SHIVEHATTERY
ARCHITECTURE + ENGINEERING

IOWA DEPARTMENT OF TRANSPORTATION

TO OFFICE: District 5

DATE: November 8, 2019

ATTENTION: Jim Armstrong

PROJECT: Mahaska County
BRFN-023-1(48)--39-62
PIN: 18-62-023-010

FROM: Jenifer Bates

OFFICE: Shive-Hattery

SUBJECT: Project Concept Statement; (Final Approval D0)

This project involves the replacement of the IA 23 bridge (Maint. No. 6208.9S023) over tributary of Cedar Creek.

A concept review was held on August 27, 2019. Those present included Mark Van Dyke from the District 5 Office; Steve Seivert, Brandon Walls, and Brandy Beavers from the Iowa DOT; and Jenifer Bates, Joe Appel, and Mark Harpole from Shive-Hattery.

The alternative considered was:
1. Replace with a twin 12' x 10' x 88' RCB with a 10 degree right ahead skew using staged construction and having an estimated cost of $926,500.

Alternative 1 is the preferred alternative due to it being a best fit of the existing stream. A bridge was not considered due to more maintenance and guardrail installation to maintain. Culverts are usually preferred over bridges when hydraulically adequate and site conditions allow for a culvert.

Traffic will be maintained via staged construction with traffic reduced to one lane via the use of temporary traffic signals.

The Draft Project Concept Statement was sent out for review and comment with concerns to be resolved by Thursday, October 24, 2019. 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 and Shive-Hattery.

Cc:

C. Purcell	M. J. Kennerly	K. D. Nicholson
S. J. Megivern	J. S. Nelson	B. Walls
M. Nop	M. A. Swenson	R. A. Younie
D. R. Tebben	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	M. J. Sankey
B. E. Azeltine	B. D. Hofer	T. D. Crouch
S. J. Gent	S. Anderson	P. C. Keen
J. Selmer	K. K. Patel	S. Godbold
D. R. Claman	J. Hauber	A. Abu-Hawash
M. E. Khoda	K. Olson	S. Neubauer
M. Van Dyke	J. R. Webb	B. Beavers
A. J. Klein	J. R. Phillips	J. Garton
J. Woodcock	B. M. Clancy	M. Claeys
H. Torres-Cacho	J. Bartholomew	D. Upton

SH Project #4192650

SHIVEHATTERY
ARCHITECTURE + ENGINEERING

FINAL PROJECT CONCEPT STATEMENT

IA 23 Bridge over tributary of Cedar Creek 0.8 mi N of Co Rd T67

Mahaska County
Proj. BRFN-023-1(48)--39-62
PIN: 18-62-023-010
Maint. No. 6208.9S023
FHWA No. 34870

Jenifer J. Bates, P.E.
515-223-8104

November 8, 2019

I. STUDY AREA

A. Project Description

This project involves the replacement of the IA 23 bridge (Maint. No. 6208.9S023) over tributary of Cedar Creek.

The alternative considered was:
1. Replace with a twin 12' x 10' x 88' RCB with a 10 degree right ahead skew using staged construction.

Alternative 1 is the preferred alternative due to it being a best fit of the existing stream. A bridge was not considered due to more maintenance and guardrail installation to maintain. Culverts are usually preferred over bridges when hydraulically adequate and site conditions allow for a culvert.

Traffic will be maintained via staged construction with traffic reduced to one lane via the use of temporary traffic signals.

The preliminary project cost is $926,500.

B. Need for Project

This is a 36' X 44' concrete beam bridge that was built in 1928 and widened in 1969. An overlay was added in 1979 and is reaching the end of its service life. The deck has several spalls and leaching cracks. The superstructure is in poor condition due to the original beams having large hollows, spalls, and exposed rebar with section loss. The abutments have leaching cracks. Spalls adjacent to the deck joints are accelerating the deterioration of the superstructure and substructure. Due to its age and condition, the bridge should be replaced.

C. Present Facility

The existing structure is a 32’ x 44’ deck girder bridge constructed in 1928.

IA 23 in the project area is 24’ wide type A asphalt pavement with 3’ wide granular shoulders and 3:1 foreslopes, constructed in 1928. Asphaltic concrete resurfacing was accomplished in 1961.

D. Traffic Estimates

The 2021 construction year and 2041 design year average daily traffic estimates are 2,500 ADT with 11% trucks and 2,800 ADT with 10% trucks, respectively.

E. Sufficiency Ratings

IA 23 is classified as an Area Development route and is a maintenance service level C roadway. The federal bridge sufficiency rating is 83.7.

F. Access Control

Access rights will not be acquired for this project.

G. Crash History

During the five-year study period from January 1, 2014 through December 31, 2018, there were two crashes including, one minor injury crash and one property damage only crash.

II. PROJECT CONCEPT

A. Feasible Alternatives

Alternative #1 - Replace with a culvert using staged construction

The existing 32’ x 44’ deck girder bridge will be replaced with a twin 12’ x 10’ x 88’ reinforced concrete box (RCB) placed at a 10 degree right ahead skew. The typical cross section will consist of a 24’ roadway with 8’ effective shoulders (4’ paved and 4’ granular) and 6:1/3:1 foreslopes.

The roadway will be reconstructed on the existing vertical and horizontal alignment. The flow line of the box will be buried 1’ below the existing flow line in the channel. This will allow the bottom of the box to silt in and provide a natural bottom for fish passage. The existing ditches will need to be relocated to meet the inlet and outlet flowlines of the new RCB. Class E revetment will be placed at the ends of the RCB.

Due to the existing bridge width, during both stages 1 and 2, an 11’ wide traffic lane will be maintained. As noted in chapter 9B-9 of the Design Manual, as a 14’ 6” lane width is not provided, special signing must be placed in advanced of the work zone area.

The removal of the existing bridge and bridge approach pavement will require approximately 230 ft. of new 10 in. PCC pavement over 12 in. of modified subbase, including the installation of subdrains.

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

Right of way appears to be required for this project.

One lane of traffic in each direction will be maintained via staged construction utilizing temporary traffic signals.

Bridge Items	Estimated Costs
New Culvert	$ 240,500
Staging (10%)	$24,000
Bridge Removal	$11,900
Temporary Sheet Pile	$27,600
Engineering Fabric	$800
Revetment	$7,900
Mobilization - 10%	$31,300
Contingency - 20%	$62,600
Bridge Costs	**$406,600**
Roadway Items	
Clear & Grubb	$10,000
Special Backfill	$39,900
Embankment in place, contractor furnished	$40,000
Excavation, Class 10	$10,000
Modified Subbase	$10,400
Granular Shoulders	$2,600
PCC Paved Shoulder	$15,800
PCC Pavement, 10”	$48,800
Flooded backfill	$1,800
Roadway Removals	$12,000
Temporary Pavement	$44,400
Temporary Concrete Barrier Rail	$16,000
Temporary Traffic Signal	$15,000
Temporary Crash Cushion	$6,000
Guardrail Removal	$2,400
Erosion Control	$50,000
Right of Way	$50,000
Traffic Control - 5%	$18,100
Mobilization - 5%	$18,100
M & C - 30%	$108,600
Roadway Costs	**$519,900**
Project Total	**$926,500**

Other Alternatives Considered

Flowable mortar option clearances were not met at this site. The detour option was dismissed based on the out-of-travel distance of 17 miles.

B. Detour Analysis

There will be no off-site detour. Traffic will be maintained via staged construction with traffic reduced to one lane via the use of temporary traffic signals.

An offsite detour was reviewed for comparison purposes and was anticipated to have the following costs assuming it would be in place for approximately 75 days. The detour reviewed followed County Road V13 north to IA 92, then west on IA 92 to its junction with IA 23 within the city of Oskaloosa. Out of distance travel is 17 miles. The total distance user cost is anticipated to be $294,100. The cost for county road maintenance will be $31,000 as

calculated by the Gas Tax Method. Detour signing costs will be $10,000.

C. Recommendations

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

D. Construction Sequence

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

E. ADA Accommodations

There are no bike paths or sidewalks adjacent to IA 23; therefore, no ADA accommodations are planned in conjunction with this project.

F. Special Considerations

This will not be a traffic critical project.

The ABC Rating Score of 42 is less than the first stage filter threshold of 50, therefore no further evaluation is considered.

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

Right of Way appears to be required for this project.

The Location and Environment Bureau has reviewed this project and based on preliminary desktop observations, has determined that a Section 404 Permit will be required. It is expected that the work will be covered by Nationwide Permit 14.

F. Program Status

Site data has been developed by Shive-Hattery. This project is listed in the 2020-2024 Iowa Transportation Improvement Program, with $690,000 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.

Following page has a map of the county showing the location of the project area and the anticipated detour route.

Attachment A - Utilities

ATTACHMENT A

Jenifer J. Bates

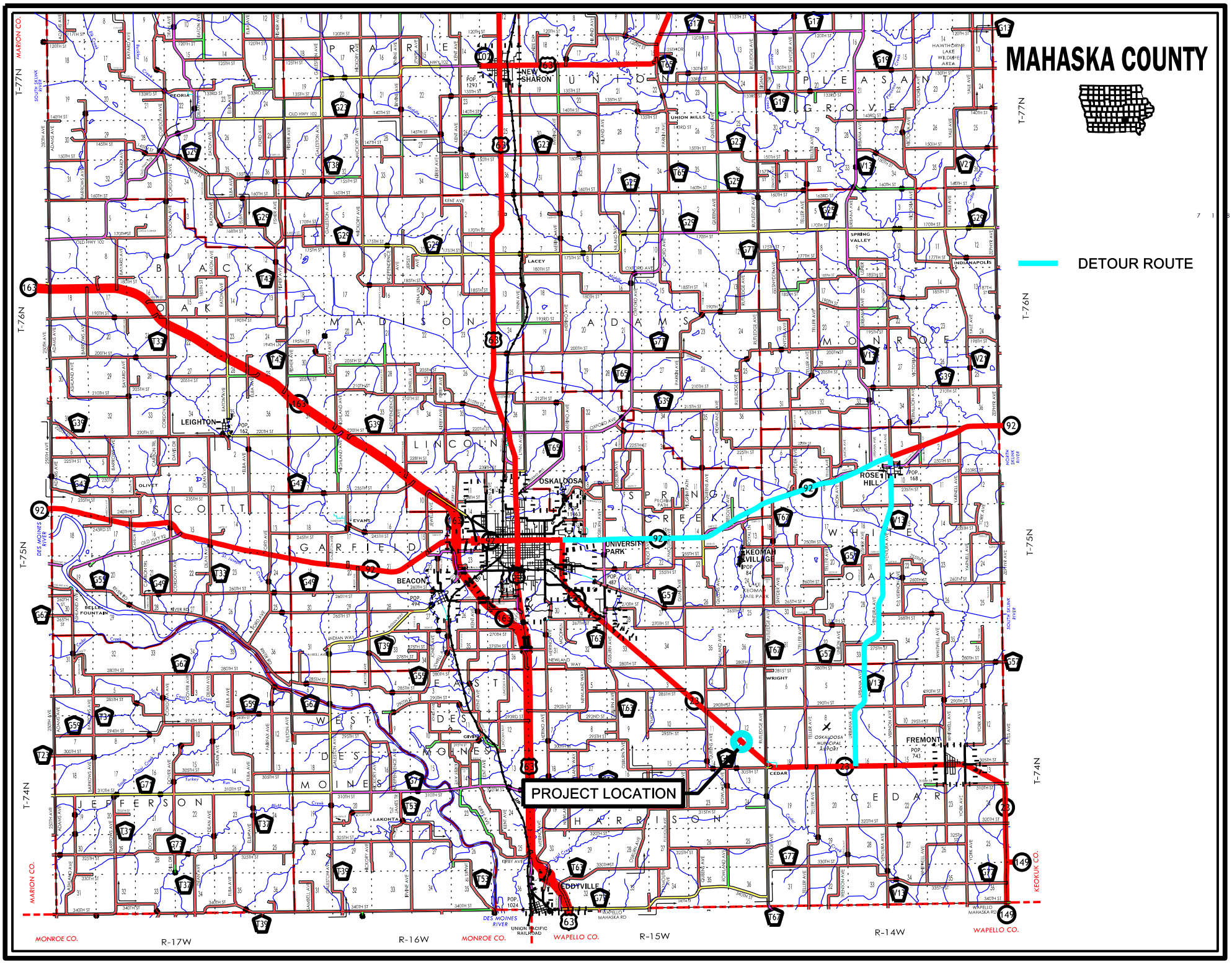
From: ia@occinc.com
Sent: Tuesday, May 7, 2019 5:29 PM
To: Sutherland, Nels
Subject: Design Information Results for Ticket # 551903374

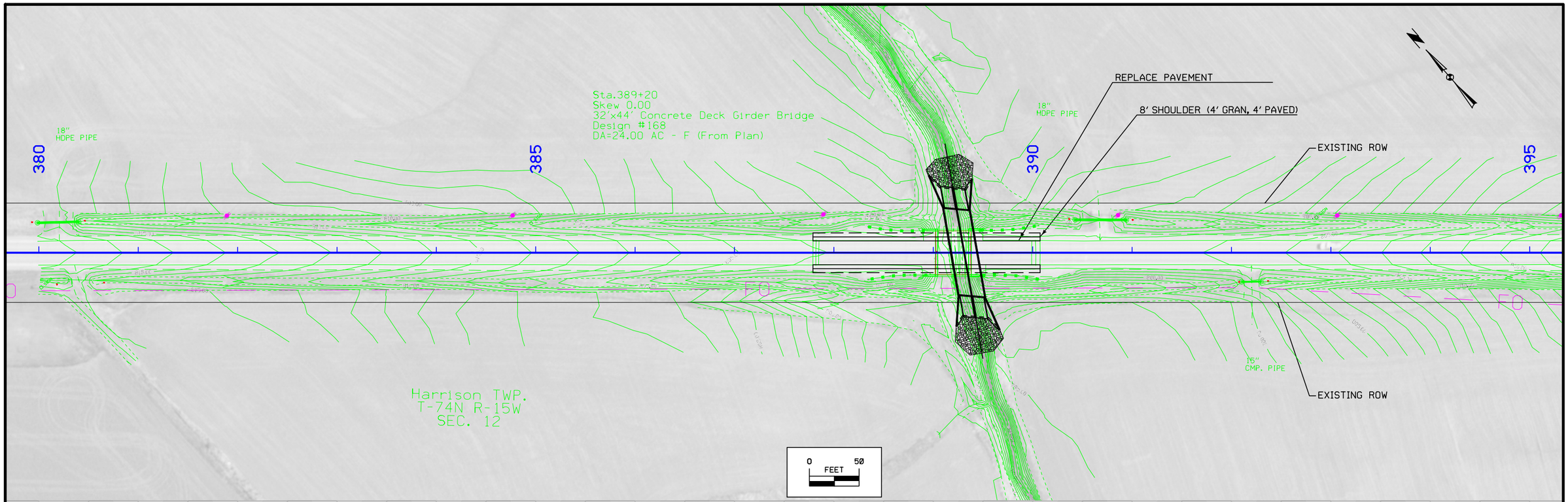
(CTLIA01) CENTURYLINK
Contact Name : Tom Sturmer
Contact Phone : 7205788090
Contact Email : Thomas.sturmer@centurylink.com
Locate Requested: N

(M54E) MIDAMER-ELEC
Contact Name : Jason Sandifer
Contact Phone : 6416727008
Contact Email : jwsandifer@midamerican.com
Locate Requested: N

(MKW) MAHASKA RURAL WATER
Contact Name : Randal L Pleima
Contact Phone : 6416738851
Contact Email : h2opleima@kdsi.net
Locate Requested: N

(M54G) MIDAMER-GAS
Contact Name : John Bixler
Contact Phone : 6416727010
Contact Email : jtbixler@midamerican.com
Locate Requested: N


MAHASKA COUNTY
DETOUR ROUTE
PROJECT LOCATION
T-77N
T-76N
T-75N
T-74N
R-17W
R-16W
R-15W
R-14W
MARION CO.
MONROE CO.
WAPELLO CO.
KEOKUK CO.
PRAIRIE
UNION
PLEASANT GROVE
BLACK OAK
MADISON
ADAMS
MONROE
LINCOLN
SPRING CREEK
WHITE OAK
SCOTT
GARFIELD
EAST DES MOINES
WEST DES MOINES
JEFFERSON
HARRISON
CEDAR
LEIGHTON
OSKALOOSA
NEW SHARON
BEACON
EDDYVILLE
FREMONT
ROSE HILL
UNIVERSITY PARK
KEOMAH VILLAGE
SPRING VALLEY
INDIANAPOLIS
OLIVET
EVANS
BELLE FOUNTAIN
LAKONTA
LACEY
UNION MILLS
PEORIA
OSKALOOSA MUNICIPAL AIRPORT
HAWTHORNE LAKE WILDLIFE AREA
DES MOINES RIVER
SOUTH SKUNK RIVER
NORTH SKUNK RIVER
UNION PACIFIC RAILROAD



FILE NO.	ENGLISH	DESIGN TEAM Shive-Hattery	MAHASKA COUNTY	PROJECT NUMBER BRF-023-1(48)--39-62	SHEET NUMBER D.1

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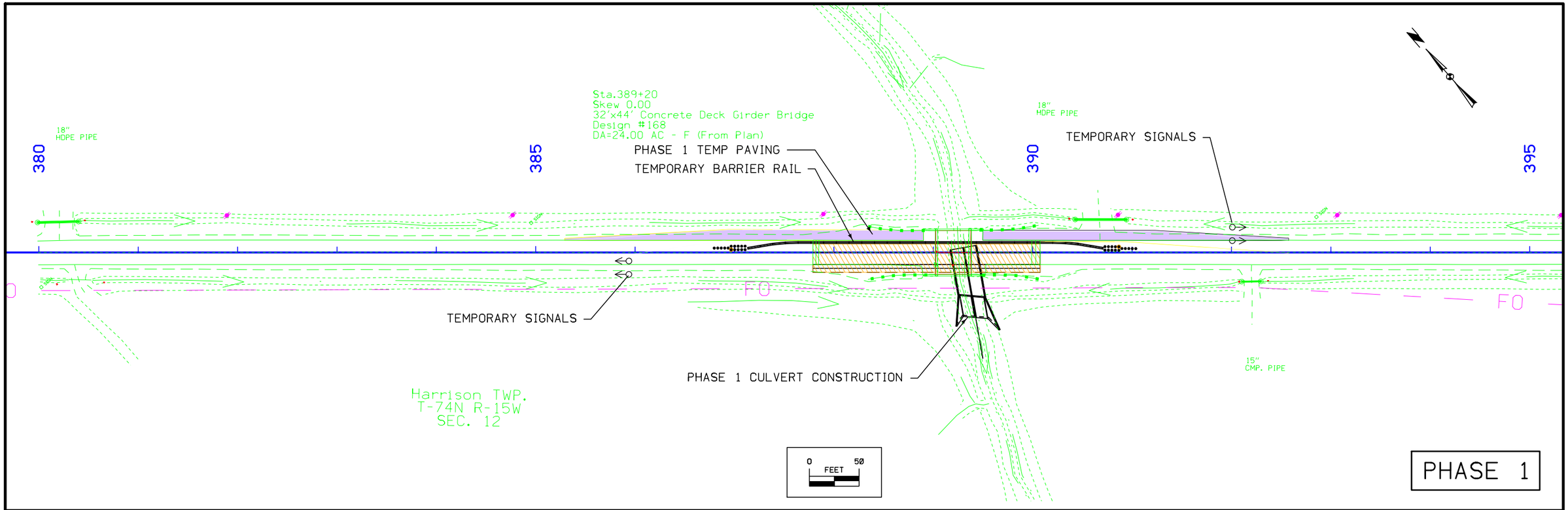
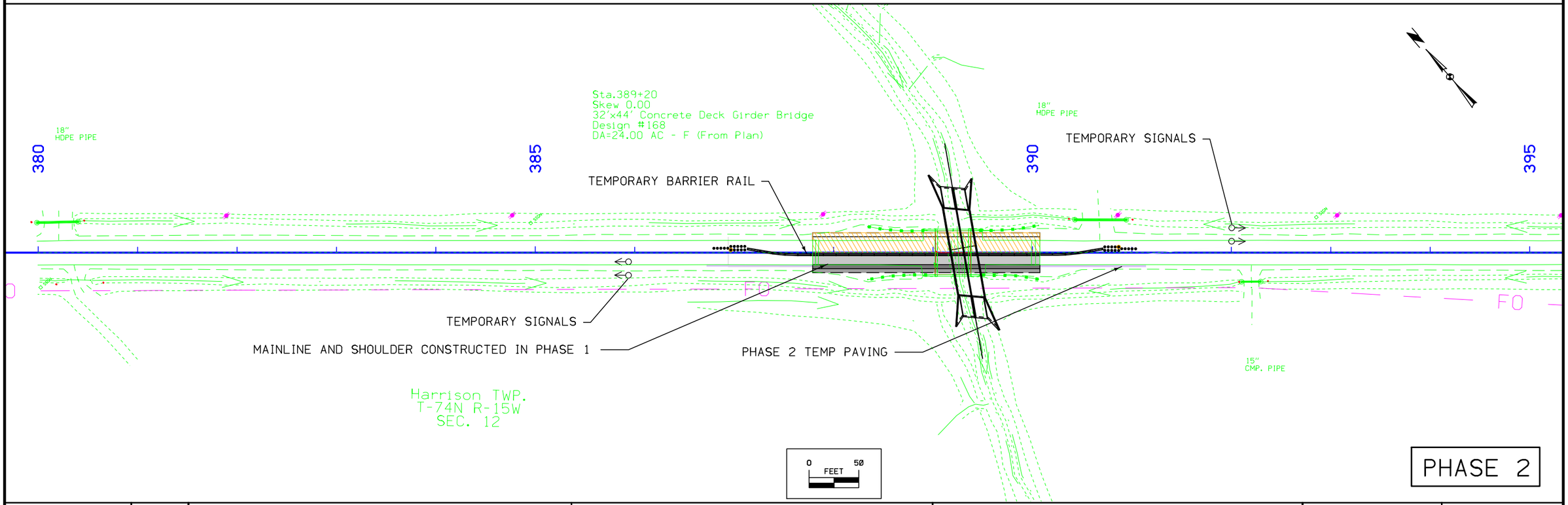


PHASE 1



PHASE 2

FILE NO.	ENGLISH	DESIGN TEAM Shive-Hattery	MAHASKA COUNTY	PROJECT NUMBER BRF-023-1(48)--39-62	SHEET NUMBER J.1

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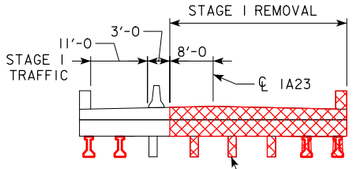


SECTION

LONGITUDINAL SECTION ALONG ℄ CULVERT

SITUATION PLAN

TYPICAL CHANNEL PROTECTION

NOTES:

1. EXISTING 32'-0 x 44'-0 DECK GIRDER BRIDGE DESIGN NO. 168.
2. DRAINAGE THROUGH EXISTING CULVERT/CHANNEL MUST BE MAINTAINED THROUGHOUT CONSTRUCTION.
3. FLOW LINE OF CULVERT NOMINALLY BURIED 1.0 FOOT.
4. BURIED AND OVERHEAD UTILITIES TO BE RELOCATED TEMPORARILY OR PERMANENTLY AS REQUIRED FOR CONSTRUCTION.

HYDRAULIC DATA

DRAINAGE AREA = 4.42 ACRES
Q_{50} = 2,070 CFS
HW ELEV. = 780.00
STREAM SLOPE = 9.0 FT./MI.
Q_{100}= 2,480 CFS, HW ELEV.= 801.20
Q_{500}= 3,490 CFS, HW ELEV.= 803.80

UTILITIES LEGEND:

— FO — — FIBER OPTIC
POWER POLE AND OVERHEAD ELECTRIC

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

LOCATION

IA 23 OVER CEDAR CFREEK
T-74N R-15W
SECTION 12
HARRISON TOWNSHIP
MAHASKA COUNTY
FHWA NO. 034870
BRIDGE MAINT. NO. 6208.9S023
LATITUDE 41.221881°
LONGITUDE -92.537646°

TRAFFIC ESTIMATE

2021 AADT	2,500	V.P.D.
2041 AADT	2,800	V.P.D.
2041 DHV	280	V.P.H.
TRUCKS	11	%

DESIGN FOR 10° SKEW R.A.

TWIN 12'-0 X 10'-0 X 88'-0 CAST IN PLACE CONCRETE CULVERT

SITUATION PLAN

STATION 389+31.00 OCTOBER 2019

MAHASKA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 1 FILE NO. ? DESIGN NO. ?

DESIGN TEAM SHIVE-HATTERY | MAHASKA COUNTY | PROJECT NUMBER BRFN-023-1(48)--39-54 | SHEET NUMBER V.1

11/8/2019 8:47:26 AM jwinter pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\6202301018\BRPrelim\Shive Hattery\STR_62023048_SHIVE_Z09.dgn TSL_62_DDDD_01 11x17_pdf.pltcfg

BRIDGE REPLACEMENT WITH RCB
BRFN-023-1(48)--36-62
MAHASKA Co.

LETTING DATE
11-01-2022

INDEX OF SHEETS	
No.	DESCRIPTION
A Sheets	**Title Sheets**
* A.1	Title Sheet
* A.2	Location Map Sheet
A.3 - 4	Design Criteria (Temporary)
A.4 - 7	Concept Statement (Temporary)
B Sheets	**Typical Cross Sections and Details**
B.1 - 2	Typical Cross Sections and Details
C Sheets	**Quantities and General Information**
C.1	Project Description
C.1	Estimated Project Quantities
C.1	Estimate Reference Information
C.1	Standard Road Plans
D Sheets	**Mainline Plan and Profile Sheets**
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2	IA 23
G Sheets	**Survey Sheets**
G.1 - 3	Reference Ties and Bench Marks
G.4	Horizontal Control Tab. & Super for all Alignments
J Sheets	**Traffic Control and Staging Sheets**
J.1	Traffic Control Plan
* J.2	Staging and Traffic Control Sheets Stages 1 and 2
V Sheets	**Bridge and Culvert Situation Plans**
V.1	Bridge and Culvert Situation Plans
W Sheets	**Mainline Cross Sections**
W.1	Cross Sections Legend & Symbol Information Sheet
W.2 - 5	Mainline Cross Sections
	* Color Plan Sheets

IOWA DOT

Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM

MAHASKA COUNTY

BRIDGE REPLACEMENT WITH RCB

IA 23 Over Tributary of Cedar Creek, 0.8 Mi N of Co Rd T67

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

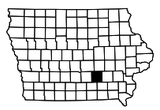
Value Engineering Saves. Refer to Article 1105.14 of the Specifications.

IOWA ONE CALL
1-800-292-8989
www.iowaonecall.com
811 Know what's below. Call before you dig.

REVISIONS

TOTAL
24
PROJECT IDENTIFICATION NUMBER
18-62-023-010
PROJECT NUMBER
BRFN-023-1(48)--36-62
R.O.W. PROJECT NUMBER
STPN-023-1(49)--2J-62

For Project Location Map
Refer to Sheet No. A.02



DESIGN DATA RURAL		
2022 AADT	2,500	V.P.D.
2042 AADT	2,800	V.P.D.
2042 DHV	280	V.P.H.
TRUCKS	10	%
Total Design ESALs	--	

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

D3 PLAN – August 21, 2020
D5 PLAN – December 18, 2020
D4 PLAN – Sept 21, 2022

PRELIMINARY PLANS

Subject to change by final design.

D2 PLAN – July 10, 2020

FILE NO. 31705	ENGLISH	DESIGN TEAM Iowa DOT \ Shive-Hattery	MAHASKA COUNTY	PROJECT NUMBER BRFN-023-1(48)--36-62	SHEET NUMBER A.1

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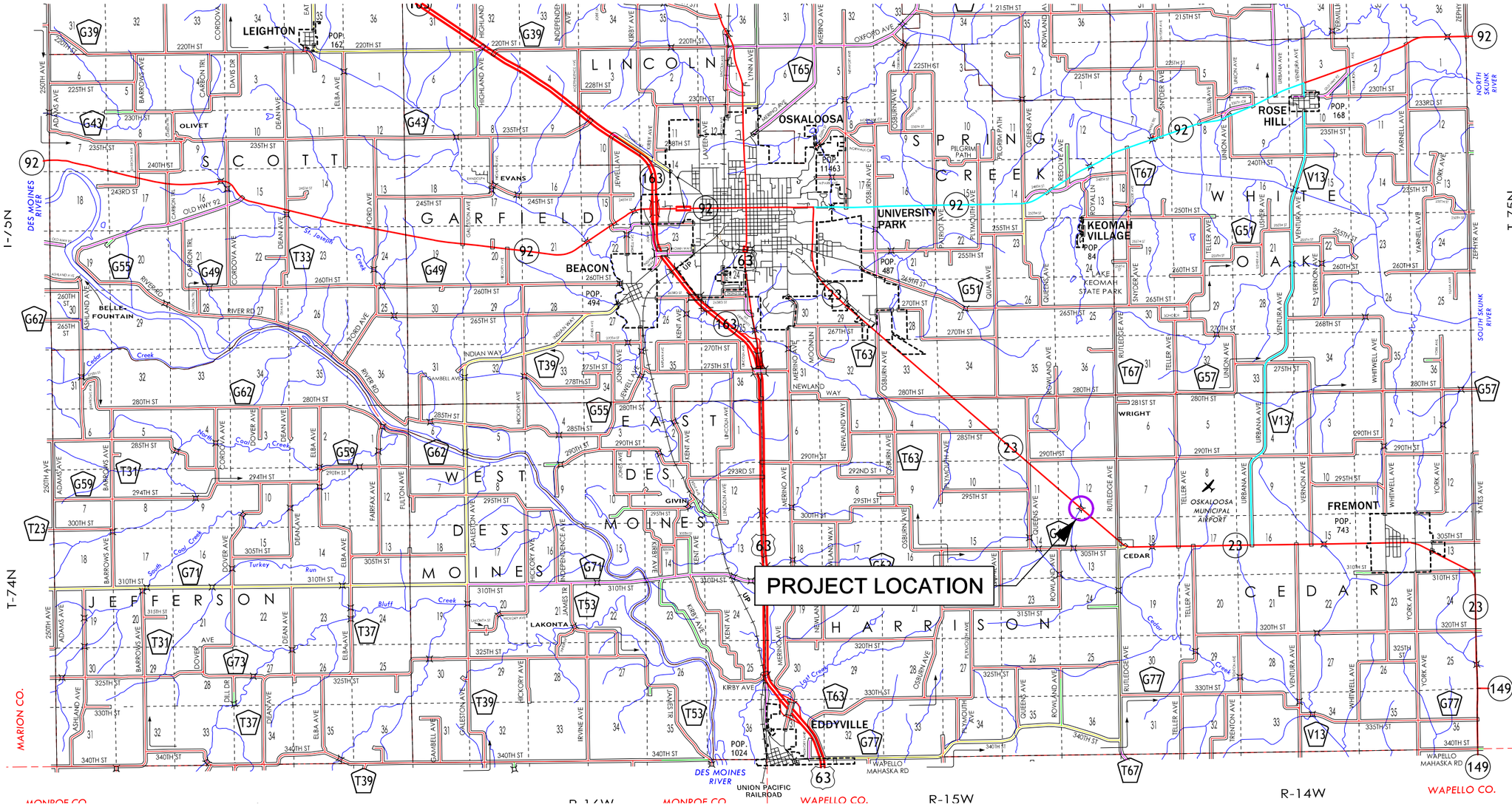

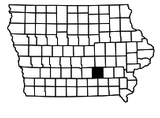

LOCATION MAP SCALE
0 1 2 3
Miles

FILE NO. 31705	ENGLISH	DESIGN TEAM Iowa DOT \ Shive-Hattery	MAHASKA COUNTY	PROJECT NUMBER BRFN-023-1(48)--36-62	SHEET NUMBER A.2

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Roadway	**IA 23**			
PIN Number	18-62-023-010		**Submittal Date**	10/09/19
Project Number	BRFN-023-1(48)--36-62			**Approval Date**
District	District 5	**Assistant District Engineer**	Mark Van Dyke	
County	MAHASKA		**or**	
Route	IA 23	**Office Director**		
Location	Bridge over Tributary of Cedar Creek 0.8 mi N of Co Rd T67			
Work Type	Bridge Replacement			
Segment Manager	Kevin Patel			
Designer				

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

Rural Two-Lane Highways (Rural Arterials)

Design Element		Preferred	Acceptable	Project Values
Design speed (mph)		60	50	60
Maximum superelevation rate (Refer to Section 2A-2)		6%	8%	6%
Design lane width (ft)		12	12	12
Full depth paved width (ft)		12	12	12
Right turn lane (ft)		12	10	N/A
Climbing Lane (ft)		12	12	N/A
Left turn lane (ft)		12	10	N/A
Pavement cross-slope (on tangent sections)	Through lanes	2%	1.5% minimum, 2% maximum	2%
	Auxiliary and turn lanes	3%	3% maximum	N/A
	Crown break at centerline	4%	4% maximum	N/A
Shoulder cross-slope (on tangent sections)		4%	Shoulder cross-slope cannot be less than the adjacent lane, 6% max for paved or granular shoulders, 8% max for earth shoulders	4%
Curb type (Refer to Section 3C-2)	Design speed = 50 or 55 mph	6-inch sloped	6-inch standard	N/A
	Design speed ≥ 60 mph	4-inch sloped	6-inch sloped	N/A
Foreslope (For fill areas greater than 40 ft, contact the Soils Design Section for assistance)	Adjacent to shoulder	10:1 for 4' then 6:1	3:1	6:1
	Beyond standard ditch depth and design clear zone	3.5:1	3:1	3:1
	Curbed roadways	2%	not steeper than 3:1	N/A
Backslope (For cut areas greater than 25 feet, contact the Soils Design Section for assistance with backslope benches.)		3:1	2.5:1	3:1
Transverse Slopes	w/ drainage structures	8:1	6:1	N/A
	w/o drainage structures	10:1	6:1	N/A
Ditches (Refer to Section 3G-1)	Outside ditch (depth x width) (ft)	5 x 10	--	5 x 10
Bridge width—new*	Bridge length ≤ 200 ft	design lane widths + effective shoulder widths	design lane widths + effective shoulder widths	40'
	Bridge length > 200 ft	design lane widths + effective shoulder widths	design lane width + 4' right and left of the design lane widths	40'
Bridge width—existing*		design lane widths + no less than 2 ft left and right	design lane widths + 2 ft. offset left and right	N/A
Vertical clearance (ft) (above lanes, shoulders and 25 feet left and right of the center of railroad tracks)	Over primary	16.5	16	N/A
	Over non-primary	16.5 at interchange locations, 15 at all other locations	14	N/A
	Over railroad	23.3	23.3	N/A
	Sign trusses and pedestrian bridges	17.5	17	N/A
Structural Capacity		Contact Office of Bridges and Structures	Contact Office of Bridges and Structures	
Level of Service		B	B	B

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

Design year ADT = 2800

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

Effective Shoulder Width and Type for Two-Lane Highways

Preferred (values shown in feet)			Acceptable (values shown in feet)			Project Values
	Rural Roadways	Urban Roadways		Rural Roadways	Urban Roadways	
Turn lanes with shoulders	6	6	Turn lanes with shoulders	6	0	N/A
Turn lanes with curbs	6	See Section 3C-2	Turn lanes with curbs	6	0	N/A
	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	Design year ADT > 2000 vpd	8	0*	Effective = 8' Paved = 4'
On roadways approaching urban areas (due to increased bike traffic)	10	10				
On all curves with a superelevation rate of 7.0% or greater	10	10				
On roadways with design year ADT > 5000	10	6	Design year ADT between 400 - 2000 vpd	6	0*	
On all other NHS	10	6				
On non-NHS routes with design year ADT > 3000	10	6	Design year ADT < 400 vpd	4	0*	
On non-NHS routes with design year ADT < 3000	8	0*				

*Requires safety edge-Refer to Section 3C-6

Curbs should be located beyond the outer edge of the effective shoulder width in rural areas

Refer to Section 3C-2 for curb offsets in urban areas

Notes:

Ask District at site visit if project is close enough to Oskaloosa to consider bike accomodations - No bike considerations needed.

At concept site visit, District requested 4' paved shoulders (still an effective 8' shoulder).

Roadway Design Speed (mph) = 60

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

Design Criteria for High Speed Roadways

Design Element			Preferred Criteria, Design Speed, mph						Acceptable Criteria, Design Speed, mph						Project Values
			50	55	60	65	70	75	50	55	60	65	70	75	
Stopping sight distance (ft) (Refer to Section 6D-1)			425	495	570	645	730	820	425	495	570	645	730	820	570
Minimum horizontal curve radius (ft) (Refer to Sections 2A-2 and 2A-3)	Method 5 superelevation and side friction distribution	e_{max} = 6%	833	1060	1330	1660	2040	2500	833	1060	1330	1660	2040	2500	1330
		e_{max} = 8%	--	--	--	--	--	--	758	960	1200	1480	1810	2210	N/A
Minimum vertical curve length (ft) (Refer to Section 2B-1)			150	165	180	195	210	225	150	165	180	195	210	225	180
Minimum rate of vertical curvature (K) (Refer to Section 2B-1)	crest vertical curves		84	114	151	193	247	312	84	114	151	193	247	312	151
	sag vertical curves	roadways without fixed-source lighting	96	115	136	157	181	206	96	115	136	157	181	206	136
		roadways with fixed-source lighting	96	115	136	157	181	206	54	66	78	91	106	121	136
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	4		3				7	6	6	–	–	–	
		Rural roadways							5	5	4	4	4	4	3
		Interstates							5	5	4	4	4	4	
Clear zone			See "Preferred Clear Zone" table in Section 8A-2						See "Acceptable Clear Zone" table in Section 8A-2						30'

SHIVEHATTERY
ARCHITECTURE + ENGINEERING

IOWA DEPARTMENT OF TRANSPORTATION

TO OFFICE: District 5

DATE: November 8, 2019

ATTENTION: Jim Armstrong

PROJECT: Mahaska County
BRFN-023-1(48)--39-62
PIN: 18-62-023-010

FROM: Jenifer Bates

OFFICE: Shive-Hattery

SUBJECT: Project Concept Statement; (Final Approval D0)

This project involves the replacement of the IA 23 bridge (Maint. No. 6208.9S023) over tributary of Cedar Creek.

A concept review was held on August 27, 2019. Those present included Mark Van Dyke from the District 5 Office; Steve Seivert, Brandon Walls, and Brandy Beavers from the Iowa DOT; and Jenifer Bates, Joe Appel, and Mark Harpole from Shive-Hattery.

The alternative considered was:
1. Replace with a twin 12' x 10' x 88' RCB with a 10 degree right ahead skew using staged construction and having an estimated cost of $926,500.

Alternative 1 is the preferred alternative due to it being a best fit of the existing stream. A bridge was not considered due to more maintenance and guardrail installation to maintain. Culverts are usually preferred over bridges when hydraulically adequate and site conditions allow for a culvert.

Traffic will be maintained via staged construction with traffic reduced to one lane via the use of temporary traffic signals.

The Draft Project Concept Statement was sent out for review and comment with concerns to be resolved by Thursday, October 24, 2019. 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 and Shive-Hattery.

Cc:

C. Purcell	M. J. Kennerly	K. D. Nicholson
S. J. Megivern	J. S. Nelson	B. Walls
M. Nop	M. A. Swenson	R. A. Younie
D. R. Tebben	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	M. J. Sankey
B. E. Azeltine	B. D. Hofer	T. D. Crouch
S. J. Gent	S. Anderson	P. C. Keen
J. Selmer	K. K. Patel	S. Godbold
D. R. Claman	J. Hauber	A. Abu-Hawash
M. E. Khoda	K. Olson	S. Neubauer
M. Van Dyke	J. R. Webb	B. Beavers
A. J. Klein	J. R. Phillips	J. Garton
J. Woodcock	B. M. Clancy	M. Claeys
H. Torres-Cacho	J. Bartholomew	D. Upton

SH Project #4192650

SHIVEHATTERY
ARCHITECTURE + ENGINEERING

FINAL PROJECT CONCEPT STATEMENT

IA 23 Bridge over tributary of Cedar Creek 0.8 mi N of Co Rd T67

Mahaska County
Proj. BRFN-023-1(48)--39-62
PIN: 18-62-023-010
Maint. No. 6208.9S023
FHWA No. 34870

Jenifer J. Bates, P.E.
515-223-8104

November 8, 2019

I. STUDY AREA

A. Project Description

This project involves the replacement of the IA 23 bridge (Maint. No. 6208.9S023) over tributary of Cedar Creek.

The alternative considered was:
1. Replace with a twin 12' x 10' x 88' RCB with a 10 degree right ahead skew using staged construction.

Alternative 1 is the preferred alternative due to it being a best fit of the existing stream. A bridge was not considered due to more maintenance and guardrail installation to maintain. Culverts are usually preferred over bridges when hydraulically adequate and site conditions allow for a culvert.

Traffic will be maintained via staged construction with traffic reduced to one lane via the use of temporary traffic signals.

The preliminary project cost is $926,500.

B. Need for Project

This is a 36' X 44' concrete beam bridge that was built in 1928 and widened in 1969. An overlay was added in 1979 and is reaching the end of its service life. The deck has several spalls and leaching cracks. The superstructure is in poor condition due to the original beams having large hollows, spalls, and exposed rebar with section loss. The abutments have leaching cracks. Spalls adjacent to the deck joints are accelerating the deterioration of the superstructure and substructure. Due to its age and condition, the bridge should be replaced.

SH Project #4192650

Shive-Hattery | 4125 Westown Parkway | Suite 100 | West Des Moines, IA 50266 | 515.223.8104 | shive-hattery.com

C. Present Facility

The existing structure is a 32’ x 44’ deck girder bridge constructed in 1928.

IA 23 in the project area is 24’ wide type A asphalt pavement with 3’ wide granular shoulders and 3:1 foreslopes, constructed in 1928. Asphaltic concrete resurfacing was accomplished in 1961.

D. Traffic Estimates

The 2021 construction year and 2041 design year average daily traffic estimates are 2,500 ADT with 11% trucks and 2,800 ADT with 10% trucks, respectively.

E. Sufficiency Ratings

IA 23 is classified as an Area Development route and is a maintenance service level C roadway. The federal bridge sufficiency rating is 83.7.

F. Access Control

Access rights will not be acquired for this project.

G. Crash History

During the five-year study period from January 1, 2014 through December 31, 2018, there were two crashes including, one minor injury crash and one property damage only crash.

II. PROJECT CONCEPT

A. Feasible Alternatives

Alternative #1 - Replace with a culvert using staged construction

The existing 32’ x 44’ deck girder bridge will be replaced with a twin 12’ x 10’ x 88’ reinforced concrete box (RCB) placed at a 10 degree right ahead skew. The typical cross section will consist of a 24’ roadway with 8’ effective shoulders (4’ paved and 4’ granular) and 6:1/3:1 foreslopes.

The roadway will be reconstructed on the existing vertical and horizontal alignment. The flow line of the box will be buried 1’ below the existing flow line in the channel. This will allow the bottom of the box to silt in and provide a natural bottom for fish passage. The existing ditches will need to be relocated to meet the inlet and outlet flowlines of the new RCB. Class E revetment will be placed at the ends of the RCB.

Due to the existing bridge width, during both stages 1 and 2, an 11’ wide traffic lane will be maintained. As noted in chapter 9B-9 of the Design Manual, as a 14’ 6” lane width is not provided, special signing must be placed in advanced of the work zone area.

The removal of the existing bridge and bridge approach pavement will require approximately 230 ft. of new 10 in. PCC pavement over 12 in. of modified subbase, including the installation of subdrains.

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

Right of way appears to be required for this project.

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One lane of traffic in each direction will be maintained via staged construction utilizing temporary traffic signals.

Bridge Items	Estimated Costs
New Culvert	$ 240,500
Staging (10%)	$24,000
Bridge Removal	$11,900
Temporary Sheet Pile	$27,600
Engineering Fabric	$800
Revetment	$7,900
Mobilization - 10%	$31,300
Contingency - 20%	$62,600
Bridge Costs	**$406,600**
Roadway Items	
Clear & Grubb	$10,000
Special Backfill	$39,900
Embankment in place, contractor furnished	$40,000
Excavation, Class 10	$10,000
Modified Subbase	$10,400
Granular Shoulders	$2,600
PCC Paved Shoulder	$15,800
PCC Pavement, 10”	$48,800
Flooded backfill	$1,800
Roadway Removals	$12,000
Temporary Pavement	$44,400
Temporary Concrete Barrier Rail	$16,000
Temporary Traffic Signal	$15,000
Temporary Crash Cushion	$6,000
Guardrail Removal	$2,400
Erosion Control	$50,000
Right of Way	$50,000
Traffic Control - 5%	$18,100
Mobilization - 5%	$18,100
M & C - 30%	$108,600
Roadway Costs	**$519,900**
Project Total	**$926,500**

Other Alternatives Considered

Flowable mortar option clearances were not met at this site. The detour option was dismissed based on the out-of-travel distance of 17 miles.

B. Detour Analysis

There will be no off-site detour. Traffic will be maintained via staged construction with traffic reduced to one lane via the use of temporary traffic signals.

An offsite detour was reviewed for comparison purposes and was anticipated to have the following costs assuming it would be in place for approximately 75 days. The detour reviewed followed County Road V13 north to IA 92, then west on IA 92 to its junction with IA 23 within the city of Oskaloosa. Out of distance travel is 17 miles. The total distance user cost is anticipated to be $294,100. The cost for county road maintenance will be $31,000 as

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calculated by the Gas Tax Method. Detour signing costs will be $10,000.

C. Recommendations

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

D. Construction Sequence

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

E. ADA Accommodations

There are no bike paths or sidewalks adjacent to IA 23; therefore, no ADA accommodations are planned in conjunction with this project.

F. Special Considerations

This will not be a traffic critical project.

The ABC Rating Score of 42 is less than the first stage filter threshold of 50, therefore no further evaluation is considered.

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

Right of Way appears to be required for this project.

The Location and Environment Bureau has reviewed this project and based on preliminary desktop observations, has determined that a Section 404 Permit will be required. It is expected that the work will be covered by Nationwide Permit 14.

F. Program Status

Site data has been developed by Shive-Hattery. This project is listed in the 2020-2024 Iowa Transportation Improvement Program, with $690,000 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.

Following page has a map of the county showing the location of the project area and the anticipated detour route.

Attachment A - Utilities

ATTACHMENT A

Jenifer J. Bates

From: ia@occinc.com
Sent: Tuesday, May 7, 2019 5:29 PM
To: Sutherland, Nels
Subject: Design Information Results for Ticket # 551903374

(CTLIA01) CENTURYLINK
Contact Name : Tom Sturmer
Contact Phone : 7205788090
Contact Email : Thomas.sturmer@centurylink.com
Locate Requested: N

(M54E) MIDAMER-ELEC
Contact Name : Jason Sandifer
Contact Phone : 6416727008
Contact Email : jwsandifer@midamerican.com
Locate Requested: N

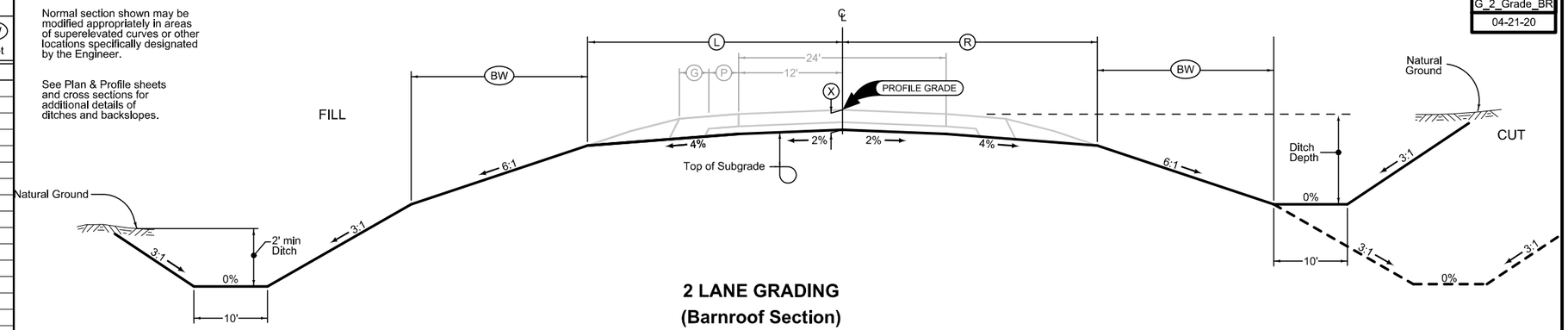
(MKW) MAHASKA RURAL WATER
Contact Name : Randal L Pleima
Contact Phone : 6416738851
Contact Email : h2opleima@kdsi.net
Locate Requested: N

(M54G) MIDAMER-GAS
Contact Name : John Bixler
Contact Phone : 6416727010
Contact Email : jtbixler@midamerican.com
Locate Requested: N

LOCATION			DIMENSIONS			
ROAD IDENTIFICATION	STATION TO STATION		(L) Feet	(R) Feet	(X) Inches	(BW) Feet
IA 23	387+78.03	390+07.38	24.5	24.5	22	6.5

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

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



2 LANE GRADING
(Barnroof Section)

G_2_Grade_BR
04-21-20

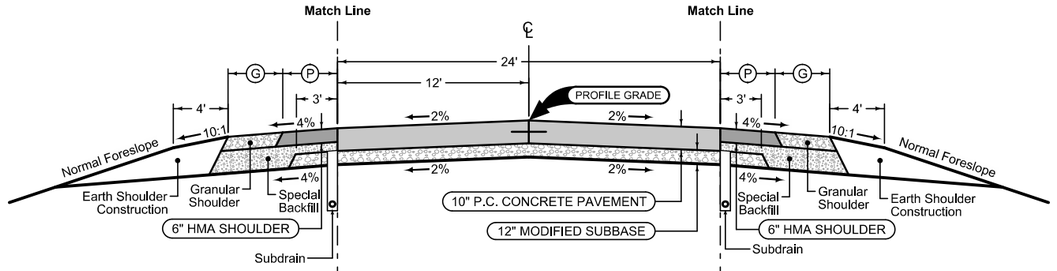
FILE NO. 31705	ENGLISH	DESIGN TEAM Iowa DOT \ Shive-Hattery	MAHASKA COUNTY	PROJECT NUMBER BRFN-023-1(48)--36-62	SHEET NUMBER B.1

11:32:14 AM 6/5/2020 mjanechek pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\6202301018\Design\SHT_62023048_B01.dgn

Combination Shoulder

Shoulder Jointing:
Longitudinal joint: B

		2_C_ 04-21-20	
STATION TO STATION		(P) Feet	(G) Feet
387+78.03	390+07.38	4	4



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

	2P_ 04-21-20
STATION TO STATION	
387+78.03	390+07.38

Combination Shoulder

Shoulder Jointing:
Longitudinal joint: B

		2_C_ 04-21-20	
STATION TO STATION		(P) Feet	(G) Feet
387+78.03	390+07.38	4	4

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

IA 23

100-1D
10-18-05

PROJECT DESCRIPTION

This project involves the replacement of the IA 23 bridge over a tributary of Cedar Creek, 0.8 miles North of CO Rd T67 with a twin 12'x 10' RCB culvert using staged construction.

100-0A
10-28-97

ESTIMATED ROADWAY QUANTITIES
(1 DIVISION PROJECT)

Item No.	Item Code	Item	Unit	Total	As Built Qty.

105-4
10-18-11

STANDARD ROAD PLANS

The following Standard Road Plans apply to construction work on this project.

Number	Date	Title
DR-303	10-17-17	Subdrains (Longitudinal)
DR-305	04-17-18	Subdrain Outlets (standard Subdrain, Pressure Release and Special)
EC-201	10-16-18	Silt Fence
EC-202	10-21-14	Floating Silt Curtain
EC-204	04-18-17	Perimeter and Slope Sediment Control Devices
EC-301	10-18-16	Rock Erosion Control (REC)
EW-101	10-17-17	Embankment and Rebuilding Embankments
EW-102	10-20-15	Allowable Placement of Unsuitable Soil in Embankments
PM-110	10-16-18	Line Types
PM-420	04-19-11	Two-Lane Roadway with no Turn Lanes (One-Way Stop Condition)
PV-101	10-16-18	Joints
TC-1	04-16-13	Work Not Affecting Traffic (Two-Lane or Multi-Lane)
TC-81	10-15-19	Restricted Width Signing (Less than 14.5')
TC-202	04-21-15	Work Within 15 ft of Traveled Way
TC-217	10-18-16	Lane Closure with Signals and TBR

SURVEY SYMBOLS

NO SURVEY LEGEND SHOWN IN G-SHEET SURVEY FILE.
REQUEST INFORMATION AT D2

UTILITY LEGEND

PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	
Green	(2)	Existing Topographic Features and Labels
Blue	(1)	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Magenta	(5)	Existing Utilities
SHADING	**Design Color No.**	
Yellow	(4)	Highlight for Critical Notes or Features
Red	(3)	Delineates Restricted Areas
Lavender	(9)	Temporary Pavement Shading
Gray, Light	(48)	Proposed Pavement Shading
Gray, Med	(80)	Proposed Granular Shading
Gray, Dark	(112)	Proposed Grade and Pave Shading "In conjunction with a paving project"
Brown, Light	(236)	Grading Shading
Tan	(8)	Proposed Sidewalk Shading
Blue, Light	(230)	Proposed Sidewalk Landing Shading
Pink	(11)	Proposed Sidewalk Ramp Shading

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

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

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

RIGHT-OF-WAY LEGEND

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

PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

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

FILE NO. 31705	ENGLISH	DESIGN TEAM Iowa DOT \ Shive-Hattery	MAHASKA COUNTY	PROJECT NUMBER BRFN-023-1(48)--36-62	SHEET NUMBER D.1

11:34:00 AM 6/5/2020 mjanechek pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\6202301018\Design\SHT_62023048_LGD.dgn

Sta.389+20
Skew 0.00
32'x44' Concrete Deck Girder Bridge
Design #168
DA=24.00 AC - F (From Plan)

REMOVE
Build: Twin 12'x10' RCB
Skew: 10 RA
Des No.: 123

18" HDPE PIPE (UAC)

BEGIN TEMP PAVEMENT
STA 385+29.06

BEGIN ROADWAY
STA 387+78.03

PI Sta 387+78.94

PI Sta 390+07.38

18" HDPE PIPE (UAC)

END ROADWAY
STA 390+07.38

EXISTING ROW

END TEMP PAVEMENT
STA 392+57.24

15" CMP. PIPE (UAC)

EXISTING ROW

END TEMP PAVEMENT
STA 391+13.93

BEGINTEMP PAVEMENT
STA 386+72.42

Harrison TWP.
T-74N R-15W
SEC. 12

0 FEET 50

380 385 395

No Grade Raise

804.13 803.50

-0.458% -0.073%

VPI +00.000
Elv 803.57
K = 390
Len 150.00 ft

804.03 803.92 803.81 803.72 803.65 803.59 803.54 803.52 803.50

830 825 820 815 810 805 800 795 790 785 780 775

Lt Rt

380 +50 381 +50 382 +50 383 +50 384 +50 385 +50 386 +50 387 +50 388 +50 389 +50 390 +50 391 +50 392 +50 393 +50 394 +50 395

FILE NO. 31705	ENGLISH	DESIGN TEAM Iowa DOT \ Shive-Hattery	MAHASKA COUNTY	PROJECT NUMBER BRFN-023-1(48)--36-62	SHEET NUMBER D.1

11:33:11 AM 6/5/2020 mjanechek pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\6202301018\Design\SHT_62023048_D2.dgn

Survey Information

County: Mahaska
SAP 947.0
PIN: 18-62-023-010
Project Number: BRFN-023-1(48)--39-62
Location: Tributary of Cedar Creek 0.8 mi N of Co Rd T67
Type of Work: Bridge-Unspecified
Project Directory: 6202301018

Party Personnel

Nels Sutherland- Party Chief
Myron Fox- Assistant Survey Party Chief

Date(s) of Survey

Begin Date	02/12/2019
End Date	06/04/2019

General Information

Measurement units for this survey are US survey feet. This survey is for proposed Bridge reconstruction over a tributary of Cedar Creek on State Hwy23. Project datum and control information is provided by Design Survey Office. This project is full field survey. This survey request was for the Hwy23 corridor only. This is a Full Field Survey.

Vertical Control

Vertical datum for this survey is NAVD88 (Computed using Geoid12B).
Benchmarks were placed throughout the project using post processed static observations relative to IaRTN Base Network. A minimum of 6hrs of data was simultaneously collected on each of the primary control points.

NGS monument OOA A 2007 was checked for vertical tolerance. The difference was less than 0.10ft.

NGS monument OSKAPORT was checked for vertical tolerance. The difference was less than 0.10ft.

NGS monument OSKAPORT AZ was checked for vertical tolerance. The difference was less than 0.10ft.

Horizontal Control

The project coordinate system for this survey is IaRCS Zone 9 (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.

NGS monument OOA A 2007 was checked for horizontal tolerance. The difference was less than 0.10ft.

NGS monument OSKAPORT AZ was checked for vertical tolerance. The difference was less than 0.10ft.

NGS monument OSKAPORT was checked for horizontal tolerance. The difference was less than 0.10ft.

Alignment Information

The horizontal alignment for this survey is a retrace of As-built Plan No P-510BCD (Paving) and Plan FN 63-3(6)—21-62 (Bridge). Survey stationing was equated to the plan bridge centerline at STA 389+20 and run back and ahead without equation throughout the survey. This is a best fit alignment.

Utility Information

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

Remark abbreviations
QLA – Quality Level A Highest guideline quality level
QLD – Quality Level D Lowest guideline quality level

A One-call Design Information Request (Ticket# 551903208) was made on Tuesday, 4/30/2019, at 4:58pm. The following Companies were listed:

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

MidAmerican Gas- Did not reply to the Design Information Request.

CenturyLink - Received an E-mail from Mindi Burgett at Mindi.Burgett@CenturyLink.com on 5/1/2019 at 8:16am. No map was provided. The request was forwarded to Bob Sampson with no reply.

MidAmerican Electric- Received an E-mail from Jason Sandifer at JWSandifer@midamerican.com on 5/13/2019 at 1:05pm. A map was attached showing an overhead electric line parallel to and on the east side of Hwy23 running the length of the project. No locates will be needed.

Mahaska Rural Water- Did not reply to the Design Information Request.

The Design Information Request (#551903208) was converted to a Locate Request (#551903374) on 5/7/2019 at 5:29pm. The following companies were notified:

Company (Quality)	Symbol	Remark
CenturyLink (QLD)	FO1D1	Buried Fiber-Optic line
MidAmerican Elec (QLD)	PPA	Overhead Power line
MidAmerican Gas		Clear
Mahaska Rural Water		Clear

Remarks:

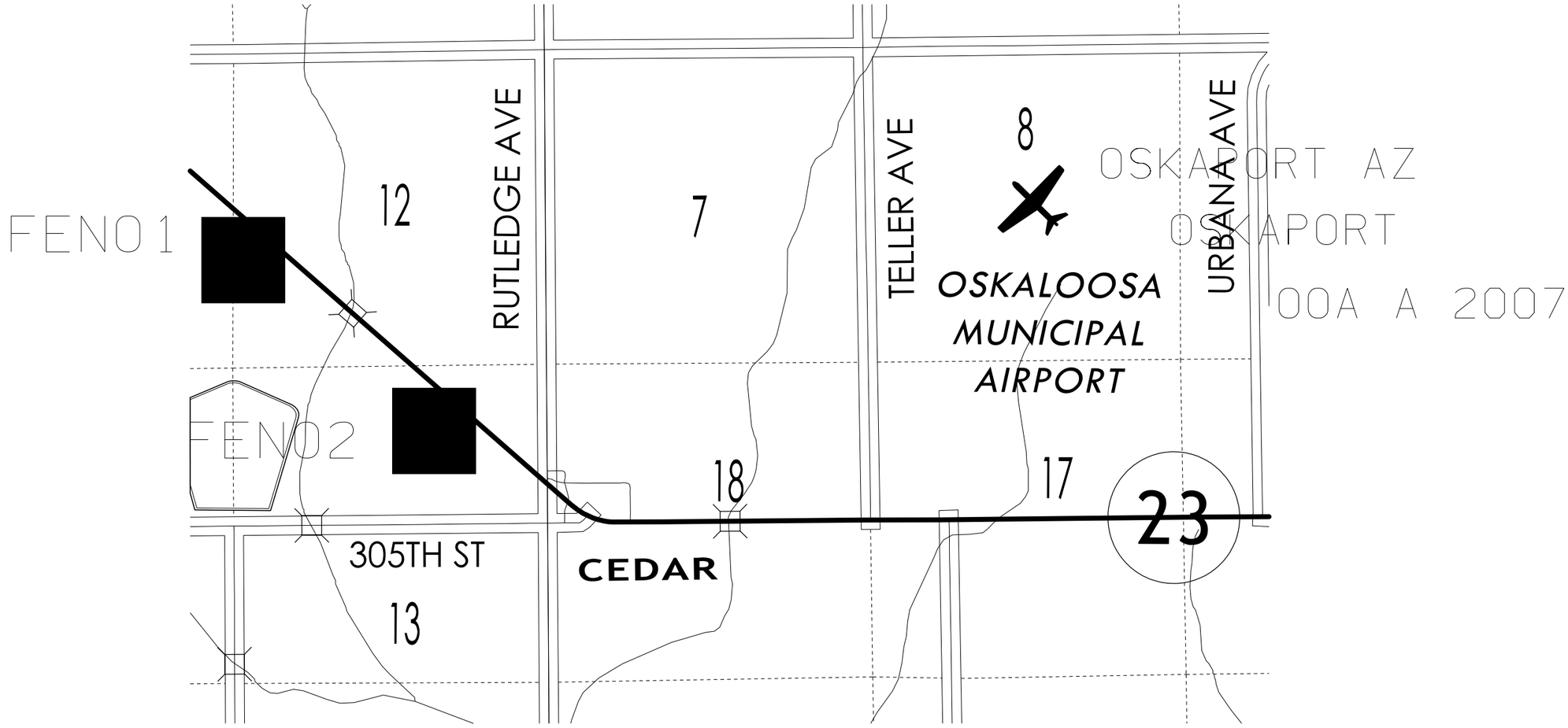
CenturyLink located a Fiber-Optic line parallel to and on the west side of Hwy23 running the length of the project. No maps were provided. The locate technician only located the utility at the beginning of the project, at the bridge, and at the end of the project.

MidAmerican Electric power poles have been collected and mapped.

MidAmerican Gas and Mahaska Rural Water have reported their utilities are clear, no conflicts.

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 9

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 9

Point Name	North Coordinate	East Coordinate	Elevation	Feature Code- Monument Description
FENO2	7552548.65	19578551.96	820.94	FENO2 MONUMENT 0.35 MILE NW OF INTERSECTION OF RUTLEDGE AVE AND HWY23 70FT SW OF EP
FENO1	7555398.17	19575357.78	833.2	FENO1 MONUMENT 1 MILE NW OF INTERSECTION OF RUTLEDGE AVE AND HWY23 25FT SW OF EP
OSKAPORT AZ	7556091.89	19588311.64	836.16	CP NGS MONUMENT STEEL ROD 3.1 MILES NW OF FREMONT AT OSK MUN AIRPORT AT JUNCTION OF RUNWAYS 4 AND 22 ON THE RIGHT 122.7 FT
OSKAPORT	7555022.44	19589404.1	834.83	CP NGS MONUMENT STEEL ROD IN SLEEVE 3.1 MILES NW OF FREMONT AT OSK MUN AIRPORT 177.5 FT NE OF INTERSECTION OF RUNWAYS 13 AND 31
00A A 2007	7554276.29	19590441.03	834.29	CP NGS MONUMENT STEEL ROD IN SLEEVE 3.1 MILES NW OF FREMONT AT OSK MUN AIRPORT NEAR RUNWAY 31 TURN AROUND 32FT NE OF EP

ALIGNMENT COORDINATES

101-16
10-20-09

Name	Location	Point on Tangent			Begin Spiral			Begin Curve			Simple Curve PI or Master PI of SCS			End Curve			End Spiral		
		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates	
			Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)
ML0231		371+12.30	7,555,419.08	19,575,394.23															
ML0233		387+78.94	7,554,321.07	19,576,648.04															
ML0235		390+07.38	7,554,170.61	19,576,819.94															
ML0236		402+54.49	7,553,348.83	19,577,758.01															

FILE NO. 31705	ENGLISH	DESIGN TEAM Iowa DOT \ Shive-Hattery	MAHASKA COUNTY	PROJECT NUMBER BRFN-023-1(48)--36-62	SHEET NUMBER G.4

108-26A
08-01-08

STAGING NOTES

Stage 1:
Remove south half of roadway and place south half of culvert with traffic shifted to WB lane using temporary signals.
Maintain traffic on temporary pavement

Stage 2:
Remove and replace north half of the roadway and complete culvert with traffic shifted to EB lane using temporary signals.

Complete remaining work under normal traffic.

108-23A
08-01-08

TRAFFIC CONTROL PLAN

1) While bridge and approaches are being removed and replaced by standard pavement and a box culvert, traffic shall be maintained by staged construction with temporary signals allowing one lane of traffic at all times.

2) Contractor shall furnish, install, maintain, and remove traffic control signage. These functions are included in the Traffic Control Bid Item.

108-25
10-21-14

511 TRAVEL RESTRICTIONS

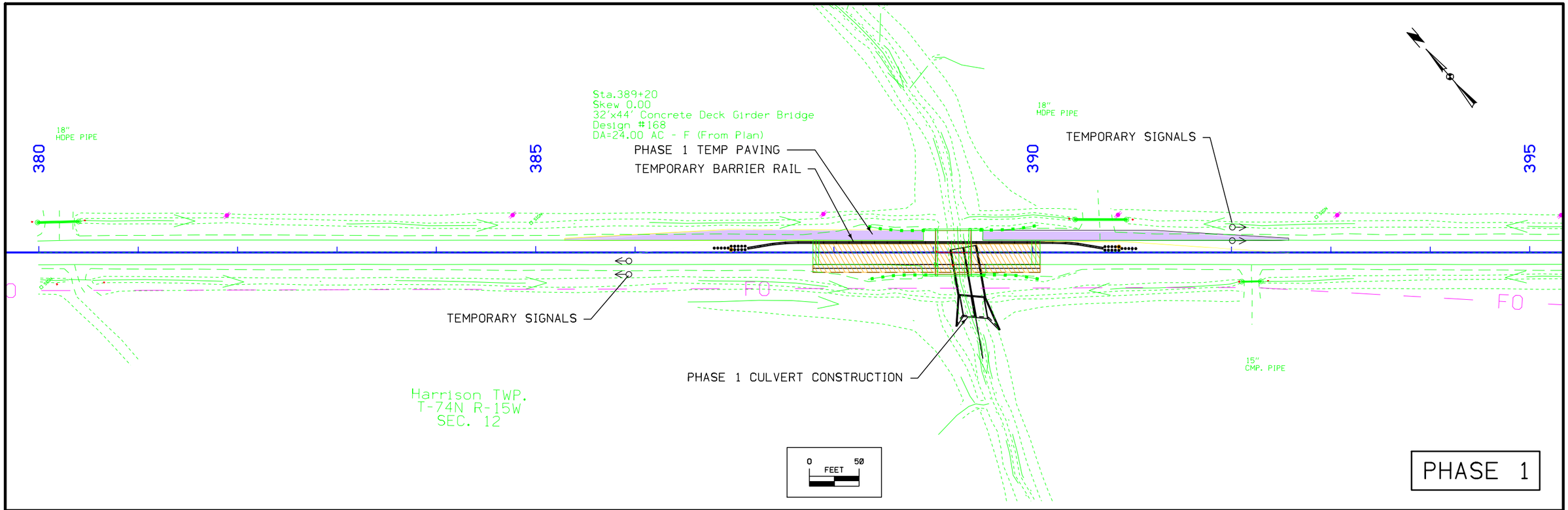
Route	Direction	County	Location Description	Feature Crossed	Object Type	Maint. Bridge No., Structure ID, or FHWA No.	Type of Restriction	Existing Measurement	Construction Measurement	Construction Measurement as Signed	Projected As Built Measurement	Remarks
IA 23	Both	Mahaska	Tributary of Cedar Creek, 0.8 mi N of Co Rd T67	Bridge (River)			Width					

111-01
04-17-12

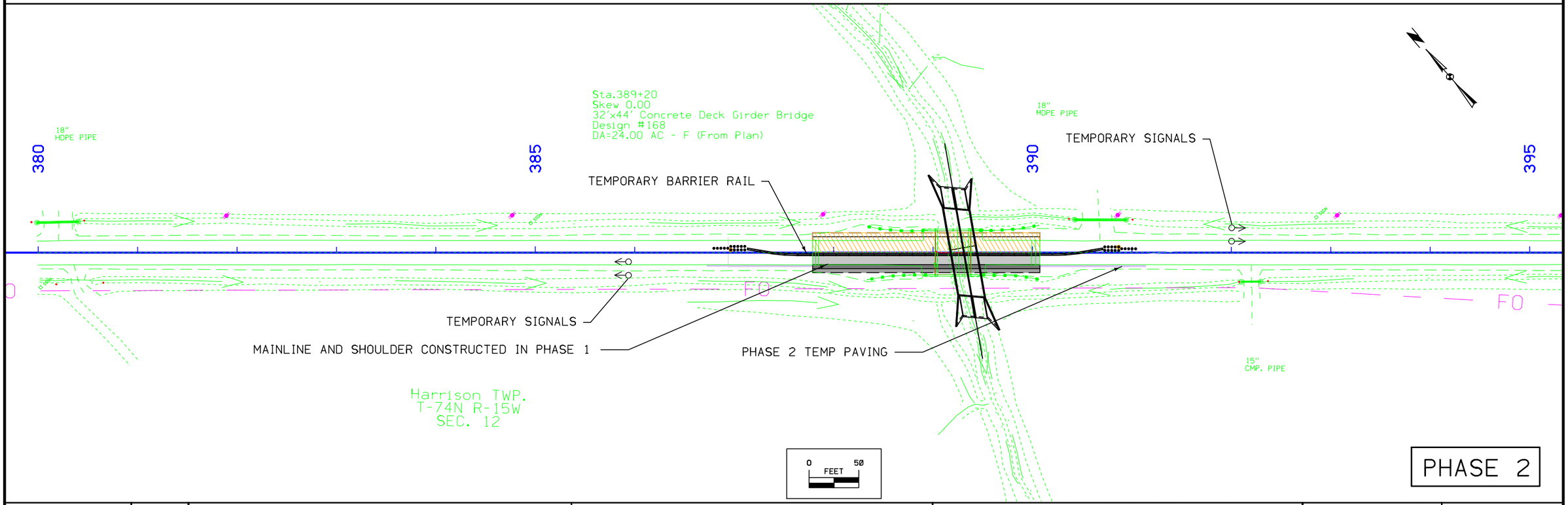
COORDINATED OPERATIONS

Other work in progress during the same period of time will include the construction of the projects listed. Coordinate operations with those of other contractors working within the same area.

Project	Type of Work
None Provided	



PHASE 1



PHASE 2

FILE NO. 31705	ENGLISH	DESIGN TEAM Iowa DOT / Shive-Hattery	MAHASKA COUNTY	PROJECT NUMBER BRFN-023-1(48)--39-62	SHEET NUMBER J.2

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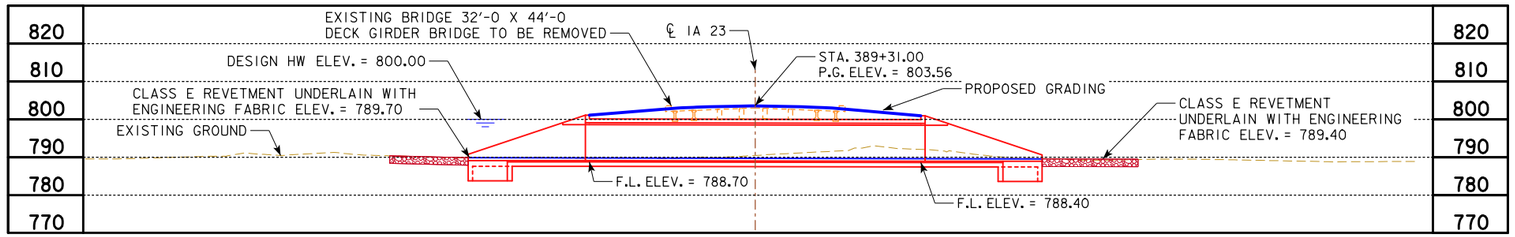
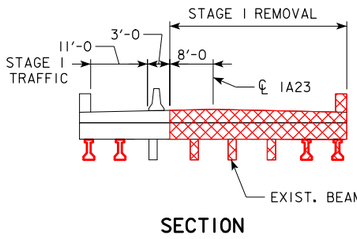




SECTION

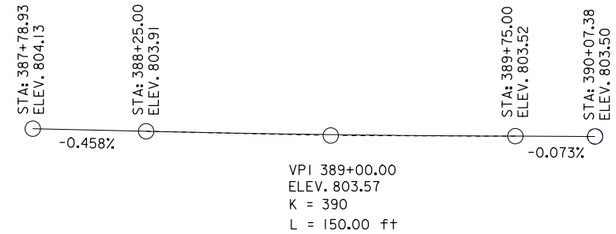
LONGITUDINAL SECTION ALONG ℄ CULVERT

TYPICAL CHANNEL PROTECTION

TYPICAL APPROACH SECTION

SITUATION PLAN

BENCHMARK: CP NGS MONUMENT STEEL ROD 3.1 MILES NW OF FREMONT AT OSK MUN AIRPORT AT JUNCTION OF RUNWAYS 4 AND 22 ON THE RIGHT 122.7 FT. ELEV. 836.16



PROPOSED PROFILE GRADE IA 23

NOTES:

1. EXISTING 32'-0 x 44'-0 DECK GIRDER BRIDGE DESIGN NO. 168.
2. DRAINAGE THROUGH EXISTING CULVERT/CHANNEL MUST BE MAINTAINED THROUGHOUT CONSTRUCTION.
3. FLOW LINE OF CULVERT NOMINALLY BURIED 1.0 FOOT.
4. BURIED AND OVERHEAD UTILITIES TO BE RELOCATED TEMPORARILY OR PERMANENTLY AS REQUIRED FOR CONSTRUCTION.

HYDRAULIC DATA

DRAINAGE AREA = 4.42 ACRES
Q_{50} = 2,070 CFS
HW ELEV. = 800.00
STREAM SLOPE = 9.0 FT./MI.
Q_{100} = 2,480 CFS, HW ELEV.= 801.20
Q_{500} = 3,490 CFS, HW ELEV.= 803.80

UTILITIES LEGEND:

— FO — — FIBER OPTIC
POWER POLE AND OVERHEAD ELECTRIC

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

LOCATION

IA 23 OVER CEDAR CREEK
T-74N R-15W
SECTION 12
HARRISON TOWNSHIP
MAHASKA COUNTY
FHWA NO.
BRIDGE MAINT. NO. 6208.9S023
LATITUDE 41.221881°
LONGITUDE -92.537646°

TRAFFIC ESTIMATE

2021 AADT	2,500	V.P.D.
2041 AADT	2,800	V.P.D.
2041 DHV	280	V.P.H.
TRUCKS	11	%

PRELIMINARY

DESIGN FOR 10° SKEW R.A.

TWIN 12'-0 X 10'-0 X 88'-0 CAST IN PLACE CONCRETE CULVERT

SITUATION PLAN

STATION 389+31.00 JUNE 2020

MAHASKA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 2 FILE NO. ? DESIGN NO. ?

DESIGN TEAM SHIVE-HATTERY | MAHASKA COUNTY | PROJECT NUMBER BRFN-023-1(48)--39-54 | SHEET NUMBER V.1

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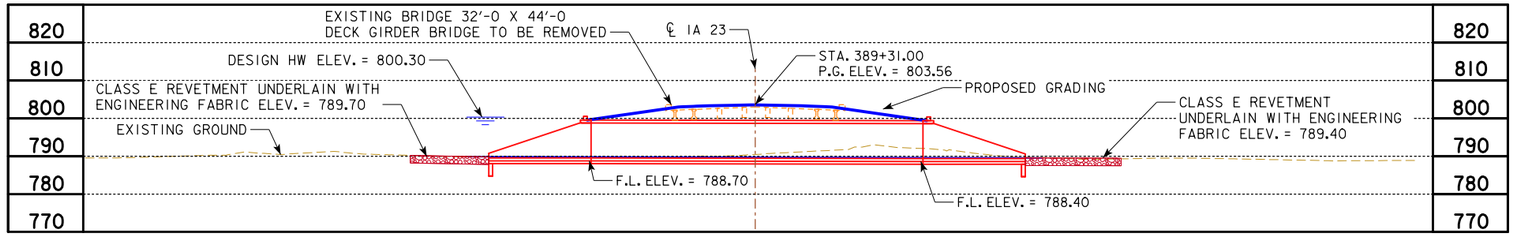
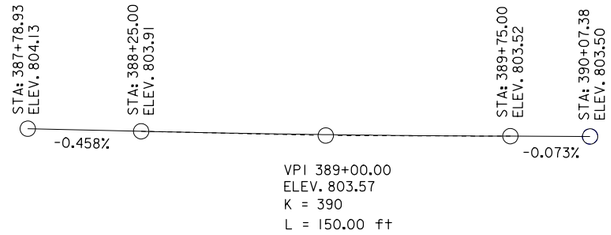
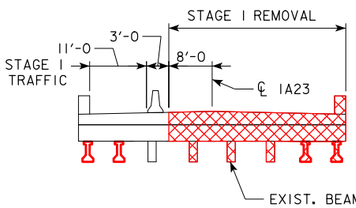


BENCHMARK: CP NGS MONUMENT STEEL ROD 3.1 MILES NW OF FREMONT AT OSK MUN AIRPORT AT JUNCTION OF RUNWAYS 4 AND 22 ON THE RIGHT 122.7 FT. ELEV. 836.16





SECTION

LONGITUDINAL SECTION ALONG ℄ CULVERT

TYPICAL CHANNEL PROTECTION

TYPICAL APPROACH SECTION

SITUATION PLAN

PROPOSED PROFILE GRADE IA 23

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HYDRAULIC DATA

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HW ELEV. = 800.30
STREAM SLOPE = 9.0 FT./MI.
Q_{100} = 2,480 CFS, HW ELEV.= 801.60
Q_{500} = 3,490 CFS, HW ELEV.= 803.60

UTILITIES LEGEND:

— FO — — FIBER OPTIC
POWER POLE AND OVERHEAD ELECTRIC

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LOCATION

IA 23 OVER CEDAR CREEK
T-74N R-15W
SECTION 12
HARRISON TOWNSHIP
MAHASKA COUNTY
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TRUCKS	11	%

PRELIMINARY

DESIGN FOR 10° SKEW R.A.

TWIN 12'-0 X 10'-0 X 89'-0 PRECAST CONCRETE CULVERT

SITUATION PLAN

STATION 389+31.00 JUNE 2020

MAHASKA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 2 OF 2 FILE NO. ? DESIGN NO. ?

DESIGN TEAM SHIVE-HATTERY | MAHASKA COUNTY | PROJECT NUMBER BRFN-023-1(48)--39-54 | SHEET NUMBER V.2

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LINE STYLE LEGEND OF CROSS SECTION SHEETS (ROAD)

- Existing Ground Line
- Proposed Template
- Proposed Topsoil Placement
- Additional Topsoil Removal
- Subgrade Treatment
- Granular Shoulder
- Pavement
- Existing Pipe\RCB
- Proposed Pipe\RCB
- Proposed Dike
- All Elements Associated with Proposed Entrances

LINE STYLE LEGEND OF CROSS SECTION SHEETS (SOILS)

- Topsoil (Class 10)
- Slope Dressing Only
- Class 10 Materials
- Select Loams And Clay-Loams
- Select Sand
- Unsuitable Type A Disposal
- Unsuitable Type B Disposal
- Unsuitable Type C Disposal
- Shale
- Waste
- Broken and Weathered Rock
- Solid Rock
- Boulders

Note: All layer lines and descriptions identify layers above the line.

Note: Vertical or near vertical lines connecting soil layers at edges of cross sections are only for the purpose of calculating template quantities and do not depict soil stratification.

SYMBOL LEGEND OF CROSS SECTION SHEETS

Existing ROW — Existing Right-of-Way Limit

Proposed ROW — Proposed Right-of-Way Limit

Temporary ROW — Temporary Right-of-Way Limit

CROSS SECTION LEGEND AND SYMBOL INFORMATION SHEET

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

FILE NO. 31705	ENGLISH	DESIGN TEAM Iowa DOT \ Shive-Hattery	MAHASKA COUNTY	PROJECT NUMBER BRFN-023-1(48)--36-62	SHEET NUMBER W.1

IA 23

Preliminary

388+00.00

387+75.00

387+50.00

387+25.00

387+00.00

FILE NO. 31705	ENGLISH	DESIGN TEAM Iowa DOT \ Shive-Hattery	MAHASKA COUNTY	PROJECT NUMBER BRFN-023-1(48)--36-62	SHEET NUMBER W.2

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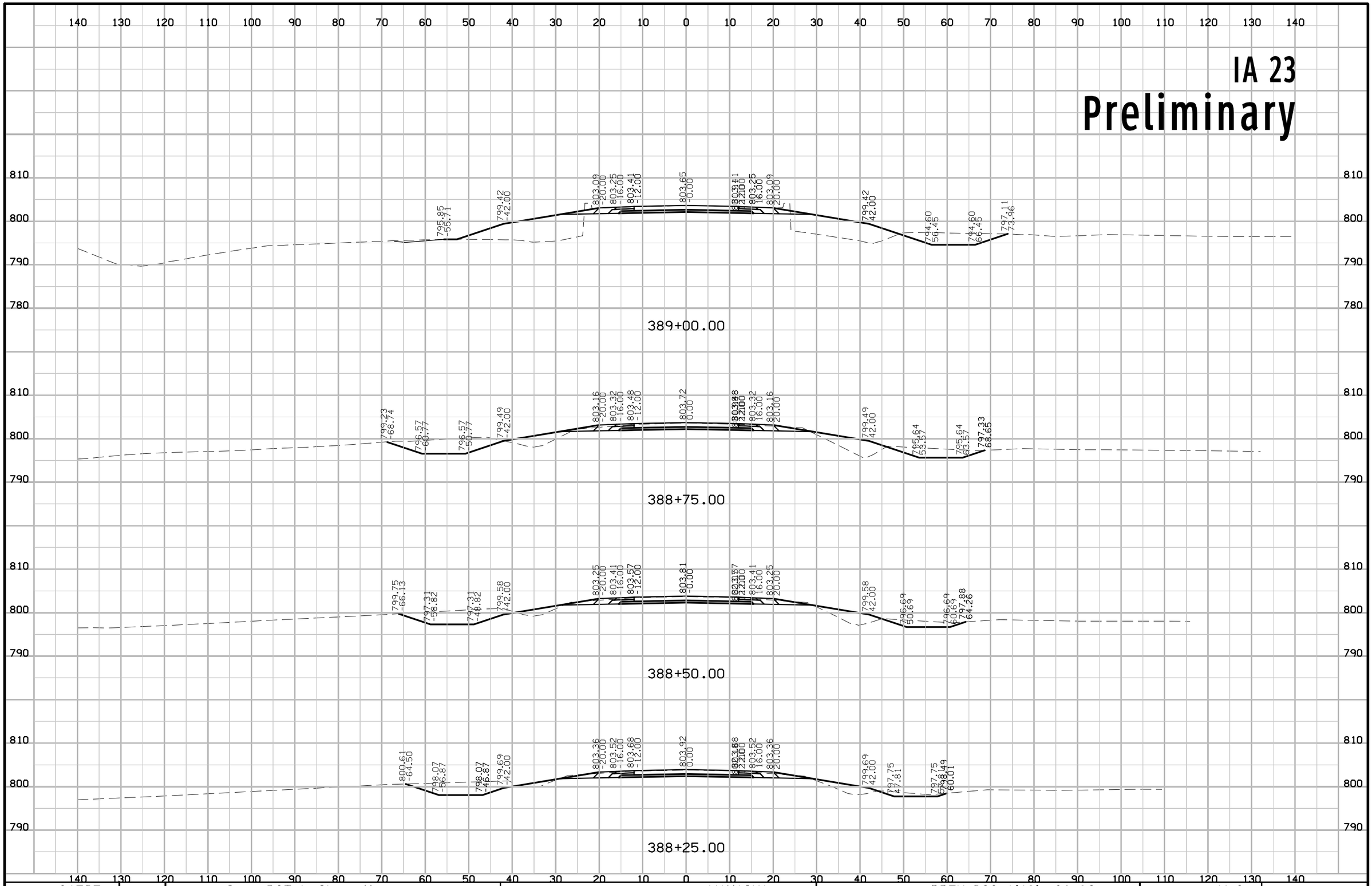
IA 23

Preliminary



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IA 23

Preliminary

390+00.00

389+75.00

389+50.00

389+25.00

FILE NO. 31705	ENGLISH	DESIGN TEAM Iowa DOT \ Shive-Hattery	MAHASKA COUNTY	PROJECT NUMBER BRFN-023-1(48)--36-62	SHEET NUMBER W.4

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IA 23

Preliminary

140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

800
790

391+00.00

800
790

390+75.00

800
790

390+50.00

800
790

390+25.00

140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

FILE NO. 31705	ENGLISH	DESIGN TEAM Iowa DOT \ Shive-Hattery	MAHASKA COUNTY	PROJECT NUMBER BRFN-023-1(48)--36-62	SHEET NUMBER W.5

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