CCS BRIDGE REPLACEMENT
BRFN-018-7(67)--39-19
CHICKASAW Co.

LETTING DATE
10-17-2023

INDEX OF SHEETS

IOWA DOT

Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM

CHICKASAW COUNTY

CCS BRIDGE REPLACEMENT

US 18 - Winters Lake Overflow 2.9 mi E of Co Rd T76

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

Field Exam Mark-up

	TOTAL 25
PROJECT IDENTIFICATION NUMBER	
19-19-018-010	
PROJECT NUMBER	
BRFN-018-7(67)--39-19	
R.O.W. PROJECT NUMBER	

Field Exam was held by Teams Mtg on 5/5/2021

Attendees included:
Nick Humpal (DOT)
Kevin Smith (DOT)
Jeremy Weber (DOT)
David Mulholland (DOT)
Ron Loecher (DOT)
Tyler Kubik (DOT)
Tracy Meise (DOT)
Mary Kay Solberg (DOT)
Steven Schroder (DOT)
Mark Harpole (Shive-Hattery)
Joe Appel (Shive-Hattery)
Jenifer Bates (Shive-Hattery)
Mike Janechek (Shive-Hattery)

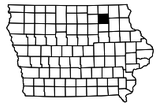
D3 PLAN – June 18, 2021
D5 PLAN – September 17, 2021
D4 PLAN – June 20, 2023

PRELIMINARY PLANS

Subject to change by final design.

D2 PLAN – May 14, 2021

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



DESIGN DATA RURAL		
2024 AADT	2,100	V.P.D.
2044 AADT	2,400	V.P.D.
2044 DHV	250	V.P.H.
TRUCKS	20	%
Total Design ESALs	--	

INDEX OF SEALS

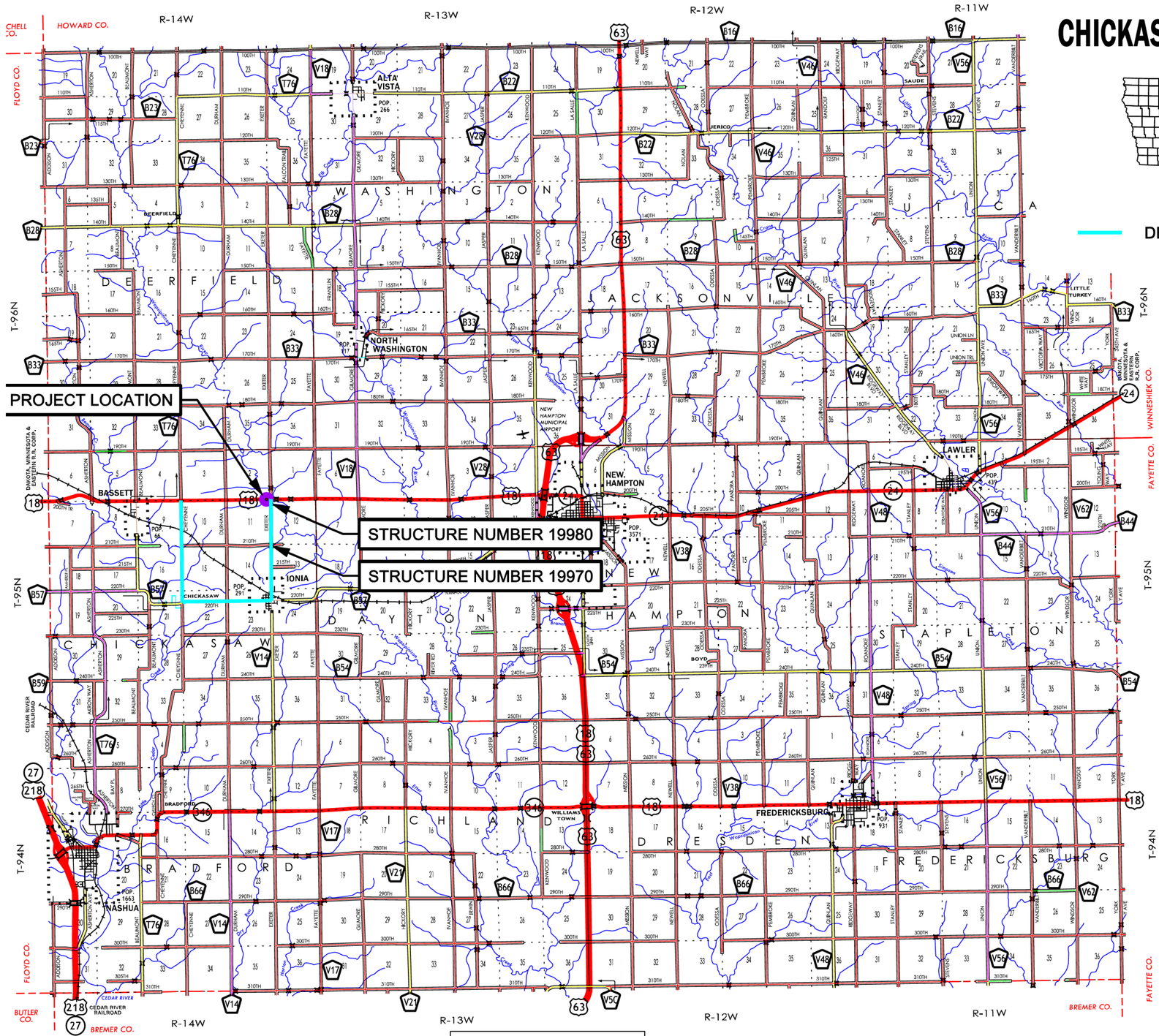
SHEET NO.	NAME	TYPE
A.1	Michael J. Janechek	Primary Signature Block
V.1	Phillip M. Harpole	Hydraulic Design

FILE NO.	ENGLISH	DESIGN TEAM Iowa DOT \ Shive-Hattery	CHICKASAW COUNTY	PROJECT NUMBER BRFN-018-7(67)--39-19	SHEET NUMBER A.1

11:34:33 PM 5/2/2021 mjanechek pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\1901801019\Design\SHT_19018067_A01.dgn

CHICKASAW COUNTY

Detour route good as shown. District will prepare signing plan and install/maintain signs during construction



FILE NO.	ENGLISH	DESIGN TEAM Iowa DOT \ Shive-Hattery	CHICKASAW COUNTY	PROJECT NUMBER BRFN-018-7(67)--39-19	SHEET NUMBER A.2

Roadway				
PIN Number	19-19-018-010		**Submittal Date**	5/22/2020
Project Number	BRFN-018-7(67)--39-19			**Approval Date**
District	District 2	**Assistant District Engineer**	Nick Humpal	
County	CHICKASAW	**or**		
Route	US 18	**Office Director**		
Location	Winters Lake Overflow 2.9 mi E of Co Rd T76			
Work Type	Bridge Replacement			
Segment Manager	John Bartholomew			
Designer	Jenifer Bates			

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	10:1 for 4' then 6:1
	Beyond standard ditch depth and design clear zone	3.5:1	3:1	3.5:1
	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	8:1
	w/o drainage structures	10:1	6:1	10:1
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	44'
	Bridge length > 200 ft	design lane widths + effective shoulder widths	design lane width + 4' right and left of the design lane widths	44'
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 =	2100

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 = 10' Paved = 6'
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:

US 18 is listed as a Primary highway on the National Highway System Map, therefore, will use the highlighted row for the effective and paved shoulder widths.

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 2

DATE: July 8, 2020

ATTENTION: E. Jon Ranney

PROJECT: Chickasaw County
BRFN-018-7(67)—39-19
PIN: 19-19-018-010

FROM: Jenifer Bates

OFFICE: Shive-Hattery

SUBJECT: Project Concept Statement; (Final, D0)

This project involves the replacement of the US 18 bridge (Maint. No 1924.0S018) over Winters Lake Overflow 2.9 mi E of Co Rd T76.

A concept review was held virtually on June 18, 2020. Those present included Jacob Page from District 2; Steven Schroder, David Mulholland, Kevin Patel, Brandon Walls, and Mary Kay Solberg from the Iowa DOT and Jenifer Bates, Joe Appel, Larry Sandhaas, and Mark Harpole from Shive-Hattery.

One alternative was considered:
1) Replace the existing bridge with a three span, 120' x 44', Continuous Concrete Slab bridge at an estimated cost of $1,471,000 (see attached concept for details). Additional right of way does not look like it will be required. Traffic will be maintained using a detour.

Alternative 1 is the preferred alternative due to the site topography, low traffic volumes, existing bridge configuration, safety considerations, and availability of a suitable detour route.

The Draft Project Concept Statement was sent out for review and comment with concerns to be resolved by July 7, 2020. Comments received during the review period have been considered and resolved.

This project is recommended for construction in FY 2024. The Bridges and Structures Bureau will coordinate the plan preparation with the assistance of 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
K. Brink	D. L. Newell	J. W. Laaser-Webb
W. A. Sorenson	D. E. Sprengeler	E. C. Wright
M. E. Ross	A. A. Welch	N. M. Miller
C. C. Poole	B. Bradley	B. E. Azeltine
B. D. Hofer	T. D. Crouch	S. J. Gent
S. Anderson	J. Selmer	K. K. Patel
S. Godbold	D. R. Claman	J. Hauber
A. Abu-Hawash	M. E. Khoda	K. Olson
S. Neubauer	T. Abbett	M. Kelly
B. Dolan	P. Hjelmstad	N. Humpal
M. K. Solberg	G. Pavelka	R. Loecher
R. Gelhaus	J. Bartholomew	

SH Project #4202350

SHIVEHATTERY
ARCHITECTURE + ENGINEERING

FINAL PROJECT CONCEPT STATEMENT

US 18 Bridge over Winters Lake Overflow 2.9 mi E of Co Rd T76.

Chickasaw County
Proj. BRFN-018-7(67)--39-19
PIN: 19-19-018-010
Maint. No. 1924.0S018
FHWA No. 19600

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

July 8, 2020

I. STUDY AREA

A. Project Description

This project involves the replacement of the US 18 bridge (Maint. No 1924.0S018) over Winters Lake Overflow 2.9 mi E of Co Rd T76.

The alternative considered was:
1. Replace the existing structure with a three span, 120' x 44', Continuous Concrete Slab bridge using a detour.

Alternative 1 is the preferred alternative due to the site topography, low traffic volumes, existing bridge configuration, safety considerations, and availability of a suitable detour route.

Traffic will be maintained by an off-site detour.

The preliminary project cost is $1,471,000. (This does not include costs associated with detour.)

B. Need for Project

The original bridge was a 62' x 30' pony truss, built in 1929, carrying US 18 over Winter Lake Overflow. The bridge was reconstructed in 1964 with voided prestressed concrete girders and widened. The bridge deck was overlaid in 1995 and is near the end of its useful life and needs replaced. There is minor beam deterioration of the beam ends at the abutments. Due to the extensive deterioration of the substructure and the girders the bridge should be replaced.

SH Project #4202350

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 62' x 36' Prestressed Concrete Beam bridge originally constructed in 1929, then widened in 1964 and overlaid in 1995.

US 18 in the project area is 24' wide HMA/PCC pavement with 10' wide granular shoulders and 4:1 foreslopes, constructed in 1926 as a gravel road, then paved with concrete in 1935. The roadway was widened and repaved in 1980. HMA resurfacing was accomplished in 2015.

D. Traffic Estimates

The 2024 construction year and 2044 design year average daily traffic estimates are 2,100 ADT with 20 % trucks and 2,400 ADT with 20 % trucks, respectively.

E. Sufficiency Ratings

US 18 is classified as a Commercial and Industrial route and is a maintenance service level B roadway. The federal bridge sufficiency rating is 87.4.

F. Access Control

Access rights will not be acquired for this project.

G. Crash History

During the five-year study period from January 1, 2015 through December 31, 2019, there were four property damage only crashes in the project area.

II. PROJECT CONCEPT

A. Feasible Alternatives

Alternative #1 - Replace with a bridge

The existing 62' x 36' Prestressed Concrete Beam bridge will be replaced with a 3 span, 120' x 44', Continuous Concrete Slab bridge.

The typical cross section adjacent to the bridge will consist of a 24' roadway with 10' effective shoulders (6' paved and 4' granular) and 10:1 for 4' then 6:1/3.5:1 foreslopes.

This bridge will be constructed on the existing vertical and horizontal alignment. New bridge approaches will be constructed. The existing guardrail will be replaced with new guardrail and the shoulders will be paved 20' beyond the ends of the guardrail. Class 10 will be necessary to flatten the existing foreslopes and to construct the new guardrail blisters. Class E revetment will be placed under the bridge for slope protection. New bridge end drains will be constructed on four ends of the bridge.

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

It appears that no right of way will be required for this project.

Traffic will be maintained by an off-site detour.

Bridge Items	Estimated Costs
New Bridge	$591,700
Cofferdams	$50,000
Bridge Removal	$39,100
Revetment	$36,000
Engineering Fabric	$3,300
Erosion Stone	$900
Mobilization - 10%	$72,100
Contingency - 20%	$144,200
Bridge Costs	**$937,300**
Roadway Items	
Bridge Approaches	$95,400
Removal of Pavement	$25,200
Embankment in place, contractor furnished	$45,000
Excavation Class 10	$2,000
Guardrail (Includes Removal)	$52,500
Paved Shoulders for Guardrail	$42,000
Class 10 for Guardrail Blisters	$23,600
Bridge End Drains	$14,000
Clearing and Grubbing	$20,000
Erosion Control	$50,000
Traffic Control - 5%	$20,500
Mobilization - 5%	$20,500
M & C - 30%	$123,000
Roadway costs	**$533,700**
Project Total	**$1,471,000**

Other Alternatives Considered

Based on the hydraulic analysis, a culvert was not an option for this location, so no culvert options were reviewed.

Staged construction could be possible, but this alternative was dismissed since there was a satisfactory detour route for this project. This site is not a good candidate for a runaround due to the existing topography and the nearby roadway intersection.

B. Detour Analysis

US 18 will be closed and an offsite detour will be utilized. It is anticipated the detour will be in place for approximately 105 days. The detour would follow Co Rd V14 south from the intersection of US 18 and Co Rd V14 through the City of Ionia to the junction of Co Rd V14 and Co Rd B57, then west on Co Rd B57 to the junction of Co Rd B57 and Co Rd T76, then north on Co Rd T76 to the junction of US 18. Out of distance travel is 4.5 miles. The total distance user cost is anticipated to be $201,300. The cost for county road maintenance will be $13,200 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 that all work on this project will be awarded to one prime contractor. The Bridges and Structures Bureau will coordinate the plan preparation with assistance from the Design Bureau and Shive-Hattery.

E. ADA Accommodations

There are no bike paths or sidewalks adjacent to US 18; 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 36 is less than the first stage filter threshold of 50, therefore this bridge will not be considered for ABC construction.

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

No additional survey is requested at this time.

Right of Way does not appear to be required for this project.

The Location and Environment Bureau review of cultural resources for the project suggests on the condition that no ROW is needed, the project will likely meet the Bureau's Minor Projects program and not require extended consultation with SHPO or other consulting parties.

G. Program Status

Site data has been developed by Shive-Hattery. This project is listed in the 2020-2024 Iowa Transportation Improvement Program, with $1,200,000 programmed for replacement in FY 2024. 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: Monday, April 20, 2020 8:06 AM
To: Page, Jason
Subject: Design Information Results for Ticket # 552002897

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

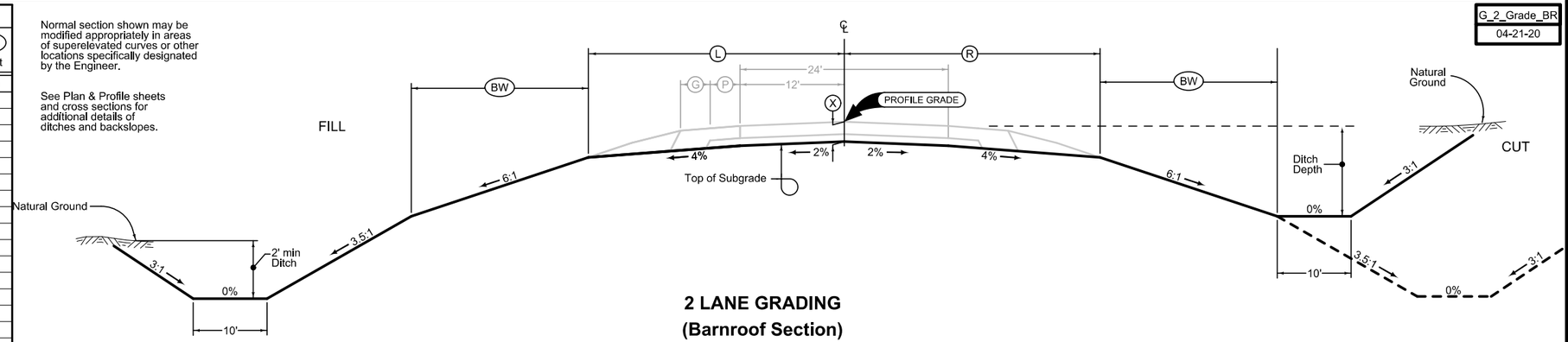
(ICN) IOWA COMMUNICATIONS NETWORK
Contact Name : Shannon Marlow
Contact Phone: 8005723940
Contact Email: icnoutsideplantiowaonecall@iowa.gov

(WINIA) WINDSTREAM COMMUNICATIONS
Contact Name : LOCATE DESK
Contact Phone: 8002891901
Contact Email: LOCATE.DESK@WINDSTREAM.COM

LOCATION			DIMENSIONS			
ROAD IDENTIFICATION	STATION TO STATION		(L) Feet	(R) Feet	(X) Inches	(BW) Feet
US 18	258+62.00	261+45.00	35.60	35.60	24	6.40

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

Modify grading to minimize impact to right of way since all work is behind guardrail

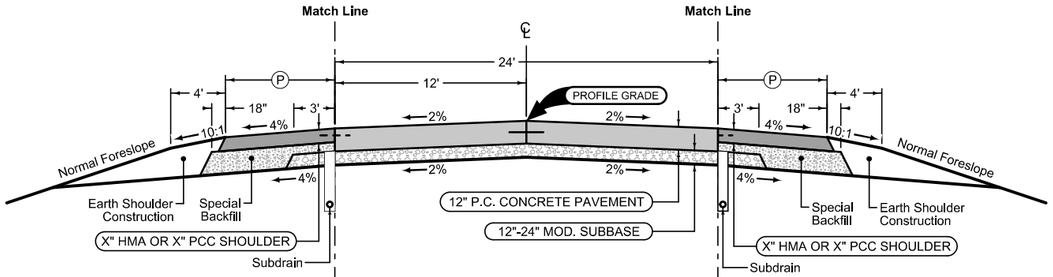
FILE NO.	ENGLISH	DESIGN TEAM Iowa DOT \ Shive-Hattery	CHICKASAW COUNTY	PROJECT NUMBER BRFN-018-7(67)--39-19	SHEET NUMBER B.1

11:35:05 PM 5/2/2021 mjanechek pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\1901801019\Design\SHT_19018067_B01.dgn

Paved Shoulder at Guardrail

PCC Shoulder Jointing:
Longitudinal joint: BT-1 or BT-5
Transverse joints: C at mainline spacing
HMA Shoulder Jointing:
Longitudinal joint: B

2_P_Guard_ 04-21-20		
STATION TO STATION		(P) Feet
258+62.00	259+42.00	VARIES
260+65.00	261+45.00	VARIES



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

2P_ 04-21-20	
STATION TO STATION	
258+62.00	259+42.00
260+65.00	261+45.00

Paved Shoulder at Guardrail

PCC Shoulder Jointing:
Longitudinal joint: BT-1 or BT-5
Transverse joints: C at mainline spacing
HMA Shoulder Jointing:
Longitudinal joint: B

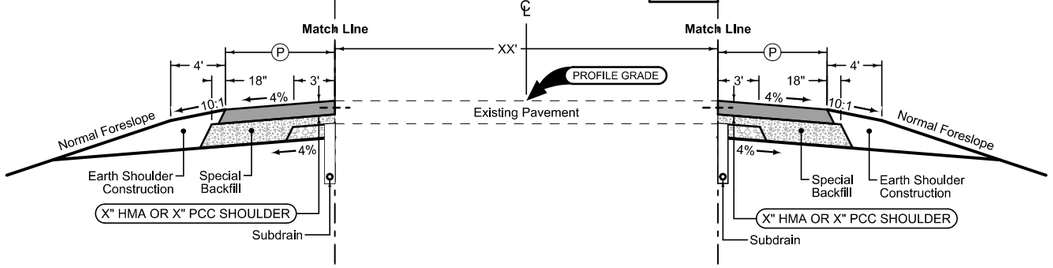
2_P_Guard_ 04-21-20		
STATION TO STATION		(P) Feet
258+62.00	259+42.00	VARIES
260+65.00	261+45.00	VARIES

Paved Shoulder at Guardrail

PCC Shoulder Jointing:
Longitudinal joint: BT-1 or BT-5
Transverse joints: C at mainline spacing
HMA Shoulder Jointing:
Longitudinal joint: B

2_P_Guard_ 04-21-20		
STATION TO STATION		(P) Feet
258+37.41	258+62.00	VARIES
261+45.00	262+07.00	VARIES

2E_
10-19-10



Extend paving limits to lead edge of paved shoulder for guardrail

Paved Shoulder at Guardrail

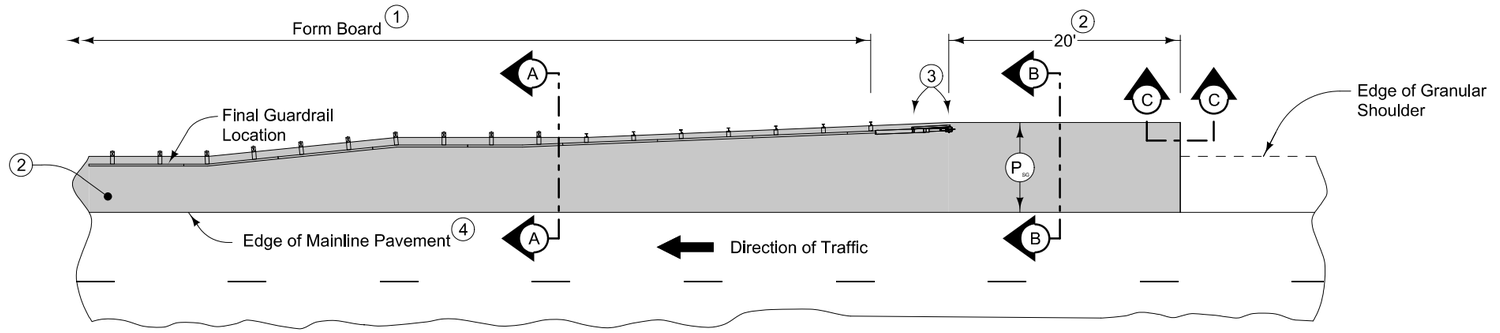
PCC Shoulder Jointing:
Longitudinal joint: BT-1 or BT-5
Transverse joints: C at mainline spacing
HMA Shoulder Jointing:
Longitudinal joint: B

2_P_Guard_ 04-21-20		
STATION TO STATION		(P) Feet
257+99.78	258+62.00	VARIES
261+45.00	261+69.72	VARIES

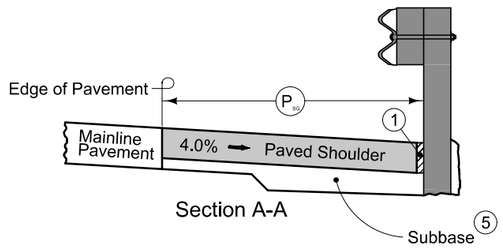
See Tab 100-24 or 100-25 for pavement quantities.

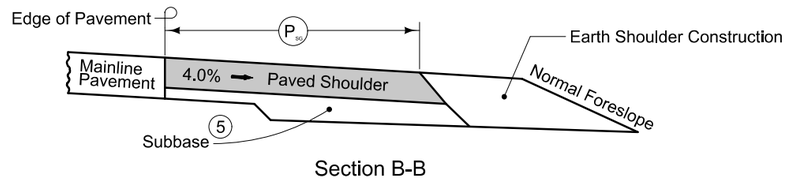
See Tab 112-9 for shoulder quantities.

US 18

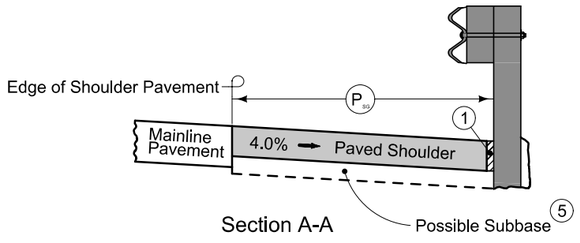


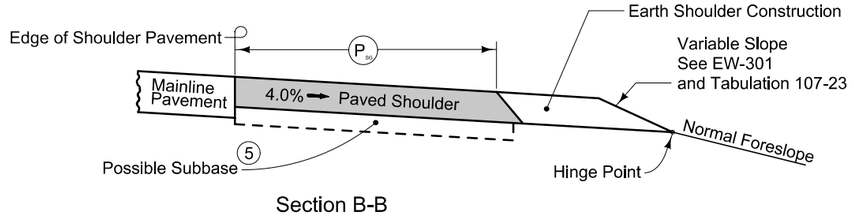
PLAN VIEW





NEW CONSTRUCTION





EXISTING SHOULDER

DESIGNER INFO

7156
10-20-20

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.

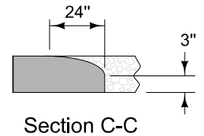
(1) PCC option only: When guardrail posts are installed prior to construction of PCC paved shoulder, fasten form board to the face of guardrail posts for the length shown.

(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-1 joint for PCC shoulder.
'B' joint for HMA shoulder.

(5) Refer to other details in the plan.



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

PAVED SHOULDER AT GUARDRAIL
(GRANULAR SHOULDER ADJACENT TO MAINLINE)

100-1D
10-18-05

PROJECT DESCRIPTION

This project involves the replacement of the US 18 bridge over Winters Lake Overflow 2.9 mi E of Co Rd T76.

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
BA-200	10-18-16	Steel Beam Guardrail Components
BA-201	04-18-17	Steel Beam Guardrail Barrier Transition Section (MASH TL-3)
BA-202	10-20-15	Steel Beam Guardrail Bolted End Anchor
BA-205	04-19-16	Steel Beam Guardrail Tangent End Terminal (MASH TL-3)
BA-250	10-18-16	Steel Beam Guardrail Installation at Concrete Barrier on Bridge End Post (MASH TL-3)
BR-203	10-17-17	Double Reinforced 12" Approach
DR-303	10-17-17	Subdrains (Longitudinal)
DR-305	04-17-18	Subdrain Outlets (standard Subdrain, Pressure Release and Special)
DR-402	04-17-18	Rock Flume for Bridge End Drain
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
EW-201	04-19-16	Bridge Berm Grading without Recoverable Slope (Barnroof Section)
EW-301	10-20-15	Guardrail Grading
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
SI-173	04-19-16	Object Markers
SI-211	10-18-16	Object Markers and Delineater Placement with Guardrail
TC-1	04-16-13	Work Not Affecting Traffic (Two-Lane or Multi-Lane)
TC-202	04-21-15	Work Within 15 ft of Traveled Way
TC-252	04-19-16	Routes Closed to Traffic

SURVEY SYMBOLS

- SCR Section Corner
- CP Control Point
- POT Tangent Point
- REF Reference Tie Point
- ROW Right of Way Mark
- BM Bench Mark
- WC Wild Card (Misc. Field Shot)
- GR Ground Shot
- BL Topo Breakline
- FO1D Fiber Optic Co. 1 - Quality D
- FO2D Fiber Optic Co. 2 - Quality D
- TL1D Telephone Line Co. 1 - Quality D
- BNK Stream Bank
- SNP Unpaved Shoulder
- EP Edge of Paved Roads (ML or SR)
- C Centerline BL of Road (ML or SR)
- CU Back of Curb
- GU Gutter In Front of Curb
- PLG Location of General Photo
- DU Centerline Draw or Stream (Up)
- PIP Pipe Culvert
- D Centerline Draw or Stream (Down)
- FW Wire Fence
- EW Edge of Water
- EB Electrical Box
- CON Concrete or A/C Slab
- PR Electic Riser Pole
- PPA Power Pole Co. 1
- ENU Edge Unpaved Entrance & Parking
- ENT Centerline BL of Entrance
- TP TPD Telephone Pedestal
- UB UB Utility Box
- SH Paved Shoulder
- GDL Guard Rail Steel
- LIN Miscellaneous Line
- BD Bridge Deck
- BCL Bridge Centerline
- SBR Size of Bridge
- BRG Bridge

UTILITY LEGEND

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

- Iowa Communications Network - Quality D
- Windstream Communications - Quality D
- Windstream Communications - Quality D

PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	
Green	(2)	Existing Topographic Features and Labels
Blue	(1)	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Magenta	(5)	Existing Utilities
SHADING	**Design Color No.**	
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.	ENGLISH	DESIGN TEAM Iowa DOT \ Shive-Hattery	CHICKASAW COUNTY	PROJECT NUMBER BRFN-018-7(67)--39-19	SHEET NUMBER D.1

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Remove paved shoulder outside of new paving limits (typ all quadrants)

District will request updated utility information so the disposition of the fiber optic and phone lines can be determined.

Adjust grading (both sides) to pull in grading limits

Extend pavement replacement limits

Extend pavement replacement limits

Ok as is for now - District will talk with property owner to see if still needed.

District asked for a turn lane analysis at this location. After running analysis, it was determined a right turn lane is not warranted so bridge width should be okay as shown.

Chickasaw TWP.
T-95N-R-14W
SEC. 2

ENT +05
U.A.C.

EXISTING ROW

24" x 72'
C.M.P.
U.A.C

PI Sta 255+38.54

PI Sta 257+51.06

PI Sta 258+62.05

PI Sta 261+48.39

PI Sta 265+44.90

APPROX. SEC. LINE

STATE ROW

COUNTY ROW

WINTER'S LAKE OVERFLOW

REMOVE

18" x 27"
H.D.P.E.
REMOVE

RELOCATE FIELD ENTRANCE
STA 257+90
24'x50' UNCL ENT PIPE

Sta. 260+03.75
59.67'x30.0'
Pretensioned Prestressed Conc. Beam Bridge
D.A.=Overflow F
REMOVE

Build
Sta 260+03.75
Skew 0°
120' x 44'
Design No.
CCS Bridge

0 50 FEET

NO GRADE RAISE

1,087.47 +0.020% 1,087.53 +0.020%

1,087.47 1,087.48 1,087.48 1,087.49 1,087.49 1,087.50 1,087.50 1,087.51 1,087.51 1,087.52 1,087.52

1120 1115 1110 1105 1100 1095 1090 1085 1080 1075 1070 1065 1060 1055 1050

Lt
Rt

253 +50 254 +50 255 +50 256 +50 257 +50 258 +50 259 +50 260 +50 261 +50 262 +50 263 +50 264 +50 265 +50 267 +50 268 +50 269

FILE NO.	ENGLISH	DESIGN TEAM Iowa DOT / Shive-Hattery	CHICKASAW COUNTY	PROJECT NUMBER BRFN-018-7(67)--39-19	SHEET NUMBER D.2

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Survey Information

Chickasaw County
BRFN-018-7(67)—39-19
Winters Lake Overflow 2.9 mi E of Co Rd T76
Bridge-Unspecified
PIN 19-19-018-010
Sap-343.1

General Information

Measurement units for this survey are US survey feet. This survey is for proposed Bridge reconstruction over Winters Lake overflow. Project datum and control information is provided by Design Survey Office. This project is a Full DTM. This survey request was for the U.S. Hwy. 18 and Chickasaw Co. Rte. V-14 corridor only.

Vertical Control

Vertical datum for this survey is NAVD88 (Computed using Geoid12b). GRS80 Ellipsoidal Height was computed at project Pts. 220, 182237,182239, 182246 and U 36 by conducting one concurrent six-hour static observation. Additional benchmarks were placed throughout the project using a GNSS Base-Rover setup relative to Pts. 182237, 182239, and Pt. 182246. Two observations with a minimum of four-hours between were collected and used in a weighted average.

This survey observed 1 NGS Control Monument with published NAVD88 heights to compare to local ground control:

NGS 2nd. order class 0 benchmark designated U 36 has a published Elev. Of 1123.38
Survey Elev. = 1123.73

This NGS Control Monument is also known as Chickasaw County GPS Control Point 513 designated NGS 2nd Order vertical control station “U 36” PID OO0217. The published Elevation is 1123.73

This survey observed 1 local area county Control Monument with published NAVD88 heights to compare to local ground control:

Chickasaw County GPS Control Pt 2000-220 has a published Elev. of 1125.81
Survey Elev. = 1125.83

No As-Built Plan benchmarks could be located, however survey elevations obtained on the bridge seats have a close vertical difference relationship with the plan bridge seat elevations as follows:

As-built Plan FN-160 Bridge Design No. 264

West abutment low step bridge seat plan elev. = 1092.07
Survey elev. = 1084.40

The average vertical difference is -7.67 to be applied to as built elevations

Horizontal Control

The project coordinate system for this survey is Iowa RCS Zone 2 (U.S. Survey Feet). This survey control is relative to IaRTN reference stations. IaRTN Reference Station coordinates are relative to the National Reference Station network datum: NAD83 (2011) for Epoch 2010.00. Coordinates were determined by conducting one concurrent six-hour static observation at project control Pts. 220, 182237,182239, 182246 and U 36. Additional control points were placed throughout the project using a GNSS Base-Rover setup relative to Pts.182237, 182239 and 182246.

Alignment Information

The horizontal alignment for U.S. Hwy 18 this survey is a retrace of As-built Plans No. FA-160 and F-18-7(24)—20-19. Survey stationing was equated to the plan POT at Sta. 265+45.2 and run back and ahead without equation throughout the survey.

Survey stationing relates to as built plan stationing as follows:

POT Sta. 265+45.2 As-built Plans Project No. FA-160
Survey POT Sta. 265+45.2

PI Sta. 255+91.1 As-built Plans Project No. FA-160
Survey PI Sta. 255+91.21

POT Sta. 238+69.5 As-built Plans Project No. FA-160
Survey POT Sta. 238+69.67

POT Sta. 265+46.0 As-built Plans Project No. F-18-7(24)—20-19
Survey POT Sta. 265+45.20

PI Sta. 276+34.20 As-built Plans Project No. F-18-7(24)—20-19
Survey PI Sta. 276+33.68

POT Sta. 291+71.30 As-built Plans Project No. F-18-7(24)—20-19
Survey POT Sta. 291+70.16

The horizontal alignment for Chickasaw Co. Rte. V-14 (Old Iowa 393) this survey is a retrace of As-built Plans No. F-1055(3). Survey stationing was equated to the plan PI at Sta. 129+53.4 and run back and ahead without equation throughout the survey.

Survey stationing relates to as built plan stationing as follows:

PI Sta. 129+53.4 As-built Plans Project No. F-1055(3)
Survey PI Sta. 129+53.4

POT Sta. 129+27.9 As-built Plans Project No. F-1055(3) = POT Sta. 265+45.2 As-built Plans Project No. FA-160
Survey POT Sta. 129+27.90 Co. Rte. V-14 = Survey POT Sta. 265+45.2 U.S. Hwy. 18

POT Sta. 102+61.8 As-built Plans Project No. F-1055(3)
Survey POT Sta. 102+61.85

POT Sta. 76+10.2 As-built Plans Project No. F-1055(3)
Survey PI Sta. 76+09.41

CONTROL POINT VICINITY MAP

This map is a guide to the vicinity of the primary project control points

Primary control is for use with RTK base stations and for RTN validation.
Future surveys will use primary project control to establish temporary control as needed for construction or other surveying applications.

HORIZ. DATUM: NAD83(2011) EPOCH 2010.00

VERT. DATUM: NAVD88

Ia. Regional Coordinate System Zone 2

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

HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING

HORIZ. DATUM: NAD83(2011) EPOCH 2010.00

VERT. DATUM: NAVD88

Ia. Regional Coordinate System Zone 2

Point Name	Northing	Easting	Elevation	Code - Description
182237	9763689.154	12576695.637	1095.319	BM SET FENO MONUMENT 0.37 MI W OF INTSC US HWY 18 AND EXETER AVE_53 FT S OF CTR US HWY 18_36 FT E OF CTR FLD ENT S_48 FT E OF ROW RAIL
182239	9763707.043	12577739.324	1082.481	BM FND ROW RAIL DRILL HOLE IN BALL_0.17 MI W OF INTSC US HWY 18 AND EXETER AVE_50 FT S OF CTR US HWY 18_32 FT E OF CTR FLD ENT N
182246	9763700.770	12581241.175	1085.935	BM SET FENO MONUMENT 0.49 MI E OF INTSC US HWY 18 AND EXETER AVE_39 FT S OF CTR US HWY 18_25 FT W OF CTR FLD ENT S
220	9769649.973	12583896.798	1125.825	BM FND CHICKASAW CO GPS CONTROL PT 2000-220 AS DESCRIBED
U36	9755815.907	12573313.084	1123.727	BM FND NGS 2ND ORDER CLASS 0 BM U 36 AS DESCRIBED_AKA CHICKASAW CO GPS CONTROL PT 513

108-23A
08-01-08

TRAFFIC CONTROL PLAN

1) While bridge and approaches are being removed and replaced, traffic on US 18 shall be maintained via an off-site detour.

2) Signage and devices shall be furnished, installed, maintained, and removed by Contractor. See sheet A.2 for proposed detour.

108-25
10-21-14

511 TRAVEL RESTRICTIONS

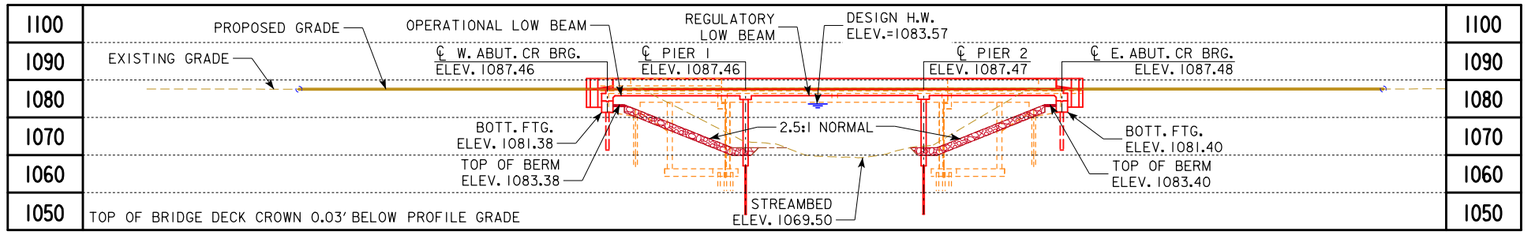
Route	Direction	County	Location Description	Feature Crossed	Object Type	Maint. Bridge No., Structure ID, or FHWA No.	Type of Restriction	Existing Measurement	Construction Measurement	Construction Measurement as Signed	Projected As Built Measurement	Remarks
US 18	Both	Chickasaw	No Restrictions Anticipated	None - Detour								

111-01
04-17-12

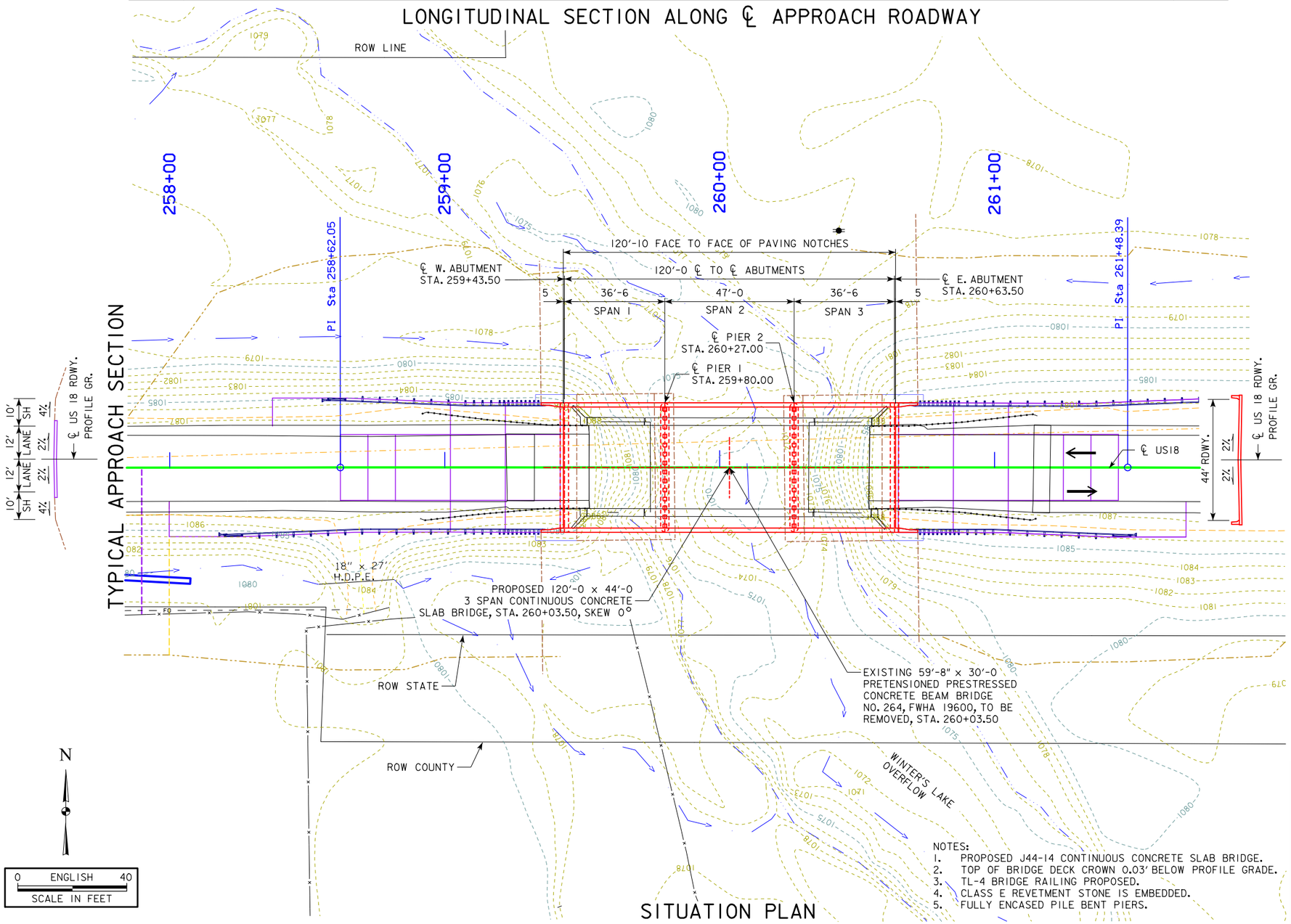
COORDINATED OPERATIONS

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	



LONGITUDINAL SECTION ALONG ℄ APPROACH ROADWAY



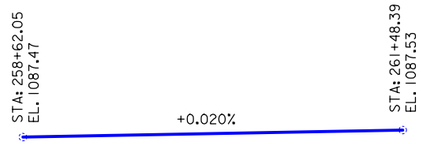
TYPICAL APPROACH SECTION

TYPICAL BRIDGE SECTION

NOTES:
1. PROPOSED J44-14 CONTINUOUS CONCRETE SLAB BRIDGE.
2. TOP OF BRIDGE DECK CROWN 0.03' BELOW PROFILE GRADE.
3. TL-4 BRIDGE RAILING PROPOSED.
4. CLASS E REVETMENT STONE IS EMBEDDED.
5. FULLY ENCASED PILE BENT PIERS.

SITUATION PLAN

BENCH MARK NO.



PROPOSED PROFILE GRADE US 18

UTILITIES LEGEND:

— FO — - IOWA COMMUNICATIONS NETWORK - QUALITY D
— FO2 — — WINDSTREAM COMMUNICATIONS - QUALITY D
— T1 — - WINDSTREAM COMMUNICATIONS - QUALITY D

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

HYDRAULIC DATA

DRAINAGE AREA = 147.0 SQ. MI.
STREAM SLOPE = 3.42 FT./MI.
AVG. LOW WATER STAGE = 1076.5

Q_{50}= 2,306 CFS
STAGE = 1083.57 FT.
REGULATORY LOW BEAM = 1085.36
BACKWATER = 1.33 FT.
AVG. BRIDGE VELOCITY = 3.62 FPS

Q_{100}= 2,626 CFS
STAGE = 1083.96 FT.
OPERATIONAL LOW BEAM = 1085.35
BACKWATER = 1.51 FT.
AVG. BRIDGE VELOCITY = 3.91 FPS

Q_{200}= 3,132 CFS
STAGE = 1084.68
CALCULATED CHECK SCOUR =

Q_{500}= 3,176 CFS
STAGE = 1084.82
CALCULATED CHECK SCOUR =
ROADWAY OVERTOP = 1087.43

LOCATION

US18 OVER WINTERS LAKE OVERFLOW
T-95N R-14W
SECTION 2 & 11
CHICKASAW TOWNSHIP
CHICKASAW COUNTY
FHWA NO. _____
BRIDGE MAINT. NO. 1924.0S018
LATITUDE 40.066840
LONGITUDE -92.457832

TRAFFIC ESTIMATE

2024	AADT	2100	V.P.D.
2044	AADT	2400	V.P.D.
2044	DHV	250	V.P.H.
TRUCKS		20	%

PRELIMINARY

DESIGN FOR 0° SKEW

120'-0 X 44'-0 CONTINUOUS CONCRETE SLAB BRIDGE

36'-6 END SPANS — 47'-0 INTERIOR SPAN

SITUATION PLAN

STATION 260+03.50 (US18) — MAY, 2021

CHICKASAW COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION
DESIGN SHEET NO. 1 OF ? FILE NO. ? DESIGN NO. ?

DESIGN TEAM SHIVE-HATTERY,INC | CHICKASAW COUNTY | PROJECT NUMBER BRFN-018-7(67)--39-19 | SHEET NUMBER V.1

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

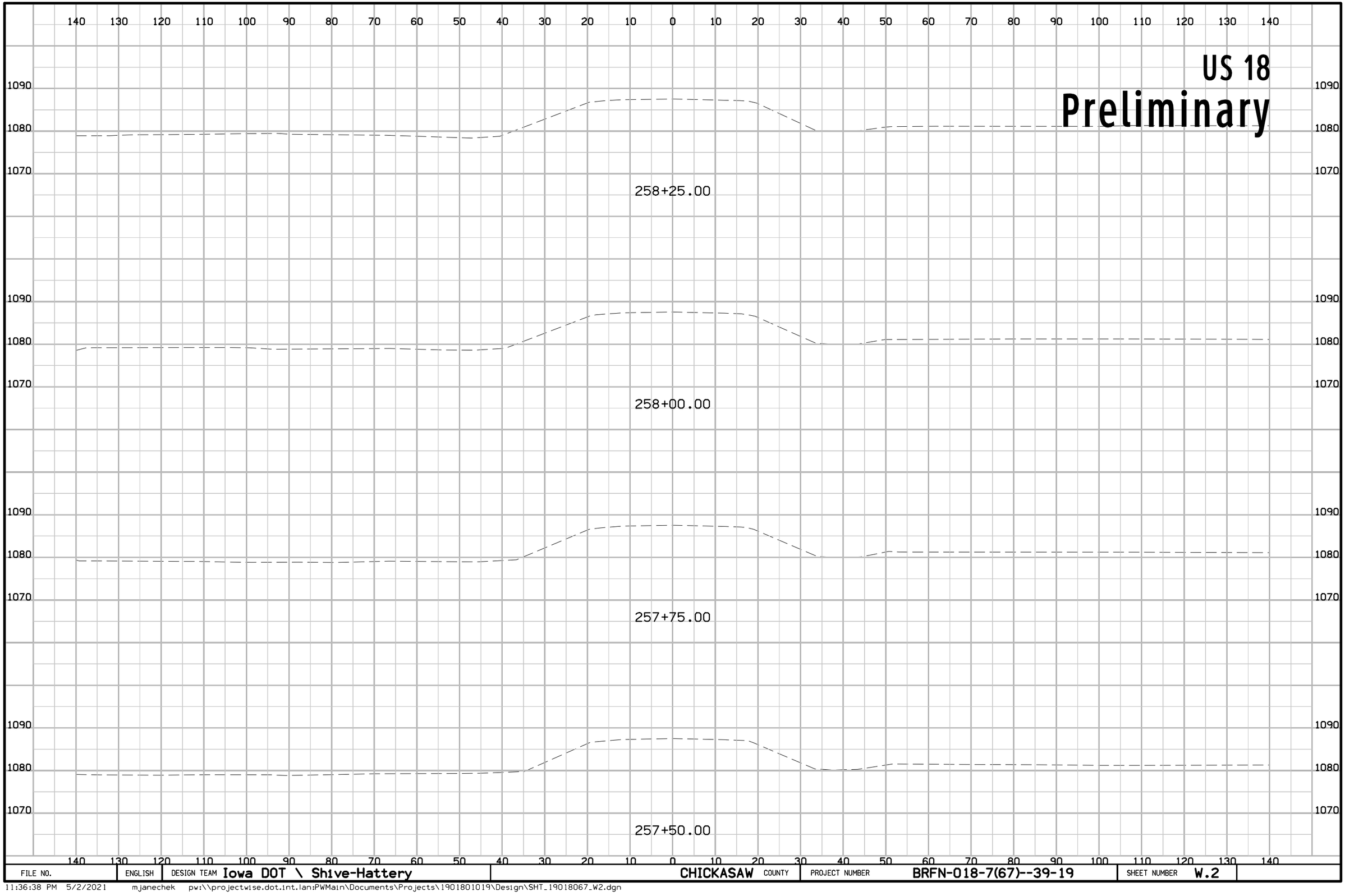
CROSS SECTION LEGEND AND SYMBOL INFORMATION SHEET

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

FILE NO.	ENGLISH	DESIGN TEAM Iowa DOT \ Shive-Hattery	CHICKASAW COUNTY	PROJECT NUMBER BRFN-018-7(67)--39-19	SHEET NUMBER W.1

US 18

Preliminary



FILE NO.	ENGLISH	DESIGN TEAM Iowa DOT \ Shive-Hattery	CHICKASAW COUNTY	PROJECT NUMBER BRFN-018-7(67)--39-19	SHEET NUMBER W.2

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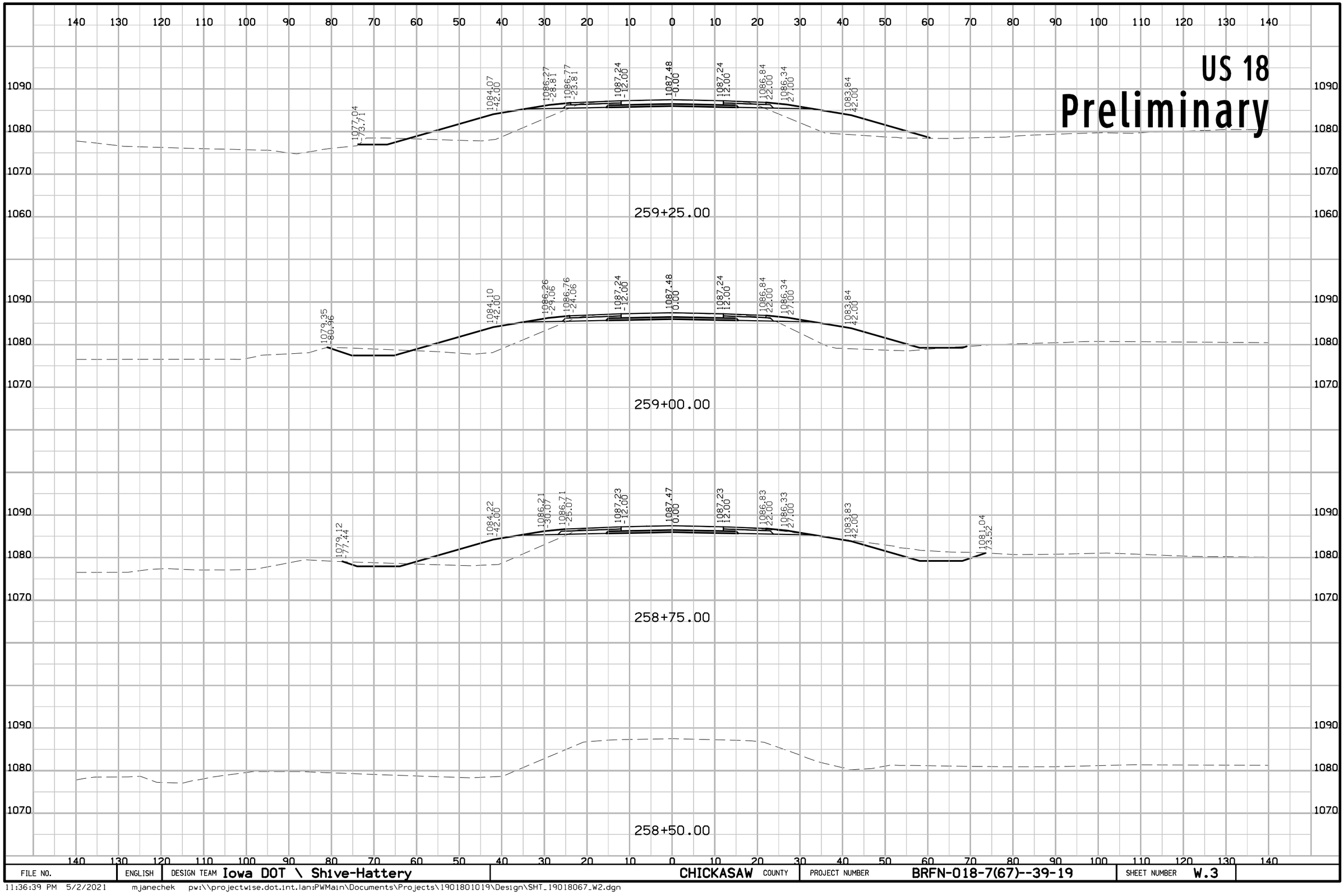
US 18

Preliminary



FILE NO.	ENGLISH	DESIGN TEAM Iowa DOT \ Shive-Hattery	CHICKASAW COUNTY	PROJECT NUMBER BRFN-018-7(67)--39-19	SHEET NUMBER W.3

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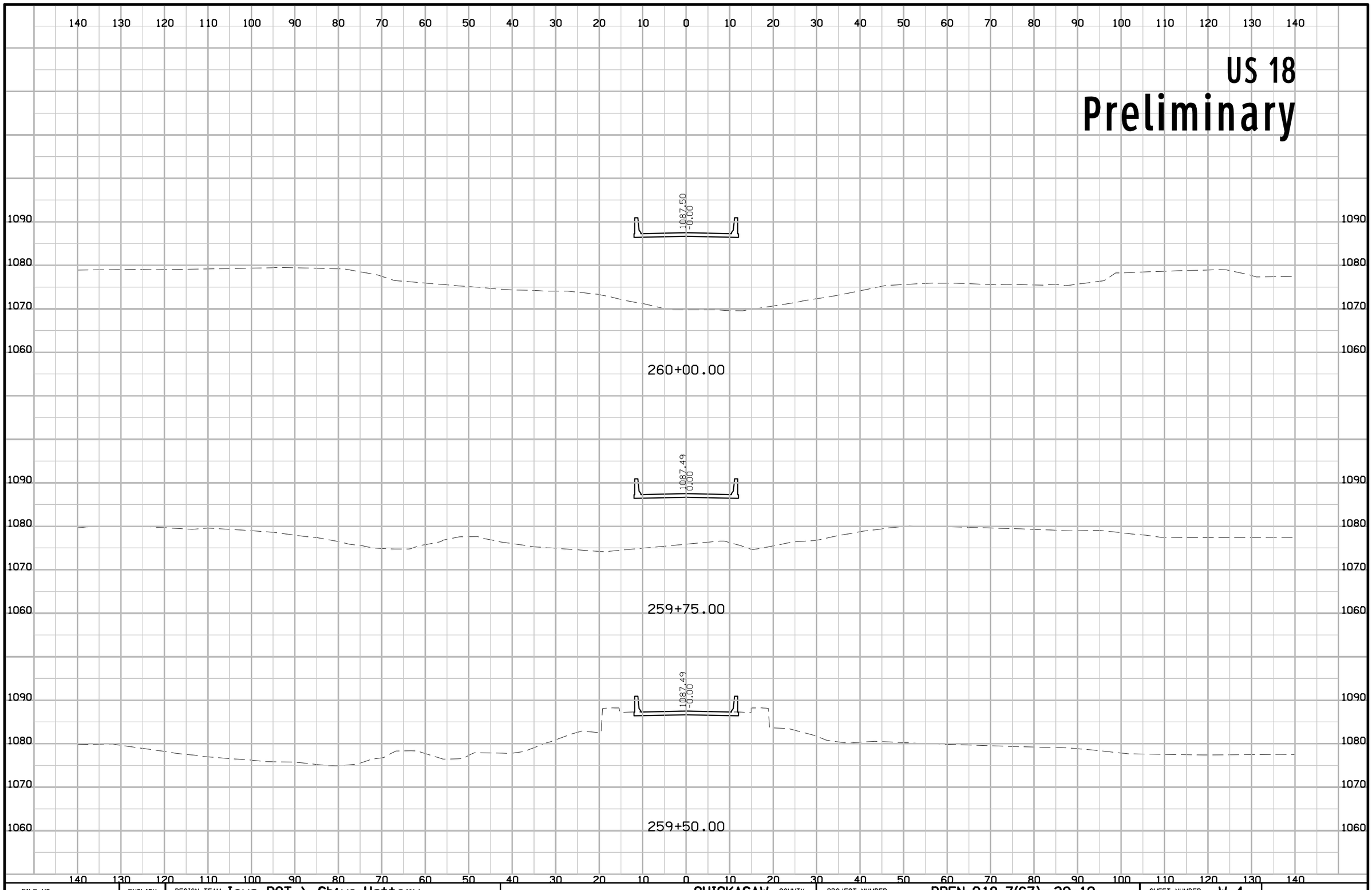
US 18
Preliminary



FILE NO.	ENGLISH	DESIGN TEAM Iowa DOT \ Shive-Hattery	CHICKASAW COUNTY	PROJECT NUMBER BRFN-018-7(67)--39-19	SHEET NUMBER W.4

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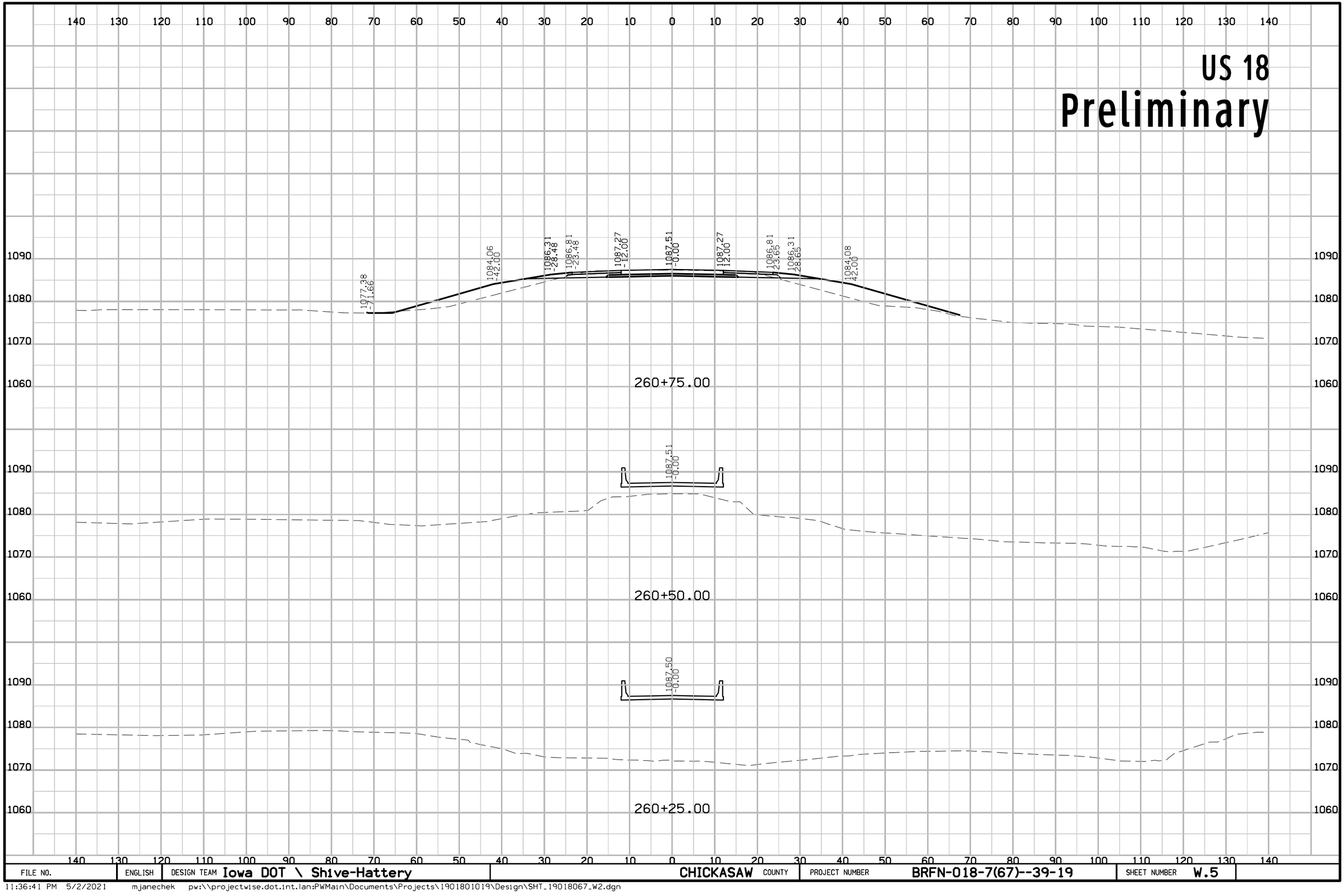
US 18

Preliminary



FILE NO.	ENGLISH	DESIGN TEAM Iowa DOT \ Shive-Hattery	CHICKASAW COUNTY	PROJECT NUMBER BRFN-018-7(67)--39-19	SHEET NUMBER W.5

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US 18

Preliminary

261+75.00

261+50.00

1084.05
42.00
1086.33
28.36
1086.83
23.36
1087.28
12.00
1087.52
0.00
1087.28
12.00
1086.78
24.60
1086.28
29.60
1084.21
42.00
1077.65
-76.80
1080.11
71.73

261+25.00

1084.06
42.00
1086.32
28.42
1086.82
23.42
1087.28
12.00
1087.52
0.00
1087.28
12.00
1086.81
23.71
1086.31
28.71
1084.10
42.00
1077.65
-76.84
1079.47
69.43

261+00.00

FILE NO.	ENGLISH	DESIGN TEAM Iowa DOT \ Shive-Hattery	CHICKASAW COUNTY	PROJECT NUMBER BRFN-018-7(67)--39-19	SHEET NUMBER W.6

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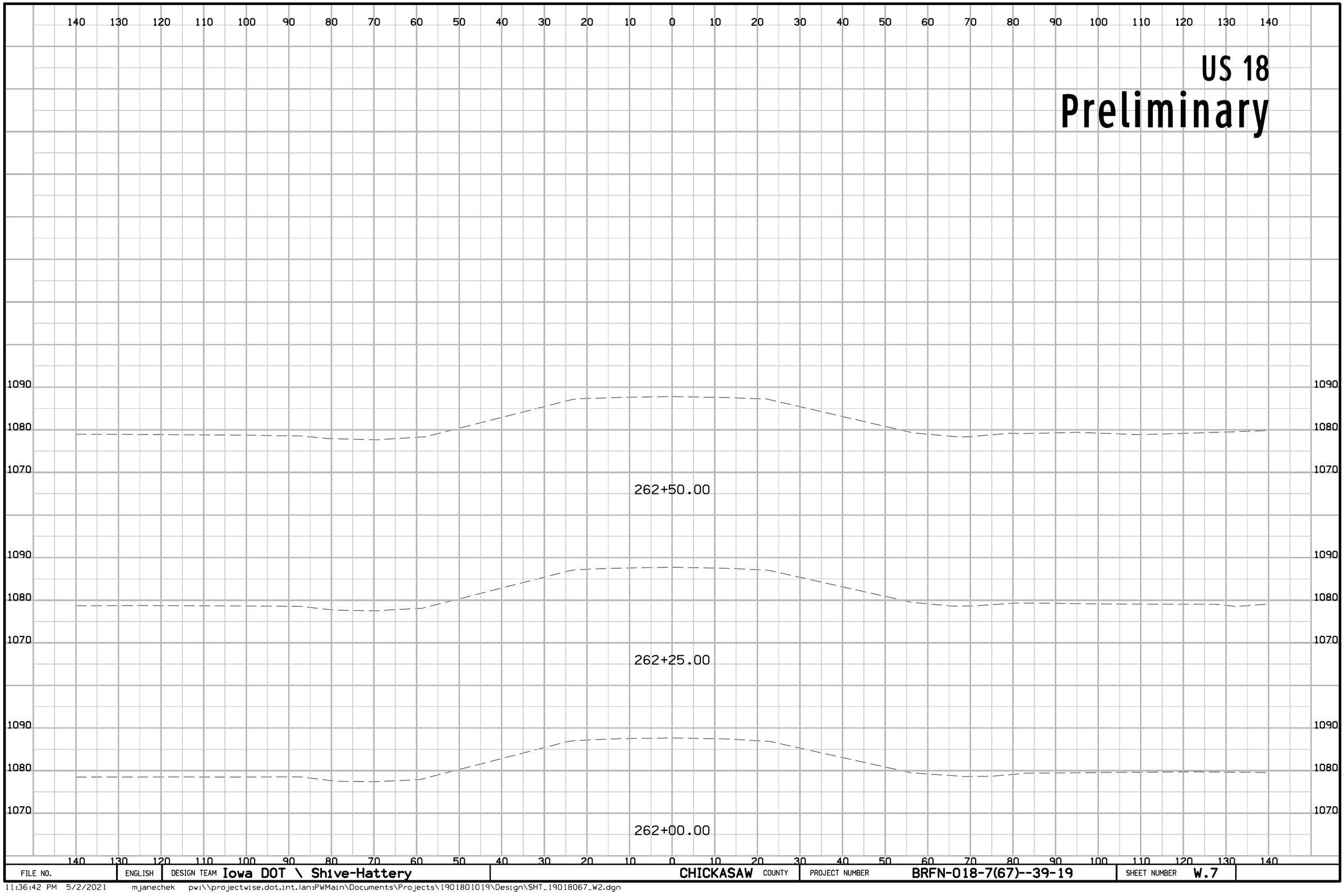
US 18
Preliminary



FILE NO.	ENGLISH	DESIGN TEAM Iowa DOT \ Shive-Hattery	CHICKASAW COUNTY	PROJECT NUMBER BRFN-018-7(67)--39-19	SHEET NUMBER W.7

11:36:42 PM 5/2/2021 mjanechek pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\1901801019\Design\SHT_19018067_W2.dgn