8:38:49 AM

3/9/2021

mbenne2



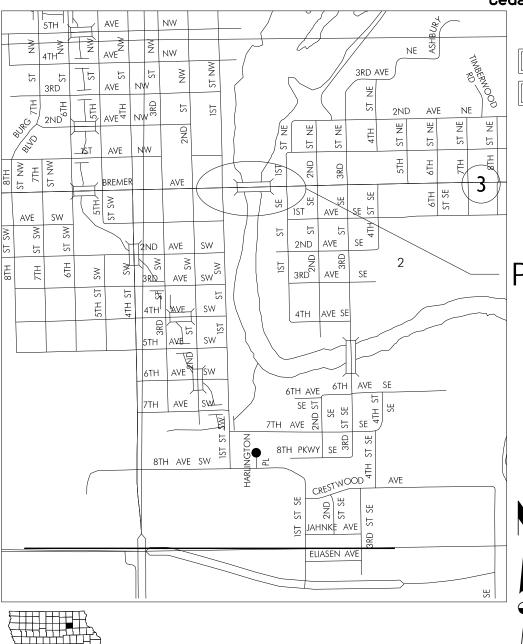
Highway Division

PRIMARY ROAD SYSTEM

Bridges and Approaches-PPCB

Cedar River 3.7 mi E of US 218 in Waverly

SCALES: As Noted



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

1-800-292-8989

PROJECT IDENTIFICATION NUMBER 18-09-003-010 PROJECT NUMBER BRF-003-6(69)--38-09 R.O.W. PROJECT NUMBER NH\$N-003-6(70)--2R-09

		INDEX OF SHEETS
	No.	DESCRIPTION
A	A.1 A.2 - 11 A.12 - 14 A.15	Title Sheets Title Sheet Project Concept Design Criteria Field Exam Ouestions
В	Sheets B.1	Typical Cross Sections and Details Typical Cross Sections and Details
D	* D.1 * D.2 * D.3	Mainline Plan and Profile Sheets Plan & Profile Legend & Symbol Information Sheet IA 3 Plan and Profile IA 3 Plan 50 scale
G	Sheets G.1 - 3	Survey Sheets Reference Ties and Bench Marks
V	Sheets V.1	Bridge and Culvert Situation Plans Bridge and Culvert Situation Plans * Color Plan Sheets

REVISIONS

PROJECT LOCATION

D3 PLAN - Date: 5/14/2021 D5 PLAN - Date: 9/17/2021 D4 PLAN - Date: 620/2023 B3 PLAN - Date: 8/01/2023

Subject to change by final design.

D2 PLAN - Date: 3/10/2021

DESIGN DATA URBAN 2023 AADT <u>13,600</u> V.P.D. 2043 AADT <u>15,700</u> V.P.D. 2043 DHV <u>1,620</u> V.P.H. TRUCKS __3% / 4%__ % Total Design ESALs

BREMER COUNTY DESIGN TEAM Strum \ Bennett

PROJECT NUMBER

BRF-003-6(69)--38-09

SHEET NUMBER A.1

IOWA DEPARTMENT OF TRANSPORTATION

TO OFFICE: District 2 **DATE:** July 20, 2020

ATTENTION: E. Jon Ranney **PROJECT:** Bremer County

BRF-003-6(69)--38-09

FROM: John E. Bartholomew PIN: 18-09-003-010

BUREAU: Design

SUBJECT: Project Concept Statement; (Final, D0)

This project involves the replacement of the IA 3 bridge (Maint No. 0921.4S003) over the Cedar River, 3.7 miles east of U.S. 218 in Waverly.

A concept review was held on June 1, 2020. This meeting was held online through Microsoft Teams. No site visit was conducted. Those present included Jon Ranney, Nick Humpal, Roy Gelhaus and Tracy Meise from the District 2 Office; Patricia Schwarz and Dave Claman from the Bridges and Structures Bureau; Terri Abbett, Brennan Dolan, Emily Perrott and Brandon Walls from the Location and Environment Bureau; Mike Cherry, James Bronner and Bill Werger from the City of Waverly; and John Bartholomew, Kevin Patel, Hollie Richey and Mike Ross from the Design Bureau.

The two alternatives considered were:

- 1. Remove and replace the existing continuous welded girder bridge with a 352 ft. x 54 ft. pretensioned prestressed concrete beam bridge, utilizing an off-site detour
- 2. Remove and replace the existing continuous welded girder bridge with a 352 ft. x 55.5 ft. pretensioned prestressed concrete beam bridge, using staged construction.

Alternative 1 is the preferred alternative due to minimized construction duration, simplified construction, lower costs, and traffic safety increased during construction along with worker safety (see attached concept for details). The preliminary estimated project cost is \$6,709,900. Additional right of way may be required. Traffic will be maintained by off-site detour.

Alternative 2 was discussed and dismissed due to site constraints, added cost, and increased construction duration of approximately one year. Additionally, the City has concerns with staged bridge construction feasibility and impacts to adjacent area traffic and businesses.

The Draft Project Concept Statement was sent out for review and comment with concerns to be resolved by Tuesday, July 14, 2020. Comments received during the review period have been considered and resolved.

This project is recommended for construction in FY 2023. The Bridges and Structures Bureau will coordinate plan preparation with assistance from the Design Bureau.

JEB:hsr Attach. cc:

P. Schwarz

PROJECT NUMBER

C. Purcell M. J. Kennerly K. D. Nicholson S. J. Megivern J. S. Nelson B. Walls M. A. Swenson R. A. Younie M. Nop S. Majors K. Brink D. L. Newell J. W. Laaser-Webb W. A. Sorenson D. E. Sprengeler E. C. Wright M. E. Ross A. A. Welch N. M. Miller C. C. Poole B. Hofer B. E. Azeltine T. D. Crouch S. J. Gent S. Anderson D. Stokes J. Selmer K. K. Patel S. Godbold J. Vortherms D. R. Claman J. Hauber A. Abu-Hawash K. Olson M. E. Khoda S. Neubauer T. Abbett R. Gelhaus B. Dolan P. Hjelmstad N. Humpal T. Meise K. Billhorn M. K. Solberg R. Loecher

FHWA

BRF-003-6(69)--38-09

SHELETETNUNUBAERER A.2

FINAL PROJECT CONCEPT STATEMENT

IA 3 Bridge over the Cedar River, 3.7 miles east of U.S. 218 in Waverly.

Bremer County BRF-003-6(69)--38-09 PIN: 18-09-003-010 Maint. No. 0921.4S003 FHWA No. 15570

Highway Division Design Bureau

John Bartholomew, P.E. 515-239-1540

July 20, 2020

I. STUDY AREA

A. <u>Project Description</u>

This project involves the replacement of the IA 3 bridge (Maint. No. 0921.4S003) over the Cedar River, 3.7 miles east of U.S. 218 in Waverly.

The two alternatives considered were:

- 1. Remove and replace the existing continuous welded girder bridge with a 352 ft. x 54 ft. pretensioned prestressed concrete beam bridge, utilizing an off-site detour
- 2. Remove and replace the existing continuous welded girder bridge with a 352 ft. x 55.5 ft. pretensioned prestressed concrete beam bridge, using staged construction.

Alternative 1 is the preferred alternative due to minimized construction duration, simplified construction, lower costs, and traffic safety increased during construction along with worker safety. The preliminary estimated project cost is \$6,709,900.

Alternative 2 was discussed and dismissed due to site constraints, added cost, and increased construction duration of approximately one year. Additionally, the City has concerns with staged bridge construction feasibility and impacts to adjacent area traffic and businesses.

Need for Project

The existing bridge is a 370 ft. x 48 ft. steel beam bridge built in 1950 carrying Iowa 3 over the Cedar River. The bridge deck was overlaid in 1983 and was epoxy injected

Bremer County BRF-003-6(69)--38-09 PIN: 18-09-003-010

Page 2

and is near the end of its useful life. The bottom of the bridge deck has numerous spalls and hollow areas with exposed rebar and leaching transverse cracks. The deck joints are leaking and there are areas of measured section loss on the steel girders and the bridge is fatigue vulnerable. The bridge was designed for live loads below current standards. The current abutments incorporate concrete and masonry from the original bridge with an unknown design date and need replaced. Due to the extent of these deficiencies to the deck, superstructure and substructure, the bridge should be replaced instead of repaired.

Looking south (this photo taken from SIIMS site, dated 2014)



The following photos were taken June 2020







Looking east along IA 3 from west side of bridge Looking west along IA 3 from east side of bridge

Bremer County

BRF-003-6(69)--38-09 PIN: 18-09-003-010

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Looking northeast from the south side of bridge



Looking west toward the bridge



Looking east from the east end of the bridge

Present Facility

The existing structure is a 370 ft. x 48 ft. continuous welded girder bridge with 8 ft. sidewalks on each side, constructed in 1950.

IA 3 in the project area is 67 ft. wide PCC pavement with curb and gutter, constructed in 2017. The west side of the bridge is comprised of a right turn lane (westbound to northbound), left turn lane (westbound to southbound), west and east bound thru lane with a shoulder on the south side of the roadway. The east side of the bridge is comprised of a left turn lane (eastbound to northbound), east and west thru lanes and on-street parking lanes.

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D. <u>Traffic Estimates</u>

The 2023 construction year and 2043 design year average daily traffic estimates are 13,600 ADT with 3% trucks and 15,700 ADT with 4% trucks, respectively.

E. Sufficiency Ratings

IA 3 is classified as an 'Area Development' route and is a maintenance service level "B" roadway. The federal bridge sufficiency rating is 43.6.

F. Access Control

Access rights will not be acquired for this project.

G. Crash History

During the five-year study period from January 1, 2015 through December 31, 2019, there were 10 crashes including, 1 suspected minor injury crash, 1 possible/unknown injury crash, and 8 personal property crashes.

II. PROJECT CONCEPT

A. <u>Feasible Alternatives</u>

Alternative #1 - Replace with a Pretensioned prestressed concrete beam bridge using off-site detour.

The existing 370 ft. x 48 ft., continuous welded girder bridge will be replaced with a 3 span, 352 ft. x 54 ft., pretensioned prestressed concrete beam bridge, with a 10 ft. sidewalk on the north side of the bridge and an 8 ft. sidewalk along the south side.

The typical cross section adjacent to the bridge on the east side will consist of a 38 ft. roadway (14 ft. left turn lane and two 12 ft. driving lanes) with on street parking lanes on the north and south sides of the road, along with curb and gutter resulting in a total width of 67 ft. The typical cross section adjacent to the bridge on the west side consists of 67 ft. of pavement from back of curb to back of curb with west and east bound thru lanes, a left turn lane and a right turn lane (westbound to northbound), and a shoulder on the south side of the roadway.

Bremer County BRF-003-6(69)--38-09 PIN: 18-09-003-010

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The existing grade will need to be raised a minimum of 1 ft. near the center of the bridge which will transition through the bridge and approaches. The grade raise will transition back to existing grade by the end of the approaches. New bridge approaches will be constructed. In order to limit the amount of new pavement reconstruction adjacent to the bridge, the length of the new bridge approach sections should be minimized to the greatest extent possible. The fence and/or wall on the four corners of the bridge will also be removed where needed and replaced to fit the new aesthetics on the bridge. Class E revetment will be placed under the bridge for slope protection.

Apply erosion control and urban 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.

Bridge Items	Estimated Costs
New Bridge	\$ 4,049,000
	, ,
Bridge Removal	375,000
Cofferdam	50,000
Revetment	50,000
Aesthetics - 5%	226,000
Mobilization - 10%	475,000
M & C - 20%	1,045,000
Bridge Costs	\$ 6,270,000
Roadway Items	
Bridge Approaches	\$156,200
Removal of Pavement	8,300
Sidewalk and Removal	9,400
Remove and Replace Wall/Fence	8,000
Excavation Class 13 Waste	1,000
Vibration Monitoring	20,000
Seeding and Fertilizing	1,000
Erosion Control	50,000
Right of Way	10,000
Traffic Control - 5%	22,000
Mobilization - 5%	22,000
M & C - 30%	132,000
Roadway costs	\$ 439,900
Project Total	\$6,709,900

Bremer County BRF-003-6(69)--38-09 PIN: 18-09-003-010

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Alternative #2 - Replace with a pretensioned prestressed concrete beam bridge using staged construction.

The existing 370 ft. x 48 ft., continuous welded girder bridge will be replaced with a 3 span, 352 ft. x 55.5 ft., pretensioned prestressed concrete beam bridge, with two 8 ft. sidewalks.

This alternative was discussed and dismissed. The staged option is not desirable due to site constraints, added cost, and increased construction duration of approximately one year. Additionally, the City has concerns with staged bridge construction feasibility and impacts to adjacent area traffic and businesses.

B. <u>Detour Analysis</u>

IA 3 will be closed and an off-site detour will be utilized. It is anticipated the detour will be in place for 200 working days, which is approximately 280 calendar days. The detour would follow 10th Ave. SW east to Cedar River Parkway east to IA 3. The cost for city road maintenance will be \$84,600 as calculated by the Gas Tax Method. Detour signing costs will be \$10,000.

C. Recommendations

It is recommended that the present structure be removed and replaced, as described in Alternative No. 1.

D. Construction Sequence

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

E. ADA Accommodations

There is a shared use path adjacent to IA 3; therefore, ADA accommodations are planned in conjunction with this project.

Bremer County BRF-003-6(69)--38-09 PIN: 18-09-003-010

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F. Special Considerations

This will not be a traffic critical project.

The ABC Rating Score of 21 is less than the first stage filter threshold of 50, therefore this bridge will not undergo further ABC evaluation.

Additional survey limits were discussed at a meeting held on May 3, 2019 and have been obtained accordingly.

Right of Way may be required for this project.

During the Concept Review Meeting, the City of Waverly requested a 10 ft. sidewalk along the north side of the proposed bridge along with an 8 ft. observation deck. Aesthetic treatments comparable to the new Cedar River Parkway bridge were requested as well. Decorative railing and fencing as well as form liner or aesthetic treatment to concrete barrier rail were noted as options by the City. Also requested were flood lighting to illuminate the dam and the river, street lighting and enhancements to the southwest embankment for better trail accommodation.

This project will require both a Predesign and Preconstruction Agreement.

The east abutment of the bridge adjoins the East Bremer Avenue Commercial Historic District (09-00975), as such Iowa DOT will be using our vibration monitoring Special Provision to ensure no damage to these properties is realized.

The Location and Environment Bureau has reviewed this project and has determined that a Section 404 Permit will be required. It is expected that the work will be covered by Nationwide Permit 14. At this time wetland and stream mitigation are not anticipated.

The following properties/facilities may be subject to Section 4(f) and require further review:

- A shared use path will be required as part of this project. The existing 8 ft. sidewalk on each side of the bridge will be replaced, 10 ft. on the north side of the bridge and 8 ft. on the south side.
- Kohlmann Park is located in the northwest corner of the project; it may be a 4(f) property and therefore should be avoided if possible.
- Waverly Rolling Prairie Trail runs along the west side of the project.
- The Cedar River is a designated paddling route by the Iowa DNR.

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G. Program Status

This project is listed in the 2020-2024 Iowa Transportation Improvement Program, with \$6,000,000 programmed for replacement in FY 2023. Costs for this project may be eligible for bridge replacement funds. A schedule of events will be developed following approval of the Project Concept.

JEB:hsr



Bremer County

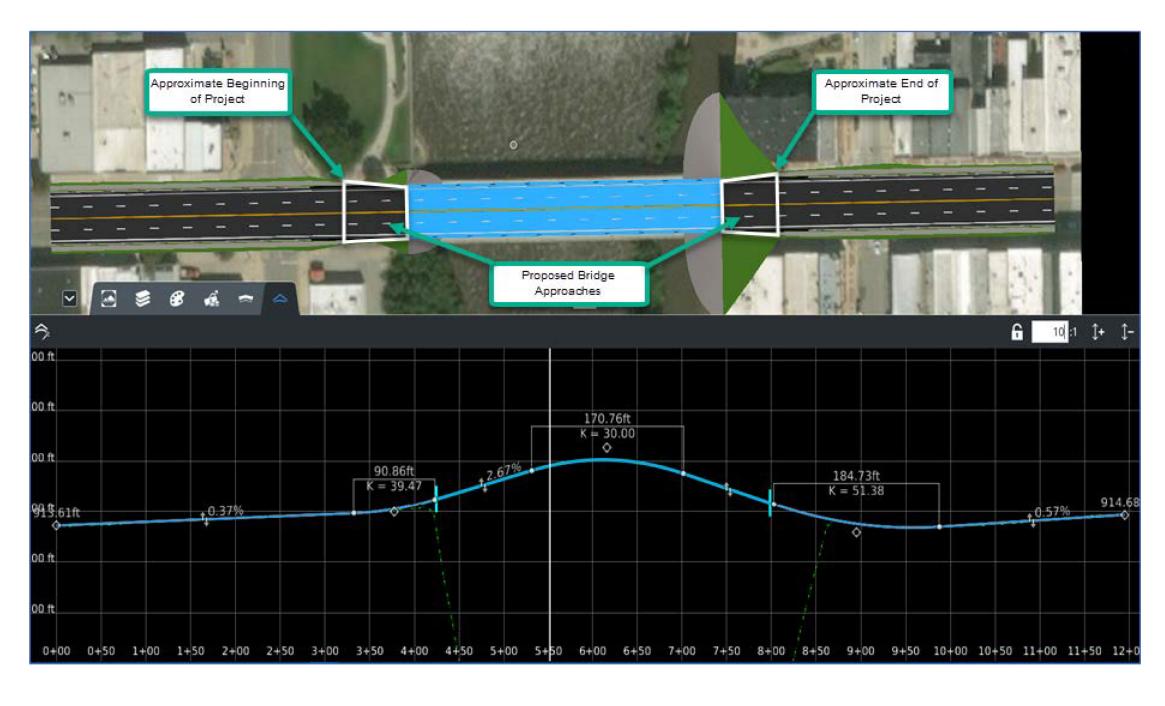
PIN: 18-09-003-010

Project Number: BRF-003-6(69)--38-09

Location: Cedar River 3.7 mi E of US 218 in Waverly

Project Directory: 0900301018

FHWA No.: 15570 Maint. No.: 0921.4S003



BRF-003-6(69)--38-09

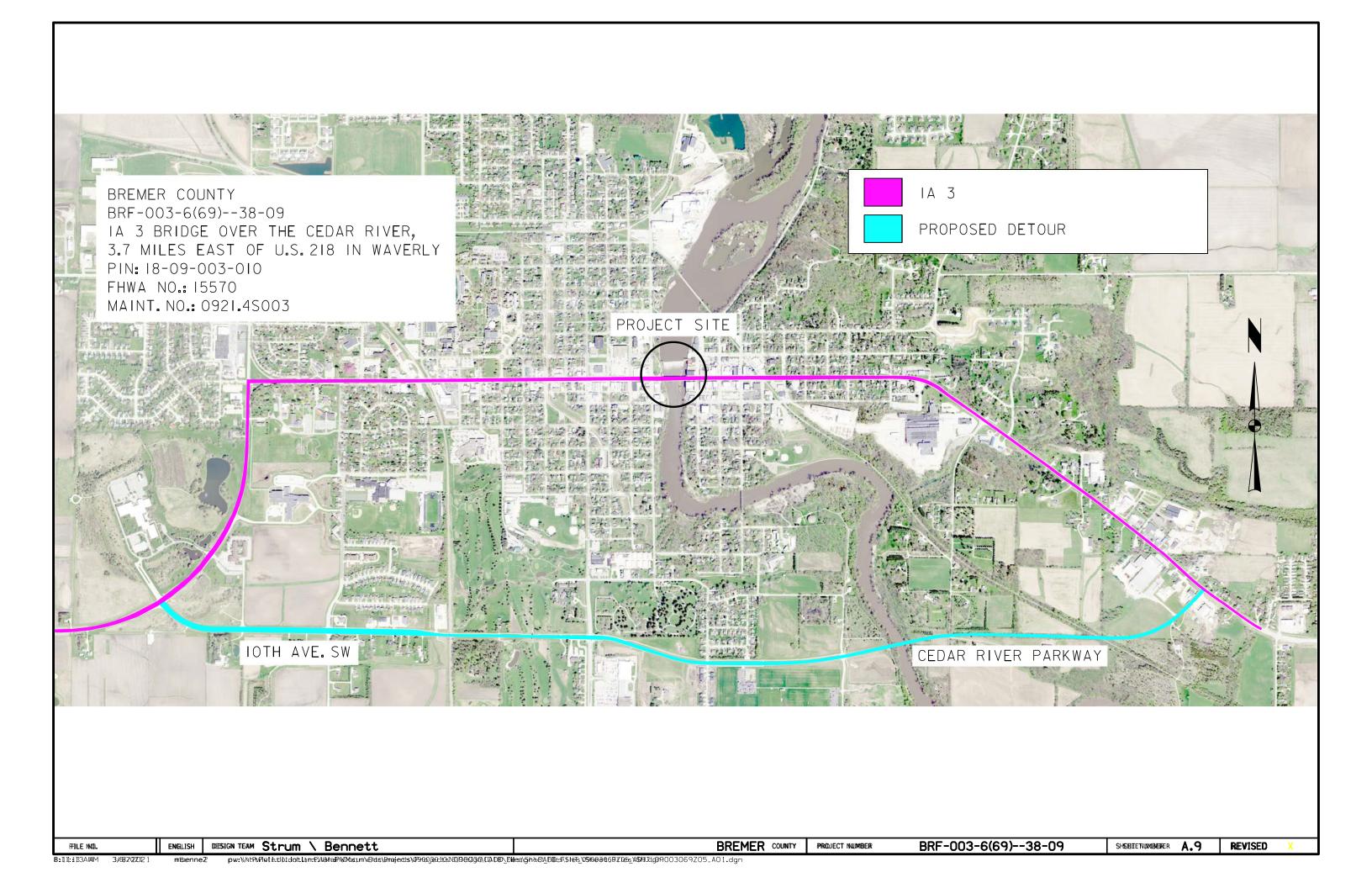
SHEETETNUMBERER A.8

REVISED

BREMER COUNTY

PROJECT NUMBER

DESIGN TEAM Strum \ Bennett



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WAVERLY
Mike Cherry
Public Works Director & City Engineer
(Water, Sanitary Sewer and Storm Sewer)
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(319) 352-9065
mike@ci.waverly.ia.us

Bridge Bureau Attachment for Concept Statement

Date: Revised June 11, 2020

By: P. Schwarz

Location: IA 3 over Cedar River

County: Bremer

Project No.: BRF-003-6(69)- -38-09

Pin No.: 18-09-003-010

1. Regulatory/Coordination

- a. Iowa DNR Flood Plain permit = Yes
- o. Iowa DNR Sovereign Lands permit = No
- . Local Record of Coordination = No
- d. Flood Insurance Study = Yes. LOMR dated October 24, 2014.
- e. Drainage District = No
- 2. Hydrologic/Hydraulic Analysis/RIDB Dataset
 - a. Design discharges determined = Yes, but if updated gage data can be obtained it is desired to include the more current gage data.
 - b. Hydraulic analysis done = Partial (FIS HEC-RAS Model). Modeling to be updated for the D2/D3 using survey and design roadway profile.
 - c. Riverine Infrastructure Database = Yes (DA=1560 sq.mi. > 10 sq.mi.) An RIDB dataset is complete for the existing condition.
- 3. Structure/Roadway Layout Considerations
 - a. Recommend a 1-foot roadway profile grade raise near the center bridge that can be obtained within the site constraints.
 - b. The bridge size shall be verified after survey and hydraulic modeling is finalized.
 - c. The Concept Team proposes a 10' sidewalk for the north side in lieu of matching the existing 8' width. The design shall meet trail requirements.
- 4. Special construction issues
 - a. Shallow bedrock may require consideration of wall piers with spread footing on rock. Three-foot wide wall piers were assumed in the concept hydraulic model.
 - b. Drilled shaft foundations may be considered by the final designer.
 - c. It is recommended that the proposed abutments be located on the river side of the existing high concrete abutments to minimize the need for construction retainment and site constraint issues.
 - d. The proposed bridge length will need to meet no-rise criteria, and therefore, the proposed length of bridge may not provide as much horizontal clearance to existing abutment foundations as would be desirable. Also, there is potential for some footing conflicts.
 - e. Per BLE input, a pre-construction building survey and vibration monitoring during construction will be required.
 - f. Per City input, the contractor's working room and material storage areas will be severely limited due to adjacent buildings and other site constraints, making a staged option less feasible.
 - g. Per DOT District input, winter work to construct the piers during low water conditions may be desired.

~ 1 ~

FILE NO. ENGLISH DESIGN TEAM Strum \ Bennett BREMER COUNTY PROJECT NUMBER BRF-003-6(69)--38-09 SHEDEETNUMBER A.10 REVISED X

Concept Statement - Bridge Office Attachment

- h. There are several utilities that will need accommodation across the bridge. The need for utility conduits within barrier rails shall be coordinated during final design. A note shall be placed on the TSL to alert the final designer.
- 5. Special survey = Yes. Survey should cover the May 3, 2019, meeting discussions, and normal project survey to the extent that it can be safely collected.
- Aesthetic enhancements = yes. The City requests DOT coordination on the fencing, rail, and other aspects of aesthetics; to ensure enhancement details will be similar to the new City bridge. An observation deck on the north side may be incorporated, if desired by the City. Initial coordination will be through Nick Humpal of the District.
- 7. Other
 - a. Special design PPCB beam lengths may be necessary.
- Per the Concept Team review meeting with the City of Waverly on June 1, 2020
 - a. It is the Concept Team and City proposal to close the bridge during construction and utilize a detour on 10th Ave SW. The staged option is not proposed due to site constraints, added cost, and increased construction duration (est. by the District to be about a 1-year increase). In addition, the City has concerns with staged bridge construction feasibility and the impacts to adjacent area traffic.
 - b. Flood lights on the bridge to illuminate the dam may be desired, anticipated at City cost.
 - c. A viewing area at the middle span of the bridge may be desired, anticipated at City cost.
 - d. At the SW corner of the bridge, some grading work not directly associated with the bridge project may be desired for plan inclusion (grading similar to the NW corner). Anticipated to be at City cost.

Roadway				
PIN Number	18-09-003-010		Submittal Date	
Proiect Number	BRF-003-6(69)38-09			Approval Dat
District	District 2	Assistant District Engineer	Nick Humpal	Approvariba
County	BREMER	/toolotant blothet Engineer	Oř	
Route	IA 3	Office Director		
_ocation	Cedar River 3.7 mi E of US 218			
Vork Type	Bridge replacement			
Segment Manager	Jason Holst			
Designer	Strum/Bennett			
Design Manual Section 1C-1 Last Updated: 04-29-19		Urban Two-Lane Roadw	ays (Urban Arterials)	
	ın Element	Preferred	Acceptable Criteria	Project Values
Design speed (mph)		The anticipated posted speed limit	30	25
Maximum superelevation rate (Ref	er to Section 2A-2)	4%	6%	N/A
Design lane width (ft)	,	12	11	12
Full depth paved width (ft)		Design lane width + curb and gutter unit or 14 feet for roadways with shoulders		лаtch design lane v
Right turn lane (ft)		12	10 10 ft + median 10 11	
	With raised or painted median	12 ft + median		match existing match existing
eft turn lane (ft)	With depressed median	12		N/A
wo-way left turn lane				14
Parking lane width (ft)			7	match existing
· · · · · · · · · · · · · · · · · · ·	Through lanes		1.5% minimum. 2% maximum	match existing
avement cross-slope			·	match existing
on tangent sections)	ross-slope sections) Through lanes Auxiliary and turn lanes Crown break at centerline Shoulders Though lanes 2% 1.5% minimum, 2% maximum 3% 3% maximum 4% Shoulder cross-slope cannot be less than the adjacent lane, 6% max for paved or granular shoulders, 8% max for earth shoulders	4%		
Shoulder cross-slope			Shoulder cross-slope cannot be less than the adjacent lane, 6%	2.5%
on tangent sections)	Curb and gutter units	Match pavement cross-slone		2.5%
	Parking lanes	1% greater than pavement cross-slope	6% maximum	2.5%
Curb type (See Section 3C-2)	Design speed ≤ 45 mph	6-inch standard	any shape	6" standard
· · · · · · · · · · · · · · · · · · ·	Adjacent to shoulder	10:1 for 4' then 6:1	3:1	N/A
Foreslope For fill areas greater than 40 ft, contact the Soils Design Section	Beyond standard ditch depth and design clear zone	3.5:1	3:1	N/A
or assistance)	Curbed roadways	2%	not steeper than 3:1	match existing
Backslope (For cut areas greater the Section for assistance with backslo	han 25 feet, contact the Soils Design	3:1	2.5:1	Variable
	w/ drainage structures	8:1	6:1	N/A
raverse Slopes	w/o drainage structures	10:1	6:1	N/A
Ditches (See Section 3G-1)	Outside ditch (depth x width) (ft)	5 x 10		N/A
	Bridge length ≤ 200 ft	design lane widths + effective shoulder widths (curbed or uncurbed) or design lane width + 3 ft each side (curbed)	design lane widths + effective shoulder widths or curb-to-curb width in curb and gutter section**	N/A
3ridge width—new*	Bridge length > 200 ft	which ever is greater design lane widths + effective shoulder widths (curbed or uncurbed) or design lane width + 3 ft each side (curbed) which ever is greater	design lane widths + 4 ft offset each side for roadways with shoulders or curb-to-curb width in curb and gutter section**	N/A
Bridge width—existing*		design lane widths + no less than 2 ft left and right	design lane widths + 2 ft left and right	48
ertical clearance (ft) (above	Over primary	16.5	16	N/A
ertical clearance (π) (above anes, shoulders and 25 feet left	Over non-primary	16.5 at interchange locations, 15 at all other locations	14	N/A
nd right of the center of railroad	Over railroad	23.3	23.3	N/A
acks)	Sign trusses and pedestrian bridges	17.5	17	N/A
Structural Capacity		Contact Office of Bridges and Structures	Contact Office of Bridges and Structures	14//
evel of Service		C	D	

Design year ADT =	15	700							
Design Manual Section 1C-1 Last Updated: 04-29-19		Effective S	Shoulder Width and Type for	r Two-Lane	Highways				
Preferred (values shown in feet)	Acceptable (values shown in feet)					Project Values			
	Rural Roadways	Urban Roadways		Rural Roadways	Urban Roadways	Project values			
Turn lanes with shoulders	6	6	Turn lanes with shoulders	6	0	match existing			
Turn lanes with curbs	6	See Section 3C-2	Turn lanes with curbs	6	0	match existing			
	Effective Shoulder Width	Paved Width		Effective Shoulder Width	Paved Width				
Climbing Lanes	6	4	Climbing Lanes	4	0	N/A			
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							
On roadways approaching urban areas (due to increased bike traffic)	10	10	Design year ADT > 2000 vpd	8	0*	match existing			
On all curves with a superelevation rate of 7.0% or greater	10	10	1						
On roadways with design year ADT > 5000	10	6	Danisma ADT hart	6	6 0*				
On all other NHS	10	6	Design year ADT between 400 - 2000 vpd	0					
On non-NHS routes with design year ADT > 3000	10	6	Design year ADT < 400 vpd	4					
On non-NHS routes with design year ADT < 3000	8	0*	Design year AD1 < 400 Vpd	4	U				
*Requires safety edge-Refer to Section <u>3C-6</u>									
Curbs should be located beyond the outer edge of the effective should	er width in rural are	eas							
Refer to Section 3C-2 for curb offsets in urban areas									
Notes:									
Notes.									

	Roadway Design S	Speed (mph) =	3	30									
Design Manual Section 10 Last Updated: 04-29-19	C-1					Design	Criteria f	or Low S	Speed Ro	adways			
			Preferred Criteria				Acceptable Criteria						
	Design Element			D	esign Speed, m	ıph			D	esign Speed, n	nph		Project Values
			25	30	35	40	45	25	30	35	40	45	Values
Stopping sight distance (f	t) (Refer to Section <u>6D-1</u>)		155	200	250	305	360	155	200	250	305	360	200
Minimum horizontal curve radius (ft) and	Method 2 superelevation and side friction distribution	e = 4% max		See Ta	able 10 in Section	on <u>2A-3</u>		-				N/A	
superelevation rate (Refer to Sections 2A-2	Method 5 superelevation and side friction distribution	e _{max} = 6%	144	231	340	485	643	144	231	340	485	643	N/A
and <u>2A-3</u>)		e _{max} = 8%						134	214	314	444	587	N/A
Minimum vertical curve le	ngth (ft) (Refer to Section 2B-1)		75	90	105	120	135	75	90	105	120	135	90
	crest vertical curves		12	19	29	44	61	12	19	29	44	61	19
Minimum rate of vertical curvature (K)		roadways without fixed- source lighting	26	37	49	64	79	26	37	49	64	79	N/A
(Refer to Section <u>2B-1</u>)	sag vertical curves	roadways with fixed- source lighting	26	37	49	64	79	14	20	27	35	44	37
Minimum gradient (%)	(Refer to Section 2B-1)		0.5			0.3% with a curb, 0.0% without a curb				0.5			
Maximum gradient (%)	(Defeate Coetion OD 4)	Urban roadways	5				_	9	8	8	7	5	
waxiiiluiii gradient (%)	(Refer to Section <u>2B-1</u>)	Rural roadways		5			_	_	-	6	6	N/A	
Clear zone			See "Preferred Clear Zone" table in Section 8A-2				See "Acceptable Clear Zone" table in Section 8A-2 16				16/14		

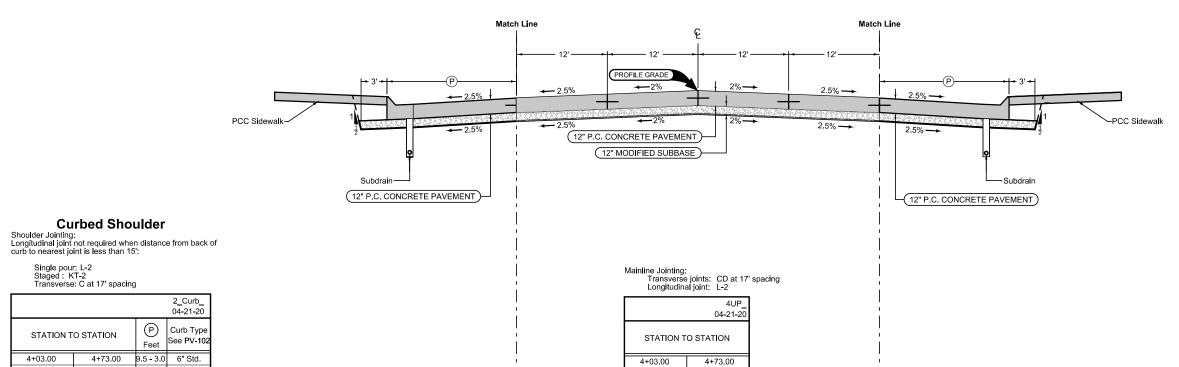
FIELD EXAM QUESTIONS: Clearing and grubbing? UNIT / AREA Note any special features not shown on plans. Do any of the utilities need to be relocated (power/telephone poles)? Permanently or temporarily? Are there any endangered species in the area? Are there any wetland impacts or any other environmental issues? Are there existing drainage problems? UAC existing sanitary sewer access? Is abandoned sanitary sewer in area? Has existing pavement been overlayed?

Height of existing curb?

Existing EF joint location?

Does proposed bridge approach need a modified design?

Should vibration monitoring be included?



8+25.00

8+95.00

Curbed Shoulder

Shoulder Jointing: Longitudinal joint not required when distance from back of curb to nearest joint is less than 15':

Single pour: L-2 Staged: KT-2 Transverse: C at 17' spacing

			2_Curb_ 04-21-20
STATION T	O STATION	P Feet	Curb Type See PV-102
4+03.00	4+73.00	9.5 - 3.0	6" Std.
8+25.00	8+95.00	3.0 - 9.5	6" Std.

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

IA 3

FILE NO. ENGLISH DESIGN TEAM Strum \ Bennett BREMER COUNTY PROJECT NUMBER BRF-003-6(69)--38-09 SHEET NUMBER B.1

8+95.00 3.0 - 9.5 6" Std.

8+25.00

4:19:25 PM

SURVEY SYMBOLS

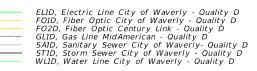
BCL, Bridge Centerline BCL, Bridge Centerline BD, Bridge Deck BD, Bridge Deck BL, Topo Breakline BL, Topo Breakline BLD, Building or Foundation BLD, Building or Foundation BLS, Bridge Low Steel BLS, Bridge Low Steel BM, Bench Mark Δ BRG. Bridge BRG, Bridge C, Centerline BL of Road -ML or SR C, Centerline BL of Road -ML or SR CON, Concrete or A/C Slab CON, Concrete or A/C Slab CP, Control Point CU, Back of Curb CU, Back of Curb DTM, Photogrammetry Elv Control Check EL1D, Electric Line Co. 1 - Quality D EL1D, Electric Line Co. 1 - Quality D ENT, Centerline BL of Entrance ENT, Centerline BL of Entrance FENO, FENO Monument FHD, Fire Hydrants FOID, Fiber Optic Co. 1 - Quality D FOID, Fiber Optic Co. 1 - Quality D FO2D, Fiber Optic Co. 2 - Quality D FO2D, Fiber Optic Co. 2 - Quality D GL1D, Gas Line Co. 1 - Quality D GL1D, Gas Line Co. 1 - Quality D GR, Ground Shot GU, Gutter In Front of Curb GU, Gutter In Front of Curb ⊙ Gv GV, Gas Valve IN, Storm Sewer Intake \boxtimes LIN, Miscellaneous Line LIN, Miscellaneous Line LUM, Luminaire MH, Utility Access -Manhole OUT, Tile Outlet PCP, Photo Control Point ΔΟ PIP, Pipe Culvert PIP, Pipe Culvert PLG, Location of General Photo PRO, Profile Shot SAID, Sanitary Sewer Co. 1- Quality D SAID, Sanitary Sewer Co. 1- Quality D SBR, Size of Bridge SI, Sign ST1D, Storm Sewer Co. 1 - Quality D ST1D, Storm Sewer Co. 1 - Quality D SWK, Sidewalk SWK, Sidewalk TL1D, Telephone Line Co. 1 - Quality D TL1D, Telephone Line Co. 1 - Quality D TOP, Top of Bridge Pier TOP, Top of Bridge Pier TSG, Traffic Signal TW. Top of Water WL1D, Water Line Co. 1 - Quality D WL1D, Water Line Co. 1 - Quality D

UTILITY LEGEND

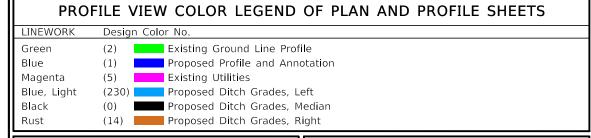
SURVEYED UTILITY OWNER SYMBOLS

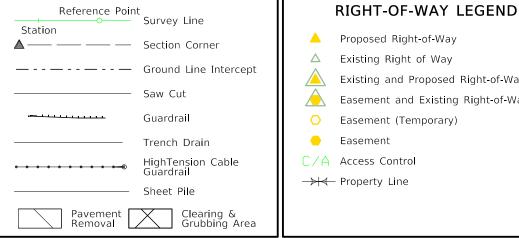
Sub-Surface Utility Mapping Quality Level is in accordance with CI/ASCE 38-02 Standard Guidelines for the Collection and Depiction of Existing Subsurface

QLA Quality Level A Highest guideline quality level QLD Quality Level D Lowest guideline quality level



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 Existing Utilities SHADING Design Color No. (9) Temporary Pavement Shading Lavender (48) Proposed Pavement Shading Gray, Light Gray, Med (80) Proposed Granular Shading Gray, Dark (112) Proposed Grade and Pave Shading "In conjunction with a paving project" (236) Grading Shading Brown, Light Tan (8) Proposed Sidewalk Shading Blue, Light (230) Proposed Sidewalk Landing Shading Pink (11) Proposed Sidewalk Ramp Shading







PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

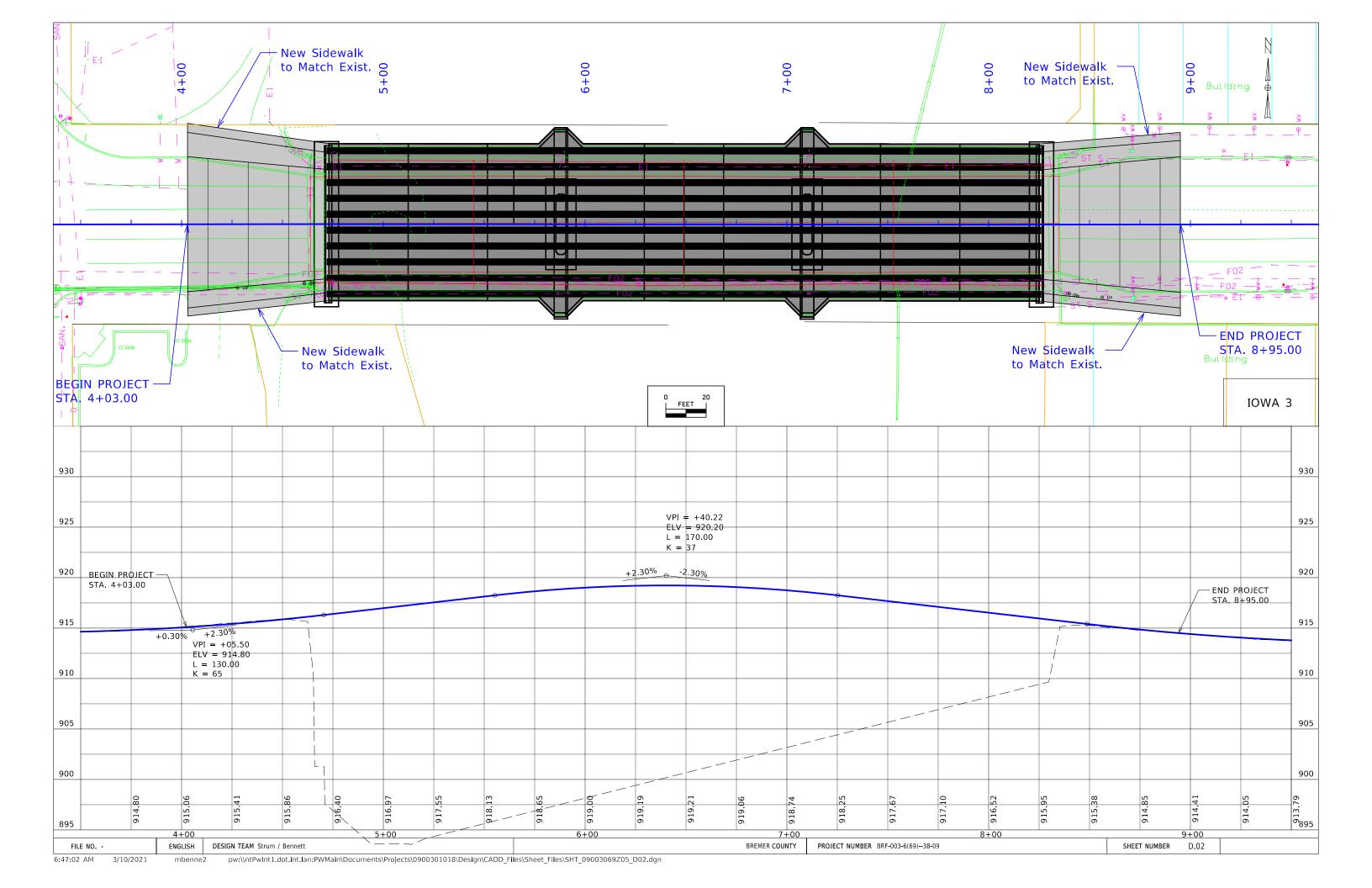
(COVERS SHEET SERIES D. E. F. & K)

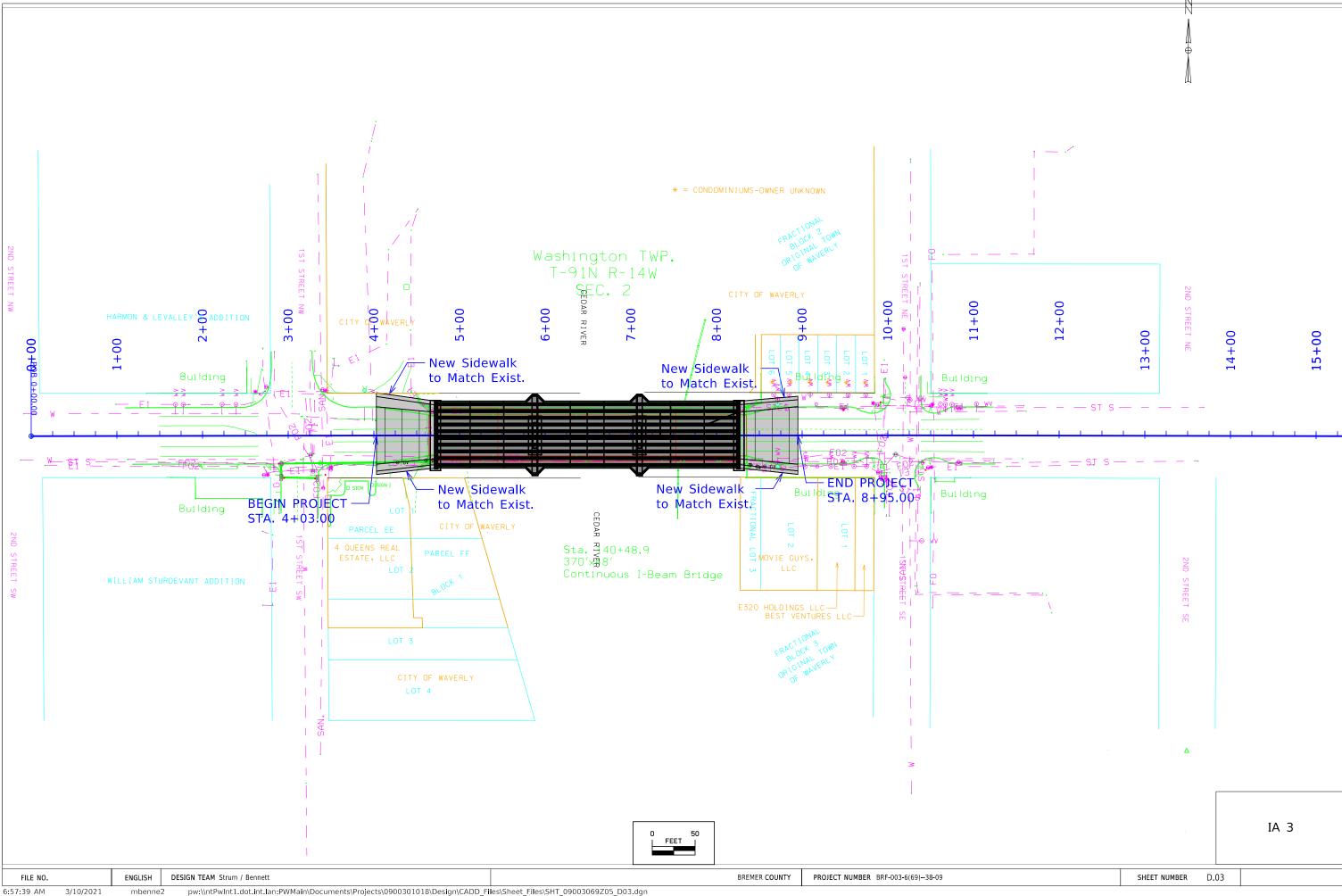
D.01

REVISED

SHEET NUMBER

PROJECT NUMBER BRF-003-6(69)--38-09 **ENGLISH** DESIGN TEAM Strum / Bennet BREMER COUNTY





Survey Information

Bremer County BRF-003-6(69)—38-09 Cedar River 3.7 mi E of us 218 in Waverly **Bridge-Unspecified** PIN 18-09-003-010 Sap-588.2

Party Personnel

Jason Page-Survey Party Chief John Hahn- Assistant Survey Party Chief

Date(s) of Survey

Begin Date 08/08/2019 End Date 03/01/2020

General Information

Measurement units for this survey are US survey feet. This survey is for proposed replacement of the IA 3 bridge over the Cedar River in Waverly. Project datum and control information is provided by Design Survey Office. This project is a Full DTM with Photo control. This survey request was for the IA 3 and 3rd St river corridors.

Vertical Control

Vertical datum for this survey is NAVD88 (Computed using Geoid12b). GRS80 Ellipsoidal Height was computed at project control Pts. CP1, CP2, B 30 and WAVERLY by conducting one concurrent six-hour static observation. Additional benchmarks were placed throughout the project using a GNSS Base-Rover setup relative to Pt. CP1. WAVERLY and Pt. CP2. Two observations with a minimum of four-hours between were collected and used in a weighted average.

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

NGS 2nd. order class 0 mark designated B 30 has a published Elev. of 936.69 Survey Elev. = 936.62

NGS 2nd. order class 0 mark designated WAVERLY has a published Elev. of 918.53 Survey Elev. = 918.46

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

BM 121 As-built Plans Project U-88(6) Elev. 944.02 = BM 505 As-built Plans Project NHSN-003-6(63)—2R-09 Elev. 942.14 BM 501 this Survey Elev. = 942.08

BM 514 As-built Plans Project NHSN-003-6(63)—2R-09 Elev. 918.77 BM 506 this Survey Elev. = 918.69

Horizontal Control

The project coordinate system for this survey is Iowa RCS Zone 5 (U.S. Survey Feet). This survey control is relative to IaRTN reference stations. IaRTN Reference Station coordinates are relative to the National Reference Station network datum: NAD83 (2011) for Epoch 2010.00. Coordinates were determined by conducting one concurrent six-hour static observation at project control Pts. CP1, CP2, B 30 and WAVERLY. Additional control points were placed throughout the project using a GNSS Base-Rover setup relative to Pt. CP1, WAVERLY and Pt. CP2. Two observations with a minimum of four-hours between were collected and used in a weighted average.

Alignment Information

The horizontal alignment for this survey is a retrace of As-built Plans Project No. NHSN-003-6(63)—2R-09. Survey stationing was equated to the plan PI at Sta. 134+00.00 and run ahead without equation throughout the survey.

Survey stationing relates to as built plan stationing as follows:

PI Sta. 134+00.00 As-built Plans Project No. NHSN-003-6(63)—2R-09 Survey PI Sta. 134+00.00

PI Sta. 138+57.90 As-built Plans Project No. NHSN-003-6(63)—2R-09 Survey PI Sta. 138+57.89

PI Sta. 142+35.88 As-built Plans Project No. NHSN-003-6(63)—2R-09 Survey PI Sta. 142+36.03

PI Sta. 144+17.46 As-built Plans Project No. NHSN-003-6(63)—2R-09 Survey PI Sta. 144+17.47

PI Sta. 157+40.86 As-built Plans Project No. NHSN-003-6(63)—2R-09 Survey PI Sta. 157+40.81

DESIGN TEAM Strum \ Bennett FILE NO. pw:\\ntPwInt1.dot.int.lan:PWMain\Documents\Projects\0900301018\Design\CADD Files\Sheet Files\SHT 09003069Z05 G01.dgn 7:13:41 AM 3/5/2021

BREMER COUNTY

BRF-003-6(69)--38-09

SHEET NUMBER G.1

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

Ia. Regional Coordinate System Zone 2

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

HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING

HORIZ. DATUM: NAD83(2011) EPOCH 2010.00

VERT. DATUM: NAVD88

Ia. Regional Coordinate System Zone 2 Project Control Marks are Bench Marks

Point Name	Northing	Easting	Elevation	Feature Code-Descriptions
CP1	8927867.402	15440475.46	913.6	FENO SET MON 175 FT NORTH OF IOWA 3 AND 135 FT EAST OF 1ST ST NW 5 FT SW OF SIDEWALK INTERSECTION
CP2	CP2 8925795.342 15442028.1 895.7		895.79	AND 32 FT WEST OF CONC FLOOD WALL FENO SET MON IN BROOKWOOD PARK 380 FT NORTH OF 6TH AVE SE AND 300 FT EAST OF 3RD ST SE STEELL TRUSS BRIDGE 45 FT SE OF S BANK CEDAR RIVER AND 44 FT WEST OF DISK GOLF BASKET AND 43 FT NW OF GRAVEL PARK DRIVE
WAVERLY	8928036.156	15441684.47	918.46	CP FD NGS SECOND ORDER CLASS 0 BM 35FT S OF CL OF 1ST AVE NE 32FT W OF CL OF 3RD ST NE PROJECTING 2IN ABOVE GROUND



- CONCEPT NOTES:
 I. I'ROADWAY PROFILE GRADE RAISE REQUESTED AT CENTER CHANNEL.

 2. EXISTING PIERS AND HIGH CONCRETE ABUTMENT
- FOUNDATIONS WERE SOCKETED INTO ROCK.

 CONCEPT BRIDGE STUB/HIGH CONCRETE ABUTMENTS
 PROPOSED INSIDE OF EXISTING ABUTMENTS FOR CONSTRUCTABILITY. THERE IS POTENTIAL FOR MINOR CONFLICTS WITH EXISTING ABUTMENT FOOTINGS. ONCE SURVEY IS OBTAINED, THE LAYOUT CAN BE OPTIMIZED.
- 3. END SPANS MAY REQUIRE NON-STANDARD BEAM LENGTHS.
- 4. WALL PIERS WITH 3' WIDTH ASSUMED.
- 5. SOILS TESTING TO ALLOW FOR THE CONSIDERATION OF DRILLED SHAFTS IS DESIRED.
- 6. THE 10' SIDEWALK ON THE NORTH SIDE IS A LIKELY FUTURE TRAIL ROUTE, AND SHALL BE DESIGNED TO MEET TRAIL
- REQUIREMENTS (RAIL/FENCE, ETC.).

 7. EXISTING ABUTMENTS ARE INTENDED TO REMAIN IN PLACE
 WITH LIMITED REMOVALS TO ACCOMMODATE APPROACH PAVEMENT. SPECIAL CONSIDERATION FOR BACKFILL BETWEEN THE PROPOSED AND EXISTING ABUTMENTS WILL BE REQUIRED. (NOTE ON TSL SHEET FOR FINAL DESIGN)

TRAFFIC ESTIMATE

200_	AADT		V.P.D.
202_	AADT		V.P.D.
202_	DHV		V.P.H.
TRUCK	S		%
TOTAL DESIG	N ESALs	_	

HYDRAULIC DATA

- DRAINAGE AREA = 1560 SQ.MI.
 REQUIRES DNR PERMIT
 BACKWATER LESS THAN I'FOR QIOO, OR
 EXISTING CONDITION BACKWATER, WHICHEVER IS LESS.
- NO RISE FOR FIS BASE FLOOD

LOCATION

IA 3 OVER CEDAR RIVER CITY OF WAVERLY, IOWA T-9IN R-I4W SECTION 2 WASHINGTON TOWNSHIP BREMER COUNTY FHWA NO. TBD
BRIDGE MAINT. NO. 0921.4S003
LATITUDE ??.123456°
LONGITUDE -??.123456°

SHEET NUMBER

JUNE 2020

CONCEPT

PRELIMINARY

CONCEPT FOR O° SKEW

B52'-O x 54'-O PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE WITH 10'&8' SDWKS

(BTC BEAM TYPE) 122'-0 INTERIOR SPAN 115'-0 END SPANS

SITUATION PLAN

BREMER COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION OF_?__ FILE NO.____? DESIGN NO. ?

6/4/2020 8:50:48 AM

pschwar