

Initials	Date
WS	3/12/2021

	Muskogee-Sequoyah	County
Project No.	J3-2100(004)	
JP #	32100(04)	

SH 100	over	MKARNS	at WEBBERS FALLS
	NBIS #	17611	

Hydraulic Summary

Total Drainage Area =	104603	sq. mi
Controlled Drainage Area =	19785	sq. mi
Effective Drainage Area =	84818	sq. mi

Existing Structure:	4(100)-207-334-207-3(100)- 4(100)-75 PL GIRDER
C/L Station	283+35.13

L =	1928.75	ft
$Q_{OT} \approx Y_{r_{freq}}$	149	

Low Bm Elev =	510.48	ft
Low Bm Sta =	292+99.25	
Rdwy _{OT} Elev =	481.5	ft
Rdwy _{OT} Sta =	245+00	

Proposed Structure:	240-320-410-320-3(208) PL GIRDER
C/L Station	
0 ft offset	

L =	1914	ft
$Q_{OT} \approx Y_{r_{freq}}$	172	

Low Bm Elev =	509.52	ft
Low Bm Sta =	292+95.75	
Rdwy _{OT} Elev =	481.5	ft
Rdwy _{OT} Sta =	245+00	

Detour Structure:	
C/L Station	
ft offset to the	

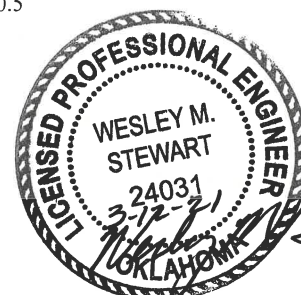
Slope =		ft/ft
$Q_{OT} \approx Y_{r_{freq}}$		

Inlet Elev =		ft
Detour _{OT} Elev =		ft
Detour _{OT} Sta =		

Freq.	Q (cfs)	CHW (ft)	V (fps)	Contraction Scour (ft)	Pier Scour (ft)	Total Scour (ft)
2	168000	461.05	8.19			
5	265000	467.31	9.27			
10	317000	470.42	9.69			
25	394000	474.62	10.27			
50	452000	478.56	10.18			
100	509000	480.73	10.66	7.04	26.71	33.75
500	645000	484.98	11.86			
OT or 500 = $Y_{r_{freq}}$	533582	481.49	10.91	7.79	26.91	34.69
Detour OT = $Y_{r_{freq}}$						

- Notes:
- 1) Bridge modeled based on January 2019 survey data.
 - 2) Scour calcs based on assumed values for D50 & D90 from NRCS soil report. Depths given have been calculated assuming the loamy fine sand at full scour depth.
 - 3) Vertical clearance required is 52' above 2% Flowline Elev. 470.5

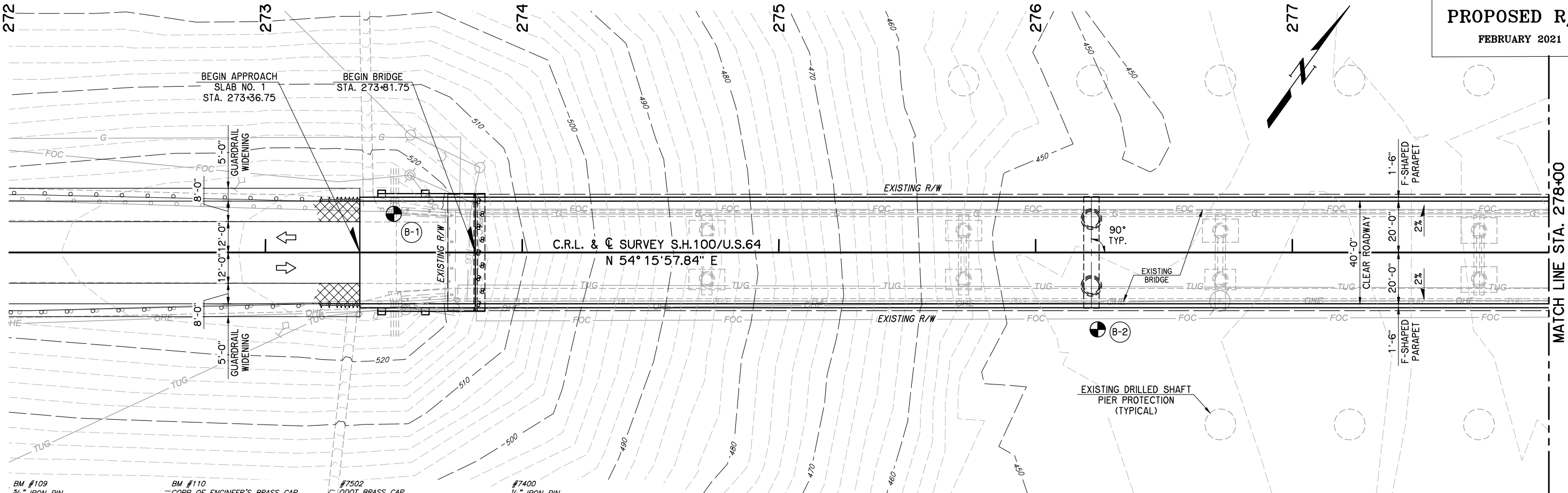
*Hydraulic Design is in compliance with
"Federal-Aid Policy Guide 23 CFR 650, Subpart A"*



Wesley M. Stewart

PROPOSED R/W

FEBRUARY 2021



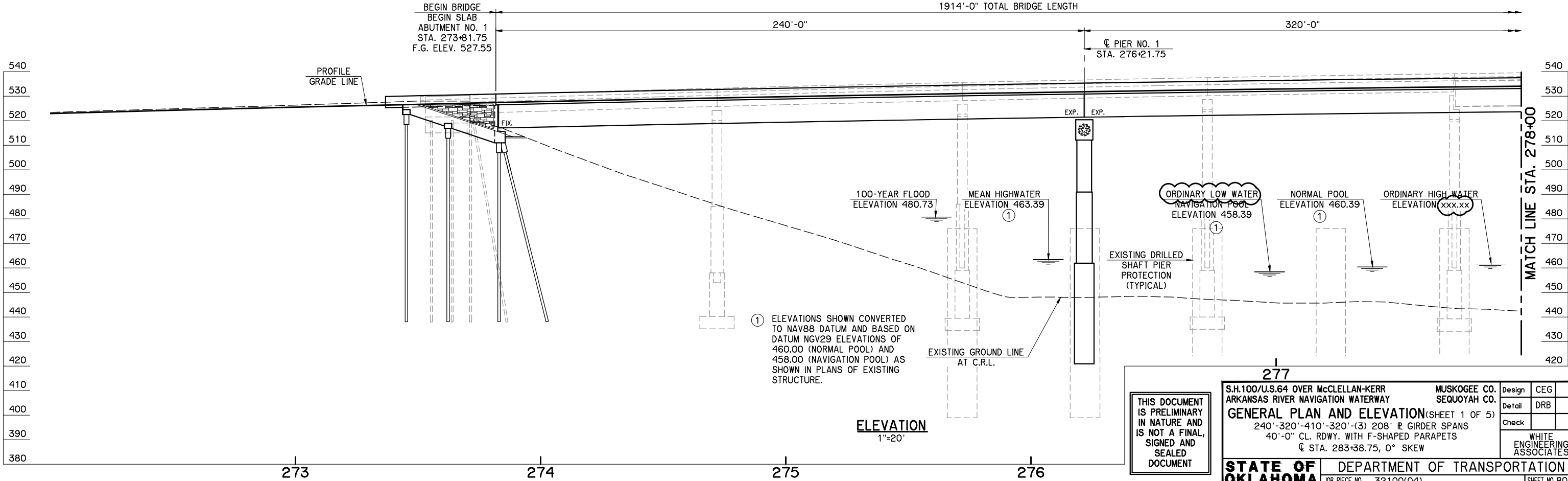
BM #109
3/8" IRON PIN
STA. 261+52 93' RT. ELEV.=477.65

BM #110
CORP OF ENGINEER'S BRASS CAP
STA. 268+08 176' RT. ELEV.=470.56

#7502
ODOT BRASS CAP
STA. 271+13 428' RT. ELEV.=467.55

#7400
1/2" IRON PIN
STA. 274+06 410' RT. ELEV.=464.13

PLAN
1"=20'



ELEVATION
1"=20'

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S.H.100/U.S.64 OVER McCLELLAN-KERR ARKANSAS RIVER NAVIGATION WATERWAY		MUSKOGEE CO. SEQUOYAH CO.	Design CEG
GENERAL PLAN AND ELEVATION (SHEET 1 OF 5)			Detail DRB
240'-320'-410'-320'-(3) 208' R GIRDER SPANS 40'-0" CL. RDWY. WITH F-SHAPED PARAPETS C STA. 283+38.75, 0° SKEW			Check
STATE OF OKLAHOMA		DEPARTMENT OF TRANSPORTATION	WHITE ENGINEERING ASSOCIATES
JOB PIECE NO. 32100(O4)		SHEET NO. B001	



1914'-0" TOTAL BRIDGE LENGTH



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283			
S.H.100/U.S.64 OVER McCLELLAN-KERR ARKANSAS RIVER NAVIGATION WATERWAY		MUSKOGEE CO. SEQUOYAH CO.	
GENERAL PLAN AND ELEVATION		Design	CEG
(SHEET 2 OF 5)		Detail	DRB
240'-320'-410'-320'-(3) 208" R GIRDER SPANS 40'-0" CL. RDWY. WITH F-SHAPED PARAPETS @ STA. 283+38.75, 0° SKEW		Check	
		WHITE ENGINEERING ASSOCIATES	
STATE OF OKLAHOMA	DEPARTMENT OF TRANSPORTATION		
JOB PIECE NO.	32100(O4)	SHEET NO. BOO:	



208'-0"



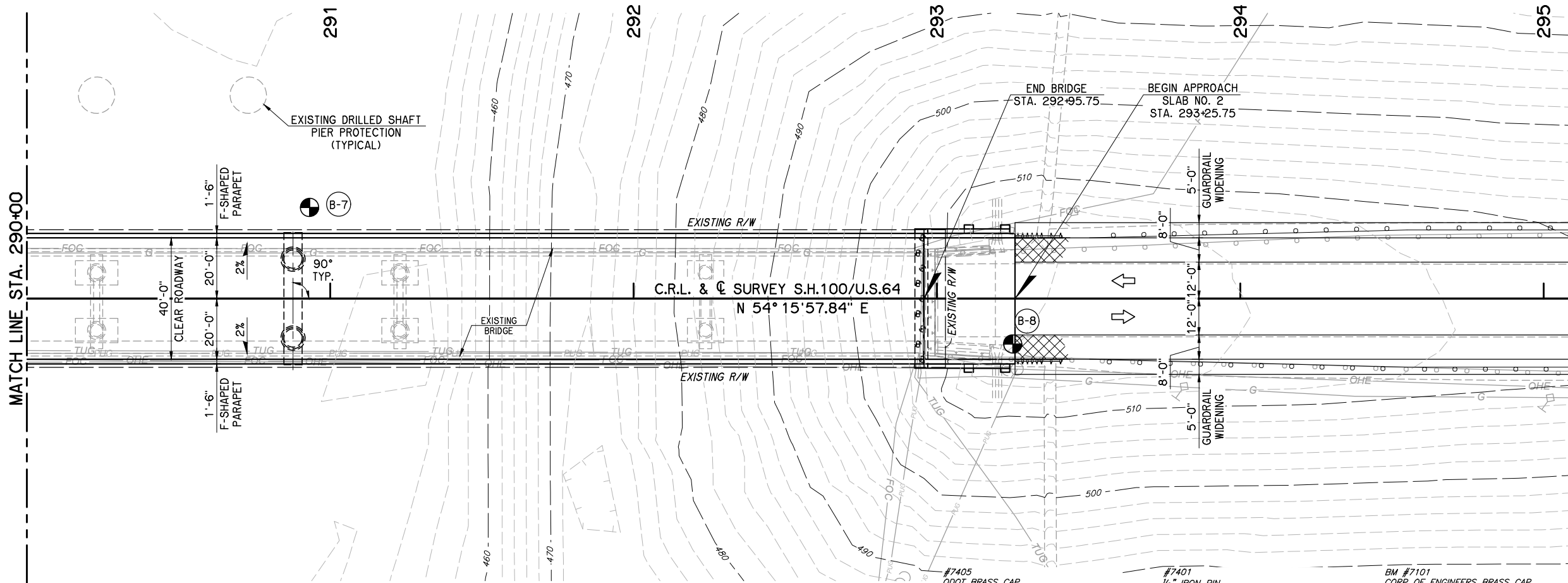
Design	CEG	
Detail	DRB	
Check		

WHITE
ENGINEERING
ASSOCIATES

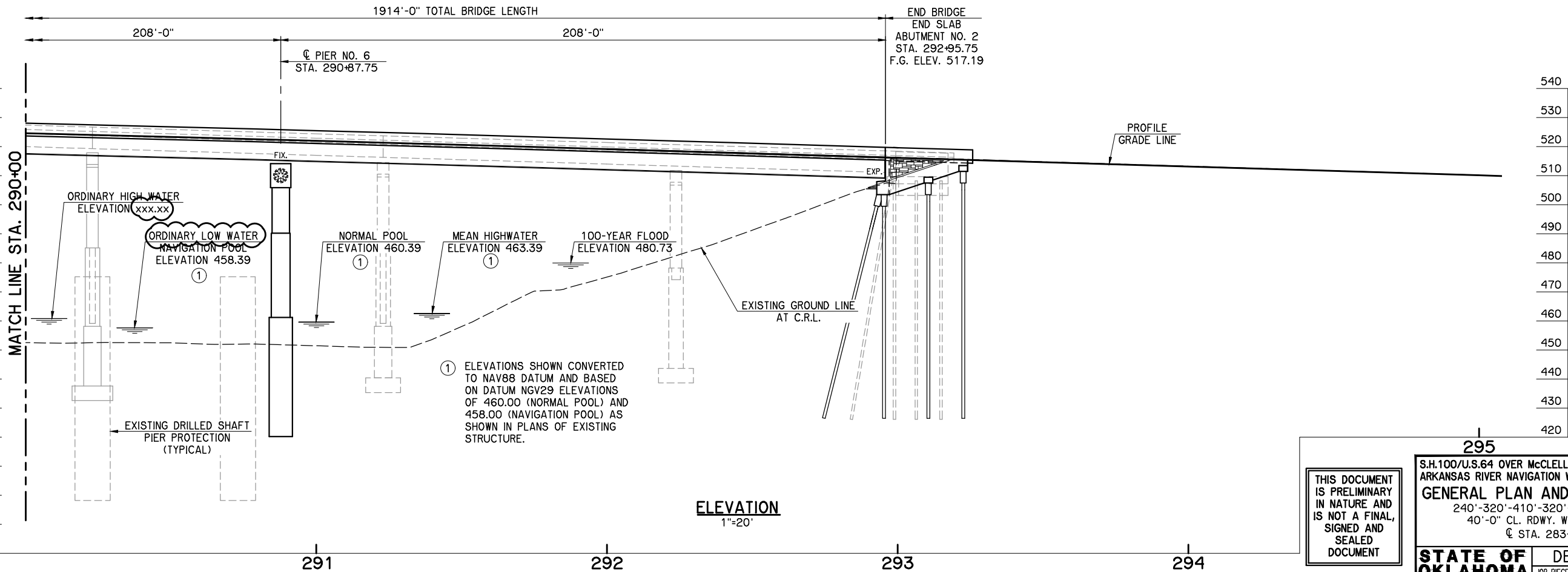
STATE OF OKLAHOMA	DEPARTMENT OF TRANSPORTATION	
	JOB PIECE NO. 32100(04)	SHEET NO. B003

PROPOSED R/W

FEBRUARY 2021



PLAN
1"=20'



ELEVATION
1"=20'

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S.H.100/U.S.64 OVER McCLELLAN-KERR ARKANSAS RIVER NAVIGATION WATERWAY		MUSKOGEE CO. SEQUOYAH CO.		Design	CEG
GENERAL PLAN AND ELEVATION (SHEET 4 OF 5)		240'-320'-410'-320'-(3) 208' R GIRDER SPANS 40'-0" CL. RDWY. WITH F-SHAPED PARAPETS C STA. 283+38.75, 0° SKEW		Detail	DRB
				Check	
				WHITE ENGINEERING ASSOCIATES	
STATE OF OKLAHOMA		DEPARTMENT OF TRANSPORTATION			
JOB PIECE NO. 32100(O4)				SHEET NO. B004	

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PROPOSED R/W
FEBRUARY 2021

DESIGN DATA

LOAD AND RESISTANCE FACTOR DESIGN

CONCRETE CLASS AA
CONCRETE CLASS A
REINFORCING STEEL (GRADE 60)
STRUCTURAL STEEL M270 (GRADE 50W)
STRUCTURAL STEEL M270 (GRADE HPS 70W)
STAINLESS STEEL A240 (TYPE 316)

f'c = 4 K.S.I.
f'c = 3 K.S.I.
fy = 60 K.S.I.
Fy = 50 K.S.I.
Fy = 70 K.S.I.
Fy = 30 K.S.I.

LOADING:
HL-93 OR OKLAHOMA OVERLOAD TRUCK OR TYPE 315 OVERLOAD TRUCK
20 PSF FUTURE WEARING SURFACE
5 PSF STAY-IN-PLACE FORMS

DESIGN:
AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8th EDITION
ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE
ANSI/AWS D1.6 STRUCTURAL WELDING CODE - STAINLESS STEEL

HL93 INVENTORY RATING FACTOR:
HL93 OPERATING RATING FACTOR:

x.xx
x.xx

INDEX OF SHEETS

AB01 - AB02 GENERAL NOTES & SUMMARY OF PAY QUANTITIES (BRIDGE)
BO01 - BO05 GENERAL PLAN AND ELEVATION
BO06 SEQUENCE OF BRIDGE CONSTRUCTION
BO07 BRIDGE TYPICAL SECTION
BO08 SUPERSTRUCTURE DETAILS
BO09 - BO10 NAVIGATION LIGHTING DETAILS

STANDARDS

FSHP-42-2
LECS-4-2
PUD-3-3
HP1-2
LTU-4-0

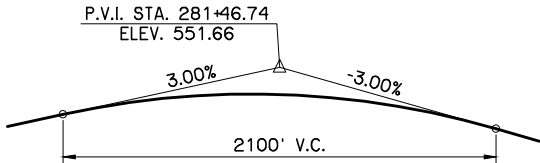
SUMMARY OF BRIDGE QUANTITIES						
ITEM DESCRIPTION	UNIT	ABUTMENTS	PIERS	SUPERSTR.	APPR. SLABS	TOTAL
SUBSTRUCTURE EXCAVATION COMMON	C.Y.					
CLSM BACKFILL	C.Y.					
APPROACH SLAB	S.Y.					
SAW-CUT GROOVING	S.Y.					
42" F-SHAPED PARAPET	L.F.					
STRUCTURAL STEEL	LB.					
STAINLESS STEEL FIXED BEARING ASSEMBLY	EA.					
STAINLESS STEEL EXP. BEARING ASSEMBLY	EA.					
ELASTOMERIC COATING	S.F.					
CLASS AA CONCRETE	C.Y.					
CLASS A CONCRETE	C.Y.					
REINFORCING STEEL	LB.					
EPOXY COATED REINFORCING STEEL	LB.					
PILES, FURNISHED (HP12x53)	L.F.					
PILES, DRIVEN (HP12x53)	L.F.					
PILE SPLICE, H-PILE (NON-BIDDABLE)	EA.					
WATER REPELLENT (VISUALLY INSPECTED)	S.Y.					
DRILLED SHAFTS 96" DIAMETER	L.F.					
CROSSHOLE SONIC LOGGING	EA.					
THERMAL INTEGRITY PROFILER	EA.					
MODULAR EXPANSION JOINTS	L.F.					
SEALER CRACK PREPARATION	L.F.					
SEALER RESIN	GAL.					
TYPE I-A FILTER BLANKET	TON					
6" PERFORATED PIPE UNDERDRAIN ROUND	L.F.					
6" NON-PERF. PIPE UNDERDRAIN RND.	L.F.					
REMOVAL OF EXISTING BRIDGE STRUCTURE	L.SUM					
(SP) BRIDGE NAVIGATION LIGHTING	L.SUM					

FOUNDATION DATA						
ABUTMENTS						
DESIGN CRITERIA					ABUTMENT 1	ABUTMENT 2
FACTORED PILE REACTION (HP 12x53)						
PILE LENGTH						
PIERS						
DESIGN CRITERIA	PIER NO. 1	PIER NO. 2	PIER NO. 3	PIER NO. 4	PIER NO. 5	PIER NO. 6
DIAMETER	96"	96"	96"	96"	96"	96"
MINIMUM DEPTH INTO ROCK						
DEPTH OF ROCK NEGLECTED FOR FRICTION						
UNIT BEARING RESISTANCE						
BEARING RESISTANCE FACTOR						
FACTORED BEARING RESISTANCE						
UNIT FRICTION RESISTANCE						
FRICTION RESISTANCE FACTOR						
FACTORED FRICTION RESISTANCE						
TOTAL FACTORED RESISTANCE						
TOTAL FACTORED REACTION						

FACTORED PILE RESISTANCE:
DRIVE PILING THROUGH THE COMPACTED FILL AND TO A POINT BEARING ON SOLID FOUNDATION MATERIAL AT THE APPROXIMATE ELEVATION SHOWN ON THE PLANS. IF A FACTORED AXIAL LOAD RESISTANCE EQUAL TO OR GREATER THAN THE FACTORED PILE REACTION IS NOT OBTAINED AT THIS ELEVATION, CONTINUE DRIVING UNTIL SUCH IS OBTAINED. THE LENGTH OF STEEL PILING SHOWN ON THE PLANS IS FOR ESTIMATING PURPOSES ONLY.

HYDRAULIC SUMMARY						
TOTAL DRAINAGE AREA = 85,840.00 SQ. MILES CONTROLLED DRAINAGE AREA = 647.00 SQ. MILES EFFECTIVE DRAINAGE AREA = 85,193.00 SQ MILES						
FREQUENCY (YEARS)	DISCHARGE (CFS)	WATER SURFACE ELEVATION (FT)	VELOCITY (FPS)	CONTR. SCOUR (FT)	PIER SCOUR (FT)	TOTAL SCOUR (FT)
2	168000	460.99	8.16			
5	265000	467.24	9.25			
10	317000	470.34	9.69			
25	394000	474.52	10.30			
50	452000	478.45	10.23	7.04	26.71	33.75
100	509000	480.73	10.67			
500	645000	484.99	11.89			
172 (OT)	533582	481.49	10.93	7.79	26.91	34.69
LOW BEAM ELEVATION = 509.78						

NOTE:
FOUNDATION DESIGN BASED ON BORINGS TO NON-ERODIBLE
ROCK AND NOT COMPUTED SCOUR DEPTHS.



VERTICAL CURVE DATA

PREPARED BY:				THIS DOCUMENT IS PRELIMINARY IN NATURE AND IS NOT A FINAL, SIGNED AND SEALED DOCUMENT		
WHITE ENGINEERING ASSOCIATES, INC.		XXXXXXXXX OKLAHOMA LICENSE NO. XXXXX				
		DATE				
S.H.100/U.S.64 OVER McCLELLAN-KERR ARKANSAS RIVER NAVIGATION WATERWAY		MUSKOGEE CO. SEQUOYAH CO.				
GENERAL PLAN AND ELEVATION(SHEET 5 OF 5) 245'-322.5'-400'-322.5'-(3) 212' R GIRDER SPANS 40'-0" CL. RDWY. WITH F-SHAPED PARAPETS @ STA. 283+36.38, 0° SKEW				Design	CEG	
				Detail	DRB	
				Check		
				WHITE ENGINEERING ASSOCIATES		
STATE OF OKLAHOMA		DEPARTMENT OF TRANSPORTATION				
JOB/PIECE NO. 32100(O4)		SHEET NO. BO05				