IOWA DEPARTMENT OF TRANSPORTATION

TO OFFICE: District 3 **DATE:** August 10, 2015

ATTENTION: Tony Lazarowicz **REF. :** Buena Vista County
BRF-003-2(65)--38-11

-FROM: Kevin K. Patel Pin: 13-11-003-020

OFFICE: Design

SUBJECT: Field Exam (D2)

A field exam was held on Thursday, July 16 2015, to review the proposed plan for replacing a bridge over the North Raccoon River, 2.5 miles east of U.S. 71.

Those present for the field exam included Tony Lazarowicz and Darwin Bishop from District 3; Chris King, Tim Chargualaf and William Diede from the Office of Bridges and Structures; Yan Jia, Kirk Romsey, Dave Campbell, Adam Dewolf, Amy Schleier and Kevin Patel from the Office of Design and Mike Carlson from the Office of Location and Environment.

IA 3 is functionally classified as an "area development" route and is a maintenance service level "B" roadway. The 2018 and 2038 ADT is 1,800 vpd and 2,400 vpd respectively with 33 % truck traffic. The bridge has a sufficiency rating of 68.

The proposed project will remove the existing 120 ft. x 26 ft. I beam bridge and replace it with a 150 ft. x 42 ft. continuous concrete slab bridge. The new bridge will be constructed on the existing vertical and horizontal alignment. No mainline reconstruction should occur beyond the ends of the new bridge approach sections.

The bridge will be built 2 ft. wider than typically required in order to facilitate staged construction. The existing piers are two-column concrete piers and cannot be cut during the staging. Therefore, they will be removed with the deck and beams in the second stage. The Contractor will need to make accommodations to ensure that no damage occurs to the existing piers, including footings, while driving the pile bents during the first stage. One lane of traffic will be maintained over the bridge via the use of temporary traffic signals. Stage 1 will provide a 14 ft. 8 in. traffic lane, while stage 2 will provide a 12 ft. traffic lane. As the lane width is less than 14.5 ft. in stage 2, special signing will be required.

The typical section will provide a 28' roadway and due to the staging the shoulder widths will be unsymmetrical. The right shoulder width will be 10 ft. wide with the left side being 8 ft. wide. The shoulders will be paved to accommodate traffic and will use detour pavement alternatives (either 7" PCC or 8" HMA). The detour pavement will remain in place at the completion of the project. The new foreslopes will be 6:1/3:1.

New guardrail will be installed. The District Office will determine if the existing guardrail should be salvaged.

There are pipes located through the levee system on the east side of the bridge that the District Office will review the condition of to determine if they should be replaced. *After the field exam, the District recommended, based upon their age, that these pipes be replaced.*

It appears that no right of way will be required to construct and maintain this project; however, this will be verified.

There are wetlands located in the northeast quadrant that construction activities should strive to minimize any impacts to.

No plans are included in this submittal; however plan sheets may be viewed as pdf files at PW:\projectwise.dot.int.lan:PWMain\Documents\Projects\1100302013\Design\DesignEvents\D2\D2_11003065_Plan.pdf

This project is currently scheduled for a December 2017 letting. The final concept cost estimate for this project was $1,347,500. The current cost estimate is now approximately $ 1,417,000 ($1,133,000 for bridge items and $284,000 for roadway costs). The current cost estimate does not include any wetland mitigation items.

Machine Guidance Electronic Files Checklist

Add information to address any incomplete items below:

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

KKP:

M. J. Sankey	S. J. Gent	M. J. Kennerly
D. A. Widick	W.A. Sorenson	D. L. Maifield
T. L. Gettings	E.C. Wright	B. R. Smith
Y. Jia	N. L. Cuva	J. P. Rost
K. D. Nicholson	K. Brink	J. E. Laaser-Webb
T. Crouch	V. A. Brewer	D. R. Tebben
M. D. Masteller	D. Matulac	M. A. Swenson
C. B. Brakke	D.E. Sprengeler	N. L. McDonald
D. A. Popp	B. Bradley	G. A. Novey
D. R. Claman	J. McCollough	S. P. Anderson
B. Hofer	B. Kimble	S. Tymkowicz
D. Bishop	A. Dewolf	S. McElmeel
D. Manly	P.C. Keen	T. Hamski
J. R. Schoenrock	Z. T. Bitting	Local FHWA
W. N. Cameron	J. Garton	T. Bowman
M. Carlson	K. Romsey	T. Chargualaf
K.Clute	W. Diede	

LETTING DATE 12-19-2017

BRIDGE-UNSPECIFIED
BRF-003-2(65)--38-11

BUENA VISTA Co.

IOWA DOT

Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM

BUENA VISTA COUNTY

BRIDGE REPLACEMENT-CCS

North Raccoon River 2.5 miles E of US 71

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

Value Engineering Saves. Refer to Article 1105.15 of the Specifications.

Review description

DMM 1-23-15

REVISIONS

TOTAL
PROJECT IDENTIFICATION NUMBER
13-11-003-020
PROJECT NUMBER
BRF-003-2(65)--38-11
R.O.W. PROJECT NUMBER
NHSN-003-2(66)--2R-11

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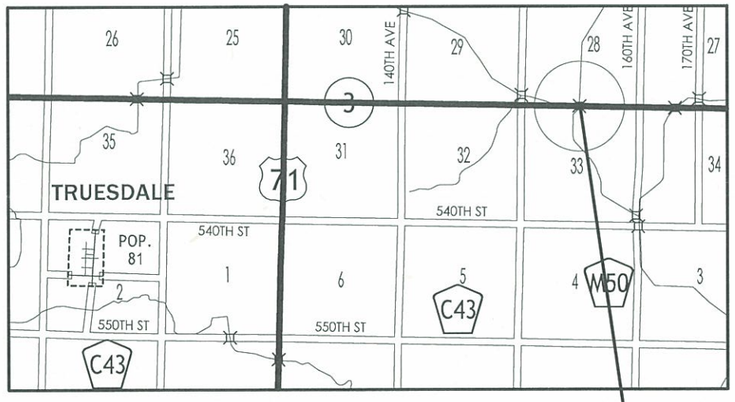


Project Location

INDEX OF SHEETS

Tony Lazarowicz
Darwin Bishop
} District 3

Yan Jia
Kirk Romsey
Dave Campbell
Adam Dewolf
Amy Schleier
Kevin Patel
} Design

Mike Carlson - OLE

Chris King
Tim Charqualat
William Diede
} Prelim Bridge

D3 PLAN – Date: 8–28–2015
D5 PLAN – Date: 12–31–2015

DESIGN DATA RURAL

2018 AADT	1800	V.P.D.
2038 AADT	2400	V.P.D.
20-- DHV	--	V.P.H.
TRUCKS	33	%
Total Design ESALs	--	

INDEX OF SEALS

SHEET NO.	NAME	TYPE
A.1	X	Primary Signature Block
X	X	X

PRELIMINARY PLANS

Subject to change by final design.

D2 PLAN – Date: 7–16–2015

FILE NO. ----	ENGLISH	DESIGN TEAM Jia \ Romsey \ Campbell	BUENA VISTA COUNTY	PROJECT NUMBER BRF-003-2(65)--38-11	SHEET NUMBER A.1

IOWA DEPARTMENT OF TRANSPORTATION

TO OFFICE:	District 3	**DATE:**	August 25, 2014
ATTENTION:	Tony G. Lazarowicz	**PROJECT:**	Buena Vista County BRF-003-2(65)--38-11 PIN: 13-11-003-020
FROM:	Kevin K. Patel		
OFFICE:	Design		
SUBJECT:	Project Concept Statement; (Final, D0)		

This project involves the replacement of the IA 3 bridge (Maint No. 1184.1S003) over the North Raccoon River, 2.5 miles east of U.S. 71.

A concept review was held on April 14, 2014. Those present included Tony Lazarowicz, Shane Tymkowicz, Darwin Bishop and Greg Mize from the District 3 Office; Chris King from the Office of Bridges and Structures; and Kevin Patel, Jean Borton, Tom Bowman and Amy Schleier from the Office of Design.

The two alternatives considered were:

1. Replace the existing 120 ft. x 26 ft. continuous I-beam bridge with a 150 ft. x 42 ft. continuous concrete slab bridge. Traffic will be maintained via staged construction. The preliminary cost estimate for this alternative is $1,347,500.
2. Replace the existing 120 ft. x 26 ft. continuous I-beam bridge with a 150 ft. x 40 ft. continuous concrete slab bridge. Traffic will be maintained using an off-site detour. This alternative is estimated to cost $1,132,700.

Alternative 1 is the preferred alternative because it minimizes the disruption to the traveling public.

Additional right of way may be required

The Draft Project Concept Statement was sent out for review and comment with concerns to be resolved by Monday, August 18, 2014. Comments received during the review period have been considered and resolved.

This project is recommended for construction in FY 2018. The Office of Bridges and Structures will coordinate plan preparation with assistance from the Office of Design.

KKP:als
Attach.
cc:

J. F. Adam
D. L. Maifield
N. M. Miller
G. A. Novey
A. Abu-Hawash
M. A. Swenson
Z. T. Bitting
D. D. Matulac
M. E. Khoda
J.W. Laaser-Webb
E. C. Wright
D. S. Schultz
D. E. Manley
V. A. Brewer
M. J. Kennerly
R. L. Stanley
C. C. Poole
D. R. Claman
B. C. Worrel
M. J. Sankey
D. R. Tebben
D. L. Newell
S. J. Gent
W.A. Sorenson
S. W. Tymkowicz
T. E. Huju
M. J. Carlson
FHWA
K. D. Nicholson
A. A. Welch
N. L. McDonald
P. Lu
J. S. McClain
R. A. Younie
B. D. Hofer
B. E. Azeltine
T. D. Crouch
D. E. Sprengeler
D. L. Bishop
M. L. Wright
B. J. Dolan
M. E. Ross

FINAL PROJECT CONCEPT STATEMENT

IA 3 Bridge over the North Raccoon River, 2.5 miles east of U.S. 71

Buena Vista County
BRF-003-2(65)--38-11
PIN: 13-11-003-020
Maint. No.1184.1S003
FHWA No. 16220

Highway Division
Office of Design

Kevin K. Patel, P.E.
515-239-1540

August 25, 2014

I. STUDY AREA

A. Project Description

This project involves the replacement of the IA 3 bridge (Maint No. 1184.1S003) over the North Raccoon River, 2.5 miles east of U.S. 71.

The two alternatives considered were:

1. Replace the existing 120 ft. x 26 ft. continuous I-beam bridge with a 150 ft. x 42 ft. continuous concrete slab bridge. Traffic will be maintained via staged construction. The preliminary cost estimate for this alternative is $1,347,500.
2. Replace the existing 120 ft. x 26 ft. continuous I-beam bridge with a 150 ft. x 40 ft. continuous concrete slab bridge. Traffic will be maintained using an off-site detour. This alternative is estimated to cost $1,132,700.

Alternative 1 is the preferred alternative because it minimizes the disruption to the traveling public.

B. Need for Project

This is a 120 ft. x 26 ft. continuous I-beam bridge, constructed in 1950 and overlaid in 1985. The bridge is classified as structurally deficient due to the poor deck condition. Both the top and bottom of the deck have many random leaching cracks and spalls. The concrete rails and curbs also have several cracks, scales and spalls. Severe rust areas were found at beams and diaphragms. There are cracks, severely scaled areas and hollows at both abutments. The bridge was originally designed for H20 load. The

width and load carrying capacity of the bridge can hardly satisfy current highway requirements. Deck replacement in conjunction with bridge repair and strengthening would not be an economical and practical option; therefore, the bridge should be replaced.

C. Present Facility

The existing structure is a 120 ft. x 26 ft. continuous I-beam bridge constructed in 1950.

IA 3 west of the bridge is 26 ft. wide PCC pavement on the west side of the bridge and 28' wide on the west side of the bridge. Both sides have 3 ft. paved shoulders and 3:1 foreslopes. HMA resurfacing was accomplished in 1991.

D. Traffic Estimates

The 2018 construction year and 2038 design year average daily traffic estimates are 1,800 ADT with 33% trucks and 2,400 ADT with 33% trucks, respectively.

D. Sufficiency Ratings

IA 3 is classified as an "area development" route and is a maintenance service level "B". The federal bridge sufficiency rating is 68.5. IA 3 is on the National Highway System.

F. Access Control

Access rights will not be acquired for this project.

G. Crash History

During the five-year study period from January 1, 2009 through December 31, 2013, there were no crashes at the location of the project.

II. PROJECT CONCEPT

A. Feasible Alternatives

Alternative #1 - Replace with a bridge, staging traffic

Replace the existing 120 ft. x 26 ft. I-beam bridge with a 150 ft. x 42 ft. continuous concrete slab bridge. The typical cross section adjacent to the bridge will consist of a 28 ft. roadway with an 8 ft. effective shoulder (2 ft. outside pavement and 6 ft. granular), with 6:1/3:1 foreslopes.

This bridge will be constructed on the existing vertical and horizontal alignment. No additional reconstruction will be required beyond the ends of the new bridge approach sections.

Replace the existing guardrail with new guardrail and pave the shoulders 20 ft. beyond the ends of the guardrail. Class 10 will be necessary to flatten the existing foreslopes and to construct the new guardrail blisters. Place class E revetment for slope protection under the bridge. Construct 4 bridge end drains, one on each corner of the bridge.

The bridge will be built 2 ft. wider than standards require to facilitate staged construction. The existing piers are two-column concrete piers and cannot be cut during the staging. They will be removed with the deck and beams in the second stage. The piers for the proposed bridge will be pile bents. The pile bents will be located within 2 ft. of the existing pier footings. The Contractor will need to make certain that no damage occurs to the existing piers, including footings, while driving the pile bents during the first stage. One lane of traffic will be maintained over the bridge via the use of temporary traffic signals. Stage 1 will provide a 14 ft. 8 in. traffic lane, while stage 2 will provide a 12 ft. traffic lane. As the lane width is less than 14.5 ft. in stage 2, special signing will be required.

It will be necessary to pave the shoulders in order to maintain traffic. As one shoulder will need to accommodate traffic due to staging, it should be constructed with 8 in. HMA or 7 in. PCC on 6 in. of special backfill. The other shoulder can be paved using the standard 6 in. HMA or 7 in. PCC alternates.

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

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

Bridge Items	Estimated Costs
New Bridge	$ 517,000
Bridge Removal	60,000

Revetment	100,000
Staging – 10%	68,000
Mobilization - 10%	75,000
M & C - 20%	164,000
Bridge Costs	**$ 984,000**
Roadway Items	
Bridge Approaches	$80,600
10 ft. paved shoulder for staging	17,700
8 ft. paved shoulder	11,400
Special Backfill	7,600
Pavement removal	2,400
Bridge end drains	13,000
Class 13 waste	1,200
Guardrail (Includes Removal)	21,900
Class 10 for Guardrail Blisters	12,000
Temporary traffic signal	8,300
Temporary floodlighting	7,300
Temporary concrete barrier	8,600
Clearing and Grubbing	2,200
Erosion Control	5,000
Wetland Mitigation	50,000
Right of way	5,000
Traffic Control - 5%	12,700
Mobilization - 5%	12,700
M & C - 30%	83,900
Roadway costs	**$ 363,500**
Project Total	**$1,347,500**

Alternative #2 - Replace with a bridge, detouring traffic

Replace the existing 120 ft. x 26 ft. I-beam bridge with a 150 ft. x 40 ft. continuous concrete slab bridge. The typical cross section adjacent to the bridge will consist of a 28 ft. roadway with an 8 ft. effective shoulder (2 ft. outside pavement and 6 ft. granular) and 6:1/3:1 foreslopes.

This bridge will be constructed on the existing vertical and horizontal alignment. No additional reconstruction will be required beyond the ends of the new bridge approach sections.

Replace the existing guardrail with new guardrail and pave the shoulders 20 ft. beyond the ends of the guardrail. Class 10 will be necessary to flatten the existing foreslopes

and to construct the new guardrail blisters. Place class E revetment for slope protection under the bridge. Construct 4 bridge end drains, one on each corner of the bridge.

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

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

Traffic will be maintained by an off-site detour, detailed in Section B.

Bridge Items	Estimated Costs
New Bridge	$ 494,000
Bridge Removal	28,000
Revetment	100,000
Mobilization - 10%	63,000
M & C - 20%	137,000
Bridge Costs	**$ 822,000**
Roadway Items	
Bridge Approaches	$79,100
Special Backfill	3,100
Pavement removal	2,400
Bridge end drains	13,000
Class 13 waste	1,100
Guardrail (Includes Removal)	21,900
Paved shoulders for guardrail	22,400
Class 10 for Guardrail Blisters	12,000
Clearing and Grubbing	2,200
Erosion Control	5,000
Wetland Mitigation	50,000
Right of way	5,000
Traffic Control - 5%	10,900
Mobilization - 5%	10,900
M & C - 30%	71,700
Roadway costs	**$ 310,700**
Project Total	**$1,132,700**

B. Detour Analysis

Alternative 1 uses staged construction so no detour is necessary. In Alternative 2, IA 3 will be closed and an offsite detour will be utilized. It is anticipated the detour will be

in place for approximately 120 days. From IA 3, the detour would follow County Road M50 north 7 miles to the junction with IA 10. Then it would follow IA 10 west for 3 miles. The detour then turns south on U.S. 71 for 7 miles to return to IA 3. Out of distance travel is 14 miles. The total out-of-distance user cost is anticipated to be $631,000. The cost for county road maintenance will be $12,400 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 1.

D. Construction Sequence

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

E. ADA Accommodations

There are no bike paths or sidewalks adjacent to IA 3; therefore, no ADA accommodations are planned in conjunction with this project.

F. Special Considerations

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

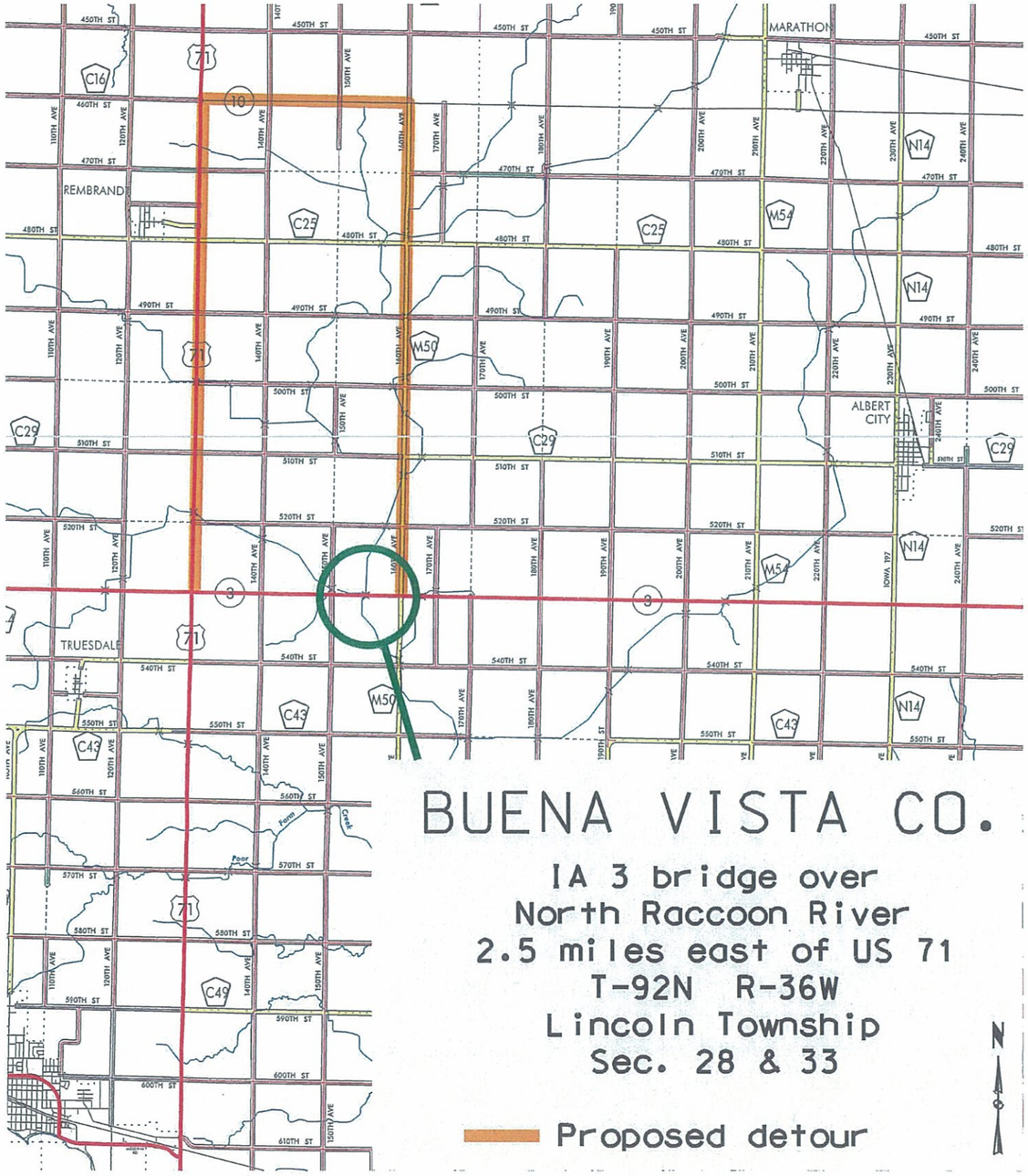
Right of Way may be required for this project.

The Office of Location and Environment has reviewed this project and based on preliminary desktop observations, has determined that a Section 404 Permit will be required. It is expected that the work will be covered by Nationwide Permit 14. Wetland mitigation will be required if wetland impacts exceeds 0.10 acre.

F. Program Status

Site data has been developed by the Office of Design. This project is listed in the 2015-2019 Iowa Transportation Improvement Program, with $1,200,000 for replacement in FY 2018. Costs for this project may be eligible for bridge replacement funds. A schedule of events will be developed following approval of the Project Concept.

KKP: als

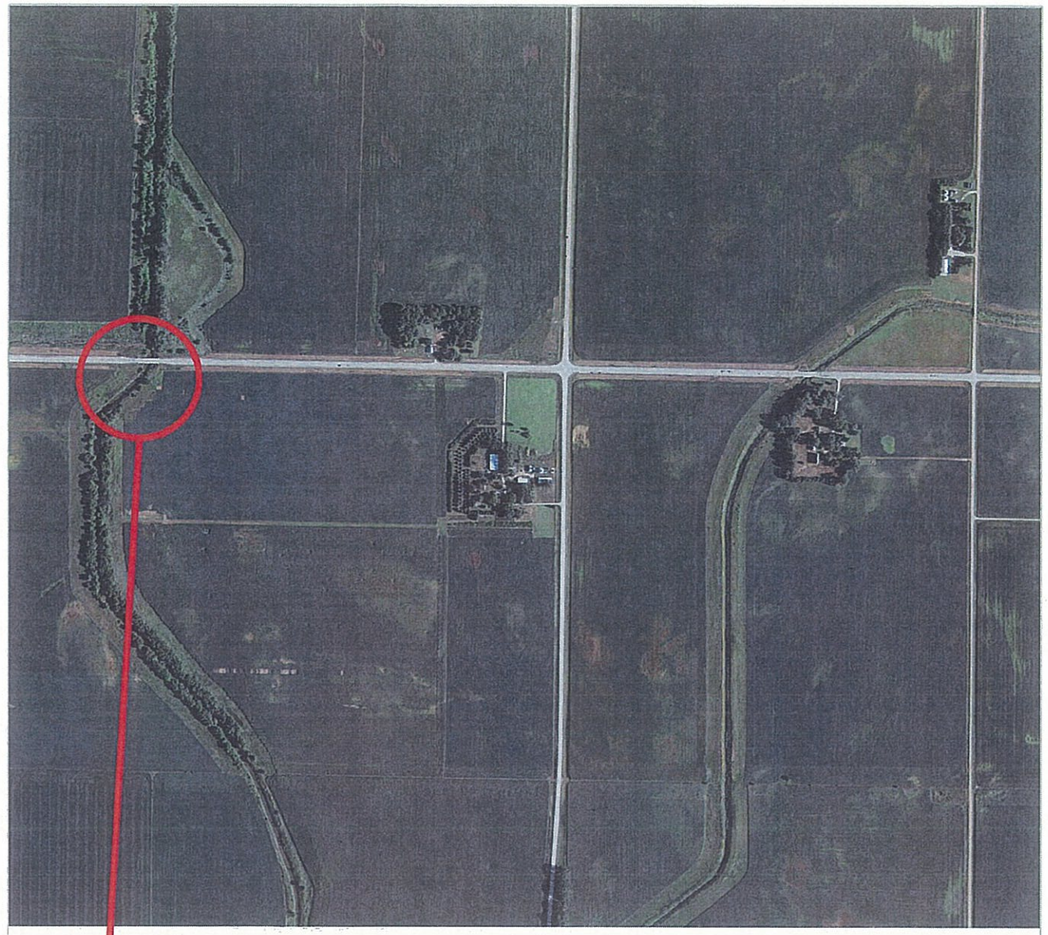


BUENA VISTA CO.

IA 3 bridge over
North Raccoon River
2.5 miles east of US 71
T-92N R-36W
Lincoln Township
Sec. 28 & 33

Proposed detour

N



BUENA VISTA CO.

IA 3 bridge over the
North Raccoon River
2.5 miles east of US 71
Maint.1184.1S003
FHWA 16220

N

FILE NO. ----	ENGLISH	DESIGN TEAM J1a \ Romsey \ Campbell	BUENA VISTA COUNTY	PROJECT NUMBER BRF-003-2(65)--38-11	SHEET NUMBER A.6

8:50:00 AM 7/15/2015 Dcampbe \\projectvise.dot.ipt.lan:PWMain\Documents\Projects\110030(2013)\Design\110030654A01.sht

Roadway	IA 3		
PIN Number	13-11-003-020	**Submittal Date**	
Project Number	BRF-003-2(65)--38-11		**Approval Date**
District	District 3	**Assistant District Engineer**	
County	Buena Vista (11)	**or**	
Route	IA 3	**Office Director**	
Location	Bridge over the North Raccoon River, 2.5 miles east of US 71		
Work Type			
Segment Manager			
Designer			
Design Manual Section 1C-1 last update: 05-06-14	**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%	NA
Design lane width (ft)		12	12	12 ft.
Full depth paved width (ft)		14	12	28 ft.
Right turn lane (ft)		12	10	NA
Climbing Lane (ft)		12	12	NA
Left turn lane (ft)		12	10	NA
Pavement cross-slope (on tangent sections)	Through lanes	2%	1.5% minimum, 2% maximum	2%
	Auxiliary and turn lanes	3%	3% maximum	
	Crown break at centerline	4%	4% maximum	4%
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	6-inch standard	
	Design speed ≥ 60 mph	4-inch sloped	6-inch sloped	
Foreslope (For fill areas greater than 40 ft, contact the Soils Design Section for assistance)	Adjacent to shoulder	10:1 for 4' then 6:1	3:1	6:1
	Beyond standard ditch depth and design clear zone	3.5:1	3:1	3:1
	Curbed roadways	2%	not steeper than 3:1	
Backslope (For cut areas greater than 25 feet, contact the Soils Design Section for assistance with backslope benches.)		3:1	2.5:1	3:1
Transverse Slopes	w/ drainage structures	8:1	6:1	8:1
	w/o drainage structures	10:1	6:1	10:1
Ditches (Refer to Section 3G-1)	Outside ditch (depth x width) (ft)	5 x 10	--	5 x 10
Bridge width—new	Bridge length ≤ 200 ft	design lane widths + effective shoulder widths	design lane widths + effective shoulder widths	42 ft. bridge (1)
	Bridge length > 200 ft	design lane widths + effective shoulder widths	design lane width + 4' right and left of the design lane widths	
Bridge width—existing		design lane widths + no less than 2 ft left and right	design lane widths + 2 ft. offset left and right	
Vertical clearance (ft) (above lanes, shoulders and 25 feet left and right of the center of railroad tracks)	Over primary	16.5	16	
	Over non-primary	16.5 at interchange locations, 15 at all other locations	14	
	Over railroad	23.3	23.3	
	Sign trusses and pedestrian bridges	17.5	17	
Structural Capacity		Contact Office of Bridges and Structures	Contact Office of Bridges and Structures	
Level of Service		B	B	

Roadway Design Speed (mph) =			60													
Design Manual Section 1C-1 last update: 05-06-14			**Design Criteria for High Speed Roadways**													
Design Element			Preferred Criteria Design Speed, mph						Acceptable Criteria Design Speed, mph						Project Values
			50	55	60	65	70	75	50	55	60	65	70	75	
Stopping sight distance (ft) (Refer to Section 6D-1)			425	495	570	645	730	820	425	495	570	645	730	820	520 (3)
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	NA
		e_{max} = 8%	--	--	--	--	--	--	758	960	1200	1480	1810	2210	
Minimum vertical curve length (ft) (Refer to Section 2B-1)			150	165	180	195	210	225	150	165	180	195	210	225	UAC
Minimum rate of vertical curvature (K) (Refer to Section 2B-1)	crest vertical curves		84	114	151	193	247	312	84	114	151	193	247	312	UAC
	sag vertical curves	roadways without fixed-source lighting	96	115	136	157	181	206	96	115	136	157	181	206	NA
		roadways with fixed-source lighting	96	115	136	157	181	206	54	66	78	91	106	121	
Minimum gradient (%)	(Refer to Section 2B-1)		0.5						0.3% with a curb, 0.0% without a curb						0.84%
Maximum gradient (%)	(Refer to Section 2B-1)	Urban roadways	4		3				7	6	6	--	--	--	5 x 10
		Rural roadways							5	5	4	4	4	4	0.91%
		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 ft.

Design year ADT =	2,400					
Design Manual Section 1C-1 last update: 05-06-14	**Effective Shoulder Width and Type for Two-Lane Highways**					
Preferred (values shown in feet)			Acceptable (values shown in feet)			Project Values
	Rural Roadways	Urban Roadways		Rural Roadways	Urban Roadways	
Turn lanes with shoulders	6	6	Turn lanes with shoulders	6	0	NA
Turn lanes with curbs	6	See Section 3C-2	Turn lanes with curbs	6	0	NA
	Effective Shoulder Width	Paved Width		Effective Shoulder Width	Paved Width	
Climbing Lanes	6	4	Climbing Lanes	4	0	NA
Two-Lane Highways	Effective Shoulder Width	Paved Width	Two-Lane Highways	Effective Shoulder Width	Paved Width	
Routes where bicycles are to be accommodated	10	10	Design year ADT > 2000 vpd	8	2*	8 ft./10 ft. effective shoulders (2)
On roadways approaching urban areas (due to increased bike traffic)	10	10				
On all curves with a superelevation rate of 7.0% or greater	10	10				
On roadways with design year ADT > 5000	10	6	Design year ADT between 400 - 2000 vpd	6	2*	
On all other NHS	10	4				
On non-NHS routes with design year ADT > 3000	10	4	Design year ADT < 400 vpd	4	2*	
On non-NHS routes with design year ADT < 3000	8	2*				
*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:

(1) Bridge width of 42 ft. to facilitate staging.
(2) 8 ft./10 ft. effective shoulder widths will be used due to staged construction
(3) <570 due construction limitations.

FIELD EXAM NOTES

OTHER ITEMS

DISCUSSION/REVIEW IN FIELD

1. Disposition of old guardrail. *District to review*

2. Remove ~~shoulder strengthe~~ning when project is completed?
Detour pavement
No, leave in place

FILE NO. ----	ENGLISH	DESIGN TEAM Jia \ Romsey \ Campbell	BUENA VISTA COUNTY	PROJECT NUMBER BRF-003-2(65)--38-11	SHEET NUMBER A.10	

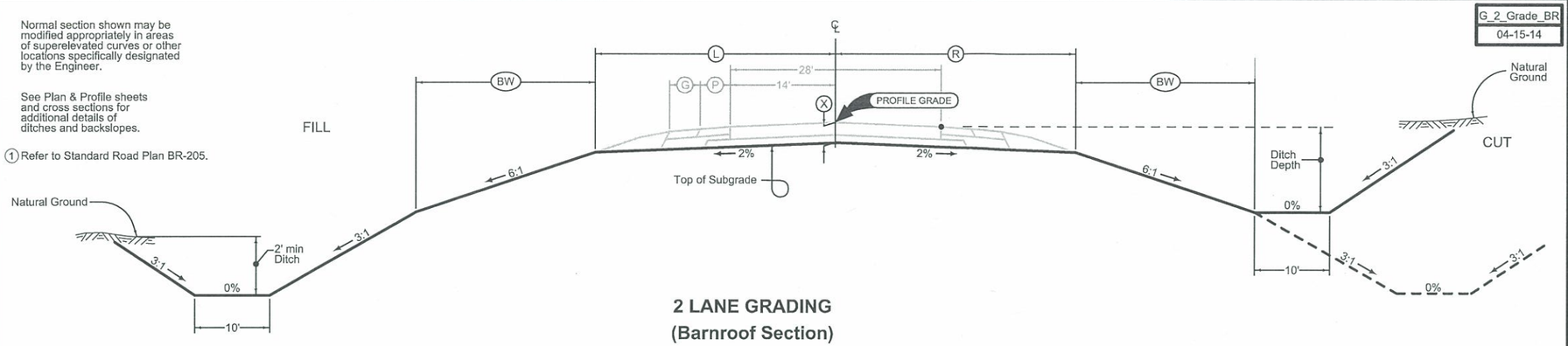
LOCATION			DIMENSIONS			
ROAD IDENTIFICATION	STATION TO STATION		(L) Feet	(R) Feet	(X) Inches	(BW) Feet
Ia. 3	129+57.87	130+33.50	25.78	25.78	(1)	16.22
Ia. 3	131+86.50	132+58.59	25.78	25.78	(1)	16.22

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

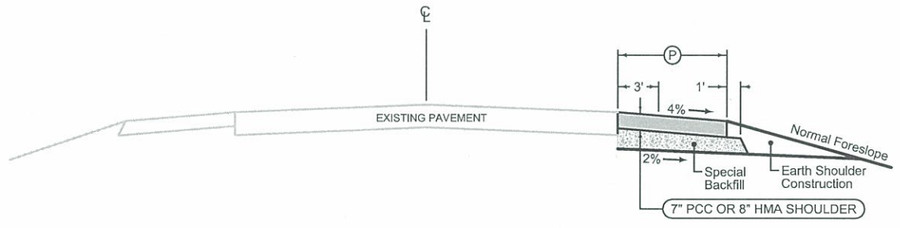
See Plan & Profile sheets and cross sections for additional details of ditches and backslopes.

(1) Refer to Standard Road Plan BR-205.

G_2_Grade_BR
04-15-14



2 LANE GRADING
(Barnroof Section)



Paved Shoulder Strengthening Alternates

PCC Shoulder Jointing:
Longitudinal joint: BT-1 or BT-5
Transverse joints: C at 20' spacing
HMA Shoulder Jointing:
Longitudinal joint: B

2_P_ALT_
10-21-14

STATION TO STATION		(P) Feet
128+56.95	129+06.95	14.5
132+88.16	133+63.16	11.5

FILE NO. ----	ENGLISH	DESIGN TEAM Jia \ Romsey \ Campbell	BUENA VISTA COUNTY	PROJECT NUMBER BRF-003-2(65)--38-11	SHEET NUMBER B.1	

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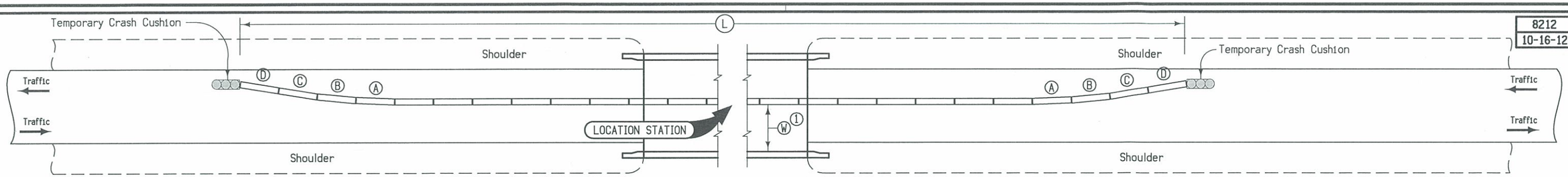
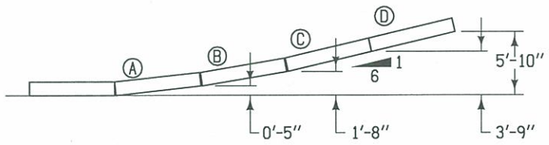
8212
10-16-12





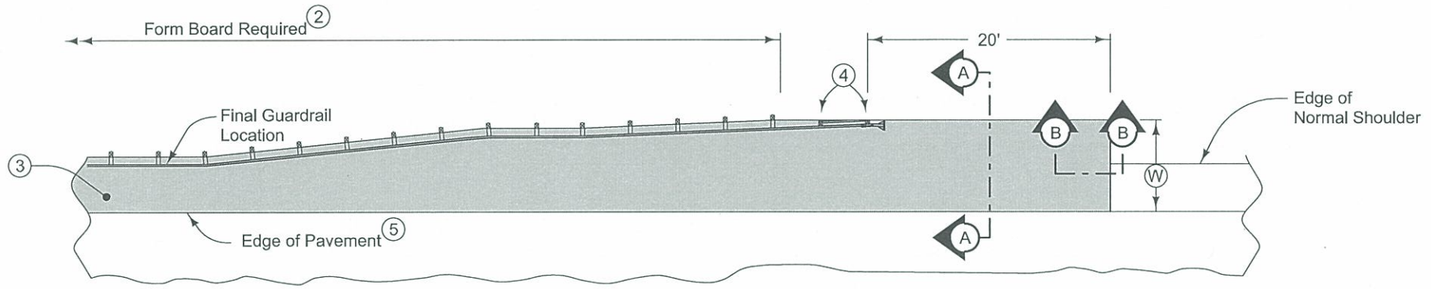
BARRIER OFFSETS FOR FLARE SECTIONS

Station	Side	AA	WL	TA	L	Anchored	W ①	Remarks
		Feet	Feet	Feet	Feet	X	Ft-Inches	
131+10.82	Rt	20.00	523.00	20.00	663.00		14-8	Stage 1
131+10.82	Lt	20.00	422.50	20.00	562.50		12-0	Stage 2

① Where W is less than 14'-6", install restricted width signing as per Standard Road Plan TC-81.

TEMPORARY CONCRETE BARRIER LAYOUT
for Two-Way Traffic

7156
MODIFIED

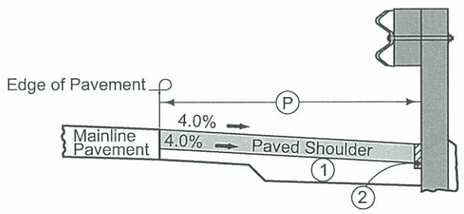


8" HMA Paved Shoulder at guardrail. 7" PCC may be substituted with the following jointing layout:

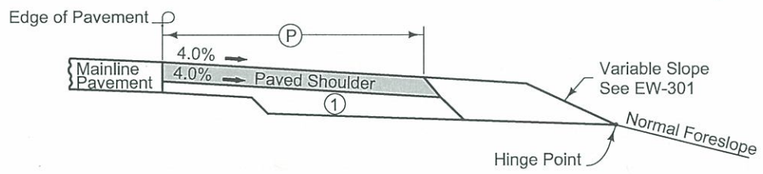
Match mainline pavement joint spacing. When mainline pavement is 8" or greater in thickness, place additional transverse 'C' joints in shoulder at mid-panel of the mainline pavement. Place longitudinal 'C' joint at W/2 from edge of mainline pavement when W is greater than 10' wide. Terminate longitudinal 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 & reinstallation of guardrail will be allowed with no additional payment.

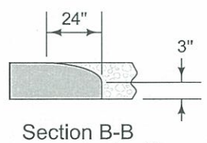
Refer to Shoulder tabulation (112-9) for quantities.



Typical Section with Form Board



Section A-A



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

① 6" subgrade treatment.

② When guardrail posts are installed prior to construction of paved shoulder, nail 1" x 6" untreated form boards along the face of guardrail posts for the length shown. This board is to prevent shoulder material from contacting the sides of the posts and altering the function of the guardrail. Form board not required for final 2 posts.

③ Continue paved shoulder to existing paved shoulder or 20' beyond the end of guardrail.

④ Shoulder may be notched for final 2 posts or post sleeves may be installed through pavement.

⑤ 'KT-1' joint for PCC shoulder.
'B' joint for HMA shoulder.

See Tab 100-24 or 100-25 for pavement quantities.

See Tab 112-9 for shoulder quantities.

ROADWAY IDENTIFICATION PAVED SHOULDER AT GUARDRAIL

SURVEY SYMBOLS

- TPD Telephone Pedestal
- FW Wire Fence
- BRG Bridge
- TDC Tree Deciduous
- OUT Tile Outlet
- TIL Tile Line
- TLNL Tree Line Left
- PIP Pipe Culvert
- TOP Top of Bridge Pier
- TLNR Tree Line Right
- COS Square Bridge Pier Column
- MM Mile Marker Post
- BNK Stream Bank
- DU Centerline Draw or Stream (Up)
- ENU Edge Unpaved Entrance & Parking
- ENT Centerline BL of Entrance
- D Centerline Draw or Stream (Down)
- EW Edge of Water
- SP Stream Profile
- SOP Size of Pipe or Culvert
- BD Bridge Deck
- BCL Bridge Centerline
- PRO Profile Shot
- SBR Size of Bridge
- TW Top of Water
- BLS Bridge Low Steel
- BL Topo Breakline
- C Centerline BL of Road (ML or SR)
- GDL Guard Rail Steel
- LIN Miscellaneous Line
- SNP Unpaved Shoulder
- SH Paved Shoulder
- EP Edge of Paved Roads (ML or SR)

UTILITY LEGEND

— FO – Century Link

Century Link
Carroll Wheaton Manager
7404 N 78th Street
Omaha, NE. 68122
402-572-5887
Carroll.Wheaton@centurylink.com

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

RIGHT-OF-WAY LEGEND

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

PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

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

FILE NO.	ENGLISH	DESIGN TEAM	COUNTY	PROJECT NUMBER	SHEET NUMBER D.1

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Lincoln TWP.
T-92N R-36W
SEC. 28

125 130 135

FO FO FO FO

Sta. 129+57.87

Sta. 132+58.59

Wetland area
try to minimize impacts

Sta. 131+83.22, 53.92 Lt.
30" X 50.0 CMP W/ Flapper Gate
D.A. = 21 A - F
(U.A.C.)

• small area therefore do not need to include rumble strips.

Sta. 131+10.98
120' X 26 Continuous
I-Beam Bridge
D.A. = 96.5 Sq. Miles R-F
(Remove)
Construct
150' X 42' Continous Concrete Slab Bridge

24" X 32.72 C.M.P.

Sta. 131+85.91, 47.37 Rt.
18" X 48.0 RCP
W/ 18" X 26.86 CMP Extension
D.A. = 21 A - R
(U.A.C.)

30" pipe not shown

Sect. No. 33

0 FEET 50

District to review condition of existing pipes to determine replacement

As per the 8/4/15 note from Tony L. pipes should be replaced

1295
1290
1285
1280
1275
1270
1265
1260
Lt
Rt

VPI +10.000 SSD = 520'
Elv 1,282.75
K = 160
Len 280.06 ft

1,281.36
1,281.51

Sta. 129+57.87
Begin Profile

Sta. 132+58.59
End Profile

+0.914%
-0.835%

1,281.52 1,281.72 1,281.88 1,282.00 1,282.09 1,282.13 1,282.14 1,282.10 1,282.03 1,281.92 1,281.77 1,281.58

170 +50 171 +50 172 +50 173 +50 174 +50 175 +50 176 +50 177 +50

FILE NO. ----	ENGLISH	DESIGN TEAM J1a \ Romsey \ Campbell	BUENA VISTA COUNTY	PROJECT NUMBER BRF-003-2(65)--38-11	SHEET NUMBER D.2

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Survey Information

General Information

Measurement units for this survey are US survey feet. This survey is for proposed Bridge replacement. Project datum and control information is provided by Design Survey Office. This project is a Full DTM. Pavement was resurveyed after resurfacing and widening in Oct. 2013

Vertical Control

Vertical datum for this survey is NAVD88 (Computed using Geoid 12). GRS80 Ellipsoidal Height was computed at project Pt. 1 and Pt. 2 by averaging a minimum of five observations with appropriate time spans between from nearby Iowa RTN reference stations. The vertical accuracy estimate of these observations was less than 0.03 ft. at 95% confidence level.

Additional benchmarks were placed throughout the project using a GNSS Base-Rover setup and averaging observations from both Pt. 1 and Pt. 2. A minimum of three observations from each base were taken with appropriate time spans between. The vertical accuracy estimate of these observations was less than 0.02 ft. at 95% confidence level.

This survey observed 3 NGS Control Monuments with published NAVD88 height to compare with observed survey height:

NGS 2nd. order Class 0 mark designated V 22 has a published height of 1236.07
Iowa RTN NAVD88 height computed using Geoid 12 = 1236.187
The relative network error of the height observations was less than 0.03 ft. at 95% confidence level. V 22 is located 15 miles southeast of project.

NGS 2nd. order Class 0 mark designated B 24 Reset has a published Elev. Of 1442.04
Iowa RTN NAVD88 height computed using Geoid 12 = 1442.10
The relative network error of the height observations was less than 0.02 ft. at 95% confidence level. Mark B 24 is located 14.5 miles southwest of project.

NGS 3rd. order mark designated Q 22 Reset has a published Elev. Of 1297.4
Iowa RTN NAVD88 height computed using Geoid 12 = 1299.659
The relative network error of the height observations was less than 0.03 ft. at 95% confidence level. Mark Q 22 Reset is located 8 miles east of project.

This survey observed 2 As-Built plan bench marks to compare to local ground control:

BM 501 Plans Project No. F 939(4) Elev. 1281.73
Survey Elev. = 1282.137

BM 502 Plans Project No. F 939(4) Elev. 1281.73
Survey Elev. = 1282.098

Horizontal Control

The project coordinate system is modified Iowa State Plane North Zone (U.S. Survey Feet) scaled around Pt. 2 at 3739997.981 N, 4493657.820 E, 1282.876 (H)eight. IaRTN datum is NAD83(2011CORS) (Epoch 2010.00). Coordinates at project Pt. 1 and 2 were determined by averaging a minimum of five IaRTN RTK observations with 1 hour or greater time span between each observation. The horizontal accuracy estimate of these observations was less than 0.01 ft. at 95% confidence level.

Additional control points were placed throughout the project using a GNSS Base-Rover setup and averaging observations from both Pt. 1 and Pt. 2. A minimum of three observations from each base were taken with appropriate time spans between. The vertical accuracy estimate of these observations was less than 0.02 ft. at 95% confidence level.

1/Combined Scale Factor of project (State plane grid modified to ground) = 1.000110502259 should be used for GPS\GNSS project configuration.

A scale of 1 should be used with project control for total station stakeout.

Alignment Information

The horizontal alignment for this survey is a retrace of As-built Plans No. F 939(4). Survey stationing was equated to the plan at ¼ section corner Sta. 78+69.0, 0.7 Rt. and run ahead without equation throughout the survey. Alignment based off of station offsets of two found section corners.

Survey stationing relates to as built plan stationing as follows:

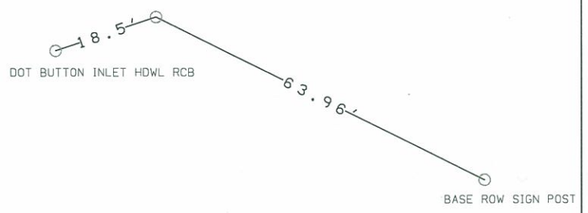
¼ Section Corner Sta. 78+69.0, 0.7 Rt. As-built Plans Project No. F 939(4).
Survey ¼ Section Corner Sta. 78+69.01, 0.7 Rt

¼ Section Corner Sta. 184+40.5, 8.3 Rt. As-built Plans Project No. F 939(4).
Survey ¼ Section Corner Sta. 184+41.23, 8.3 Rt.

VERTICAL CONTROL

Point	North	East	Elevation	Station	Offset	Feature	Description
1	3740031.083	4487911.755	1279.638	101+37.41	32.127	CP	1 SET FENO
2	3739997.981	4493657.820	1282.876	158+83.11	-40.313	CP	2 SET FENO
3	3739930.362	4496937.316	1287.326	Off Chain	Off Chain	CP	3 SET FENO
500	3740025.229	4487894.202	1279.871	101+19.96	38.303	BM	FOUND IDOT BM INLET HDWL RCB
501	3740030.094	4490816.442	1282.137	130+41.62	-20.233	BM	FOUND X NW WING
502	3739910.532	4495108.845	1282.098	173+35.50	20.471	BM	FOUND X SW WING WALL
503	3739851.346	4496252.012	1283.090	Off Chain	Off Chain	BM	CONC MONUMENT

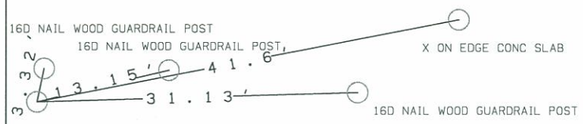
CP Sta. 101+37.41, 32.13 Rt.
CP 1 Set Feno Monument Stamped 11001
N=3740031.083, E=4487911.755, Z=1279.638



CP Sta. 131+83.68, 17.94 Lt.
CP 7 Set Iron Pin 6" Deep
N=3740025.191, E=4490958.430, Z=1281.429

CP Sta. 158+83.11, 40.13 Lt.
CP 2 Set Feno Monument Stamped 11002
N=3739997.981, E=4493657.820, Z=1282.876

CP Sta. 173+94.99, 19.95 Rt.
CP 8 Set Iron Pin 6" Deep
N=3739909.958, E=4495168.341, Z=1282.102



CP Sta. Off Chain
CP 3 Set Feno Monument Stamped 11003
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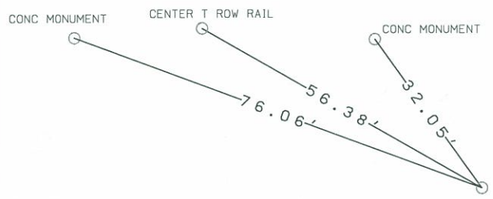

FILE NO. ----	ENGLISH	DESIGN TEAM J1a \ Romsey \ Campbell	BUENA VISTA COUNTY	PROJECT NUMBER BRF-003-2(65)--38-11	SHEET NUMBER G.2

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108-23A
08-01-08

TRAFFIC CONTROL PLAN

Traffic will be maintained on Ia. 3 at all times. Construction will be staged so as to maintain traffic.

108-26A
08-01-08

STAGING NOTES

Stage I.
  Traffic:
    EB lane closure and shift all traffic to WB lane using Standard Road Plan TC-217.

  Construction:
    Remove EB lane guardrail and the southern portion of the existing bridge after the third beam.
    Construct 14.37' of the southern most half of the new bridge and both bridge approaches.
    Construct EB shoulders and install guardrail on both ends of the bridge.

Stage II.
  Traffic:
    Switch traffic to EB lane using Standard Road Plan TC-217.

  Construction:
    Remove remaining portion of existing bridge and existing guardrail.
    Construct new piers and remaining portion of new bridge and remaining portions of both bridge approaches.
    Construct WB shoulders and install guardrail.

CROSS SECTION VIEW COLOR LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS

SHADING	Design Color No.	
Green, Light	(225)	Existing Pavement Shading
Gray, Light	(48)	Previously Constructed Pavement Shading
Gray, Med	(80)	Previously Constructed Granular Surface Shading
Blue, Light	(230)	Proposed Pavement Shading
Lavender	(9)	Temporary Pavement Shading
Brown, Med	(237)	Future Proposed Pavement Shading

CROSS SECTION VIEW PATTERN AND SYMBOL LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS

- Pavement Removal
- Proposed Granular Shoulder
- Proposed Granular Subbase
- Temporary Shoulder
- Proposed Special Backfill
- Existing Shoulder Strengthening
- Temporary Barrier Rail
- Permanent Barrier Rail
- Channelizing Device

PLAN VIEW COLOR LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS

LINEWORK	Design Color No.	
Green	(2)	Existing Topographic Features and Labels
Magenta	(5)	Pavement Marking Call Outs
Blue	(1)	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Yellow	(4)	Pavement Markings, Yellow
Off White	(254)	Pavement Markings, White
Violet	(15)	Temporary barrier rail, Unpinned
Flush Orange	(228)	Temporary barrier rail, Pinned
SHADING	**Design Color No.**	
Green, Light	(225)	Existing Pavement Shading
Gray, Light	(48)	Previously Constructed Pavement Shading
Gray, Med	(80)	Proposed Granular Surface Shading
Gray, Med	(80)	Previously Constructed Granular Surface Shading
Blue, Light	(230)	Proposed Pavement Shading
Lavender	(9)	Temporary Pavement Shading
Brown, Light	(236)	Proposed Grading Limits Shading
Pink, Dark	(13)	Proposed MSE or CIP Wall Shading
Red	(3)	Proposed Bridge Shading and Sign Trusses
Black w/Gray, Light Fill	(0,48)	Previously Constructed Structure

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

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

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

TRAFFIC CONTROL AND STAGING LEGEND AND SYMBOL INFORMATION SHEET

(COVERS SHEET SERIES J)

FILE NO.	ENGLISH	DESIGN TEAM		COUNTY	PROJECT NUMBER	SHEET NUMBER J.2	

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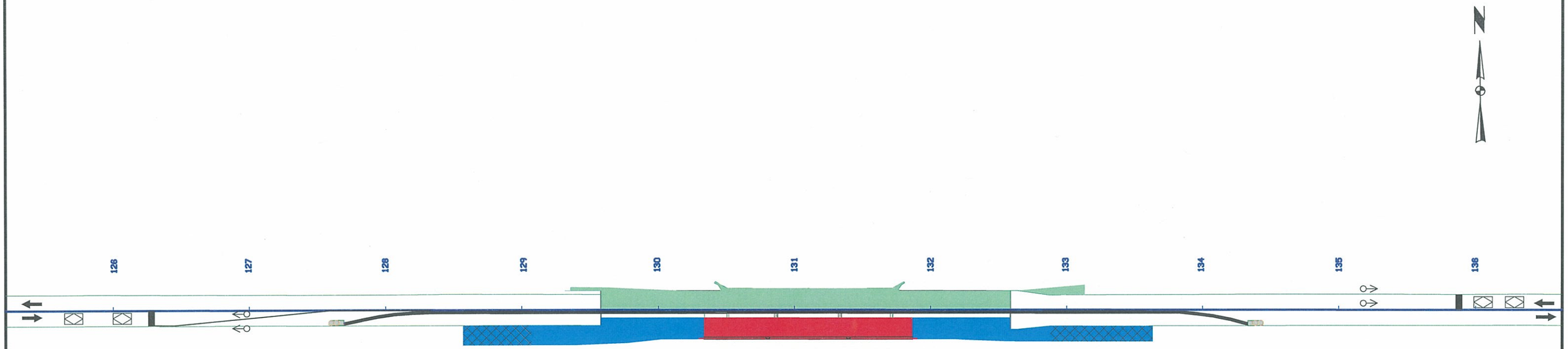
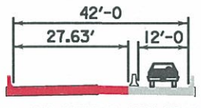


Shoulder Strengthening

STAGE I

CUT AFTER THIRD BEAM. PIERS TO REMAIN IN PLACE.
CONSTRUCT 14.37'± OF NEW BRIDGE.



REMOVE REST OF BRIDGE, INCLUDING PIERS.
CONSTRUCT REMAINDER OF NEW BRIDGE.

FILE NO. ----	ENGLISH	DESIGN TEAM J1a \ Romsey \ Campbell	BUENA VISTA COUNTY	PROJECT NUMBER BRF-003-2(65)--38-11	SHEET NUMBER J.3	

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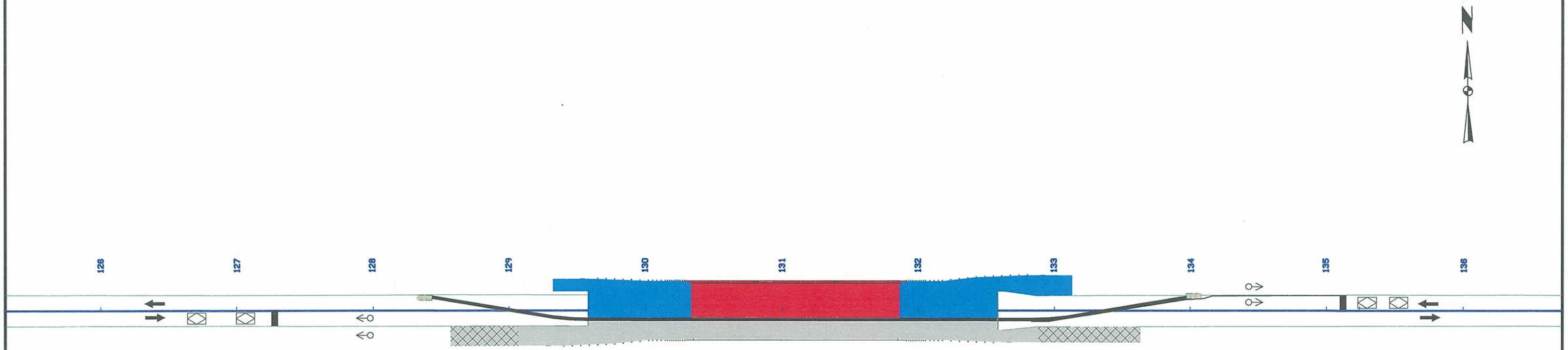
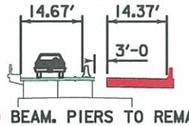


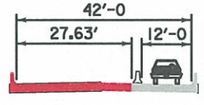
Shoulder Strengthening

STAGE II

EXISTING BRIDGE

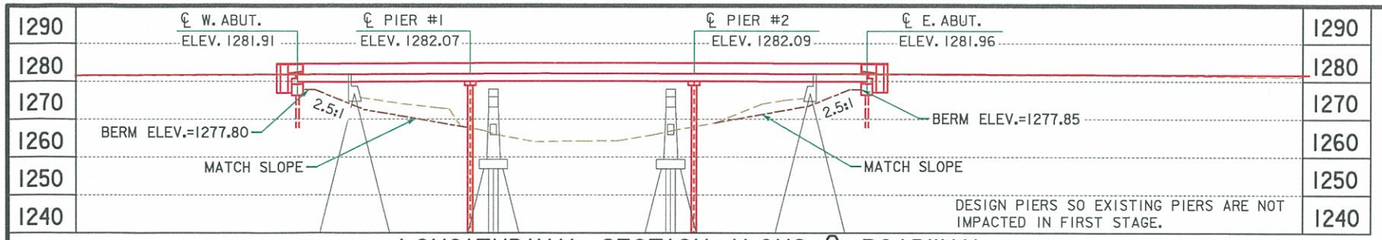


CUT AFTER THIRD BEAM. PIERS TO REMAIN IN PLACE.
CONSTRUCT 14.37'± OF NEW BRIDGE.

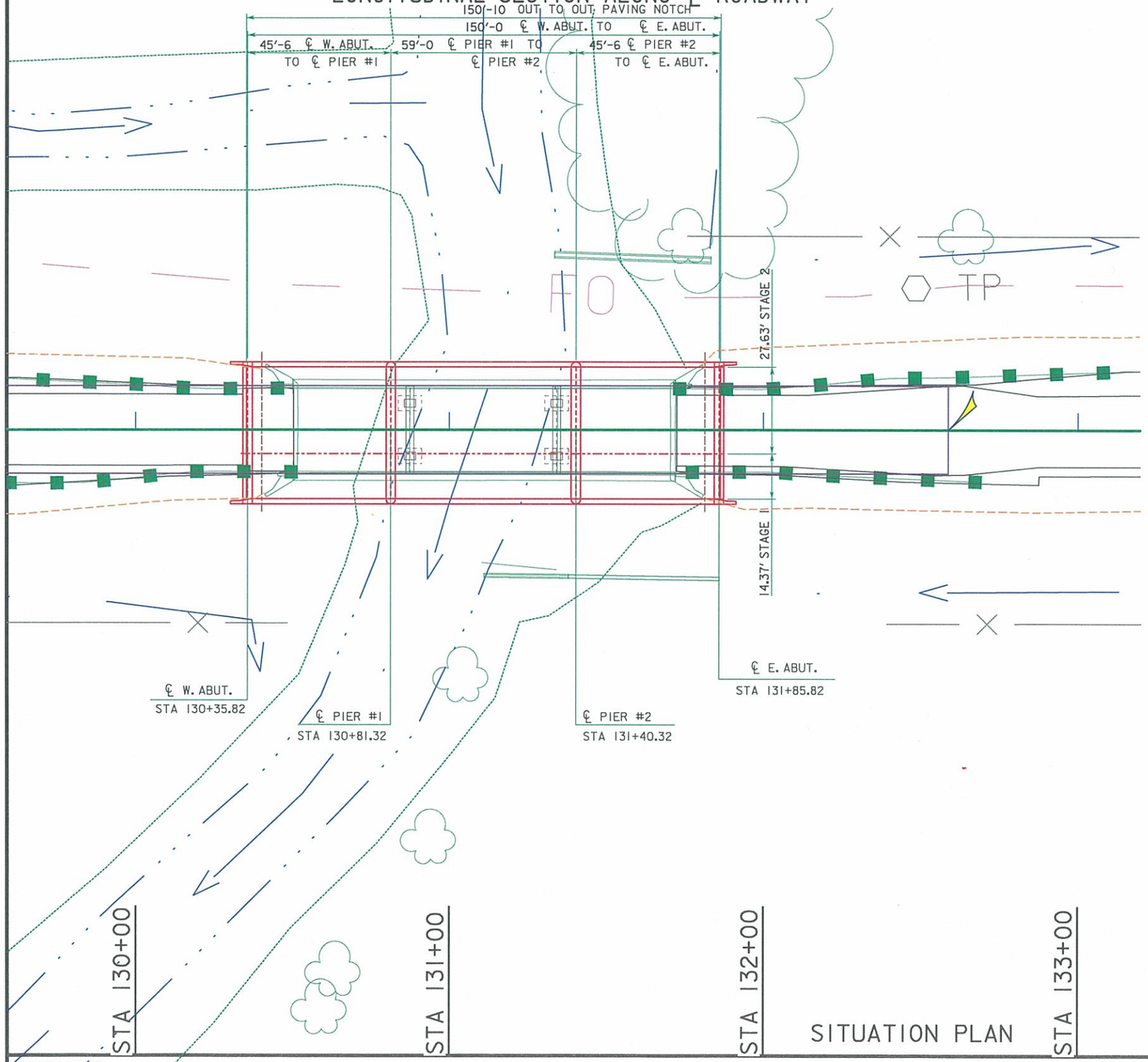


REMOVE REST OF BRIDGE, INCLUDING PIERS.
CONSTRUCT REMAINDER OF NEW BRIDGE.

FILE NO. ----	ENGLISH	DESIGN TEAM J1a \ Romsey \ Campbell	BUENA VISTA COUNTY	PROJECT NUMBER BRF-003-2(65)--38-11	SHEET NUMBER J.4



LONGITUDINAL SECTION ALONG ℄ ROADWAY



SITUATION PLAN

TRAFFIC ESTIMATE

2018 AADT	1800 V.P.D.
2038 AADT	2400 V.P.D.
20?? DHV	- V.P.H
TRUCKS	33 %
TOTAL DESIGN ESAL's	-

BENCH MARK NO.

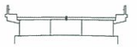
0.914% ~0.835%

PI STA 131+10.00 VC = 280.06'
PI ELEV 1282.75

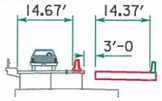
PROPOSED PROFILE GRADE ON IA 3

PROFILE GRADE LINE (PGL) IS AT ℄ OF LANES.
TOP OF BRIDGE DECK AT ℄ ROADWAY IS .03' BELOW THE PROFILE GRADE TO ACCOUNT FOR PARABOLIC CROWN.

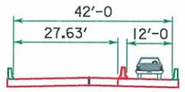
STAGING (FROM CONCEPT)



EXISTING BRIDGE



CUT AFTER THIRD BEAM. PIERS TO REMAIN IN PLACE.
CONSTRUCT 14.37'± OF NEW BRIDGE.



REMOVE REST OF BRIDGE, INCLUDING PIERS.
CONSTRUCT REMAINDER OF NEW BRIDGE.

HYDRAULIC DATA

DRAINAGE AREA= 108 MI²
STREAM SLOPE= 5.8 FT./MI.

Q_{50}= 3957 CFS
NATURAL STAGE= 1276.52
MAXIMUM BACKWATER= .72'
AVG. BRIDGE VELOCITY= 5.61 FT/SEC

Q_{100}= 4762 CFS
NATURAL STAGE= 1276.99
MAXIMUM BACKWATER= .98'

Q_{200}= 5400 CFS
STAGE = 1277.30
CALCULATED DESIGN SCOUR= ?

Q_{500}= 6014 CFS
NATURAL STAGE= 1277.57
CALCULATED CHECK SCOUR= ?

AVG. LOW WATER STAGE= ?

LOCATION

IA 3 OVER NORTH RACCOON RIVER
T-92N R-36W
SECTION 28/33
LINCOLN TOWNSHIP
BUENA VISTA COUNTY
FHWA NO. 16220
BRIDGE MAINT. NO. 1184.1S003
LATITUDE ?° N
LONGITUDE ?° W

0 ENGLISH 40
SCALE IN FEET

PRELIMINARY

DESIGN FOR 0° SKEW

150'-0 X ~~40'~~ 42' CONTINUOUS CONCRETE SLAB BRIDGE

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

SITUATION PLAN

STATION: 131+10.82 ?

BUENA VISTA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

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

DESIGN TEAM	COUNTY	PROJECT NUMBER	SHEET NUMBER

6/25/2015 4:14:02 PM