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A Sheets	Title Sheets
A.1	Title Sheet
A.2	Location Map Sheet
B Sheets	Typical Cross Sections and Details
B.1	Typical Cross Sections and Details
C Sheets	Quantities and General Information
C.1	Estimated Project Quantities and Reference Notes
C.1	Standard Road Plans
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J Sheets	Traffic Control and Staging Sheets
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PLANS OF PROPOSED IMPROVEMENT ON THE
PRIMARY ROAD SYSTEM
KEOKUK COUNTY
Bridge Replacement
IA 21 bridge
over Cedar Creek
1.1 miles north of junction of IA 92
SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

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



REVISIONS

PROJECT IDENTIFICATION NUMBER	TOTAL
	29
21-54-021-020	
PROJECT NUMBER	
BRF-021-1(46)--38-54	
R.O.W. PROJECT NUMBER	
STPN-021-1(47)--2J-54	

DESIGN DATA RURAL			
20 21	AADT	1,760	V.P.D.
20 46	AADT	1,800	V.P.D.
20 46	DHV	180	V.P.H.
TRUCKS		15	%
Total			
Design ESALs		-	

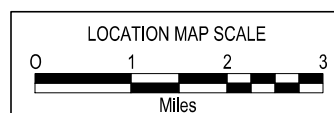
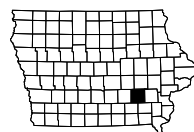
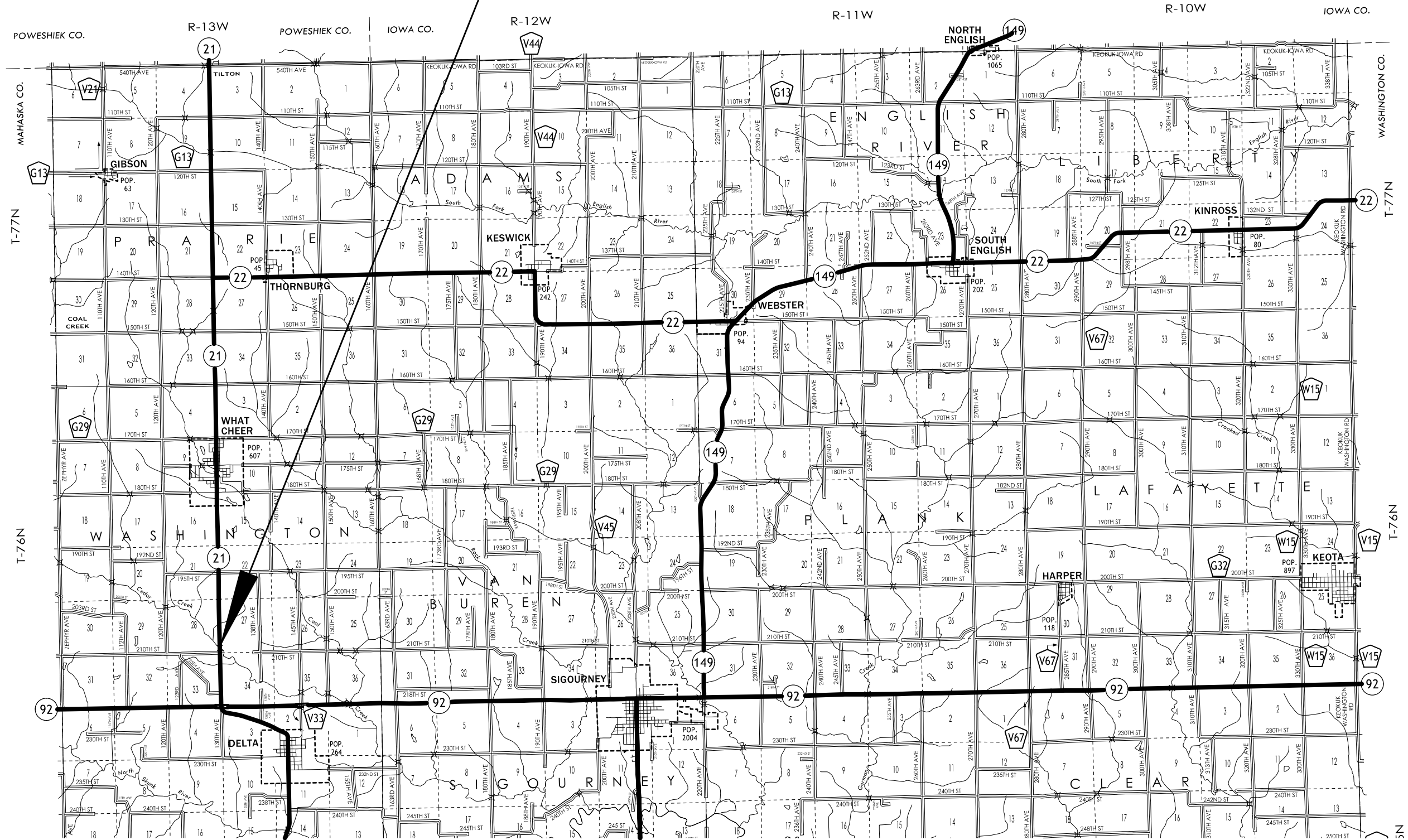
INDEX OF SEALS			
SHEET NO.	NAME	TYPE	BID QUANTITY SHEETS
A.1	X	Primary Signature Block	X
V.1	Mark D. Werner	Hydraulic Design	X

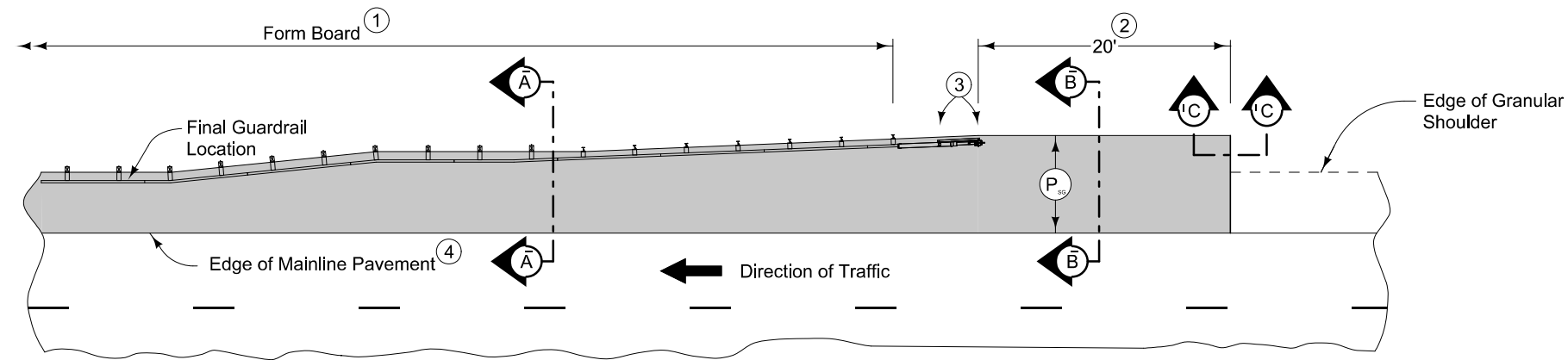
PRELIMINARY PLANS

Subject to change by final design.

D5 PLAN - Date: 2/23/2024

IA 21 BRIDGE REPLACEMENT
FHWA NO. 32601
MAINT. 5414.5S021
STA. 57+50.00





PLAN VIEW

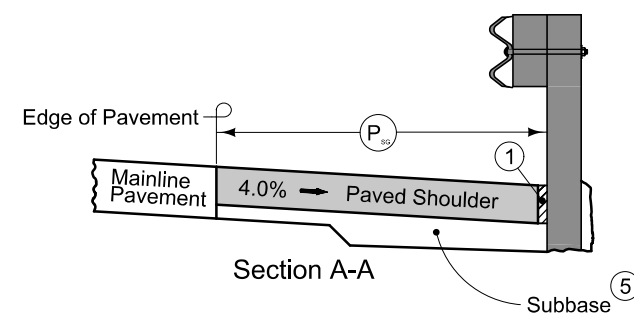
9" HMA Paved Shoulder at guardrail. 8" PCC may be substituted with the following jointing layout:

Match mainline pavement joint spacing. When mainline pavement is 8" or greater in thickness, place additional transverse 'C' joints in shoulder at mid-panel of the mainline pavement. Place longitudinal 'C' joint at $P/2$ from edge of mainline pavement when P is greater than 10' wide. Terminate longitudinal joint at transverse joint less than 10' in length.

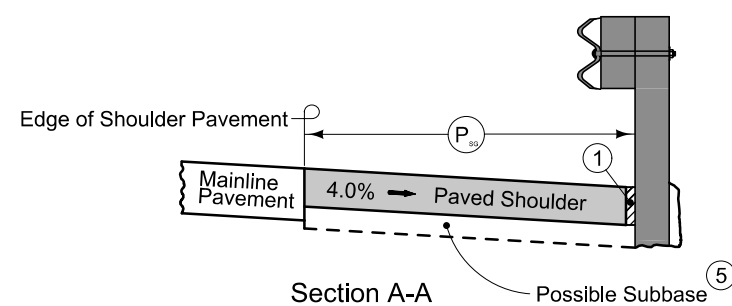
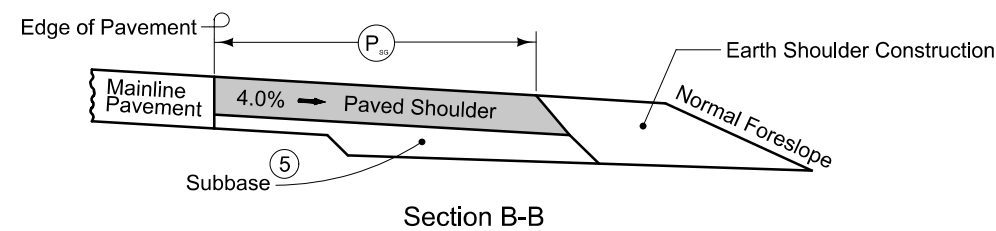
Compaction of HMA is required to face of guardrail post. Hand compaction will be allowed under guardrail. Removal and reinstallation of guardrail will be allowed with no additional payment.

Refer to Tabulation 112-9 for shoulder quantities.

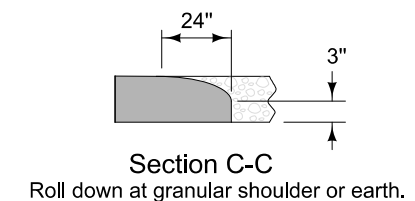
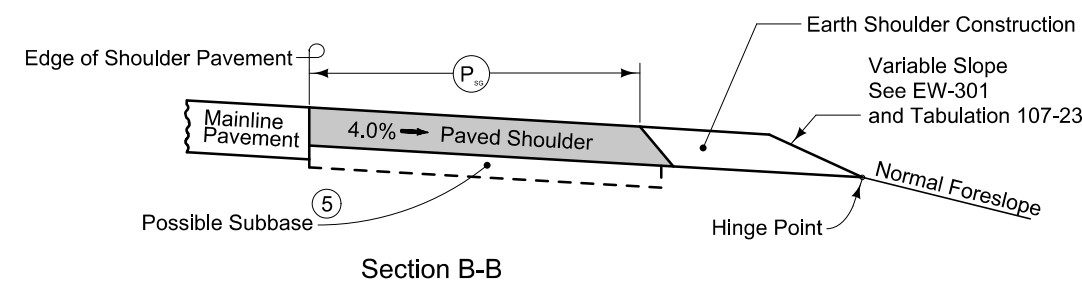
- ① PCC option only: When guardrail posts are installed prior to construction of PCC paved shoulder, fasten form board to the face of guardrail posts for the length shown.
- ② Continue paved shoulder 20 feet beyond the center of the first post.
- ③ Shoulder may be notched for first 2 posts or post sleeves may be installed through pavement. Do not drive posts through pavement.
- ④ 'KT' joint (per PV-101) for PCC shoulder. 'B' joint (per PV-101) for HMA shoulder.
- ⑤ Refer to other details in the plan.



NEW CONSTRUCTION



EXISTING SHOULDER



PAVED SHOULDER AT GUARDRAIL
(GRANULAR SHOULDER ADJACENT TO MAINLINE)

ESTIMATED ROADWAY QUANTITIES (1 DIVISION PROJECT)						100-0A 10-28-97
Item No.	Item Code	Item	Unit	Total	As Built Qty.	

ESTIMATE REFERENCE INFORMATION			100-4A 10-29-02
Item No.	Item Code	Description	

STANDARD ROAD PLANS			105-4 10-18-11
The following Standard Road Plans apply to construction work on this project.			
Number	Date	Title	
BA-200	04-20-21	Steel Beam Guardrail Components	
BA-201	10-18-22	Steel Beam Guardrail Barrier Transition Section (MASH TL-3)	
BA-202	04-16-24	Steel Beam Guardrail Bolted End Anchor	
BA-205	10-17-23	Steel Beam Guardrail Tangent End Terminal (MASH TL-3)	
BA-250	04-20-21	Steel Beam Guardrail Installation at Concrete Barrier or Bridge End Post (MASH TL-3)	
BR-205	04-16-24	Double Reinforced 12" Approach (Slab Bridge)	
DR-306	10-17-23	Precast Concrete Headwall for Subdrain Outlets	
DR-402	04-16-24	Rock Flume for Bridge End Drain	
EC-204	10-19-21	Perimeter, Slope and Ditch Check Sediment Control Devices	
EC-502	04-21-15	Seeding in Rural Areas	
EW-301	04-16-24	Guardrail Grading	
PM-110	04-16-24	Line Types	
PR-103	10-17-23	Full Depth PCC Patch with Dowels	
PV-101	04-19-22	Joints	
PV-102	04-21-20	PCC Curb Details	
SI-173	04-19-16	Object Markers	
SI-211	10-18-22	Object Marker and Delineator Placement with Guardrail	
SI-881	04-16-19	Special Signs for Workzones	
TC-1	10-15-19	Work Not Affecting Traffic (Two-Lane or Multi-Lane)	
TC-202	04-18-23	Work Within 15 ft of Traveled Way	
TC-252	04-21-20	Routes Closed to Traffic	

SURVEY SYMBOLS

SURVEYED UTILITY OWNER SYMBOLS

PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

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

	GL1C, ALLIANT ENERGY- Quality C Billie Reid 319-786-3073 billiereid@alliantenergy.com
	EL1C, ALLIANT ENERGY - Quality C Billie Reid 319-786-3073 billiereid@alliantenergy.com
	WL1C, WAPELLO RURAL WATER ASSOCIATION - Quality C Krista Huffman 641-682-8351 kristah@wapelloruralwater.com
	FO1C, WINDSTREAM - Quality C Dan Hogan 563-920-2428 Dan.Hogan@windstream.com

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
Yellow	(4)	Proposed Pavement Shading
Orange	(6)	Proposed Granular Shading
Orange	(70)	Proposed Shoulder Granular Shading
Yellow	(68)	Proposed Shoulder Paved Full Depth Shading
Yellow	(132)	Proposed Shoulder Paved Partial Depth Shading
Gray, Dark	(112)	Proposed Grade and Pave Shading "In conjunction with a paving project"
Brown, Light	(236)	Grading Shading
Orange, Light	(134)	Proposed Granular Entrance Shading
Yellow	(220)	Proposed Paved Entrance Shading
Tan	(8)	Proposed Sidewalk Shading
Blue, Light	(230)	Proposed Sidewalk Landing Shading
Pink	(11)	Proposed Sidewalk Ramp Shading
Green, Light	(225)	Existing Pavement Shading
Red	(3)	Proposed Structure Shading
Red	(3)	Delineates Restricted Areas

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK		Design Color No.
Green	(10)	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

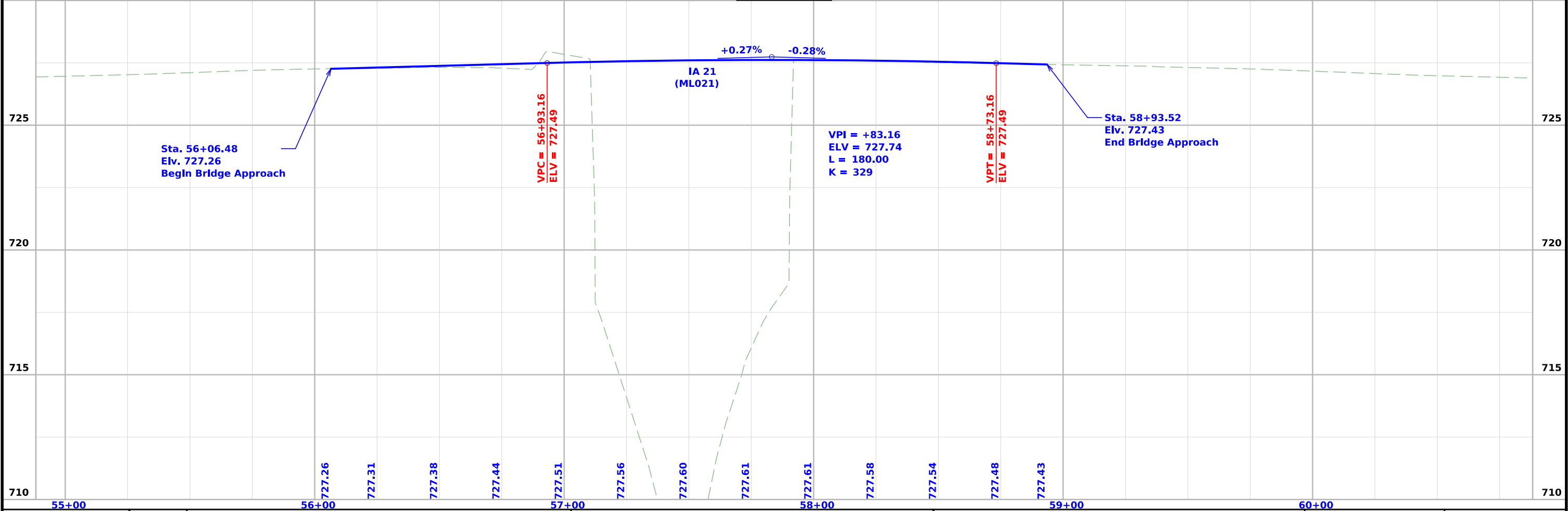
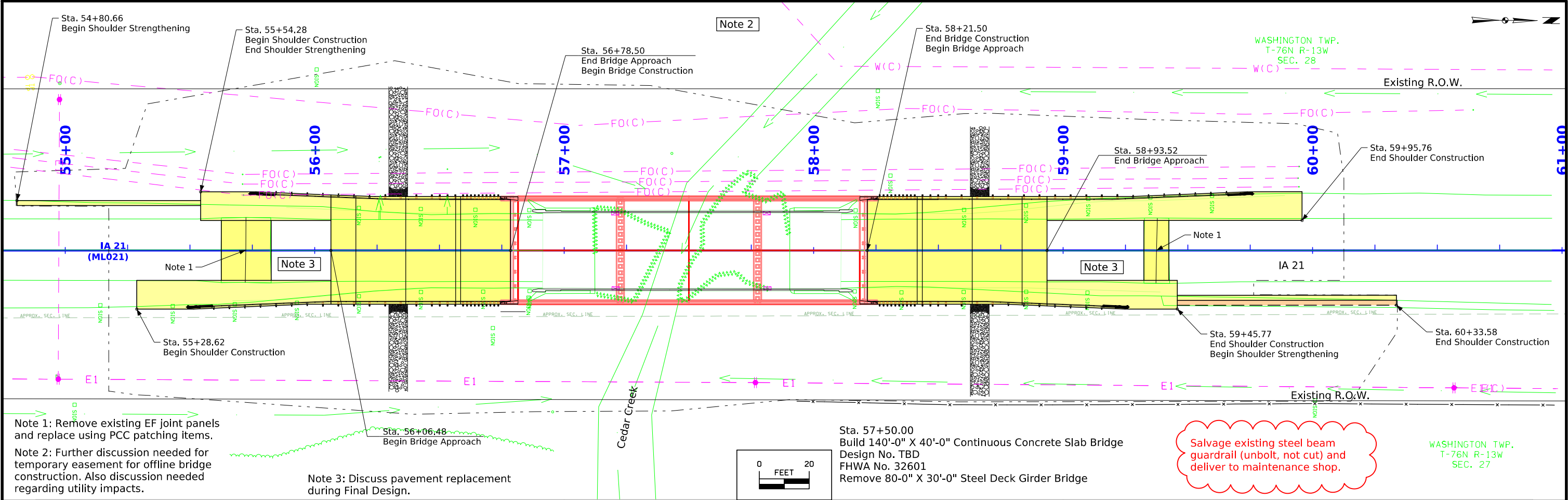
RIGHT-OF-WAY LEGEND

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

PLAN AND PROFILE
LEGEND AND SYMBOL
INFORMATION SHEET

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

	AST, Above Ground Storage Tank
	BB, Billboard
	BBB, Bottom of Bridge Beam
	BCL, Bridge Centerline
	BD, Bridge Deck
	BIN, Grain Bin
	BL, Topo Breakline
	BLD, Building or Foundation
	BLS, Bridge Low Steel
	BM, Bench Mark
	BNK, Stream Bank
	BRG, Bridge
	C, Centerline BL of Road -ML or SR
	CAV, Cave
	CEL, Cell Phone Tower
	CIS, Cistern
	CON, Concrete or A/C Slab
	CP, Control Point
	CRP, Corporation Line
	CS, Curve Point
	CU, Back of Curb
	CUL, Culvert
	D, Centerline Draw or Stream -Down
	DAB, Drainage Area Boundary
	DIK, Centerline of Dike or Dam
	DTM, Photogrammetry Elv Control Check
	DU, Centerline Draw or Stream -Up
	EB, Electrical Box
	EG, Edge of Gravel Road
	ENP, Edge Paved Entrance and Park Lot
	ENT, Centerline BL of Entrance
	ENU, Edge Unpaved Entrance and Parking
	EP, Edge of Paved Roads -ML or SR
	EW, Edge of Water
	FCL, Chain Link and Security Fence
	FENO, FENO Monument
	FHD, Fire Hydrants
	FLG, Flag Poles
	FP, Filler Pipe
	FW, Wire Fence
	FWD, Wood Fence
	GDC, Guard Rail Cable
	GDL, Guard Rail Steel
	GP, Guard Post -Less Than 4 Posts
	GPR, Guard Post -4 or More Posts
	GR, Ground Shot
	GRV, Grave
	GU, Gutter In Front of Curb
	GV, Gas Valve
	HDG, Hedge Row
	HS, Hydric Soil -Wetlands
	HT, Electrical Highline Tower
	IN, Storm Sewer Intake
	INB, Storm Sewer Beehive Intake
	LC, Lot Corner
	LIN, Miscellaneous Line
	LP, L.P. Tank
	LUM, Luminaire
	MH, Utility Access -Manhole
	MIS, Miscellaneous
	MM, Mile Marker Post
	OUT, Tile Outlet
	PC, Curve Point
	PCP, Photo Control Point
	PCT, Photo Control Target
	PI, Tangent Point
	PIP, Pipe Culvert
	PL, Location of Photo -Wetlands
	PLG, Location of General Photo
	POC, Curve Point
	POST, Spiral Point
	PR, Electric Riser Pole
	PRO, Profile Shot
	PT, Curve Point
	REF, Reference Tie Point
	RET, Retaining Walls
	RIP, Rip-Rap
	ROC, Rock Outcropping
	ROW, Right of Way Mark
	RR, Centerline of Railroad Tracks
	RRB, Railroad Signal Box
	RRF, Railroad Frog
	RRR, Railroad Rail
	RRS, Railroad Signal
	RRW, Railroad Switch
	RT, Radio Tower
	S, Soil Sampling Site -Wetlands
	SBR, Size of Bridge
	SC, Spiral Point
	SCR, Section Corner
	SEP, Septic Tank
	SF, Silt Fence -Wetlands
	SG, Staff Gauge -Wetlands
	SH, Paved Shoulder
	SHR, Shrub
	SI, Sign
	SL, Speed Limit Sign
	SLN, Section Line
	SLO, Silo
	SNK, Sink Hole
	SNP, Unpaved Shoulder
	SP, Stream Profile
	STP, Stump
	SWK, Sidewalk
	SWP, Swamp or Marsh
	TA, Tower Anchor
	TBO, Telephone Booth
	TCB, Traffic Signal Box
	TDC, Tree Deciduous
	TDL, Traffic Detection Loop
	TER, Terrace
	TEV, Evergreen Tree
	TFR, Tree Fruit
	TGP, Telegraph Pole
	TIL, Tile Line
	TLNL, Tree Line Left
	TLNR, Tree Line Right
	TOP, Top of Bridge Pier
	TPA, Telephone Pole Co. 1
	TPB, Telephone Pole Co. 2
	TPC, Telephone Pole Co. 3
	TR, Telephone Riser Pole
	TRL, Trail
	TS, Spiral Point
	TSB, Telephone Switch Box
	TSG, Traffic Signal
	TSL, Traffic Signal and Luminaire
	TV, Satellite TV Dish
	TVP, TV Pedestal
	TW, Top of Water
	UB, Utility Box
	UE, Utility Elevation
	UPH, Utility Pot Hole - Quality A
	UST, Underground Tank
	UV, Underground Utility Vault
	VS, Channel Cross Section
	WC, Wild Card -Misc. Field Shot
	WEL, Well
	WHD, Water Hydrant
	WHU, RV Water Hook Up
	WM, Wind Mill
	WND, Wind Turbine
	WV, Water Valve



Survey Information

SURVEY INDEX

County: Keokuk
PIN: 21-54-021-020
Project Number: BRF-021-1(46)--38-54
Location: Cedar Creek 1.1 Mi North of IA 92
Type of Work: Bridge Replacement

(U.S. SURVEY FOOT)
VERTICAL DATUM: NAVD88
GEOID MODEL: GEOID12B

Alignment Information

Alignment created by District ROW Office.

Survey Personnel

Matthew Fouts – PLS
Daniel Marti – PLS
Drake Marti – Survey Technician
Joshua Randolph – Survey CADD Technician

Date(s) of Survey

Begin Date 02/10/2023
End Date 02/10/2023

General Information

This survey is for preliminary design for the section of approximately 0.1 mile of roadway, there is one bridge along the route. Project datum is provided by Design Survey Office. This project is a full DTM Survey.

Utility Information

For logging data and other utility details see Utility Survey and Ownership Report in the Utility folder of the PrelimSurvey project directory.

Project Control

(RTN)
Nearby Iowa Real Time Network reference stations were utilized to obtain horizontal and vertical control on primary project control points. For additional details of the control survey, contact the Preliminary Survey department.

(Static)
Static observations were not used for this survey.

PROJECT DATUM: NAD83(2011) for EPOCH 2010.00
COORDINATE SYSTEM: IOWA REGIONAL COORDINATE SYSTEM ZONE 13
(Fairfield).

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) for EPOCH 2010.00 (IaRTN 2019 Adjustment) - Iowa RCS Zone 13 (U.S. Survey Foot)

VERT. DATUM: NAVD88 - Geoid Model: 12B

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) for EPOCH 2010.00 (laRTN 2019 Adjustment)
la. Regional Coordinate System Zone 13 (U.S. Survey Foot)
VERT. DATUM: NAVD88
Geoid Model: 2018u3 or 2018u2

POINT NAME	NORTHING	EASTING	ELEVATION	DESCRIPTION							
CP1	6802215.08	23379805.07	725.69	SET 5/8" REBAR 2'+/- WEST OF HIGHWAY 21 134'+/- NORTH OF BRIDGE GUARD RAIL							
CP2	6801529.83	23379857.38	725.97	SET 5/8" REBAR 1'+/- ON THE SOUTHEAST SIDE OF HIGWAY 21							
CP3	6801790.67	23379896.47	719.57	SET 5/8" REBAR ON THE SOUTHEAST SIDE OF THE BRIDGE ON THE SOUTH SIDE OF THE CREEK BANK							
CP4	6801837.90	23379792.60	717.27	SET 5/8" REBAR ON THE SOUTHWEST SIDE OF HIGHWAY 21 ON THE SOUTH SIDE OF THE CREEK BANK							
BM1	6802152.05	23379884.73	719.86	RAIL ROAD SPIKE IN WEST SIDE OF LIGHT POLE ON THE NORTHEAST SIDE OF HWY 21; 2ND LIGHT POLE UP FROM THE NORTH SIDE OF THE CREEK							
BM2	6801592.07	23379883.66	719.96	RAIL ROAD SPIKE IN WEST SIDE OF LIGHT POLE ON THE NORTHEAST SIDE OF HIGHWAY 21; 1ST POLE SOUTH OF CREEK							
CP5	6801366.00	23379754.62	725.31	60' WEST OF HIGHWAY 21 & 5' SOUTH OF 210TH ST - FENO MONUMENT							
CP6	6802558.19	23379858.53	726.15	15' EAST OF HIGHWAY 21 & 2' SOUTH OF FIELD DRIVE - FENO MONUMENT							
CP7	6800651.29	23379894.34	738.88	60' EAST OF HIGHWAY 21 & 5' NORTH OF FIELD DRIVE INLINE WITH GATE POST EAST - FENO MONUMENT							
NGS8	6790552.56	23349949.67	817.27	NGS	SURVEY DISK IN CONCRETE MONUMENT STAMPED ROSE 1934 0.2' BELOW GROUND						

[illegible]

108-23A
08-01-08

TRAFFIC CONTROL PLAN

Maintain existing IA 21 traffic pattern for stage 1.
IA 21 will be closed and an off-site detour will be utilized for stage 2.

Detour (Sheet J.2) -
IA 92 east to IA 149 north to IA 22 west.
Detour will be signed and maintained by Iowa Department of Transportation.
(Confirm signing installation/maintenance responsibility during Final Design.)

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	

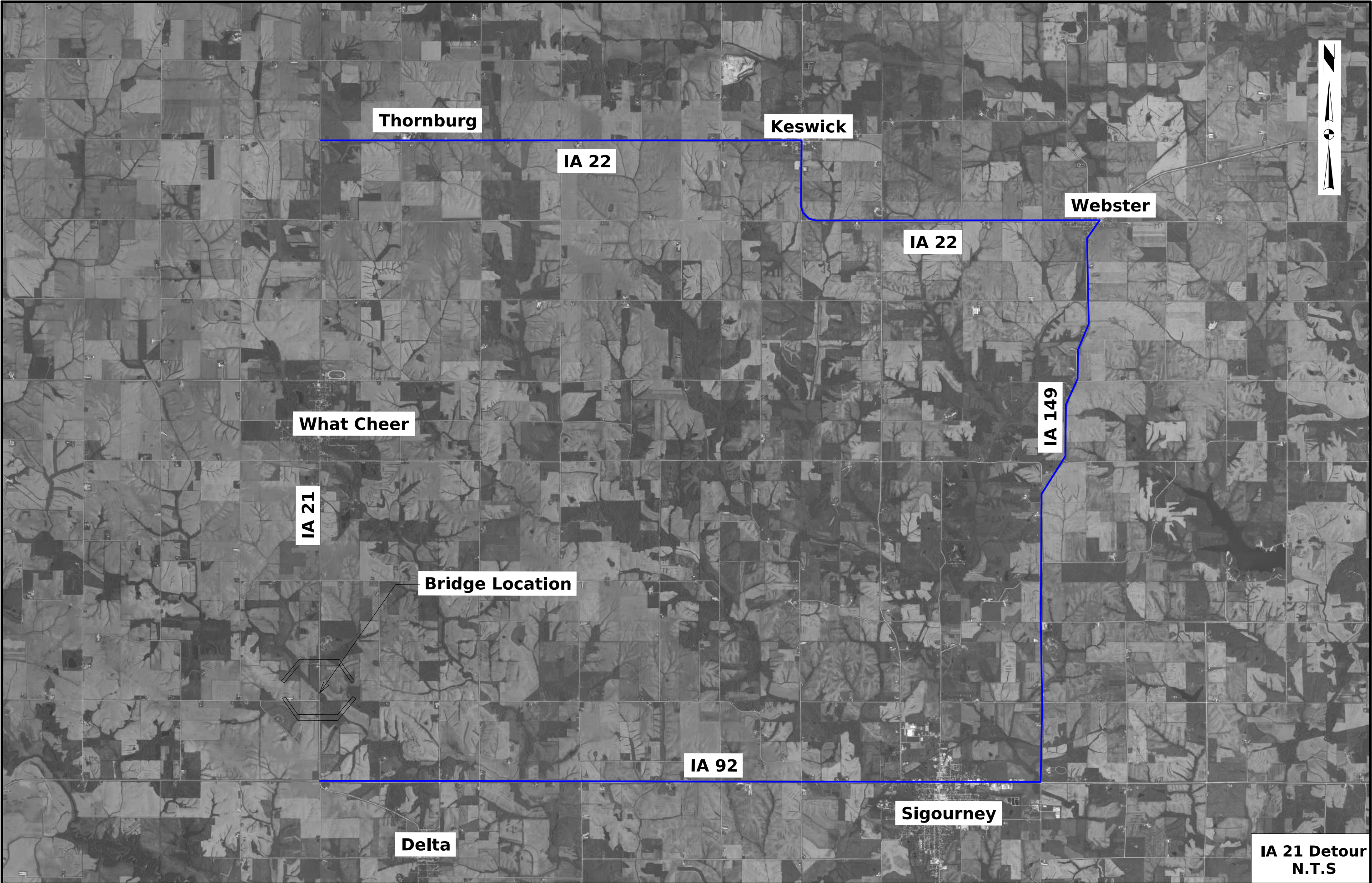
108-25 10-21-14												
511 TRAVEL RESTRICTIONS												
Route	Direction	County	Location Description	Feature Crossed	Object Type	Maint. Bridge No., Structure ID, or FHWA No.	Type of Restriction	Existing Measurement	Construction Measurement	Construction Measurement as Signed	Projected As Built Measurement	Remarks
None												

108-26A
08-01-08

STAGING NOTES

Stage 1
Traffic Control: Maintain existing IA 21 traffic pattern.
Construction: Construct new bridge on west side of existing bridge.

Stage 2
Traffic Control: Detour all IA 21 traffic offsite per Sheet J.2.
Construction: Demo old bridge. Slide new bridge into final location. Construct approach pavements, shoulders and guardrail.



100-18
10-16-18

SILT FENCES FOR DITCH CHECKS

Possible Standard: EC-201

Functional Height

FS:1

Storage Volume

Ditch Width

BS:1

Cross Section View

Functional Height

Length

Upstream Device or Ground

Storage Volume

Average Percent Ditch Grade

Longitudinal Profile View

* The functional height used in the volume equation is 85% of effective height. Effective height is 1.58 feet as shown on EC-201.
* Volume equation: $[0.5 * \text{Spacing} * (0.5 * H^2 * FS + DW * H + 0.5 * H^2 * BS)]$

Basin No.	Type	Location		Bid Items			Stormwater Storage Volume Summary						Remarks
		Station	Side	Installation	Maintenance	Removal	Foreslope	Backslope	Ditch Width	Avg.% Slope	Volume*		
				LF	LF	LF	FS:1	BS:1	FT	Ditch Grade	CF		
1	4	55+65.00	Lt	50.0	5.0	25.0	4.0	6.0	0.0	1.0%	698.9		
1	4	56+42.00	Lt	52.0	5.2	26.0	4.0	6.0	0.0	1.0%	698.9		
1	5	57+16.00	Lt	56.0	5.6	28.0	4.0	0.0	0.0	0.5%	568.1		
1	5	58+15.00	Lt	45.0	4.5	22.5	3.0	0.0	0.0	0.5%	426.1		
1	5	59+10.00	Lt	45.0	4.5	22.5	3.0	0.0	0.0	0.5%	426.1		
1	5	55+60.00	Rt	50.0	5.0	25.0	3.0	0.0	0.0	0.5%	426.1		
1	5	56+41.00	Rt	52.0	5.2	26.0	3.0	0.0	0.0	0.2%	426.1		
1	5	57+16.00	Rt	50.0	5.0	25.0	3.0	0.0	0.0	0.2%	426.1		
1	5	57+80.00	Rt	100.0	10.0	50.0	3.0	0.0	0.0	0.2%	426.1		
1	5	58+80.00	Rt	112.0	11.2	56.0	3.0	0.0	0.0	0.2%	426.1		
1	5	59+80.00	Rt	48.0	4.8	24.0	3.0	0.0	0.0	0.2%	426.1		
		Total:		660.0	66.0	330.0					5374.9		

100-19
10-19-21

PERIMETER, SLOPE AND DITCH CHECK SEDIMENT CONTROL DEVICES

Possible Standards: EC-204

Location			Perimeter and Slope			Ditch Check		Remarks
Begin Station	End Station	Side	Length of Installation			Length of Installation		
			9 inch Dia	12 inch Dia	20 inch Dia	12 inch Dia	20 inch Dia	
			LF	LF	LF	LF	LF	
54+80.00	57+32.00	Lt		260				
57+20.00	57+20.00	Both		60				
55+34.00	57+36.00	Lt		210				
55+27.00	57+20.00	Rt		200				
55+27.00	57+14.00	Rt		190				
57+65.00	57+88.00	Lt		60				
57+88.00	59+96.00	Lt		210				
57+83.00	59+96.00	Lt		220				
57+60.00	60+35.00	Rt		270				
	Totals:			1680				

100-34
10-17-17

STORMWATER DRAINAGE BASIN AND STORAGE

Refer to EC Standards and 570s Details.

Drainage Basin Location						Summary of Stormwater Storage							Remarks
Basin No.	Station to Station		Side	Discharge Point		Total Disturbed Area	Disturbed Area with Storage Provided	Disturbed Area without Storage Provided	Best Management Practice	Total Storage Volume Provided	Total Storage Volume Required	Storage Volume Met?	
				Station	Side					Acres	Acres	Acres	
	1	54+80.66		60+33.58		57+50.00	Rt	1.4		1.4	0.0	Silt Fence for Ditch Check (EC-201)	

FILE NO. 32542

ENGLISH

DESIGN TEAM Stanley Consultants Inc.

KEOKUK COUNTY

PROJECT NUMBER BRF-021-1(46)--38-54

SHEET NUMBER RC.1

2/19/2024 3:30:50 PM 8877 c:\pw_work\pmain\greg.shuger\d1181016\SHI_54021046_RC01.xlsm

110-12 10-20-20			110-12 10-20-20		
POLLUTION PREVENTION PLAN					
<p>This project is regulated by the requirements of the Iowa Department of Natural Resources (DNR) National Pollutant Discharge Elimination System (NPDES) General Permit No. 2 OR an Iowa Department of Natural Resources (DNR) National Pollutant Discharge Elimination System (NPDES) individual storm water permit. The Contractor shall carry out the terms and conditions of this permit and the Pollution Prevention Plan (PPP).</p> <p>This Base PPP includes information on Roles and Responsibilities, Project Site Description, Controls, Maintenance Procedures, Inspection Requirements, Non-Storm Water Controls, Potential Sources of Off Right-of-Way Pollution, and Definitions. This plan references other documents rather than repeating the information contained in the documents. A copy of this Base Pollution Prevention Plan, amended as needed during construction, will be readily available for review.</p> <p>All contractors shall conduct their operations in a manner that controls pollutants, minimizes erosion, and prevents sediments from entering waters of the state and leaving the highway right-of-way. The Contractor shall be responsible for compliance and implementation of the PPP for their entire contract. This responsibility shall be further shared with subcontractors whose work is a source of potential pollution as defined in this PPP.</p> <p>I. ROLES AND RESPONSIBILITES</p> <p>A. Designer:</p> <ol style="list-style-type: none">1. Prepares Base PPP included in the project plan.2. Prepares Notice of Intent (NOI) submitted to Iowa DNR.3. Is signature authority on the Base PPP. If consultant designed, signature from Contracting Authority is also required. <p>B. Contractor:</p> <ol style="list-style-type: none">1. Signs a co-permittee certification statement adhering to the requirements of the NPDES permit and this PPP. All co-permittees are legally required under the Clean Water Act and the Iowa Administrative Code to ensure compliance with the terms and conditions of this PPP.2. Designates a Water Pollution Control Manager (WPCM), who has the duties and responsibilities as defined in Section 2602 of the Standard Specifications.3. Submits an Erosion Control Implementation Plan (ECIP) and ECIP updates according to Section 2602 of the Standard Specifications.4. Installs and maintains appropriate controls. This work may be subcontracted as documented through Subcontractor Request Forms (Form 830231).5. Supervises and implements good housekeeping practices according to Paragraph III, C, 2.6. Conducts joint required inspections of the site with inspection staff. When Contractor is not mobilized on site, Contractor may delegate this responsibility to a trained or certified subcontractor. Contracting Authority also may waive joint inspection requirement during winter shutdown. In both circumstances, WPCM (or trained or certified delegate from the Contractor) is still responsible to review and sign inspection reports.7. Complies with training and certification requirements of Section 2602 of the Standard Specifications.8. Submits amended PPP site map according to Section 2602 of the Standard Specifications. <p>C. Subcontractors:</p> <ol style="list-style-type: none">1. Sign a co-permittee certification statement adhering to the requirements of the NPDES permit and this PPP if: responsible for sediment or erosion controls; involved in land disturbing activities; or performing work that is a source of potential pollution as defined in this PPP. Subcontracted work items are identified in Subcontractor Request Forms (Form 830231). All co-permittees are legally required under the Clean Water Act and the Iowa Administrative Code to ensure compliance with the terms and conditions of this PPP.2. Implement good housekeeping practices according to Paragraph III, C, 2. <p>D. RCE/Project Engineer:</p> <ol style="list-style-type: none">1. Is Project Storm Water Manager.2. On projects where DOT is the Contracting Authority, is current with erosion control training or certification.3. Takes actions necessary to ensure compliance with storm water requirements including, where appropriate, issuing stop work orders, and directing additional inspections at construction project sites that are experiencing problems with achieving permit compliance.4. Orders the taking of measures to cease, correct, prevent, or minimize the consequences of non-compliance with the storm water requirements of the Applicable Permit.5. Supervises all work necessary to meet storm water requirements at the Project, including work performed by contractors and subcontractors.6. Requires employees, contractors, and subcontractors to take appropriate responsive action to comply with storm water requirements, including requiring any such person to cease or correct a violation of storm water requirements, and to order or recommend such other actions as necessary to meet storm water requirements.7. Is familiar with the Project PPP and storm water site map.8. On projects where DOT is Contracting Authority, is responsible for periodically monitoring inspection reports to determine whether deficiencies identified in inspection reports were adequately and timely addressed, and if not, has the authority and responsibility to direct immediate actions to correct the deficiencies.9. Is the point of contact for the Project for regulatory officials, Inspector, contractors, and subcontractors regarding storm water requirements.10. Is signature authority on Notice of Discontinuation.11. Maintains an up-to-date record of contractors, subcontractors, and subcontracted work items through Subcontractor Request Forms (Form 830231).12. Makes information to determine permit compliance available to the DNR upon their request. <p>E. Inspector:</p> <ol style="list-style-type: none">1. Updates PPP through fieldbook entries and storm water site inspection reports if there is a change in design, construction, operation, or maintenance which has a significant effect on the discharge of pollutants from the project.2. Makes information to determine permit compliance available to the DNR upon their request.3. Conducts joint required inspections of the site with the contractor/subcontractor.4. Completes an inspection report after each inspection.5. Is signature authority on storm water inspection reports. <p>II. PROJECT SITE DESCRIPTION</p> <p>A. This Pollution Prevention Plan (PPP) is for the construction of a Bridge Repacement.</p> <p>B. This PPP covers approximately 1.4 acres with an estimated 1.4 acres being disturbed. The portion of the PPP covered by this contract has 1.4 acres disturbed.</p> <p>C. The PPP is located in an area of 1 soil association Otley - Ladoga The estimated weighted average runoff coefficient number for this PPP after completion will be 0.49.</p> <p>D. Storm Water Site Map is located in the R sheets. Proposed slopes are shown in cross sections, details, or standard road plans. Supplemental information is located in the Tabulations in the C or CE sheets.</p> <p>E. The base storm water site map is amended by contract modifications and progress payments (fieldbook entries) of completed erosion control work. Also, due to project phasing, erosion and sediment controls shown on project plans may not be installed until needed, based on site conditions. For example, silt fence ditch checks will typically not be installed until the ditch has been installed. Installed locations may also be modified from tabulation locations by field staff. Installed locations will be</p>					
POLLUTION PREVENTION PLAN					
<p>documented by fieldbook entries and amended PPP site map.</p> <p>F. Runoff from this work will flow into Cedar Creek.</p> <p>III. CONTROLS</p> <p>A. The Contractor’s ECIP specified in Article 2602.03 of the Standard Specifications for accomplishment of storm water controls should clearly describe the intended sequence of major activities, and for each activity define the control measure and the timing during the construction process that the measure will be implemented.</p> <p>B. Preserve vegetation in areas not needed for construction.</p> <p>C. Sections 2601 and 2602 of the Standard Specifications define requirements to implement erosion and sediment control measures. Actual quantities used and installed locations may vary from the Base PPP and amendment of the plan will be documented via fieldbook entries, amended PPP site map, or by contract modification. Additional erosion and sediment control items may be required as determined by the inspector and/or contractor during storm water site inspections. If the work involved is not applicable to any contract items, the work will be paid for according to Article 1109.03 paragraph B of the Standard Specifications.</p> <p>1. EROSION AND SEDIMENT CONTROLS</p> <p>a. Stabilization Practices</p> <ol style="list-style-type: none">1) Site plans will ensure that existing vegetation or natural buffers are preserved where attainable and disturbed portions of the site will be stabilized.2) Initialize stabilization of disturbed areas immediately after clearing, grading, excavating, or other earth disturbing activities have:<ol style="list-style-type: none">a) Permanently ceased on any portion of the site, orb) Temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days.3) Staged permanent and/or temporary stabilizing seeding and mulching shall be completed as the disturbed areas are completed. Incomplete areas shall be stabilized according to paragraph III, C, 1, a, 2, b above.4) Permanent and Temporary Stabilization practices to be used for this project are located in the storm water site map, Estimated Project Quantities (100-0A, 100-1A, or 100-1C), and Estimate Reference Information (100-4A) located in the C or R sheets. Typical drawings detailing construction of the practices to be used on this project are referenced in the Standard Road Plans Tabulation (105-4) in the C or R sheets.5) Preservation of existing vegetation within right-of-way or easements will act as vegetative buffer strips.6) Preservation of topsoil: Bid items to be used for this project are located in the Estimated Project Quantities (100-0A, 100-1A, or 100-1C) and Estimate Reference Information (100-4A) located in the C or R sheets. Additional information may be found in the Tabulations in the C or T Tabulation sheets, or is referenced in Section 2105 of the Standard Specifications. <p>b. Structural Practices</p> <ol style="list-style-type: none">1) Structural practices will be implemented to divert flows from exposed soils and detain or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Additionally, structural practices may include: silt basins that provide 3600 cubic feet of storage per acre drained or equivalent sediment controls, outlet structures that withdraw water from surface when discharging basins, and controls to direct storm water to vegetated areas.2) Structural practices to be used for this project are located in the storm water site map, Estimated Project Quantities (100-0A, 100-1A, or 100-1C), and Estimate Reference Information (100-4A) located in the C or R sheets, as well as all other item specific Tabulations. Typical drawings detailing construction of the devices to be used on this project can be found on the B or R sheets or are referenced in the Standard Road Plans Tabulation (105-4) located in the C or R sheets. <p>c. Storm Water Management</p> <p>Measures shall be installed during the construction process to control pollutants in storm water discharges that will occur after construction operations have been completed. This may include velocity dissipation devices at discharge locations and along length of outfall channel as necessary to provide a non-erosion velocity flow from structure to water course. If included with this project, these items are located in the storm water site map and Estimated Project Quantities (100-0A, 100-1A, or 100-1C) and Estimate Reference Information (100-4A) located in the C or R sheets, as well as all other item specific Tabulations. Typical drawings detailing construction of the practices to be used on this project are referenced in the Standard Road Plans Tabulation. The installation of these devices may be subject to Section 404 of the Clean Water Act.</p> <p>2. OTHER CONTROLS</p> <p>Contractor disposal of unused construction materials and construction material wastes shall comply with applicable state and local waste disposal, sanitary sewer, or septic system regulations. In the event of a conflict with other governmental laws, rules and regulations, the more restrictive laws, rules or regulations shall apply.</p> <p>a. Vehicle Entrances and Exits - Construct and maintain entrances and exits to prevent tracking of sediments onto roadways.</p> <p>b. Material Delivery, Storage and Use - Implement practices to prevent discharge of construction materials during delivery, storage, and use.</p> <p>c. Stockpile Management - Install controls to reduce or eliminate pollution of storm water from stockpiles of soil and paving.</p> <p>d. Waste Disposal - Do not discharge any materials, including building materials, into waters of the state, except as authorized by a Section 404 permit.</p> <p>e. Spill Prevention and Control - Implement chemical spill and leak prevention and response procedures to contain and clean up spills and prevent material discharges to the storm drain system and waters of the state.</p> <p>f. Concrete Residuals and Washout Wastes - Waste shall not be discharged to a surface water and is not allowed to adversely affect a water of the state. Designate temporary concrete washout facilities for rinsing out concrete trucks. Provide directions to truck drivers where designated washout facilities are located. Designated washout areas should be located at least 50 feet away from storm drains, streams or other water bodies. Care should be taken to ensure these facilities do not overflow during storm events.</p> <p>g. Concrete Grooving/Grinding Slurry - Do not discharge slurry to a waterbody or storm drain. Slurry may be applied on foreslopes or removed from the project.</p> <p>h. Vehicle and Equipment Storage and Maintenance Areas - Perform on site fueling and maintenance in accordance with all environment laws such as proper storage of onsite fuels and proper disposal of used engine oil or other fluids on site. Employ washing practices that prevent contamination of surface and ground water from wash water. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge.</p> <p>i. Litter Management - Ensure employees properly dispose of litter. Minimize exposure of trash if exposure to precipitation or storm water would result in a discharge of pollutants.</p> <p>j. Dewatering - Properly treat water to remove suspended sediment before it re-enters a waterbody or discharges off-site. Measures are also to be taken to prevent scour erosion at dewatering discharge point.</p> <p>3. APPROVED STATE OR LOCAL PLANS</p> <p>During the course of this construction, it is possible that situations will arise where unknown materials will be encountered. When such situations are encountered, they will be handled according to all federal, state, and local regulations in effect at the time.</p> <p>IV. MAINTENANCE PROCEDURES</p>					
FILE NO.	32542	ENGLISH	DESIGN TEAM	Stanley Consultants Inc.	
KEOKUK COUNTY		PROJECT NUMBER		BRF-021-1(46)--38-54	SHEET NUMBER
				RC.2	

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POLLUTION PREVENTION PLAN

The Contractor is required to maintain all temporary erosion and sediment control measures in proper working order, including cleaning, repairing, or replacing them throughout the contract period. This shall begin when the features have lost 50% of their capacity.

V. INSPECTION REQUIREMENTS

A. Inspections shall be made jointly by the Contractor and the Contracting Authority's inspector at least once every seven calendar days. Storm water site inspections will include:

1. Date of the inspection.
2. Summary of the scope of the inspection.
3. Name and qualifications of the personnel making the inspection.
5. Review of erosion and sediment control measures within disturbed areas for the effectiveness in preventing impacts to receiving waters.
6. Major observations related to the implementation of the PPP.
7. Identification of corrective actions required to maintain or modify erosion and sediment control measures.

B. Include storm water site inspection reports in the Amended PPP. Incorporate any additional erosion and sediment control measures determined as a result of the inspection. Immediately begin corrective actions on all deficiencies found within 3 calendar days of the inspection and complete within 7 calendar days following the inspection. If it is determined that making the corrections less than 72 hours after the inspection is impracticable, it should be documented why it is impracticable and indicate an estimated date by which the corrections will be made.

VI. NON-STORM WATER DISCHARGES

This includes subsurface drains (i.e. longitudinal and standard subdrains) and slope drains. The velocity of the discharge from these features may be controlled by the use of headwalls or blocks, Class A stone, erosion stone or other appropriate materials. This also includes uncontaminated groundwater from dewatering operations, which will be controlled as discussed in Section III of the PPP.

VII. POTENTIAL SOURCES OF OFF RIGHT-OF-WAY (ROW) POLLUTION

Silts, sediment, and other forms of pollution may be transported onto highway right-of-way (ROW) as a result of a storm event. Potential sources of pollution located outside highway ROW are beyond the control of this PPP. Pollution within highway ROW will be conveyed and controlled per this PPP.

VIII. DEFINITIONS

A. Base PPP - Initial Pollution Prevention Plan.

B. Amended PPP - Base PPP amended during construction. May include Plan Revisions or Contract Modifications for new items, storm water site inspection reports, fieldbook entries made by the inspector, amended PPP site map by the Contractor, ECIP, NOI, co-permittee certifications, and Subcontractor Request Forms. Items amending the PPP are stored electronically and are readily available upon request.

C. Fieldbook Entries - This contains the inspector's daily diary and bid item postings.

D. Controls - Methods, practices, or measures to minimize or prevent erosion, control sedimentation, control storm water, or minimize contaminants from other types of waste or materials. Also called Best Management Practices (BMPs).

E. Signature Authority - Representative authorized to sign various storm water documents.

CERTIFICATION STATEMENT





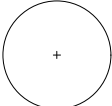
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.




Signature









Printed or Typed Name








Signature










LINE STYLE LEGEND OF LANDSCAPE SHEETS	
LINESTYLE	Design Element
-----	Living Snow Fence Single Row
-----	Living Snow Fence Double Row
-----	Mechanical Edge

















CELL LEGEND OF LANDSCAPE SHEETS		
CELL	Design Element	Plant Diameter
	Clearing	
	Proposed Shrub	6 FT
	Proposed Understory Tree	12 FT
	Proposed Conifer Tree	18 FT
	Proposed Overstory Tree	30 FT

PATTERN LEGEND OF LANDSCAPE SHEETS	
	Brush Clearing
	Clearing & Grubbing
	Spray Area

LINE STYLE LEGEND OF EROSION CONTROL SHEETS	
LINESTYLE	Design Element
	Silt Fence
	Perimeter and Slope Sediment Control Device (9")
	Perimeter and Slope Sediment Control Device (12")
	Perimeter and Slope Sediment Control Device (20")
	Open-Throat Curb Intake Sediment Filter
	Concentrated Flow
	Rock Check and Rock Check Dam
	Sheet Flow

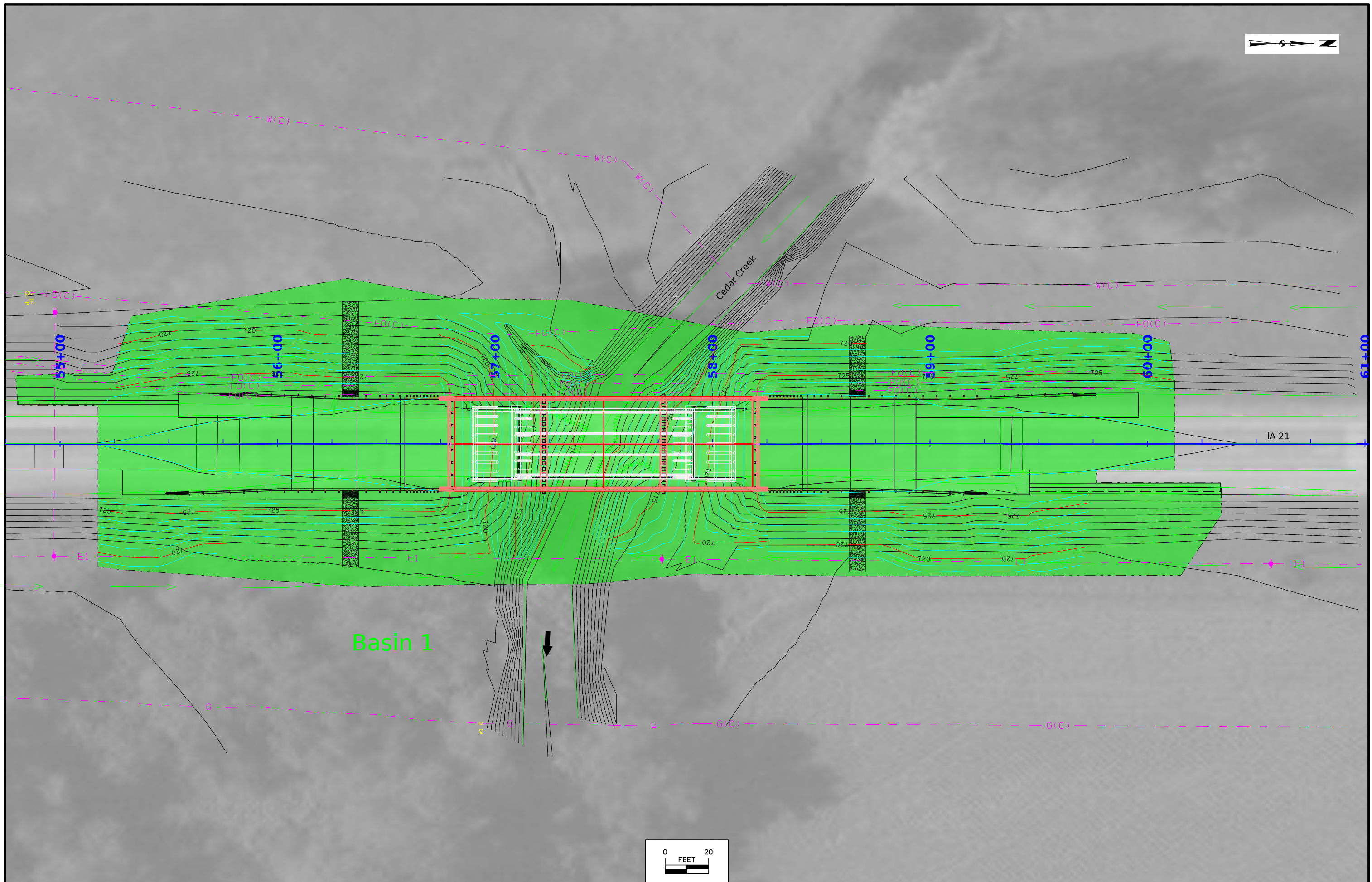
CELL LEGEND OF EROSION CONTROL SHEETS	
CELL	Design Element
	Temporary Sediment Control basin
	Erosion Control for Circular Intake or Manhole Well
	Erosion Control for Rectangular Intake or Manhole Well
	Grate Intake Sediment Filter Bag
	Silt Basin
	Silt Fence Tail
	Stormwater Drainage Basin Discharge Point

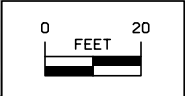
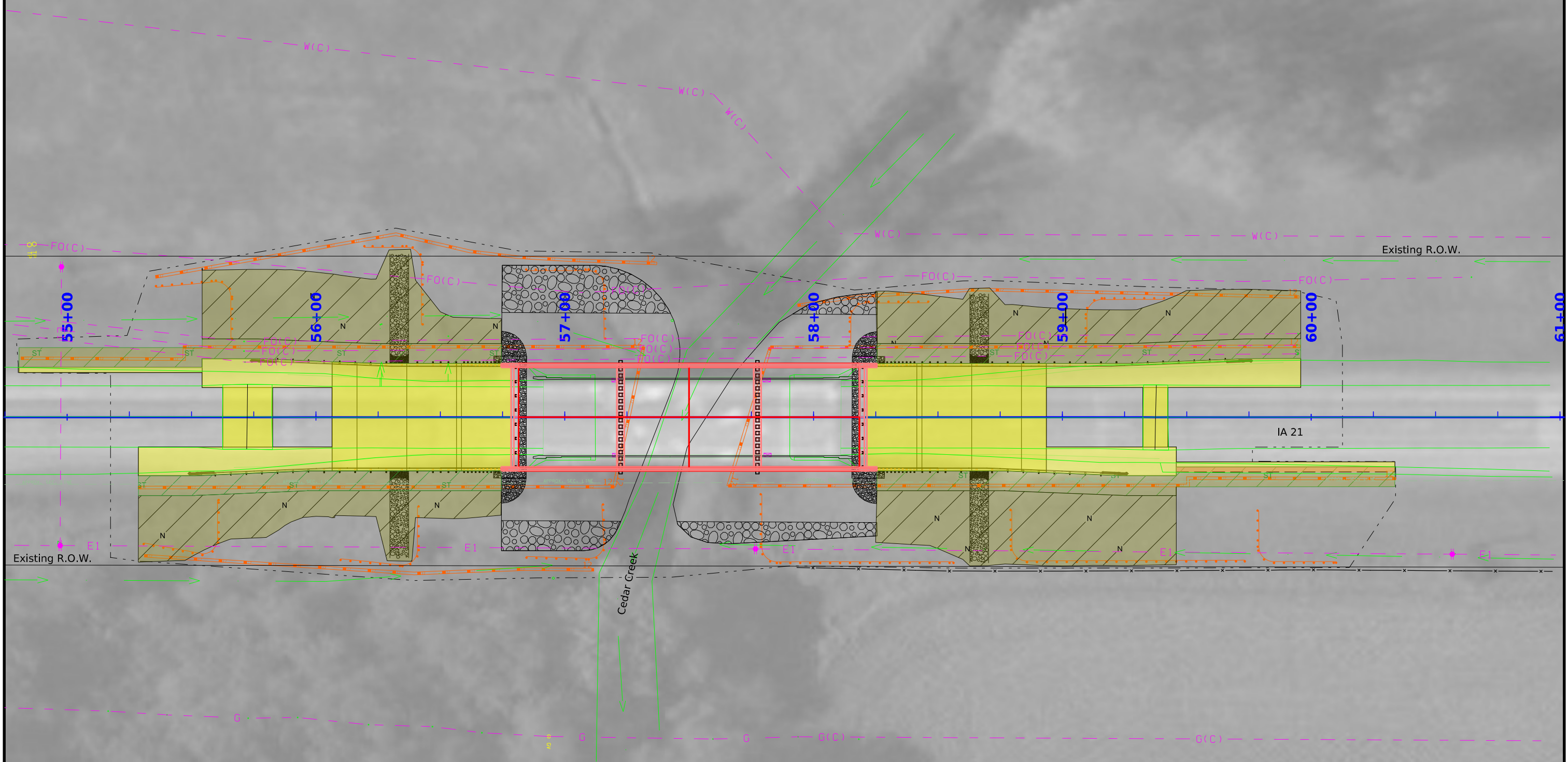
PLAN VIEW COLOR LEGEND OF EROSION CONTROL SHEETS				
LINEWORK	Design Color No.			
Green	(2)		Existing Topographic Features and Labels	
Blue	(1)		Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation	
Magenta	(5)		Existing Utilities	
Black	(0)		Permanent Erosion Control Features	
Blaze Orange	(222)		Temporary Erosion Control Features	
SHADING	Design Color No.		Transparency	
Citron	(234)		Mulching, All Types	50%
Light Brown	(238)		Special Ditch Control, Wood Excelsior Mat	0%
Grass Green	(233)		8FT Mow Strip	50%
Red	(3)		Delineates Restricted Areas	0%

PATTERN LEGEND OF EROSION CONTROL SHEETS	
	Seeding and Fertilizing
	Seeding and Fertilizing (Rural)
	Seeding and Fertilizing (Urban)
	Native Grass Seeding
	Salt Tolerant Seeding
	Wetland Grass Seeding
	Wildflower Seeding
	Sodding
	Turf Reinforcement Mat Type 1
	Turf Reinforcement Mat Type 2
	Turf Reinforcement Mat Type 3
	Turf Reinforcement Mat Type 4
	Slope Protection, Wood Excelsior Mat
	Transition Mat
	Rock Features, Permanent
	Rock Features, Temporary

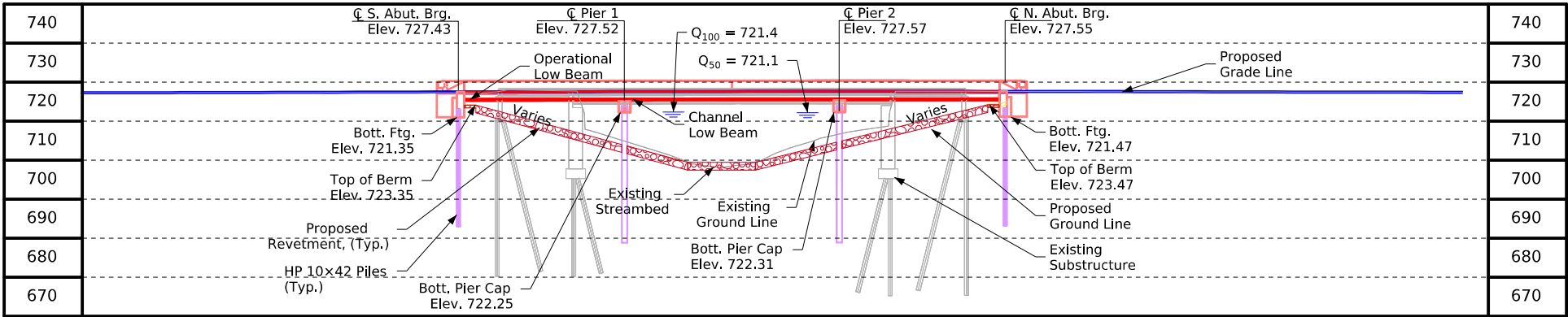
EROSION CONTROL
LEGEND AND SYMBOL
INFORMATION SHEET

(COVERS SHEET SERIES R)



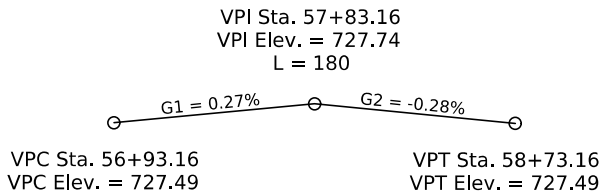


FILE NO. 32542	ENGLISH	DESIGN TEAM Stanley Consultants Inc.	KEOKUK COUNTY	PROJECT NUMBER BRF-021-1(46)--38-54	SHEET NUMBER RR.3
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Longitudinal Section Along CL Iowa 21

BENCH MARK NO. CP3: N:6801790.67 E:23379896.47; ELEV 719.57
SET 3/8" REBAR ON THE SOUTHEAST SIDE OF THE BRIDGE ON THE SOUTH SIDE OF THE CREEK BANK



Hydraulic Data

RIDB: CedarC_Keo_12.0
Drainage Area = 24.9 Sq. Mi.
Stream Slope (HGL) = 8.9 Ft./Mi.
Avg. Low Water Stage = 709.5

Q_{50} = 3,200 cfs
Stage = 721.1
Channel Low Beam = 725.16
Avg. Bridge Velocity = 5.9 fps

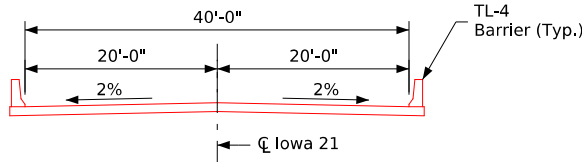
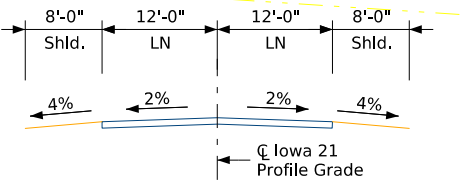
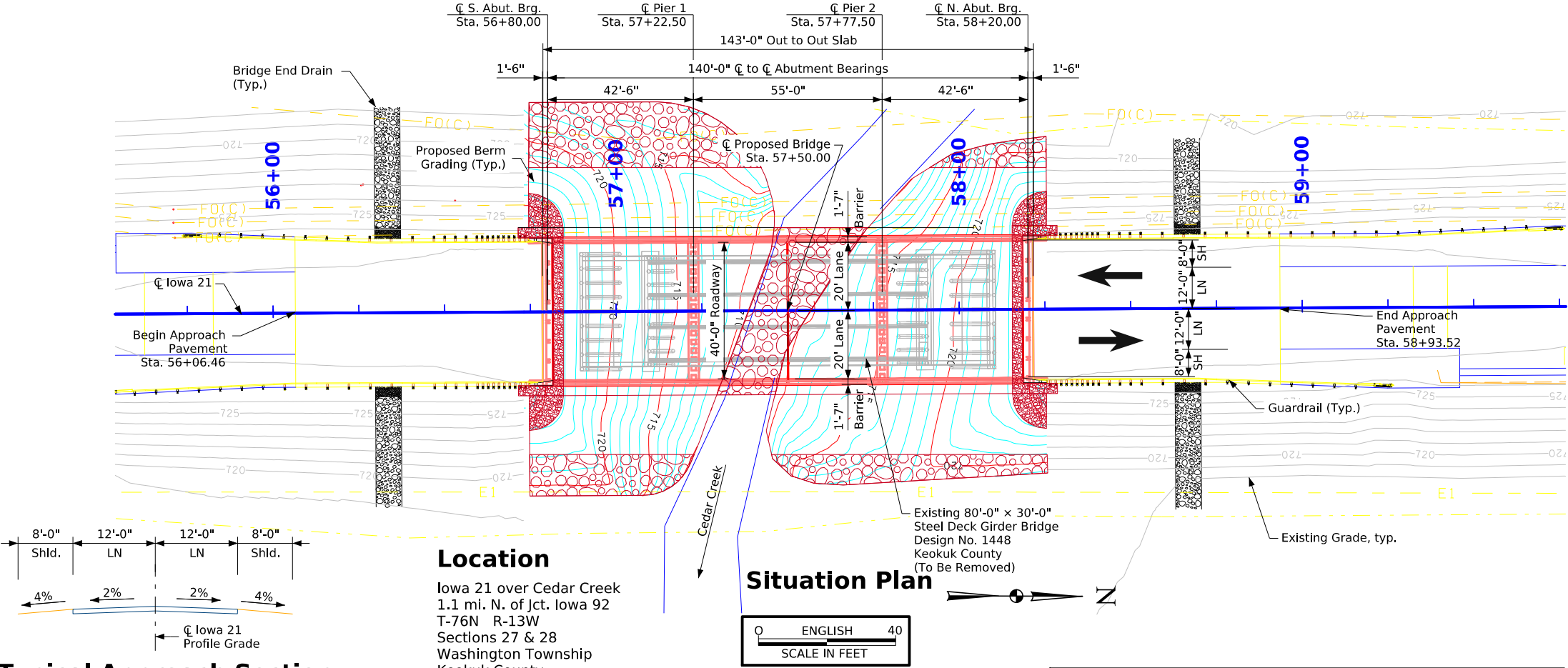
Q_{100} = 3,780 cfs
Stage = 721.4
Channel Low Beam = 725.25
Backwater = 1.1 Ft.
Avg. Bridge Velocity = 6.5 fps

Q_{200} = 4,400 cfs
Stage = 721.9
Calculated Design Scour = 701.1

Q_{500} = 5,260 cfs
Stage = 722.4
Avg. Bridge Velocity = 8.0 fps
Calculated Check Scour = 700.1

Utilities Legend:

G(C) - Gas Line - Alliant Energy
E1 - Electrical Line - Alliant Energy
W(C) - Water Line - Wapello Rural Water Association
FO(C) - Fiber Optic Line - Windstream



Location

Iowa 21 over Cedar Creek
1.1 mi. N. of Jct. Iowa 92
T-76N R-13W
Sections 27 & 28
Washington Township
Keokuk County
FHWA No. 32601
Bridge Maint. No. 5414.5S021
Latitude 41.351996°
Longitude -92.354357°

Notes

Top of slab at CL is 0.03' below the PG to account for parabolic curve.
All units are in feet unless otherwise noted.
TL-4 Bridge Railing proposed.
Pier Type = Pile Bents
Foundation type to be confirmed during final design.
ABC Construction sequence using temporary piers and lateral slide of the proposed superstructure. See bridge staging plan on Sheet V.03.
Berm slopes to be confirmed during final design.

Hydraulic Design

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Mark D. Werner 2-28-2024
Signature Mark D. Werner Date
Printed or Typed Name
My license renewal date is December 31, 2025
Pages or sheets covered by this seal: V.01

PRELIMINARY

Design For 0° Skew
140'-0" x 40'-0" Continuous
Concrete Slab Bridge
42'-6" End Spans 55'-0" Interior Span
Situation Plan
STA. 57+50.00 (CL Iowa 21)
Keokuk County
IOWA DEPARTMENT OF TRANSPORTATION
Design No. TBD Design Sheet No. 1 of 3 FHWA No. 32601
SHEET NUMBER V.01

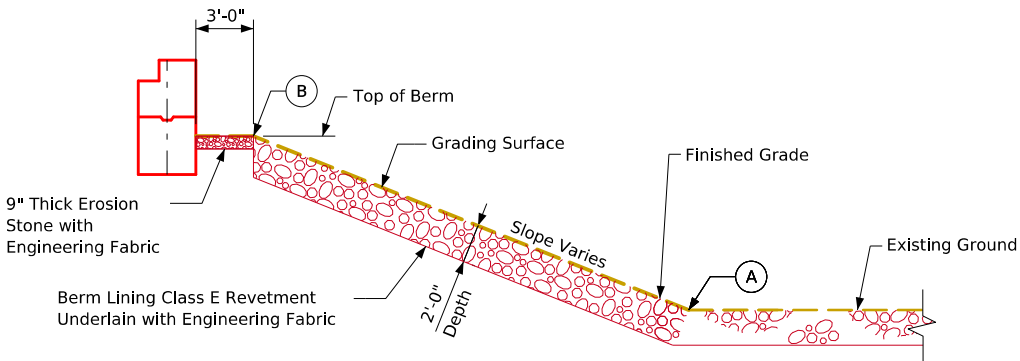
Design Notes

This design is for replacement of the existing 80'-0" x 30'-0" Steel Deck Girder Bridge, Keokuk Design No. 1448, FHWA 32600, Maint. No. 5414.5S021.

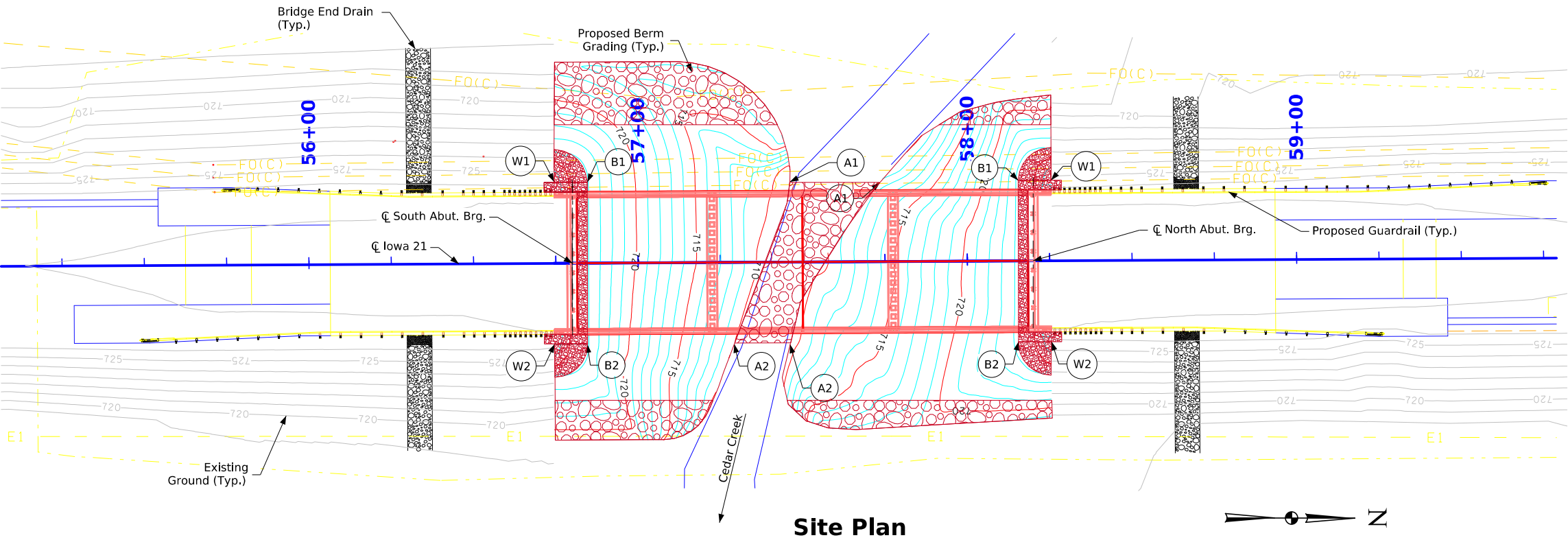
Special attention shall be taken to avoid potential conflicts between proposed structure and existing abutments and piers.

Grade creek to maintain creek flow around temporary bent locations. Restore creek channel to pre-construction contours after removal of temporary bent piles .

BENCH MARK NO. CP3: N:6801790.67 E:23379896.47; ELEV 719.57
SET 3/8" REBAR ON THE SOUTHEAST SIDE OF THE BRIDGE ON THE SOUTH SIDE OF THE CREEK BANK



Section Thru Embedded Revetment Berm



Site Plan

Estimated Berm Armoring Quantities				
Location	Revetment CL. E (Ton)	Erosion Stone (Ton)	Engineering Fabric (SY)	CL. 10 Channel Excavation (CY)
Berm Lining - South	835	16	738	760
Berm Lining - North	764	16	670	692
Totals	1599	32	1408	1452

Excavation quantity calculated from grading surface.
Excavation quantity is for embedded revetment core out only, and does not include excavation to the grading surface.
Excavation quantity to the grading surface is determined by Road Design and included in the Road Plans.
Revetment based on density of 1.6 ton/CY.
Erosion stone based on density of 120 lb/CF.

Utilities Note:

Utilities shown on this sheet are for information only. See Road Design sheets for utility information.

Utilities Legend:

- G(C) - Gas Line - Alliant Energy
- E1 - Electrical Line - Alliant Energy
- W(C) - Water Line - Wapello Rural Water Association
- FO(C) - Fiber Optic Line - Windstream

PRELIMINARY

Design For 0° Skew

140'-0" × 40'-0" Continuous Concrete Slab Bridge

42'-6" End Spans55'-0" Interior Span

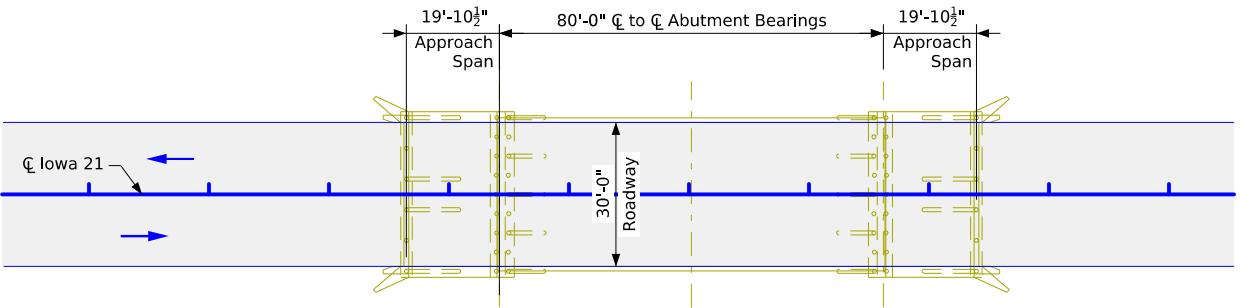
Site Plan

STA. 57+50.00 (Iowa 21)

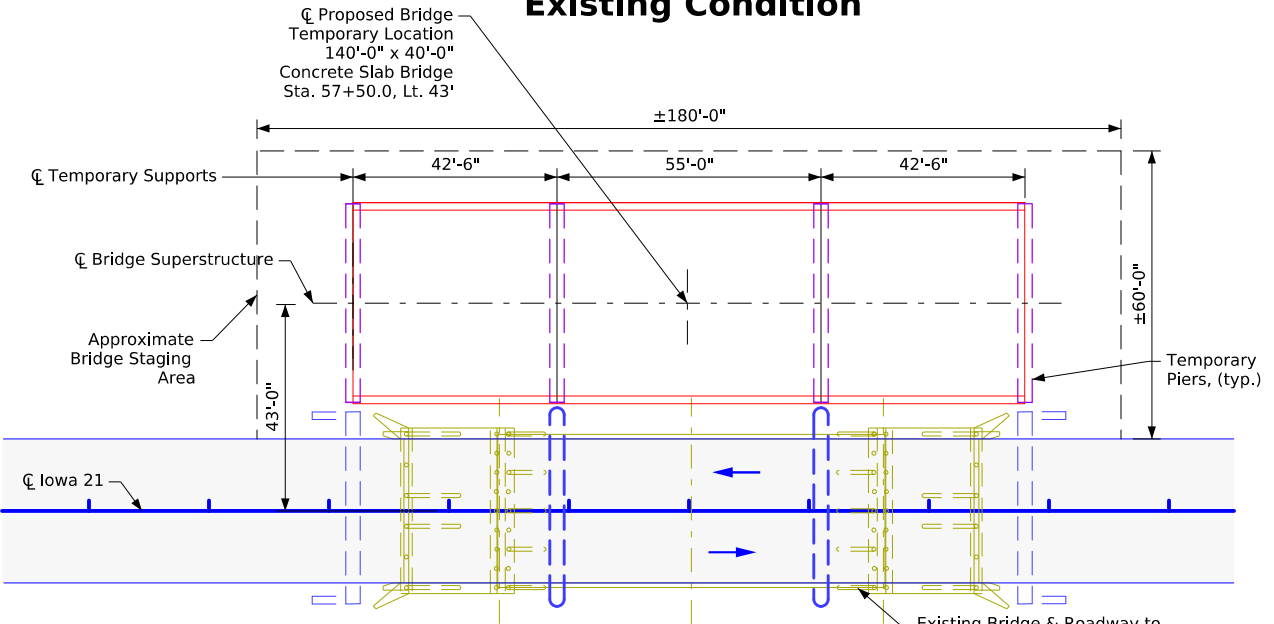
Keokuk County

IOWA DEPARTMENT OF TRANSPORTATION

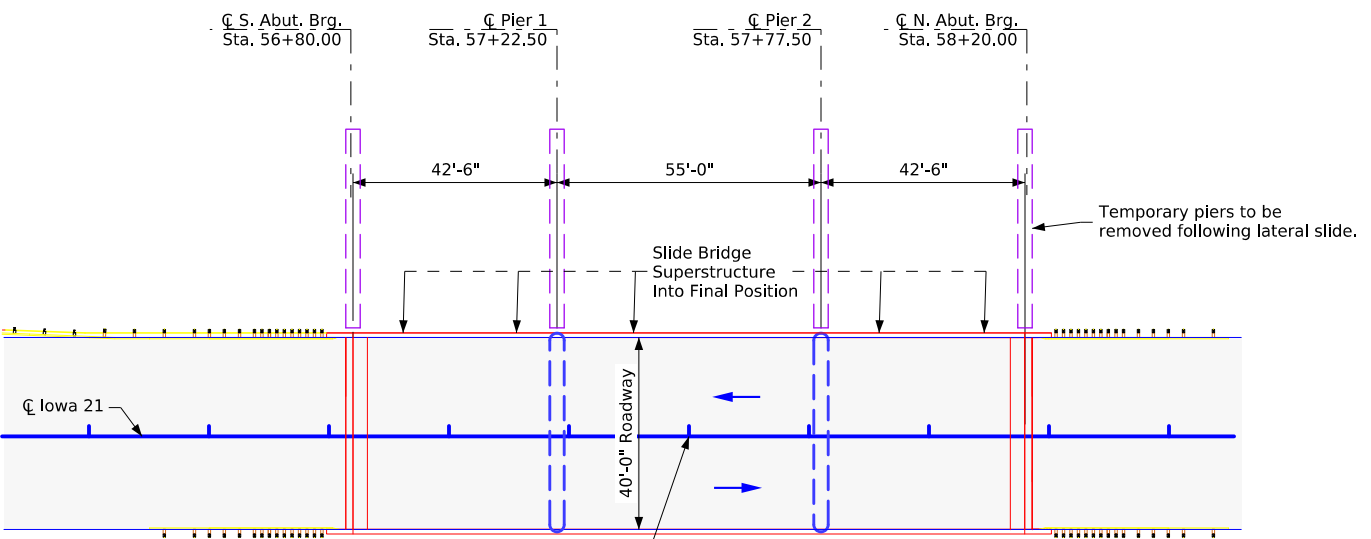
Design No. TBDDesign Sheet No. 2 of 3FHWA No. 32601



Existing Condition



Stage 1



Final

Suggested Construction Sequence For Critical Closure:

1. Demolish existing bridge.
2. Berm grading / drive piling / place revetment
3. Place CIP or precast abutment and wingwall footings, and pier cap.
4. Slide bridge superstructure into it's final position.
5. Flooded backfill
6. Bridge approach paving
7. Paved shoulder / install guardrail / longitudinal grooving

The suggested construction sequence for critical closure is a general list of major activities and not an exhaustive list of all necessary activities.

Notes to Final Designer:

1. Staging area for proposed bridge temporary location is approximated for right-of-way needs and will need to be finalized during Final Design and Construction. If larger area is needed, DOT shall be consulted.
2. Lateral slide dimension of 43 feet is preliminary. Actual distance of slide to be evaluated during Final Design and coordinated with contractor.
3. Grade creek to maintain creek flow around temporary pile bents. Restore creek channel to pre-project contours after removal of temporary pile bents.

PRELIMINARY

Design For 0° Skew

140'-0" x 40'-0" Continuous Concrete Slab Bridge

42'-6" End Spans 55'-0" Interior Span

Bridge Staging - ABC Lateral Slide

STA. 57+50.00 (C Iowa 21)

Keokuk County

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Design No. TBD Design Sheet No. 3 of 3 FHWA No. 32601

CROSS SECTION VIEW COLOR LEGEND			
Design Color No.	Feature	Design Color No.	Feature
Aggregate		Structural	
(64)	Choke Stone	(112)	Noise Wall
(42)	Engineering Fabric	(112)	Noise Wall Footing
(8)	Flooded Backfill	(112)	Retaining Wall Back
(92)	Macadam Stone	(112)	Retaining Wall Back Excavate
(20)	Modified	(112)	Retaining Wall Face
(12)	Plowing Shaping	(112)	Retaining Wall Front Excavate
(14)	Porous Backfill	(112)	Retaining Wall Front Footing
(8)	Revetment Class A	(112)	Retaining Wall MSE Gutter
(6)	Revetment Class B	(112)	Retaining Wall Reinforced Earth
(62)	Revetment Class C	Grading	
(188)	Revetment Class D	(8)	Behind Curb Cut
(28)	Revetment Class E	(6)	Granular
(12)	Shoulder Special Backfill	(13)	Granular Back Fill
(12)	Special Backfill	(48)	Rock Undercut
(20)	Subbase	(8)	Shoulder Earth Fill
(20)	Subbase Lower	(2)	Side Slopes
(20)	Subbase Upper	(226)	Side Slopes Dressing
(118)	Subgrade Treatment	Substrata	
Asphalt		(128)	Boulder Substrata
(207)	HMA Base Course	(48)	Broken Weathered Substrata
(207)	HMA Interim Course	(3)	Core Out Substrata
(207)	HMA Surface Course	(203)	Existing Pavement Substrata
Concrete		(6)	Loam Substrata
(0)	Barrier Concrete	(80)	Rock Substrata
(0)	Barrier Concrete Footing	(4)	Select Sand Substrata
(0)	Curb Gutter	(3)	Shale Substrata
(48)	Flowable Mortar	(10)	Topsoil Substrata
(0)	Median Concrete	Unsuitable / Waste	
(0)	PCC Pavement	(3)	Unsuitable Type A
(0)	Sidewalk	(13)	Unsuitable Type B
Shoulder		(11)	Unsuitable Type C
(209)	Shoulder HMA	(3)	Waste
(0)	Shoulder PCC		
(6)	Shoulder Granular		
Existing			
(0)	Existing Pavement		

NOTES:

NOTES:

CROSS SECTIONS
LEGEND AND INFORMATION SHEET
(COVERS SHEET SERIES W, X, Y, & Z)

