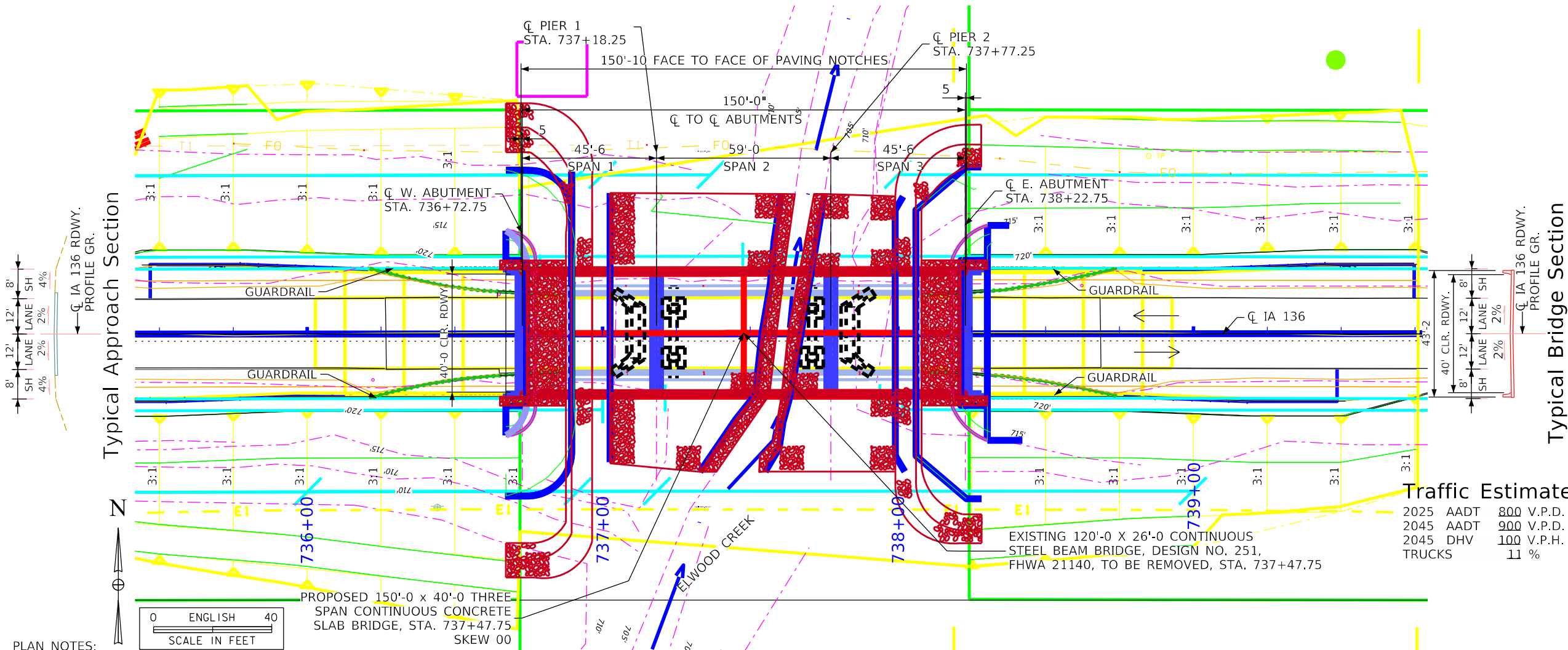
Q₂₅ = 3,585 CFS
Stagae = 713.8

Q₅₀ = 4,420 CFS
Stage = 714.1
Regulatory Low Beam = 721.87
Backwater 1.7 Ft.
Avg. Bridge Velocity = 8.5 FPS

Q₁₀₀ = 5,240 CFS
STstage = 714.5
Operational Low Beam = 721.67
Backwater = 2.5 Ft.
Avg. Bridge Velocity = 9.0 FPS

Q₂₀₀ = 6,800 CFS
Stage = 715.3
Calculated Design Scour = 694.5

Q₅₀₀ = 7,480 CFS
Stage = 715.6
Avg. Bridge Velocity 9.7 FPS
Calculated Check Scour = 694.5
Roadway Overtop = 722.6
Sta. 730+30



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 120'-0 X 26'-0 CONTINUOUS STEEL BEAM BRIDGE, DESIGN NO. 251 FHWA NO. 21140, MAINT. NO. 2333.1S136

DESIGN NOTES:

- TL-4 BRIDGE RAILING PROPOSED.
- J40-06 CONTINUOUS CONCRETE SLAB.
- PILE BENT PIERS, INDIVIDUALLY ENCASED.

Traffic Estimate

2025 AADT	800	V.P.D.	
2045 AADT	900	V.P.D.	
2045 DHV	100	V.P.H.	
TRUCKS	11	%	

Location

IA136 Over Elwood Creek
T-83N R-2E
Section 10 & 15
Brookfield Township
Clinton County
Clinton County
FHWA NO.
Bbridge Maint. No. 2333.1S136
Latitude 42.003746°
Longitude -90.717936°

SITUATION PLAN

ROADWAY DESIGN

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

Signature: PHILIP M. HARPOLE
Printed or Typed Name
My license renewal date is December 31, 2023

Date: XX-XX-XXXX

Pages or sheets covered by this seal: 1-2

DESIGN FOR 0° SKEW

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

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

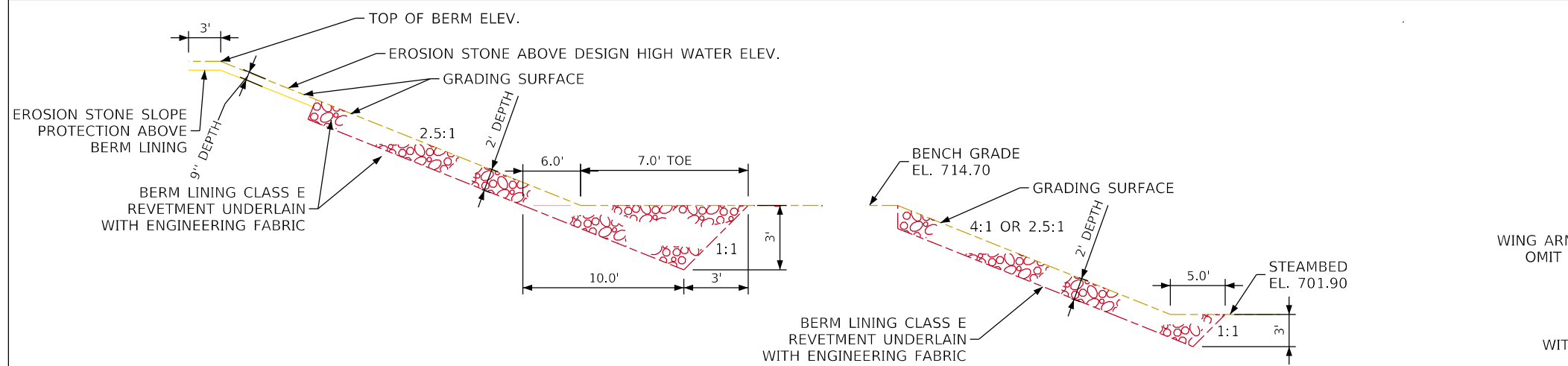
SITUATION PLAN

STA. 737+47.75 (IA 136) MAY, 2022

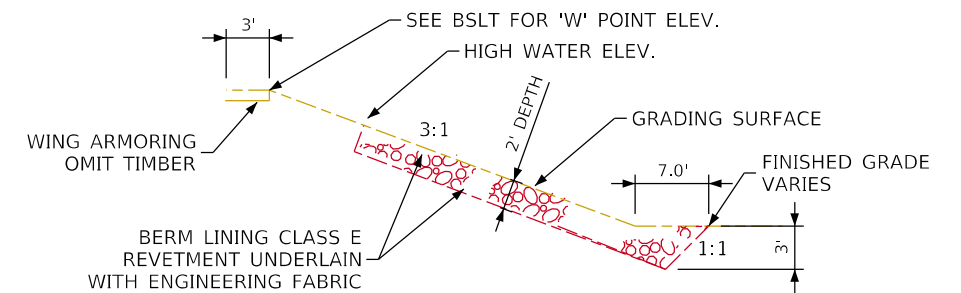
CLINTON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION

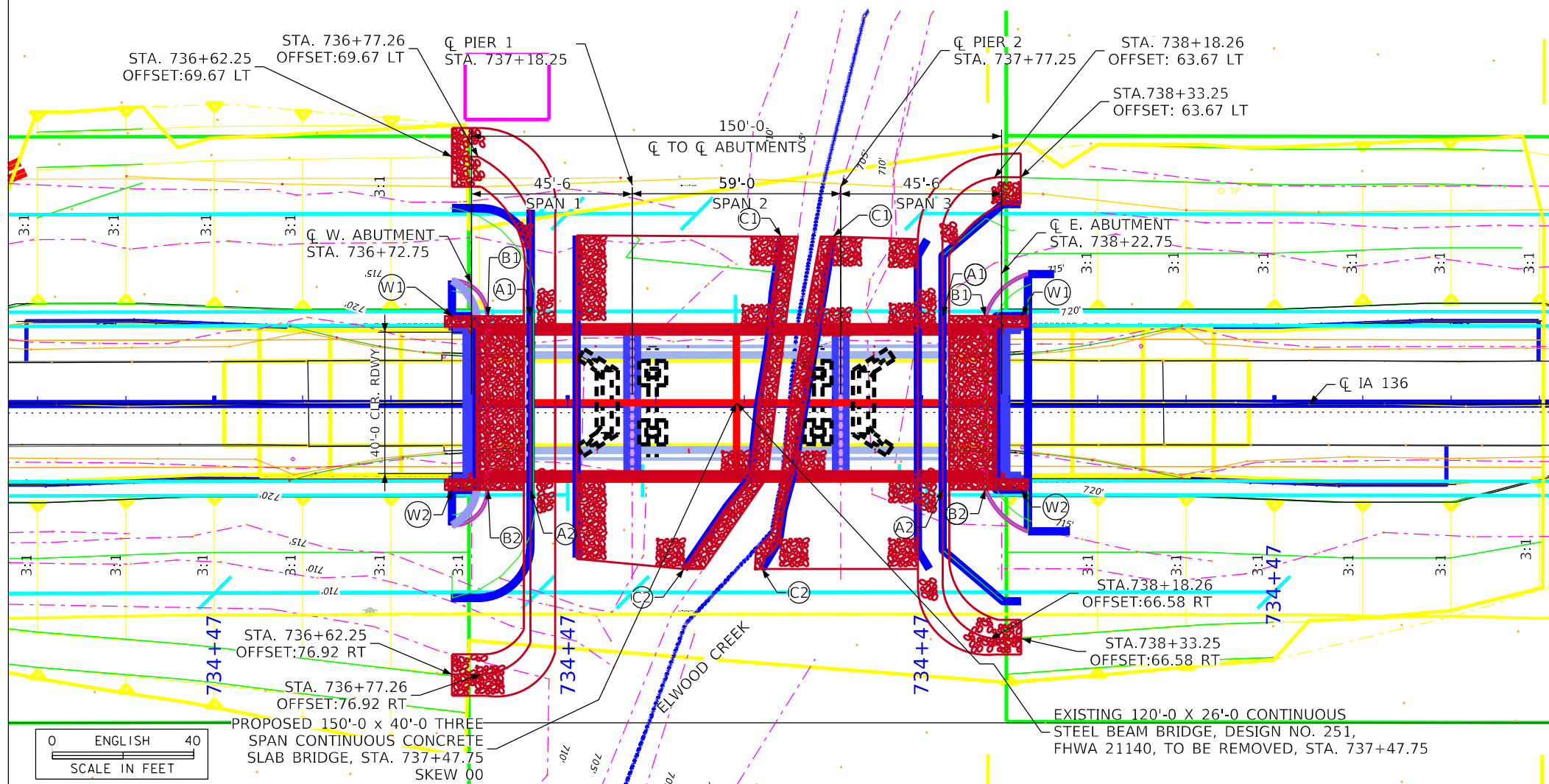
Design No. Design Sheet No. 001 of #### FHWA No. #####



SECTION THRU EMBEDDED REVETMENT BERM



SECTION THRU EMBEDDED REVETMENT NORMAL TO BRIDGE WING AT W POINT



SITE PLAN

Estimated Berm Armoring Quantities				
Location	Revetment CL. E (Ton)	Erosion Stone (Ton)	Engineering Fabric (SY)	Excavation (CY)
Berm Lining - West Abutment	880.3	31.2	860.3	550.2
Berm Lining - East Abutment	683.0	30.1	669.6	426.9
Totals	1563.3	61.3	1529.9	977.1

Excavation quantity calculated from grading surface.

Berm Slope Location Table						
Points	West Abutment			East Abutment		
	Station	Offset	Elev.	Station	Offset	Elev.
A1	736+89.50	24.58' LT	714.70	738+06.08	24.58' LT	714.70
A2	736+89.50	24.58' RT	714.70	738+06.08	24.58' RT	714.70
B1	736+77.25	24.58' LT	719.99	738+18.25	24.58' LT	720.09
B2	736+77.25	24.58' RT	719.99	738+18.25	24.58' RT	720.09
C1	737+60.43	46.91' LT	701.90	737+75.08	47.05' LT	701.90
C2	737+32.91	47.03' RT	701.90	737+55.01	47.02' RT	701.90
W1	736+67.25	24.58' LT	723.36	738+28.25	24.58' LT	723.47
W2	736+67.25	24.58' RT	723.36	738+28.25	24.58' RT	723.47

Berm slope elevations reflect the grading surface.

DESIGN FOR 0° SKEW
150'-0 X 40'-0 CONTINUOUS CONCRETE SLAB BRIDGE
 45'-6 END SPANS 59'-0 INTERIOR SPAN
SITUATION PLAN - SITE
 STA. 737+47.75 (IA 136) MAY, 2022
CLINTON COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION
 Design No. Design Sheet No. 002 of #### FHWA No. #####

CROSS SECTION VIEW COLOR LEGEND

Design Color No.	Feature	Design Color No.	Feature
Aggregate			
(64)	Choke Stone	(8)	Behind Curb Cut
(42)	Engineering Fabric	(6)	Granular
(8)	Flooded Backfill	(13)	Granular Back Fill
(92)	Macadam Stone	(48)	Rock Undercut
(20)	Modified	(8)	Shoulder Earth Fill
(12)	Plowing Shaping	(2)	Side Slopes
(14)	Porous Backfill	(226)	Side Slopes Dressing
(8)	Revetment Class A	Substrata	
(6)	Revetment Class B	(128)	Boulder Substrata
(62)	Revetment Class C	(209)	Boulder Removed Substrata
(188)	Revetment Class D	(48)	Broken Weathered Substrata
(28)	Revetment Class E	(210)	Broken Weathered Removed Substrata
(12)	Shoulder Special Backfill	(3)	Core Out Substrata
(12)	Special Backfill	(195)	Core Out Remove and Replace Substrata
(20)	Subbase	(115)	Core Out Remove Only Substrata
(20)	Subbase Lower	(203)	Existing Pavement Substrata
(20)	Subbase Upper	(200)	Existing Pavement Remove and Replace Substrata
(118)	Subgrade Treatment	(184)	Existing Pavement Remove Only Substrata
Asphalt			
(207)	HMA Base Course	(6)	Loam Substrata
(207)	HMA Interim Course	(211)	Loam Removed Substrata
(207)	HMA Surface Course	(80)	Rock Substrata
Concrete			
(0)	Barrier Concrete	(212)	Rock Removed Substrata
(0)	Barrier Concrete Footing	(4)	Select Sand Substrata
(0)	Curb Gutter	(214)	Select Sand Removed Substrata
(48)	Flowable Mortar	(3)	Shale Substrata
(0)	Median Concrete	(215)	Shale Removed Substrata
(0)	PCC Pavement	(10)	Topsoil Substrata
(0)	Sidewalk	(4)	Topsoil Remove and Replace Substrata
		(2)	Topsoil Remove Only Substrata
Shoulder			
(209)	Shoulder HMA	Unsuitable / Waste	
(0)	Shoulder PCC	(3)	Unsuitable Type A
(6)	Shoulder Granular	(216)	Unsuitable Type A Removed
Existing			
(0)	Existing Pavement	(13)	Unsuitable Type B
Structural			
(0)	Bridge	(217)	Unsuitable Type B Removed
(21)	Guardrail	(11)	Unsuitable Type C
(112)	Noise Wall	(218)	Unsuitable Type C Removed
(112)	Noise Wall Footing	(3)	Waste
(112)	Retaining Wall Back	(219)	Waste Removed
(112)	Retaining Wall Back Excavate	Trigger Switches	
(112)	Retaining Wall Face	(27)	Do Not Construct
(112)	Retaining Wall Front Excavate		
(112)	Retaining Wall Front Footing		
(112)	Retaining Wall MSE Gutter		
(112)	Retaining Wall Reinforced Earth		

NOTES:

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CROSS SECTIONS LEGEND AND INFORMATION SHEET

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

