

LOAD AND RESISTANCE FACTOR DESIGN

DESIGN DATA

CLASS AA CONCRETE f'c = 4,000 PSI
 CLASS A CONCRETE f'c = 3,000 PSI
 P.C. BEAM TYPE IV (80") f'ci = 5,250 PSI
 P.C. BEAM TYPE IV (80") f'c = 7,000 PSI
 REINFORCING STEEL Fy = 60,000 PSI
 STRUCTURAL STEEL M270 (GRADE 50W) Fy = 50,000 PSI
 STAINLESS STEEL A240 (AUSTENITIC STAINLESS STEEL TYPE 316) Fy = 30,000 PSI

LOADING: HL-93 OR OKLAHOMA OVERLOAD TRUCK AND 20 LB. PER SQ. FT.
 FUTURE WEARING SURFACE AND 5 P.S.F. STAY-IN-PLACE FORMS.

DESIGN: AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 4th EDITION
 WITH 2009 INTERIMS
 ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE
 ANSI/AWS D1.6 STRUCTURAL WELDING CODE - STAINLESS STEEL

LFD OPERATING RATING: HS 42.7

FOUNDATION DATA

ABUTMENTS (HP 12x53 PILING)

FACTORED PILE REACTION¹ ABUTMENT NO. 1 & NO. 2
 = 91.0 TONS/PILE

PIERS (5'-0" DIAMETER DRILLED SHAFTS)

	PIER NO. 1	PIER NO. 2	PIER NO. 3	PIER NO. 4
FACTORED REACTION	= 662.0 TONS/SHAFT	= 653.0 TONS/SHAFT	= 653.0 TONS/SHAFT	= 662.0 TONS/SHAFT
NOMINAL UNIT BEARING RESISTANCE	= 30.5 TONS/SQ. FT.	= 42.4 TONS/SQ. FT.	= 45.4 TONS/SQ. FT.	= 25.0 TONS/SQ. FT.
BEARING RESISTANCE FACTOR	= 0.7	= 0.7	= 0.7	= 0.7
FACTORED BEARING RESISTANCE	= 419.2 TONS/SHAFT	= 583.2 TONS/SHAFT	= 624.0 TONS/SHAFT	= 344.0 TONS/SHAFT
NOMINAL UNIT FRICTION RESISTANCE	= 6.3 TONS/SQ. FT.	= 7.7 TONS/SQ. FT.	= 7.1 TONS/SQ. FT.	= 9.0 TONS/SQ. FT.
FRICTION RESISTANCE FACTOR	= 0.45	= 0.45	= 0.45	= 0.45
FACTORED FRICTION RESISTANCE	= 443.2 TONS/SHAFT	= 271.4 TONS/SHAFT	= 252.3 TONS/SHAFT	= 636.2 TONS/SHAFT
DEPTH OF ROCK NEGLECTED FOR FRICTION	= 5.0 FT.	= 5.0 FT.	= 5.0 FT.	= 5.0 FT.
TOTAL FACTORED RESISTANCE	= 862.4 TONS/SHAFT	= 854.6 TONS/SHAFT	= 876.3 TONS/SHAFT	= 980.2 TONS/SHAFT

¹ ALL ABUTMENT PILING SHALL BE DRIVEN THROUGH THE COMPACTED FILL. PILING SHALL BE DRIVEN TO POINT BEARING ON SOLID FOUNDATION MATERIAL AT THE APPROXIMATE ELEVATION SHOWN ON THE PLANS. IF THE REQUIRED FACTORED PILE CAPACITY IS NOT OBTAINED AT THIS ELEVATION, DRIVING SHALL CONTINUE UNTIL THE REQUIRED FACTORED PILE CAPACITY IS OBTAINED. THE LENGTH OF STEEL PILING SHOWN ON THE PLANS IS FOR ESTIMATING PURPOSES ONLY.

SUMMARY OF QUANTITIES						
ITEM	UNIT	ABUTS.	PIERS	SUPERSTR.	APPR.	TOTAL
SUBSTRUCTURE EXCAVATION COMMON	C.Y.	180.0	---	---	---	180.0
CLSM BACKFILL	C.Y.	206.0	---	---	---	206.0
PRESTRESSED CONCRETE BEAMS (TYPE IV)	L.F.	---	---	1,595.0	---	1,595.0
APPROACH SLAB	S.Y.	---	---	---	281.2	281.2
SAW-CUT GROOVING	S.Y.	---	---	1,785.4	266.6	2,052.0
SEALED EXPANSION JOINT	L.F.	---	---	43.2	---	43.2
CONCRETE RAIL (TR4)	L.F.	---	---	803.4	120.0	923.4
STRUCTURAL STEEL	LB.	---	---	2,250.0	---	2,250.0
STAINLESS STEEL FIXED BEARING ASSEMBLY	EA.	---	---	8.0	---	8.0
STAINLESS STEEL EXPANSION BEARING ASSEMBLY	EA.	---	---	32.0	---	32.0
CLASS AA CONCRETE	C.Y.	---	---	471.3	---	471.3
CLASS A CONCRETE	C.Y.	96.0	169.0	---	---	265.0
REINFORCING STEEL	LB.	---	1,350.0	---	---	1,350.0
EPOXY COATED REINFORCING STEEL	LB.	12,220.0	28,670.0	101,800.0	---	142,690.0
CLASS B BRIDGE DECK REPAIR	S.Y.	---	---	---	---	45.0
CLASS C BRIDGE DECK REPAIR	S.Y.	---	---	---	---	15.0
PILES, FURNISHED (HP 10X42)	L.F.	246.0	---	---	---	246.0
PILES, FURNISHED (HP 12X53)	L.F.	813.0	---	---	---	813.0
PILES, DRIVEN (HP 10X42)	L.F.	246.0	---	---	---	246.0
PILES, DRIVEN (HP 12X53)	L.F.	813.0	---	---	---	813.0
PILE SPLICE, H-PILE (NON-BIDDABLE)	EA.	1.0	---	---	---	1.0
WATER REPELLENT (VISUALLY INSPECTED)	S.Y.	96.0	479.0	1,412.0	56.0	2,043.0
DRILLED SHAFTS 60" DIAMETER	L.F.	---	430.0	---	---	430.0
CROSSHOLE SONIC LOGGING	EA.	---	2.0	---	---	2.0
SEALER CRACK PREPARATION	L.F.	---	---	122.4	---	122.4
SEALER RESIN	GAL.	---	---	1.5	---	1.5
(SP) NEST PREVENTION - NETTING	L.SUM	---	---	---	---	1.0
TYPE 1-A PLAIN RIPRAP	TON	---	---	---	---	3,220.0
TYPE 1-A FILTER BLANKET	TON	---	---	---	---	705.0
6" PERFORATED PIPE UNDERDRAIN ROUND	L.F.	84.0	---	---	---	84.0
6" NON-PERF. PIPE UNDERDRAIN RND.	L.F.	60.0	---	---	---	60.0
REMOVAL OF EXISTING BRIDGE STRUCTURE	L.SUM	---	---	---	---	1.0

① TO BE USED ON THE EXISTING BRIDGE AS DIRECTED BY THE ENGINEER.

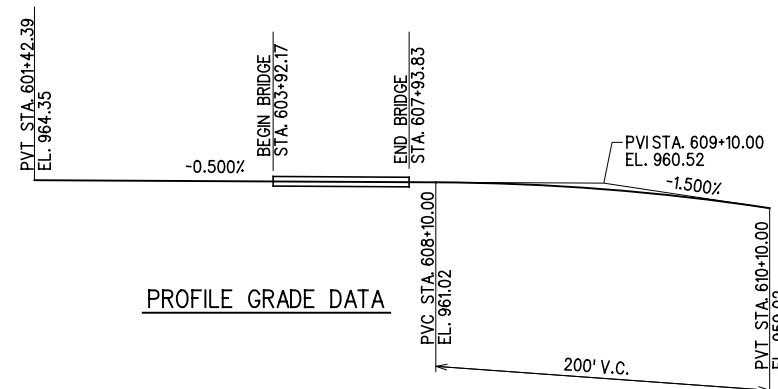
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HYDRAULIC DATA

DRAINAGE AREA = 617.00 SQ. MI
 CONTROLLED AREA = 118.00 SQ. MI
 EFFECTIVE AREA = 499.00 SQ. MI

Q2	5,392.5 C.F.S.	Q50	30,786.72 C.F.S.
V2	2.65 F.P.S.	V50	6.80 F.P.S.
Q2 HIGHWATER	EL. 945.31	Q50 HIGHWATER	EL. 954.34
Q5	10,822.59 C.F.S.	Q100	38,922.51 C.F.S.
V5	3.95 F.P.S.	V100	7.25 F.P.S.
Q5 HIGHWATER	EL. 948.05	Q100 HIGHWATER	EL. 956.11
Q10	15,366.43 C.F.S.	PIER SCOUR DEPTH = 8.42 FT.	
V10	4.71 F.P.S.	CONTRACTION SCOUR DEPTH = 67.92 FT.	
Q10 HIGHWATER	EL. 949.89	TOTAL SCOUR DEPTH = 76.34 FT.	
Q25	23,346.13 C.F.S.	Q-OT = Q50 = 30,795.55 C.F.S.	
V25	5.86 F.P.S.	PIER SCOUR DEPTH = 8.45 FT.	
Q25 HIGHWATER	EL. 952.42	CONTRACTION SCOUR DEPTH = 57.12 FT.	
		TOTAL SCOUR DEPTH = 65.57 FT.	



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 CA. #74 EXPIRES 06/30/2016

DESIGN		U.S. 277 OVER DEEP RED CREEK	COTTON COUNTY
DRAWN		BRIDGE "B"	
CHECKED		DESIGN DATA & SUMMARY OF QUANTITIES	
APPROVED			
SQUAD	G/K ENGR.	JOB PIECE NO. 28036(04)	SHEET NO. 56