

Bridges and Approaches-PPCB
BRF-003-6(69)--38-09

BREMER CO.

LETTING DATE
10/17/2023



Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM
BREMER COUNTY
Bridges and Approaches-PPCB

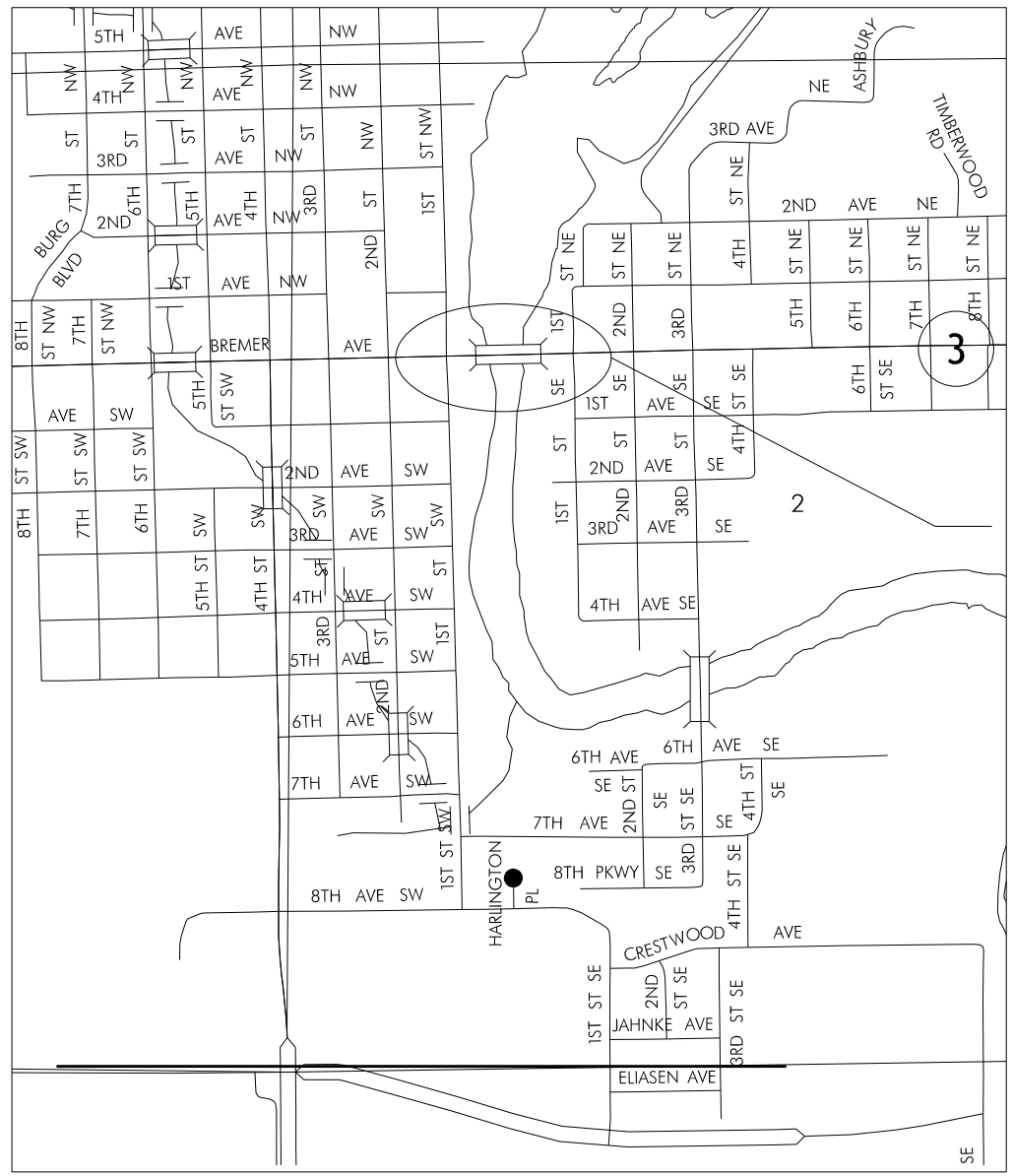
Cedar River 3.7 mi E of US 218 in Waverly

REVISIONS

TOTAL

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

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



SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.
Value Engineering Saves. Refer to Article 1105.14 of the Specifications.



PROJECT LOCATION

DESIGN DATA URBAN			
2023	AADT	13,600	V.P.D.
2043	AADT	15,700	V.P.D.
2043	DHV	1,620	V.P.H.
	TRUCKS	3% / 4%	%
	Total Design ESALs		

- D3 PLAN - Date: 5/14/2021
- D5 PLAN - Date: 9/17/2021
- D4 PLAN - Date: 6/20/2023
- B3 PLAN - Date: 8/01/2023

PRELIMINARY PLANS

Subject to change by final design.

D2 PLAN - Date: 3/10/2021

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

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)



I. STUDY AREA

A. Project Description

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.

B. 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

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

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	<u>Estimated Costs</u>
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%	<u>1,045,000</u>
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%	<u>132,000</u>
Roadway costs	\$ 439,900
Project Total	\$6,709,900

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. Detour Analysis

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.

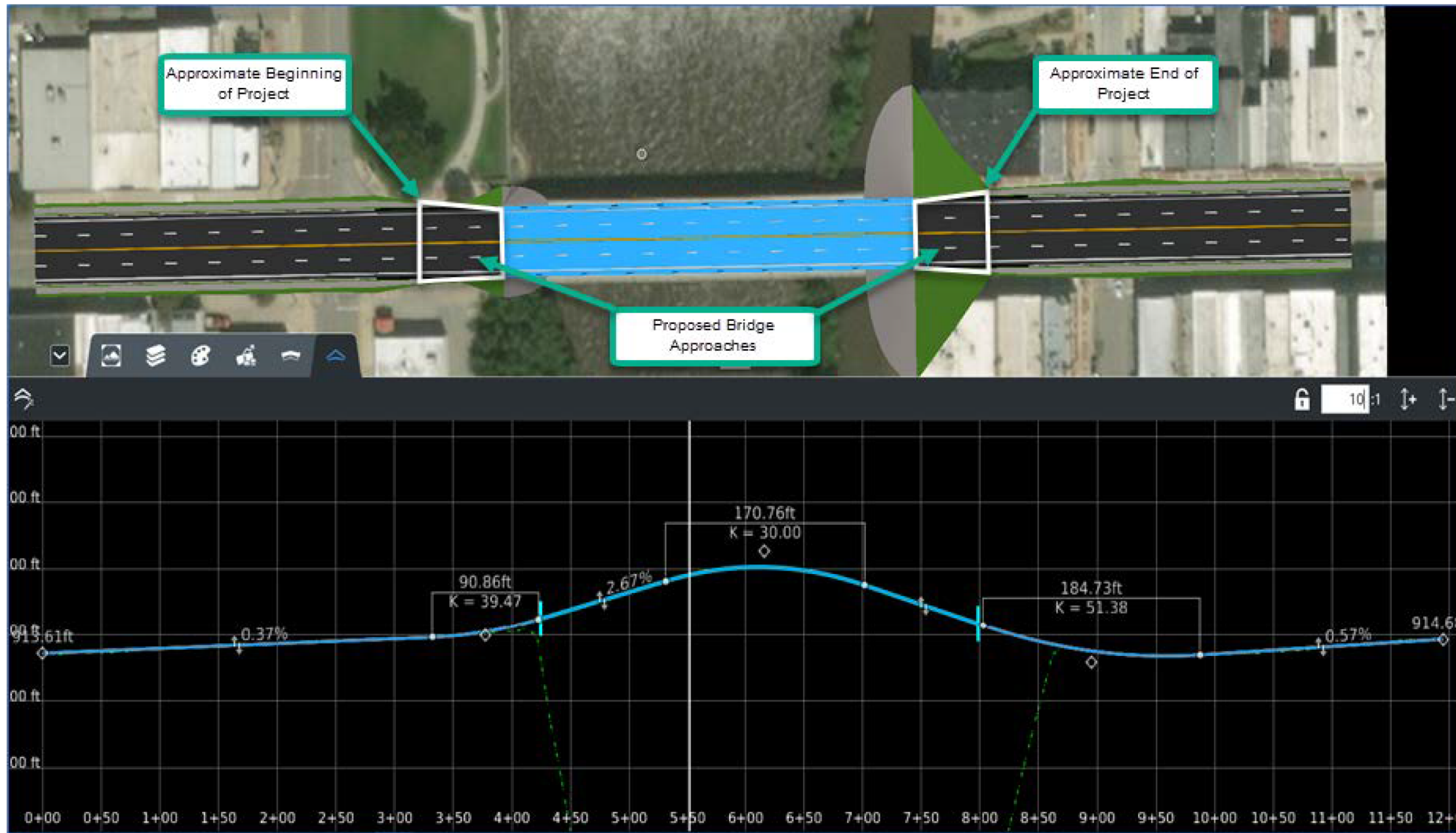
D. Construction Sequence

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
 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



BREMER COUNTY
BRF-003-6(69)--38-09
IA 3 BRIDGE OVER THE CEDAR RIVER,
3.7 MILES EAST OF U.S. 218 IN WAVERLY
PIN: 18-09-003-010
FHWA NO.: 15570
MAINT. NO.: 0921.4S003

 IA 3
 PROPOSED DETOUR

PROJECT SITE



10TH AVE. SW

CEDAR RIVER PARKWAY

Utilities

Centurylink
Steve Parker
Manager of Engineering & Construction
2103 E. University Ave.
Des Moines, IA 50317
(515) 265-0968 Cell: (507) 358-1978
Steven.Parker4@centurylink.com

Mediacom Communications Corporation
Kent Studer
Construction Supervisor
12251 265th St.
Mason City, IA 50401
(641) 430-4048 Ext. 354
kstuder@mediacomcc.com

MidAmerican Energy Company
William Schierbrock (Electric Transmission)
Manager, High Voltage engineering
106 East Second Street
Davenport, IA 52801
(563) 333-8155
wjschierbrock@midamerican.com

MidAmerican Energy Company
David Kline (Electric and Gas Distribution)
Sr. Distribution Engineer, P.E.
260 Fairview Ave
Waterloo, IA 50703
(319) 231-4726 Cell: (319) 230-2781
dkline@midamerican.com

MidAmerican Energy Company
William Barry (Gas Distribution)
Mgr. Gas Projects
602 D Ave NW
Cedar Rapids, IA 52405
(319) 298-5146 Cell: (319) 350-4952
WEBarry@midamerican.com

MidAmerican Energy Company
Molly Brower (Gas Distribution)
Gas Engineering Tech
212 S. Main St.
Clarksville, IA 50619
(319) 291-4737 Cell: (319) 231-7606
mcbrouwer@midamerican.com

WAVERLY
Mike Whitney
Distribution Planner
(Telephone, Cable TV, Electric Distribution)
1002 Adams Pkwy
Waverly, IA 50677
(319) 352-6251 Cell: (319) 240-2584
whit@wlpnet.net

WAVERLY
Mike Cherry
Public Works Director & City Engineer
(Water, Sanitary Sewer and Storm Sewer)
200 - 1st Street NE
Waverly, IA 50677
(319) 352-9065
mike@ci.waverly.ia.us

Waverly Light and Power
Mike Whitney
Distribution Planner
(Electric Distribution and Electric Transmission)
1002 Adams Parkway
Waverly, IA 50677
(319) 559-2000 Cell: (319) 240-2584
mwhitney@waverlyutilities.com

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
 - b. Iowa DNR Sovereign Lands permit = No
 - c. 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.

Roadway			
PIN Number	18-09-003-010		Submittal Date
Project Number	BRF-003-6(69)--38-09		Approval Date
District	District 2	Assistant District Engineer	Nick Humpal
County	BREMER	or	
Route	IA 3	Office Director	
Location	Cedar River 3.7 mi E of US 218 in Waverly		
Work Type	Bridge replacement		
Segment Manager	Jason Holst		
Designer	Strum/Bennett		

Design Manual Section 1C-1
Last Updated: 04-29-19

Urban Two-Lane Roadways (Urban Arterials)

Design Element	Preferred	Acceptable Criteria	Project Values
Design speed (mph)	The anticipated posted speed limit	30	25
Maximum superelevation rate (Refer 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	Match design lane width	Match design lane width
Right turn lane (ft)	12	10	match existing
Left turn lane (ft)	With raised or painted median	12 ft + median	match existing
	With depressed median	12	N/A
Two-way left turn lane	14	11	14
Parking lane width (ft)	10	7	match existing
Pavement cross-slope (on tangent sections)	Through lanes	2%	1.5% minimum, 2% maximum
	Auxiliary and turn lanes	3%	3% maximum
	Crown break at centerline	4%	4% maximum
Shoulder cross-slope (on tangent sections)	Shoulders	4%	Shoulder cross-slope cannot be less than the adjacent lane, 6% max for paved or granular shoulders, 8% max for earth shoulders
	Curb and gutter units	Match pavement cross-slope	6% maximum
	Parking lanes	1% greater than pavement cross-slope	6% maximum
Curb type (See Section 3C-2)	Design speed ≤ 45 mph	6-inch standard	any shape
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
	Beyond standard ditch depth and design clear zone	3.5:1	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	Variable
Traverse Slopes	w/ drainage structures	8:1	6:1
	w/o drainage structures	10:1	6:1
Ditches (See Section 3G-1)	Outside ditch (depth x width) (ft)	5 x 10	--
Bridge width—new*	Bridge length ≤ 200 ft	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 + effective shoulder widths or curb-to-curb width in curb and gutter section**
	Bridge length > 200 ft	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**
Bridge width—existing*	design lane widths + no less than 2 ft left and right		design lane widths + 2 ft 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	C	D	

*FHWA notification via email is required if acceptable criteria is not met on the NHS system (No formal design exception is required)

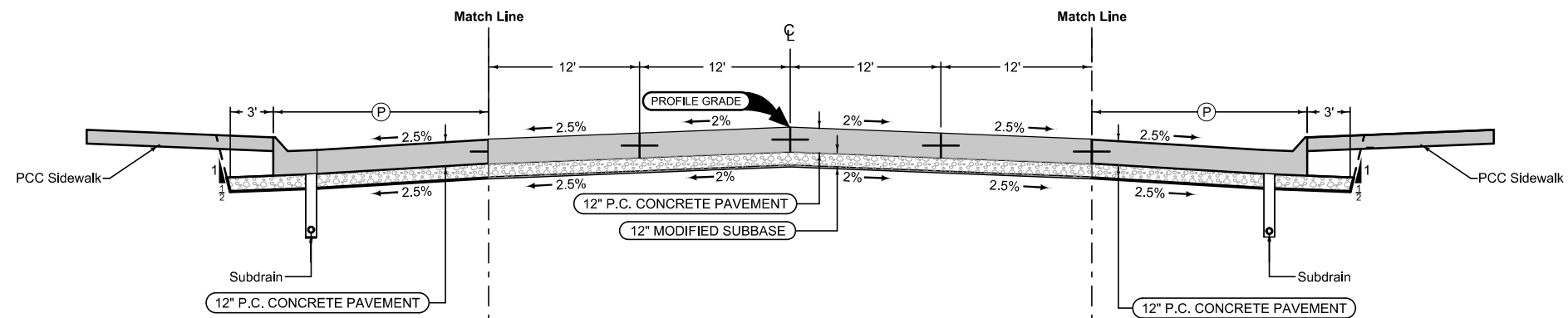
** If travel lanes are less than 12 ft wide contact the Methods Section for assistance.

Roadway Design Speed (mph) = 30

Design Manual Section 1C-1
Last Updated: 04-29-19

Design Criteria for Low Speed Roadways

Design Element	Preferred Criteria					Acceptable Criteria					Project Values		
	Design Speed, mph					Design Speed, mph							
	25	30	35	40	45	25	30	35	40	45			
Stopping sight distance (ft) (Refer to Section 6D-1)	155	200	250	305	360	155	200	250	305	360	200		
Minimum horizontal curve radius (ft) and superelevation rate (Refer to Sections 2A-2 and 2A-3)	Method 2 superelevation and side friction distribution	e = 4% max					See Table 10 in Section 2A-3					N/A	
	Method 5 superelevation and side friction distribution	e _{max} = 6%					144	231	340	485	643	N/A	
		e _{max} = 8%					--	--	--	--	--	N/A	
Minimum vertical curve length (ft) (Refer to Section 2B-1)	75	90	105	120	135	75	90	105	120	135	90		
Minimum rate of vertical curvature (K) (Refer to Section 2B-1)	crest vertical curves		12	19	29	44	61	12	19	29	44	61	19
	sag vertical curves	roadways without fixed-source lighting	26	37	49	64	79	26	37	49	64	79	N/A
		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 (%) (Refer to Section 2B-1)	Urban roadways		5					--	9	8	8	7	5
	Rural roadways							--	--	--	6	6	N/A
Clear zone	See "Preferred Clear Zone" table in Section 8A-2					See "Acceptable Clear Zone" table in Section 8A-2					16/14		



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 TO 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.

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

4UP_ 04-21-20	
STATION TO STATION	
4+03.00	4+73.00
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 TO 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

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
	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
	FO1D, Fiber Optic Co. 1 - Quality D
	FO1D, 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, Gas Valve
	IN, Storm Sewer Intake
	LIN, Miscellaneous Line
	LIN, Miscellaneous Line
	LUM, Luminaire
	MH, Utility Access -Manhole
	OUT, Tile Outlet
	PCP, Photo Control Point
	PIP, Pipe Culvert
	PIP, Pipe Culvert
	PLG, Location of General Photo
	PRO, Profile Shot
	SA1D, Sanitary Sewer Co. 1- Quality D
	SA1D, 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
	WV, Water Valve

UTILITY LEGEND

SURVEYED UTILITY OWNER SYMBOLS

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

Remark Abbreviations

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

	EL1D, Electric Line City of Waverly - Quality D
	FO1D, Fiber Optic City of Waverly - Quality D
	FO2D, Fiber Optic Century Link - Quality D
	GL1D, Gas Line MidAmerican - Quality D
	SA1D, Sanitary Sewer City of Waverly- Quality D
	ST1D, Storm Sewer City of Waverly - Quality D
	WL1D, Water Line City of Waverly - Quality D

PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design	Color No.	
Green	(2)		Existing Topographic Features and Labels
Blue	(1)		Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Magenta	(5)		Existing Utilities
SHADING			
Design	Color No.		
Lavender	(9)		Temporary Pavement Shading
Gray, Light	(48)		Proposed Pavement Shading
Gray, Med	(80)		Proposed Granular Shading
Gray, Dark	(112)		Proposed Grade and Pave Shading "In conjunction with a paving project"
Brown, Light	(236)		Grading Shading
Tan	(8)		Proposed Sidewalk Shading
Blue, Light	(230)		Proposed Sidewalk Landing Shading
Pink	(11)		Proposed Sidewalk Ramp Shading

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

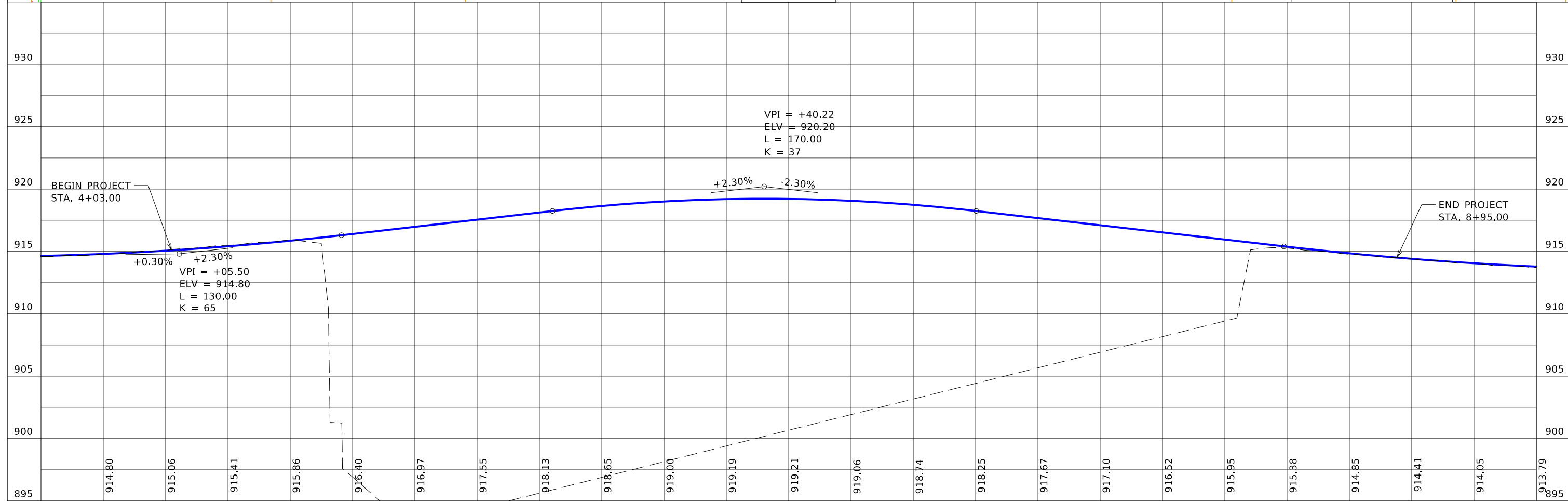
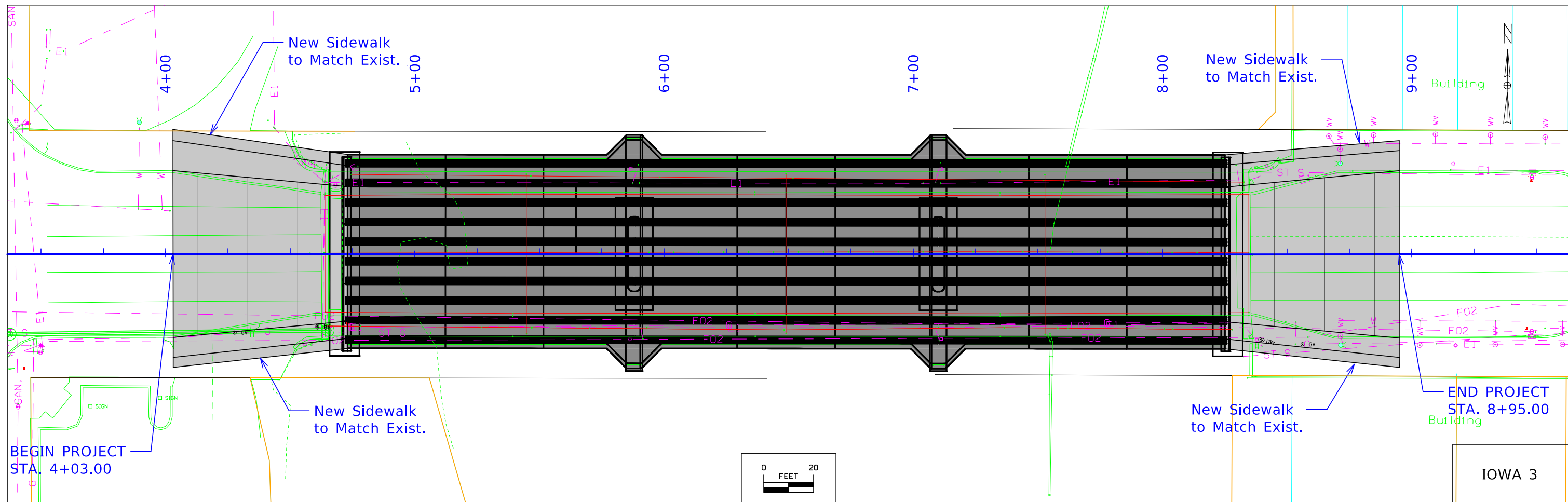
LINEWORK	Design	Color No.	
Green	(2)		Existing Ground Line Profile
Blue	(1)		Proposed Profile and Annotation
Magenta	(5)		Existing Utilities
Blue, Light	(230)		Proposed Ditch Grades, Left
Black	(0)		Proposed Ditch Grades, Median
Rust	(14)		Proposed Ditch Grades, Right

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

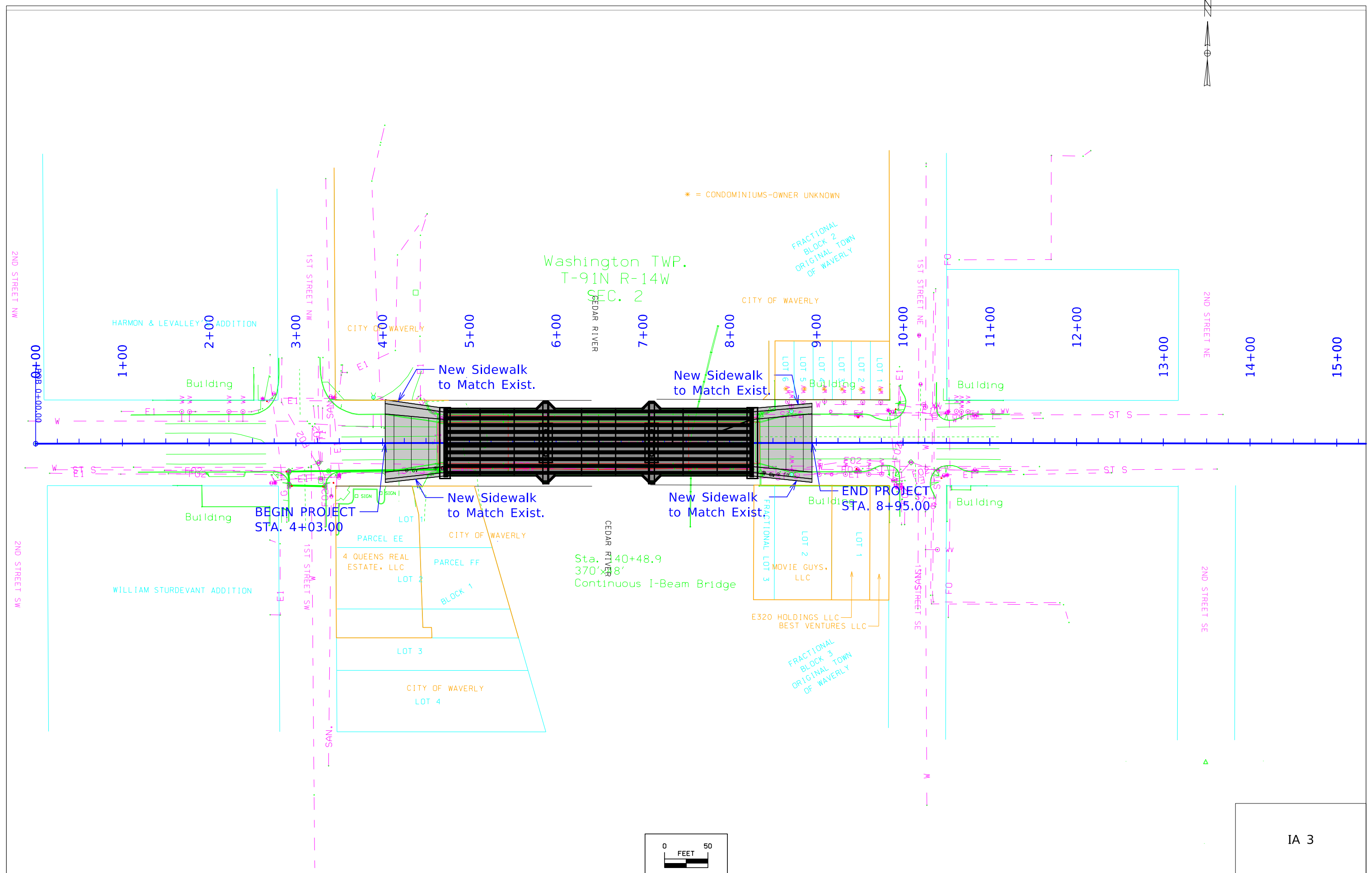
RIGHT-OF-WAY LEGEND	
	Proposed Right-of-Way
	Existing Right of Way
	Existing and Proposed Right-of-Way
	Easement and Existing Right-of-Way
	Easement (Temporary)
	Easement
	Access Control
	Property Line

PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

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



FILE NO. -	ENGLISH	DESIGN TEAM Strum / Bennett	BREMER COUNTY	PROJECT NUMBER BRF-003-6(69)--38-09	SHEET NUMBER D.02
------------	---------	-----------------------------	---------------	-------------------------------------	-------------------



* = CONDOMINIUMS-OWNER UNKNOWN

Washington TWP.
T-91N R-14W
SEC. 2

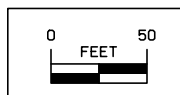
FRACTIONAL
BLOCK 2
ORIGINAL TOWN
OF WAVERLY

CITY OF WAVERLY

Sta. 4+40+48.9
370' x 48'
Continuous I-Beam Bridge

E320 HOLDINGS LLC
BEST VENTURES LLC

FRACTIONAL
BLOCK 3
ORIGINAL TOWN
OF WAVERLY



IA 3

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

CONTROL POINT VICINITY MAP

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



HORIZ. DATUM: NAD83(2011) EPOCH 2010.00

VERT. DATUM: NAVD88

1a. Regional Coordinate System Zone 2

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

HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING

HORIZ. DATUM: NAD83(2011) EPOCH 2010.00

VERT. DATUM: NAVD88

1a. 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 AND 32 FT WEST OF CONC FLOOD WALL
CP2	8925795.342	15442028.1	895.79	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:
- 1' ROADWAY PROFILE GRADE RAISE REQUESTED AT CENTER CHANNEL.
 - 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.
 - END SPANS MAY REQUIRE NON-STANDARD BEAM LENGTHS.
 - WALL PIERS WITH 3' WIDTH ASSUMED.
 - SOILS TESTING TO ALLOW FOR THE CONSIDERATION OF DRILLED SHAFTS IS DESIRED.
 - THE 10' SIDEWALK ON THE NORTH SIDE IS A LIKELY FUTURE TRAIL ROUTE, AND SHALL BE DESIGNED TO MEET TRAIL REQUIREMENTS (RAIL/FENCE, ETC.).
 - 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.
	TRUCKS	_____	%
	TOTAL DESIGN ESALS	_____	

HYDRAULIC DATA

DRAINAGE AREA = 1560 SQ. MI.
 REQUIRES DNR PERMIT
 - BACKWATER LESS THAN 1' FOR Q100, OR EXISTING CONDITION BACKWATER, WHICHEVER IS LESS.
 - NO RISE FOR FIS BASE FLOOD

LOCATION

IA 3 OVER CEDAR RIVER
 CITY OF WAVERLY, IOWA
 T-91N R-14W
 SECTION 2
 WASHINGTON TOWNSHIP
 BREMER COUNTY
 FHWA NO. TBD
 BRIDGE MAINT. NO. 0921.4S003
 LATITUDE ??.123456°
 LONGITUDE -??.123456°

CONCEPT PRELIMINARY

CONCEPT FOR 0° SKEW
352'-0" x 54'-0" PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE WITH 10' & 8' SDWKS

115'-0" END SPANS (BTC BEAM TYPE) 122'-0" INTERIOR SPAN
SITUATION PLAN
 STATION ? JUNE 2020
BREMER COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. ? OF ? FILE NO. ? DESIGN NO. ?