PROJECT CONCEPT STATEMENT

Bridge on Iowa Highway 14 over Alloway Creek

Jasper County
Project # BRFN-014-4(67)--39-50
PIN: 18-50-014-010
Maint. No. 5084.5S014
FHWA No. 30690

Prepared for:
Iowa Department of Transportation
District 1
Tony Gustafson, P.E.

Prepared by: Snyder & Associates, Inc. / Shuck-Britson Inc.

October 18, 2019

I. STUDY AREA

A. Project Description

This project involves replacement of the Iowa Highway 14 bridge over Alloway Creek (Maint. No. 5084.5S014), approximately 1.6 miles west of Iowa Highway 224, in Jasper County.

B. Present Facility--Need for Project

The existing bridge is a 74' x 30' single span, steel I-beam bridge constructed in 1948. The roadway approaches are approximately 42' wide and the bridge is not skewed. Past repairs have consisted of strengthening of steel beams (1992), retrofit of the barrier rails (1992), a low-slump concrete overlay (1996), and rip-rap/revetment (2017).

The bridge was last inspected in May, 2018 and has deck, superstructure and substructure condition ratings of 5, 6 and 6, respectively, on a scale of 0 to 9. A rating of '4' or less on any of the condition ratings would make the bridge "Structural Deficient". Maintenance and repairs have been made over the years to extend the life of the bridge. Repairs done to typical bridges with this current level of condition ratings are often an exercise in diminishing returns. It is likely that at least one of the condition ratings will drop to a '4' in the near future which would make the bridge both "Structurally Deficient" and eligible for federal funds through the Highway Bridge Replacement and Rehabilitation Program.

The bridge also has a Deck Geometry appraisal rating of '5' on a scale of 0 to 9 determined by the roadway width on the bridge available for the Average Daily Traffic.

Under old bridge deficiency procedures, a rating of '3' would have made the bridge "Functionally Obsolete".

For these reasons, the bridge is not a rehabilitation or widening candidate but should be held as a replacement candidate for a future letting. The bridge's expected replacement type and total project cost should be determined with this Draft Project Concept phase.

West of the bridge, as-built plans indicate that the roadway is a 24 foot wide paved rural section with 4 foot wide paved shoulders and 6 foot wide granular shoulders. Milled centerline and shoulder rumble strips are present in this area. Improvements were most recently made in 2015.

East of the bridge, as-built plans indicate that the roadway is a 24 foot wide paved rural section with 2 foot wide paved shoulders and 8 foot wide granular shoulders. Milled centerline rumble strips are present. Improvements were most recently made in 2011.

Roadway foreslopes are 3:1, and the roadway was built without clear zone

considerations. Recent improvements did not affect roadway foreslopes.

No side road intersections are present in the immediate vicinity of the bridge. Entrances are present on the right side of the roadway approximately 380 feet east of the bridge and on the left side of the roadway approximately 490 feet west of the bridge.

The existing roadway profile in the vicinity of the bridge has three VPI's in the span of a little more than 400 feet, two of which are sag vertical curves, and one of which is a simple grade break. A tangent grade of 3.36% extends over 2,000 feet east of the bridge site, and a tangent grade of 4.70% extends 2,000 feet east of the bridge site. The largest sag vertical curve, just east of the bridge, has a K value of 58.4, which corresponds with a design speed of 35 mph.

C. Hydrology

StreamStats discharges are 4390 cfs (50-year) and 5210 (100-year) for the 12.2 square mile drainage area and were used to compare values calculated using rural regression equations outlined in USGS Water-Resources Investigation Report 87-4132 that are more accurate for ungaged streams with drainage areas between 2 and 20 square miles. Discharges used for hydraulic evaluations are 3840 cfs (50-year) and 4630 (100-year).

D. Traffic Estimates

The 2018 traffic count was 1,530 vehicles per day (VPD), with trucks comprising approximately 15% of total traffic. Historic traffic counts to 1992 vary between 1,190 VPD and 1,530 VPD.

Iowa DOT Office of Systems Planning forecasts an AADT volume of 1,520 VPD in Year 2023 (15% truck traffic), and 1,720 VPD in Year 2043 (17% truck traffic). Year 2043 design hour forecast volumes are 180 vehicles per hour

E. Crash History

No crashes were reported on Iowa 14 in the vicinity of the bridge in the past 10 years. Two "animal" related property damage only crashes have occurred west of the bridge. The bridge is in a sag vertical curve and has adequate sight distance available.

F. Sufficiency Ratings

The official federal bridge sufficiency rating is 63.0 and the unofficial federal bridge sufficiency rating is 61.9. A drop in any of the aforementioned bridge condition ratings is expected to drop the sufficiency rating to near or below 50. In the past, there was an

instruction to those determining appropriate rehabilitation or replacement strategies for bridges eligible for federal funding that both rehabilitation and replacement options should be evaluated when the sufficiency rating was between 50 and 80. With a sufficiency rating at or below 50, the near-deficiency condition rating of the deck, and structural steel superstructure details (welded cover plates) vulnerable to fatigue cracking, replacement is the clear choice.

G. Accelerated Bridge Construction Score

The Accelerated Bridge Construction (ABC) normalized score using state roads is 18, far under the threshold (50) that would qualify the project for further evaluation of ABC techniques. The raw score is made up of an average annual daily traffic (AADT) score of 10, out of distance travel (OODT) score of 10, daily road user costs (DRUC) score of 10, and an economy of scale (EOS) score of 0.

H. Access Control

Access rights will not be acquired on this project.

II. PROJECT CONCEPT

A. Feasible Alternatives

Two options were explored for replacement of the existing bridge. Refer to attached sheets for additional information.

For both options, we propose reconstructing roughly 930 feet of roadway, in order to increase the design speed on the sag vertical curve from 35 mph to 55 mph, and to generally clean up the profile. The vertical curve will connect the tangents east and west of the bridge. It will extend onto the bridge, but the low point will be just east of the bridge.

1. Alternative Number 1: 115’ x 44’ Pretensioned Prestressed Concrete Beam Bridge

Replace the existing 74’ long steel I-beam bridge with a 115’ x 44’ single span PPCB bridge on a sag vertical curve higher than the existing. Preliminary calculations indicate that the maximum haunch value, located at each abutment, are less than the Design Limits outlined in the Bridge Design Manual. Traffic will be detoured on other state routes to allow the removal of the existing bridge and the construction of the replacement bridge in one stage.

The proposed bridge will not be skewed and will be centered on the channel similar to the existing bridge. 3’-0 wide berms and 2.5:1 (H:V) slopes in front of each abutment are proposed. Class E Revetment is proposed as protection for the

abutment slopes. Each abutment will be founded on steel H-piles.

The maximum Q100 backwater is 0.35 feet, the roadway will not be overtopped, and freeboard requirements have been met.

Estimated Construction Cost

Bridge Item	Estimated Cost
Remove Existing Bridge	$19,000
Excavation, Class 20	$4100
Piles, Steel, HP 10x57	$144,000
Structural Concrete (Bridge)	$188,500
Reinforcing Steel, Epoxy Coated	$78,200
Beams, Pretensioned Prestressed Concrete, BTD 115	$138,000
Structural Steel	$12,000
Concrete Barrier Railing	$22,700
Revetment, Class E	$39,900
Staging (0%)	$0
Aesthetics (0%)	$0
Mobilization (10%)	$64,600
Contingency (20%)	$142,200
Bridge Total	**$853,200**

Roadway Item	Estimated Cost
Special Backfill	$21,308
Embankment-in-place	$85,515
Modified Subbase	$26,881
Granular Shoulders, Type B	$4,851
Paved Shoulders, HMA, 6”	$14,667
Paved Shoulders, HMA, 9”	$35,760
Bridge Approach, BR-205	$95,655
Standard or Slip-form PCC Pavement, Class C, Class 3, 10”	$105,728
Bridge End Drain, DR-402	$8,000
Steel Beam Guardrail Items	$21,074
Removal of Pavement	$30,482
Traffic Control (5%)	$22,497
Mobilization (5%)	$22,497
Contingency (30%)	$148,478
Roadway Total	**$643,403**

Project Total: $1,496,603

2. Alternative Number 2: 130' x 44' Continuous Concrete Slab Bridge
   Replace the existing 74' long steel I-beam bridge with a 130' x 44' continuous concrete slab bridge on a sag vertical curve higher than the existing. Traffic will be detoured off-project to allow the removal of the existing bridge and the construction of the replacement bridge in one stage.

   The proposed bridge will not be skewed and will be centered on the channel similar to the existing bridge. 3'-0 wide berms and 2.5:1 (H:V) slopes in front of each abutment are proposed. Class E Revetment is proposed as protection for the abutment slopes. Each abutment will be founded on steel H-piles. Pile bent piers with monolithic caps and concrete pile encasements are proposed as well.

   The maximum Q100 backwater is 0.36 feet, the roadway will not be overtopped, and freeboard requirements have been met.

Estimated Construction Cost

Bridge Item	Estimated Cost
Remove Existing Bridge	$19,000
Excavation, Class 20	$3200
Piles, Steel, HP 10x57	$217,800
Structural Concrete (Bridge)	$283,500
Reinforcing Steel, Epoxy Coated	$129,400
Concrete Barrier Railing	$22,600
Revetment, Class E	$41,900
Staging (0%)	$0
Aesthetics (0%)	$0
Mobilization (10%)	$71,700
Contingency (20%)	$157,800
Bridge Total	**$946,900**

Roadway Item	Estimated Cost
Special Backfill	$20,894
Embankment-in-place	$85,515
Modified Subbase	$26,280
Granular Shoulders, Type B	$4,719
Paved Shoulders, HMA, 6"	$14,268
Paved Shoulders, HMA, 9"	$35,760
Bridge Approach, BR-205	$95,655
Standard or Slip-form PCC Pavement, Class C, Class 3, 10"	$103,368
Bridge End Drain, DR-402	$8,000

Steel Beam Guardrail Items	$21,074
Removal of Pavement	$30,482
Traffic Control (5%)	$22,301
Mobilization (5%)	$22,301
Contingency (30%)	$147,188
Roadway Total	**$637,816**

Project Total: $1,584,716

B. Recommendations

Alternative Number 1 is our recommended bridge solution because of its cost effectiveness and a relatively faster speed of construction, i.e. no piers and less cast-in-place concrete construction. Alternative Number 2 is a good option and is one routinely used on other projects, but is not recommended here because of the increase in total project costs.

C. Detour Analysis

Iowa 14 will be closed to traffic during construction. The proposed detour route will be the same as the route used during replacement of the bridge over Snipe Creek in 2009 (Project No. BRF-014-4(44)--38-50). The detour followed I-80 east to Iowa 224, then north and west to Iowa 14. No county roads will be utilized with this detour.

D. Special Considerations

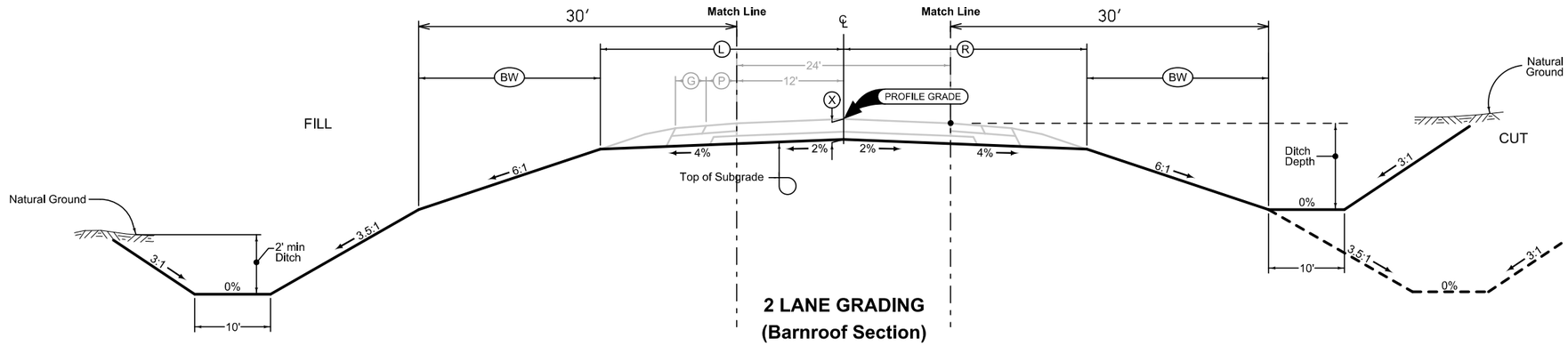
Construction will need to be staged to allow access to two properties each of the bridge which will have entrances impacted by construction. Staging will need to be coordinated with the Contractor and will generally consist of gapping the paving to maintain access.

E. Construction Sequence

It is anticipated that all work will be awarded to one prime contractor. The Bridges and Structures Bureau will coordinate the plan preparation with the District 1 Office.

F. Program Status

This project is listed in the 2020-2024 Iowa Transportation Improvement Program with $860,000 programmed for construction in FY 2023. The project is currently scheduled for a December 20, 2022 letting.

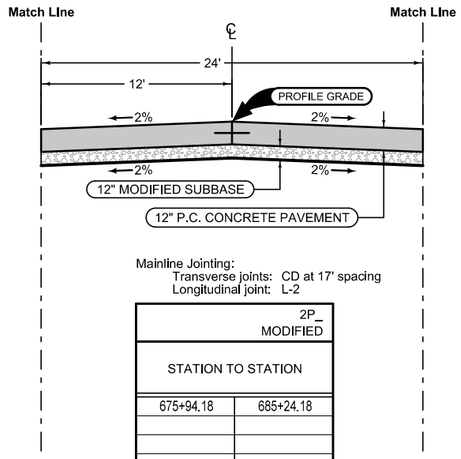


2 LANE GRADING (Barnroof Section)

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.

LOCATION			DIMENSIONS			
ROAD IDENTIFICATION	STATION TO STATION		(L) Feet	(R) Feet	(X) Inches	(BW) Feet
Iowa 14	675+94.18	685+24.18			24	



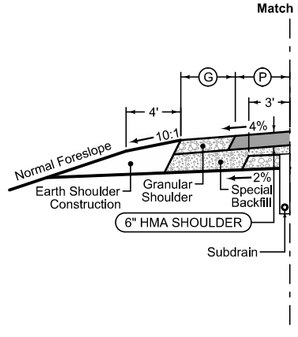
Mainline Jointing:
Transverse joints: CD at 17' spacing
Longitudinal joint: L-2

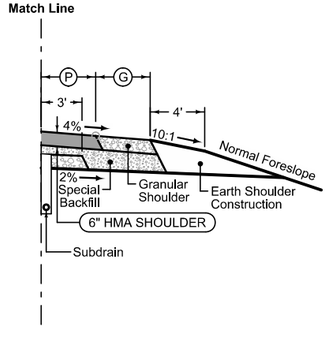
2P_ MODIFIED	
STATION TO STATION	
675+94.18	685+24.18

Combination Shoulder

Shoulder Jointing:
Longitudinal joint: B

2_C_ 10-15-13			
STATION TO STATION		(P) Feet	(G) Feet
675+94.18	685+24.18	4	6

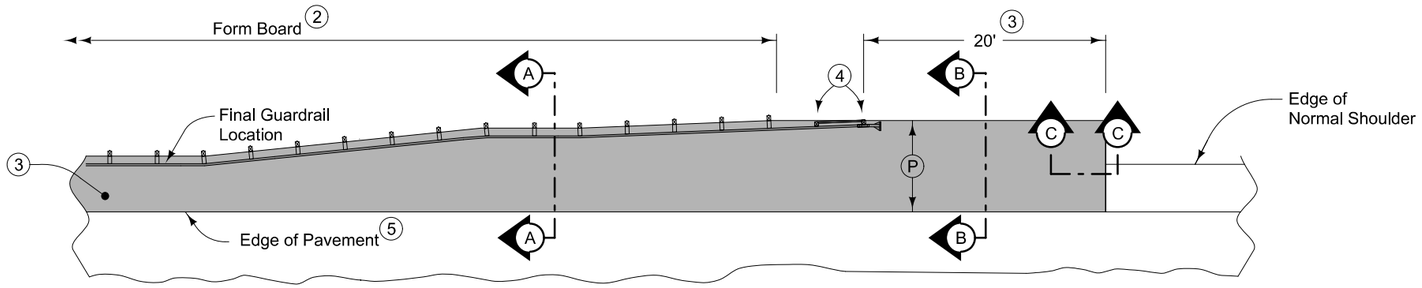




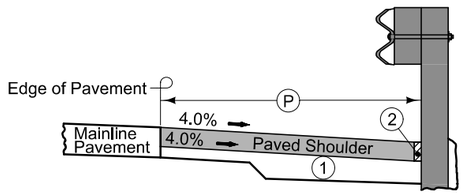
Combination Shoulder

Shoulder Jointing:
Longitudinal joint: B

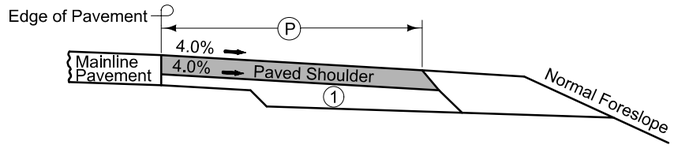
2_C_ 10-15-13			
STATION TO STATION		(P) Feet	(G) Feet
675+94.18	685+24.18	4	6



PLAN VIEW

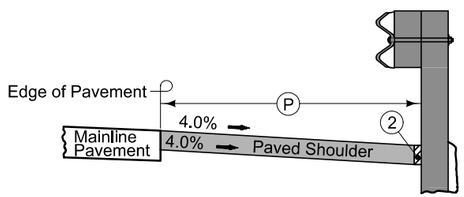


Section A-A

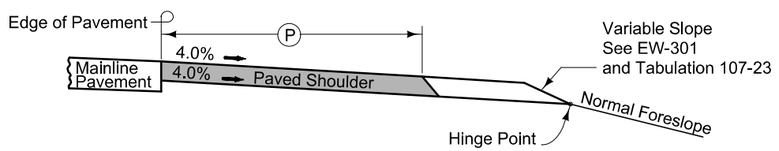


Section B-B

NEW CONSTRUCTION



Section A-A



Section B-B

EXISTING SHOULDER

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.

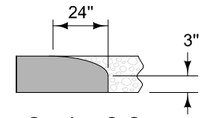
(1) For subgrade treatment, refer to other details in the plan.

(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.

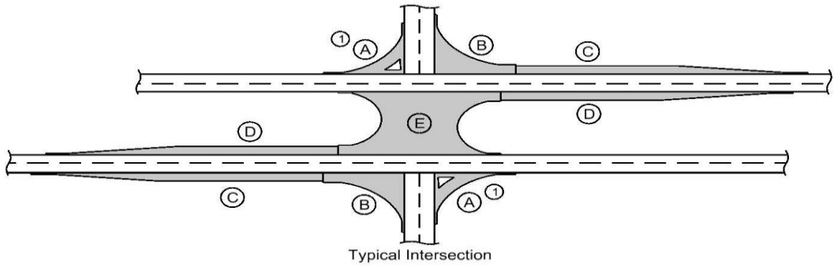
(5) 'KT-1 joint for PCC shoulder.
'B' joint for HMA shoulder.



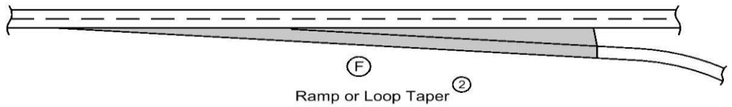
Section C-C
Roll down at granular shoulder or earth.

PAVED SHOULDER AT GUARDRAIL

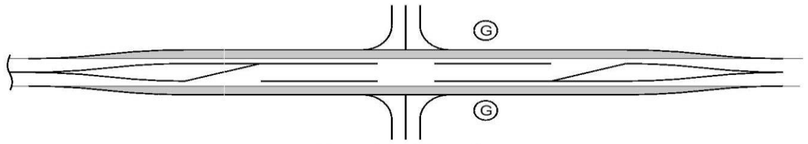
PCC PAVEMENT



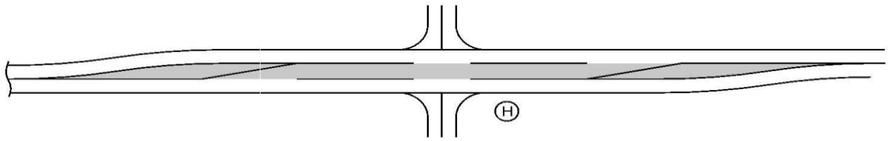
Typical Intersection



Ramp or Loop Taper (2)



Channelized Intersection
Widen Existing Roadway



Channelized Intersection
Reconstructed Roadway

(1) Does not include raised island area or curb. Refer to tabulation 112-4 for quantities.

(2) Refer to PV-410, PV-411, PV-412, and PV-414.

(3) Quantity includes Pavement Header.

Location				Mainline			Area (3)								Total Area By Pavement Thickness		Special Backfill	Modified Subbase	Granular Subbase	Remarks
Road Identification	Direction of Travel	Station to Station		Width	Length	Area	A (1)	B	C	D	E	F (2)	G	H	SY					
				FT	FT	SY	SY	SY	SY	SY	SY	SY	SY	SY	10 IN	10½ IN	TONS	CY	SY	
Iowa 14	BOTH	675+94.18	677+11.00	24.0	116.8	311.5									311.5			129.8		
	BOTH	679+69.00	685+24.18	24.0	555.2	1480.5									1480.5			616.9		

BRIDGE APPROACH SECTION

Refer to the BR Series.

* Not a bid item

Location				Approach Pavement					Standard Road Plans BR Series			Subdrain				*	*	*	Remarks
Bridge Station	End	Skew Ahead Degrees		(T) Thickness	Pay Length	Non-Reinf. Pavement Area	Single-Reinf. Pavement Area	Double-Reinf. Pavement Area	Approach	Fixed or Movable Abutment	Abutting Pavement	* Perforated Subdrain 4"	* Subdrain Outlet		* Porous Backfill	* Class 'A' Crushed Stone Backfill	* Modified Subbase	* Polymer Grid	* Special Backfill	
		LEFT	RIGHT	Inches	FT	SY	SY	SY				LF	STA	Side	CY	CY	TON	SY	TON	
678+40.00	W			12.0	70.0	80.0	53.3	100.0	BR-203		BR-211		677+21.00							
678+40.00	E			12.0	70.0	80.0	53.3	100.0	BR-203		BR-211		679+59.00							

SHOULDERS

(1) Lane(s) to which the shoulder is adjacent.
(2) Bid Item
(3) Applies only for Paved Shoulders constructed on project with existing granular shoulders.
(4) Does not include shrink.

Calculations assume a HMA unit weight (lbs/cf) of 145, a Special Backfill unit weight (lbs/cf) of 140, and a Granular Shoulder unit weight (lbs/cf) of 140.

Location							Quantities															Remarks
Road Identification	Direction Of Traffic (1)	Station to Station		Side	P Width	G Width	L Length	Class 13 Excavation (3)	Hot Mix Asphalt		Binder	Paved Shoulder	Reinforced Paved Shoulder	Special Backfill				Modified Subbase	Granular Shoulder		Earth Shoulder Construction Alternates			
														HMA Alternate		PCC Alternate					STA (2)	HMA	PCC	
					FT	FT	FT	CY (2)	TON	TON/STA	TONS	SY (2)	SY (2)	TON (2)	TON/STA	TON (2)	TON/STA	CY (2)	TON (2)	TON/STA		CY (4)	CY (4)	
Iowa 14		675+94.18	676+31.27	RT	4.0	6.0	37.1		5.378	14.500	0.323	16.5		28.494	76.825				7.789	21.000	0.4			6" HMA
		676+31.27	676+64.27	RT	14.5		33.0		26.018	78.844	1.561	53.2		31.231	94.640						0.3			9" HMA
		676+64.27	676+98.94	RT	14.5 to 13		34.7		25.921	74.766	1.555	53.0		30.822	88.900						0.3			9" HMA
		676+98.94	677+23.94	RT	13 to 10.5		25.0		15.973	63.891	0.958	32.6		18.445	73.780						0.3			9" HMA
		677+23.94	677+61.00	RT	10.5		37.1		21.159	57.094	1.270	43.2		23.815	64.260						0.4			9" HMA
		679+19.00	679+43.57	RT	10.5		24.6		14.028	57.094	0.842	28.7		15.789	64.260						0.2			9" HMA
		679+43.57	679+78.24	RT	10.5 to 12		34.7		21.208	61.172	1.272	43.3		24.259	69.972						0.3			9" HMA
		679+78.24	680+11.24	RT	12.0		33.0		21.533	65.250	1.292	44.0		24.971	75.670						0.3			9" HMA
		680+11.24	685+24.18	RT	4.0	6.0	512.9		74.376	14.500	4.463	228.0		394.066	76.825				107.717	21.000	5.1			6" HMA
		675+94.18	676+68.77	LT	4.0	6.0	74.6		10.816	14.500	0.649	33.2		57.304	76.825				15.664	21.000	0.7			6" HMA
		676+68.77	677+01.77	LT	12.0		33.0		21.533	65.250	1.292	44.0		24.971	75.670						0.3			9" HMA
		677+01.77	677+36.44	LT	12 to 10.5		34.7		21.208	61.172	1.272	43.3		24.259	69.972						0.3			9" HMA
		677+36.44	677+61.00	LT	10.5		24.6		14.022	57.094	0.841	28.7		15.782	64.260						0.2			9" HMA
		679+19.00	679+56.07	LT	10.5		37.1		21.165	57.094	1.270	43.2		23.821	64.260						0.4			9" HMA
		679+56.07	679+81.07	LT	10.5 to 13		25.0		15.973	63.891	0.958	32.6		18.445	73.780						0.3			9" HMA
		679+81.07	680+15.74	LT	13 to 14.5		34.7		25.921	74.766	1.555	53.0		30.822	88.900						0.3			9" HMA
		680+15.74	680+48.74	LT	14.5		33.0		26.018	78.844	1.561	53.2		31.231	94.640						0.3			9" HMA
		680+48.74	685+24.18	LT	4.0	6.0	475.4		68.939	14.500	4.136	211.3		365.257	76.825				99.842	21.000	4.8			6" HMA

STEEL BEAM GUARDRAIL AT CONCRETE BARRIER OR BRIDGE RAIL END SECTION

Possible Standards: BA-200, BA-201, BA-202, BA-205, BA-206, BA-210, BA-211, BA-221, BA-225, BA-250, BA-260, LS-625, LS-626, LS-630, LS-635, SI-172, SI-173 and SI-211.

(1) Lane(s) to which the obstacle is adjacent.
(2) Not a bid item. Incidental to guardrail installation.

Location				Layout Lengths				Long-Span System		Delineators and Object Markers (2)					Bid Items										Remarks
				BA-250, BA-260, LS-630, or LS-635														BA-250 or LS-630					BA-260 or LS-635		
No.	Direction of Traffic (1)	Side O = Outside M = Median	Station	Offset	VT1	VF	VT2	ET	BA-211		SI-211	Delineator SI-172 Type 1	Object Marker SI-173 Type 2	Object Marker SI-173 Type 3		Bolted End Anchor	Post Adapter	Steel Beam Guardrail	Barrier Transition Section	End Terminal				Barrier Transition Section	End Terminal	
																				Tangent	Flared	Tangent	Flared		Tangent	
				FT	LF	LF	LF	LF	STATION	TYPE	TYPE	White	OM2-2	OM3-L	OM3-R	BA-202	BA-210	BA-200	BA-201	BA-205	BA-206	LS-625	LS-626	BA-221	BA-225	
												EACH	EACH	EACH	EACH	TYPE EACH	EACH	LF	EACH	EACH	EACH	EACH	EACH	EACH	EACH	
1	EB	O	677+77.06	22.0	53.125	25.00		47.7							1	A 1		37.5	1	1					
2	EB	O	679+02.94	22.0	40.625	0.00		47.7						1		A 1		0.0	1	1					
3	WB	O	679+02.94	-22.0	53.125	25.00		47.7							1	A 1		37.5	1	1					
4	WB	O	677+77.06	-22.0	40.625	0.00		47.7						1		A 1		0.0	1	1					

Mariposa TWP.
T-81N R-18W
SEC. 16

Sta. 673+53
Skew 24°28'19.3" RT AH
36" x 97' RCP
D.A.=9.7 Acres V.H.

Sta. 678+40
70' x 30' I-Beam Bridge
D.A.=12 Sq. Miles V.H. - Rolling

24" X 32' C.M.P.

30" X 42' C.M.P.

ALLOWAY CREEK

Sta. 675+94.18
Begin Construction

Sta. 685+24.18
End Construction

Sect. No. 21

0 FEET 50

Sta. 675+94.18
Begin Construction
Elev. = 907.98

Sta. 685+24.18
End Construction
Elev. = 914.21

VPI +59.180
Elv 892.35
ex = 9.37'
Len 930.00 ft
K = 115
(v = 55 mph)

-3.36%

+4.70%

+2.96% RT Ditch Grade

+2.402% RT Ditch Grade

+48.00 RT
878.12

+90.00 RT
888.26

+04.00 RT
893.40

Lt No Ditch

Rt No Ditch | Ditch Grade | No Ditch

907.79 906.24 904.91 903.79 902.90 902.22 901.75 901.51 901.48 901.66 902.07 902.69 903.53 904.58 905.85 907.34 909.04 910.96 913.10

671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686

FILE NO.	ENGLISH	DESIGN TEAM SNYDER & ASSOCIATES, INC.	JASPER COUNTY	PROJECT NUMBER BRFN-014-4(67)-39-50	SHEET NUMBER D.1

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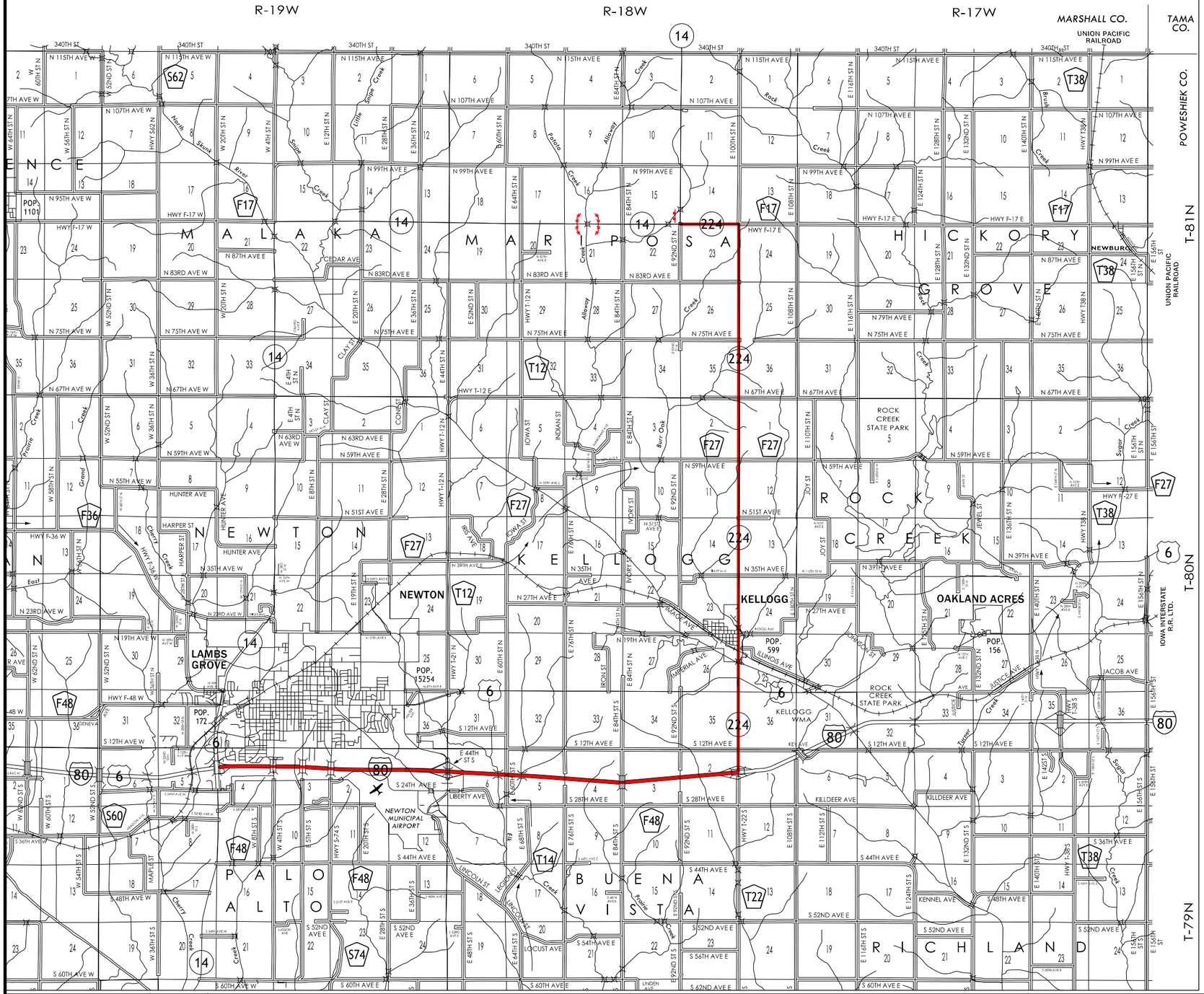
108-23A
08-01-08

TRAFFIC CONTROL PLAN

1. Iowa 14 will be closed to traffic during construction. Traffic will follow the detour shown on Sheet J.2.

2. Access to individual properties shall be maintained at all times.



N

0 5000 FEET

LEGEND

- DETOUR ROUTE
- HAZARD CLOSURE
- ROAD CLOSURE

FILE NO.	ENGLISH	DESIGN TEAM **SNYDER & ASSOCIATES, INC.**	**JASPER** COUNTY	PROJECT NUMBER **BRFN-014-4(67)-39-50**	SHEET NUMBER **J.2**

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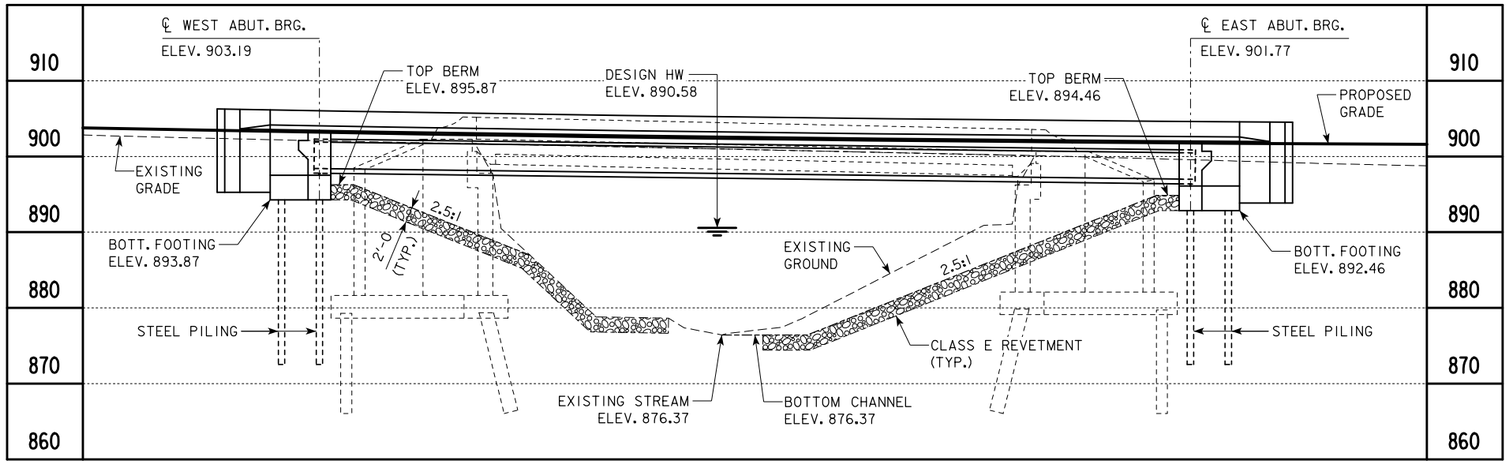
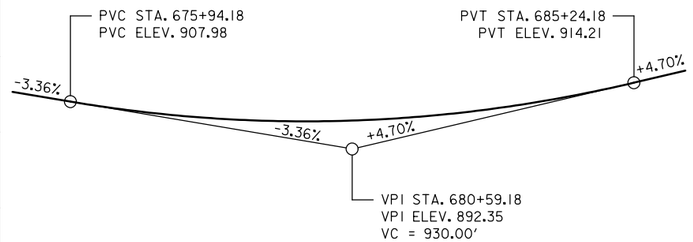
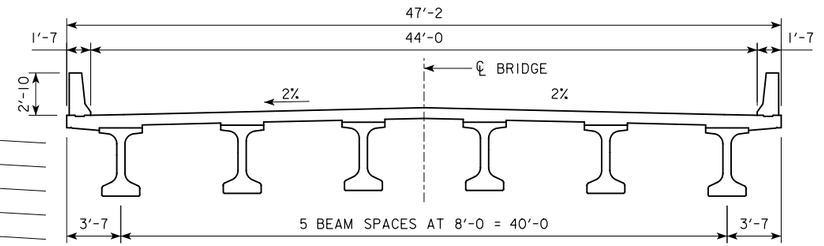


LONGITUDINAL SECTION ALONG ℄ ROADWAY

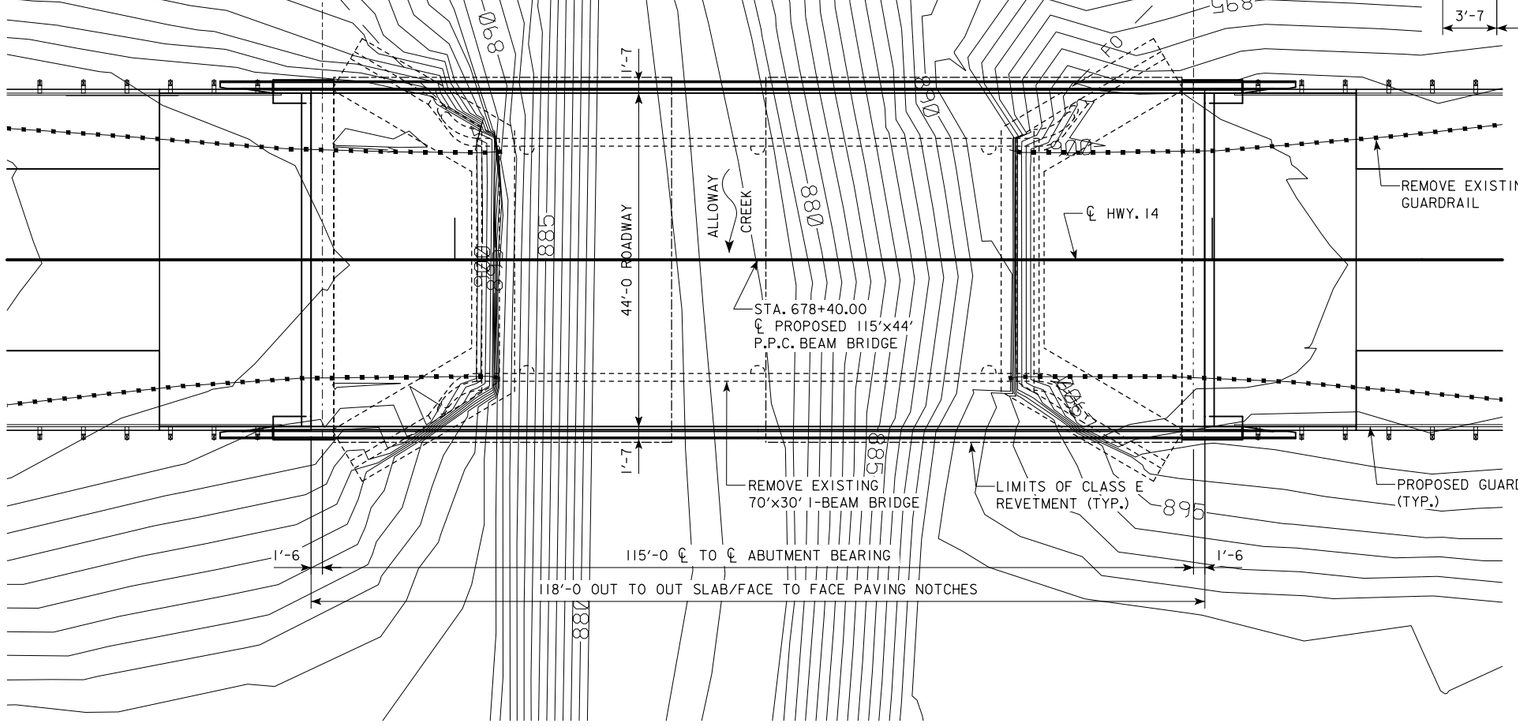
CONTROL POINT 4: NORTHING 7771998.22 EASTING 19464826.27 ELEVATION 971.98
DESCRIPTION: SET FENO MONUMENT_STAMPED IOWA DEPT OF TRANS SURVEY MARKER_
SET NEAR SHOULDER N. OF IA HWY 14,_.5' BELOW GROUND._.28' N. OF HWY 14,_.86'S.
OF FENCE_76' NW MILE MARKER 85 SIGN_136' E TOP INLET CONC PIPE.



PROPOSED PROFILE GRADE



TYPICAL SECTION
(BTD BEAMS)



SITUATION PLAN

HYDRAULIC DATA

DRAINAGE AREA = 12.20 SQ. MI.
STREAM SLOPE = 12.12 FT./MI.

DESIGN DISCHARGE, Q_{50} = 3,840 CFS
STAGE = 890.58 FT.
REGULATORY LOW BEAM = 896.52 FT.
BACKWATER = 0.21 FT.
AVG. BRIDGE VELOCITY = 4.88 FPS

DISCHARGE, Q_{100} = 4,630 CFS
STAGE = 890.91 FT.
OPERATIONAL LOW BEAM = 895.97 FT.
BACKWATER = 0.35 FT.

LOCATION

IOWA 14 BRIDGE OVER
ALLOWAY CREEK
1.6 MILES WEST OF IOWA 224
T-81N R-18W
SECTION 16
JASPER COUNTY
LATITUDE 41.819744°
LONGITUDE -92.953579°

UTILITIES LEGEND

FO - FIBER OPTIC - UNKNOWN
W - WATER - UNKNOWN

N

0 ENGLISH 20
SCALE IN FEET

DESIGN FOR 0° SKEW

115' x 44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

115'-0 SINGLE SPAN

SITUATION PLAN

STA. 678+40.00 OCTOBER 2019

JASPER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

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

SHUCK-BRITSON

DESIGN TEAM CJC/CLS	S.B.I. NO. 119.1213.01C	JASPER COUNTY	PROJECT NUMBER BRFN-014-4(67)--39-50	SHEET NUMBER V.1

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