



J24-06 CONTINUOUS CONCRETE SLAB BRIDGE STANDARDS

REVISED 06-13 - REVISION FOR LRFD PILE DESIGN.
REVISED 08-2022:UPDATED BRIDGE ENGINEER SIGNATURE. REMOVED REFERENCE TO BRIDGE DESIGN MANUAL CADD NOTE E177.

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GENERAL NOTES:

THE J24-06 BRIDGE STANDARDS, IF PROPERLY USED, PROVIDE THE STRUCTURAL PLANS NECESSARY TO CONSTRUCT THREE SPAN 24'-0 ROADWAY CONTINUOUS CONCRETE SLAB BRIDGES WITH LENGTHS OF 70'-0, 80'-0, 90'-0, 100'-0, 110'-0, 120'-0, 130'-0, 140'-0 AND 150'-0.

THESE BRIDGES MAY BE BUILT ON A 0°, 15°, 30° OR 45° SKEW. THESE PLANS SHOW THE BRIDGES SKEWED IN ONE DIRECTION, BUT ALL DIMENSIONS AND DETAILS WOULD BE THE SAME FOR THE OPPOSITE SKEW.

THESE STANDARDS GIVE MOST OF THE INFORMATION NECESSARY TO BUILD THESE BRIDGES. HOWEVER, THE FOLLOWING ADDITIONAL INFORMATION IS REQUIRED FOR USE ON PRIMARY ROUTES. FOR SECONDARY ROUTES THE ENGINEER MAY NOT REQUIRE ALL SHEETS TO BE PROVIDED:

1. TITLE SHEET WITH ENGINEERS SEAL
2. ESTIMATED QUANTITIES TOTALS INCLUDING CLASS 20 EXCAVATION FOR BRIDGE
3. SITUATION PLAN LAYOUT OF BRIDGE
4. TOP OF SLAB ELEVATIONS LAYOUT
5. BOTTOM OF ABUTMENT FOOTING ELEVATIONS
6. BOTTOM OF PIER CAP ELEVATIONS
7. PILING DESIGN INFORMATION
8. SLOPE PROTECTION LAYOUT IF NEEDED
9. CONDUIT LAYOUT
10. LIGHTING LAYOUT IF NEEDED

THESE BRIDGES ARE DESIGNED FOR HL93 LOADING PLUS 20 LBS. PER SQ. FT. OF ROADWAY FOR FUTURE WEARING SURFACE. CONTROL OF CRACKING BY DISTRIBUTION OF REINFORCEMENT FOR SLAB DESIGN BASED ON PRE LRFD 2005 INTERIMS.

NOTE THAT WHEN APPROACH PAVEMENT IS TO BE PLACED, THE TEMPORARY PAVING BLOCKS SHALL BE REMOVED AND A PROPER JOINT FOR EXPANSION SHALL BE PROVIDED BETWEEN THE BRIDGE AND THE APPROACH PAVING.

THE FLOOR SLAB AS SHOWN INCLUDES ½" INTEGRAL WEARING SURFACE.

THE ABUTMENTS FOR THESE BRIDGES ARE BUILT INTEGRAL WITH THE SUPERSTRUCTURE. THEREFORE, IT IS IMPORTANT THAT A PROPER JOINT FOR EXPANSION BE PROVIDED BETWEEN THE BRIDGE AND APPROACH PAVING, WHEN APPROACH PAVING IS NEEDED.

THE ABUTMENT DESIGN UTILIZED ON THESE BRIDGES RESTRICTS THEIR USE IN THE FOLLOWING MANNER:

1. THESE BRIDGES ARE NOT TO BE USED WHEN POINT BEARING FOR THE ABUTMENT STEEL PILING WOULD BE OBTAINED ON ROCK AT A DISTANCE LESS THAN 15 FEET FROM THE BOTTOM OF FOOTING.
2. FOR THE 140 FOOT AND 150 FOOT LONG BRIDGES THE ABUTMENT PILING ARE TO BE DRIVEN THROUGH OVERSIZED HOLES PREBORED TO A MINIMUM OF 10 FEET BELOW THE BOTTOM OF FOOTING. THE PREBORED HOLES SHALL BE IN ACCORDANCE WITH SECTION 2501.03, Q OF THE STANDARD SPECIFICATIONS. THE ELEVATION OF THE BOTTOM OF THE PREBORED HOLE SHALL BE SHOWN ON THE PLANS.
3. IF ROCK IS ENCOUNTERED LESS THAN 5 FOOT BELOW THE PREBORED HOLES, A SPECIAL ANALYSIS WILL BE REQUIRED. WHEN PREBORING IS NOT REQUIRED FOR THE ABUTMENT FOOTING AND ROCK IS ENCOUNTERED LESS THAN 10 FOOT BELOW THE BOTTOM OF ABUTMENT FOOTING, A SPECIAL ANALYSIS WILL BE REQUIRED.

THE PIERS AND ABUTMENTS FOR THESE STANDARDS HAVE BEEN DESIGNED FOR THE USE OF BOTH FRICTION AND POINT BEARING PILES. IT IS NECESSARY THAT THE TYPE AND LENGTH FOR BOTH THE ABUTMENT AND PIER PILES BE DESIGNATED ON THE FRONT SHEET OF THE PLANS.

THE INTEGRAL ABUTMENTS AND PILE BENTS FOR THESE J24 STANDARDS HAVE BEEN DESIGNED FOR THE USE OF VARIOUS TYPES OF PILE FOOTINGS AS FOLLOWS.

- INTEGRAL ABUTMENTS: TIMBER PILES OR HP 10x42 PILES AT BRIDGE DESIGN MANUAL(BDM) ARTICLE 6.2.6.1 STRUCTURAL RESISTANCE LEVEL-I (SRL-I)
- PILE BENTS: STANDARD CONCRETE-FILLED STEEL PIPE PILES (PIOL), STANDARD PRESTRESSED CONCRETE PILES (PIOL), OR STANDARD H-PILES (PIOL AND SRL-I)

BECAUSE THESE BRIDGE STANDARDS HAVE BEEN REVISED FOR LRFD BASED ON 2012-COMPLETED IOWA STATE UNIVERSITY RESEARCH, FOR PILE FOUNDATIONS THE DESIGNER WILL NEED TO DETERMINE THE CONSTRUCTION CONTROL METHOD, CONTRACT LENGTH, AND DRIVING TARGET AND GIVE THAT INFORMATION ON THE FRONT SHEET OF THE PLANS. BRIDGE DESIGN MANUAL CADD NOTES E718, E719, E818, AND E819 ARE APPROPRIATE FOR THAT PURPOSE. THE NOTES, AS WELL AS THE BRIDGE DESIGN MANUAL AND DESIGN EXAMPLES, ARE AVAILABLE ON THE BRIDGES AND STRUCTURES BUREAU WEBSITE.

STRUCTURAL RESISTANCE LEVEL-I (SRL-I) REPLACES THE 50 TON STEEL PILE DESIGNATION.

FOR MORE INFORMATION ON SRL-I, SEE THE BRIDGE DESIGN MANUAL, LOCATED ON THE IOWA DEPARTMENT OF TRANSPORTATION, BRIDGES AND STRUCTURES BUREAU WEB SITE.

FOR PIERS SUBJECT TO SCOUR THE DESIGN BEARING SHALL BE OBTAINED BELOW SCOUR ELEVATION. SCOUR ELEVATION SHALL BE SHOWN ON THE FRONT SHEET.

KEYWAY DIMENSIONS SHOWN ON THE PLANS ARE BASED ON NOMINAL DIMENSIONS UNLESS STATED OTHERWISE. IN ADDITION, THE BEVEL USED ON THE KEYWAY SHALL BE LIMITED TO A MAXIMUM OF 10 DEGREES FROM VERTICAL.

THESE BRIDGE PLANS LABEL ALL REINFORCING STEEL WITH ENGLISH NOTATION (5d1 IS 5/8" DIAMETER BAR). ENGLISH REINFORCING STEEL RECEIVED IN THE FIELD MAY DISPLAY THE FOLLOWING "BAR DESIGNATION". THE "BAR DESIGNATION" IS THE STAMPED IMPRESSION ON THE REINFORCING BARS, AND IS EQUIVALENT TO THE BAR DIAMETER IN MILLIMETERS.

ENGLISH SIZE	3	4	5	6	7	8	9	10	11
BAR DESIGNATION	10	13	16	19	22	25	29	32	36

SPECIFICATIONS:

DESIGN: AASHTO LRFD, SERIES OF 2004 WITH INTERIM 2005.

CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2012, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 3rd Ed, SERIES OF 2004.
REINFORCING STEEL IN ACCORDANCE WITH LRFD AASHTO SECTION 5, GRADE 60.
CONCRETE IN ACCORDANCE WITH LRFD AASHTO SECTION 5, f'c = 3,500 PSI,
STRUCTURAL STEEL IN ACCORDANCE WITH LRFD AASHTO SECTION 6. ASTM A709 GRADE 36 OR GRADE 50 (AASHTO M270 GRADE 36 OR GRADE 50).
n = 9 FOR TENSION STEEL
2n = 18 FOR COMPRESSION STEEL
HL-93 LIVE LOAD PLUS 20 LBS. PER SQ. FT. FOR FUTURE WEARING SURFACE.
END SPAN LENGTH IS USED TO CALCULATE EQUIVALENT WIDTH IN LIVE LOAD DISTRIBUTION.
SIX FOOT OF APPROACH SLAB DEAD & LIVE LOAD INCLUDED IN ABUTMENT LOADS.
CONTROL OF CRACKING BY DISTRIBUTION OF REINFORCEMENT FOR SLAB DESIGN BASED ON PRE 2005 LRFD INTERMS.

LATEST REVISION DATE

08-2022

APPROVED BY BRIDGE ENGINEER

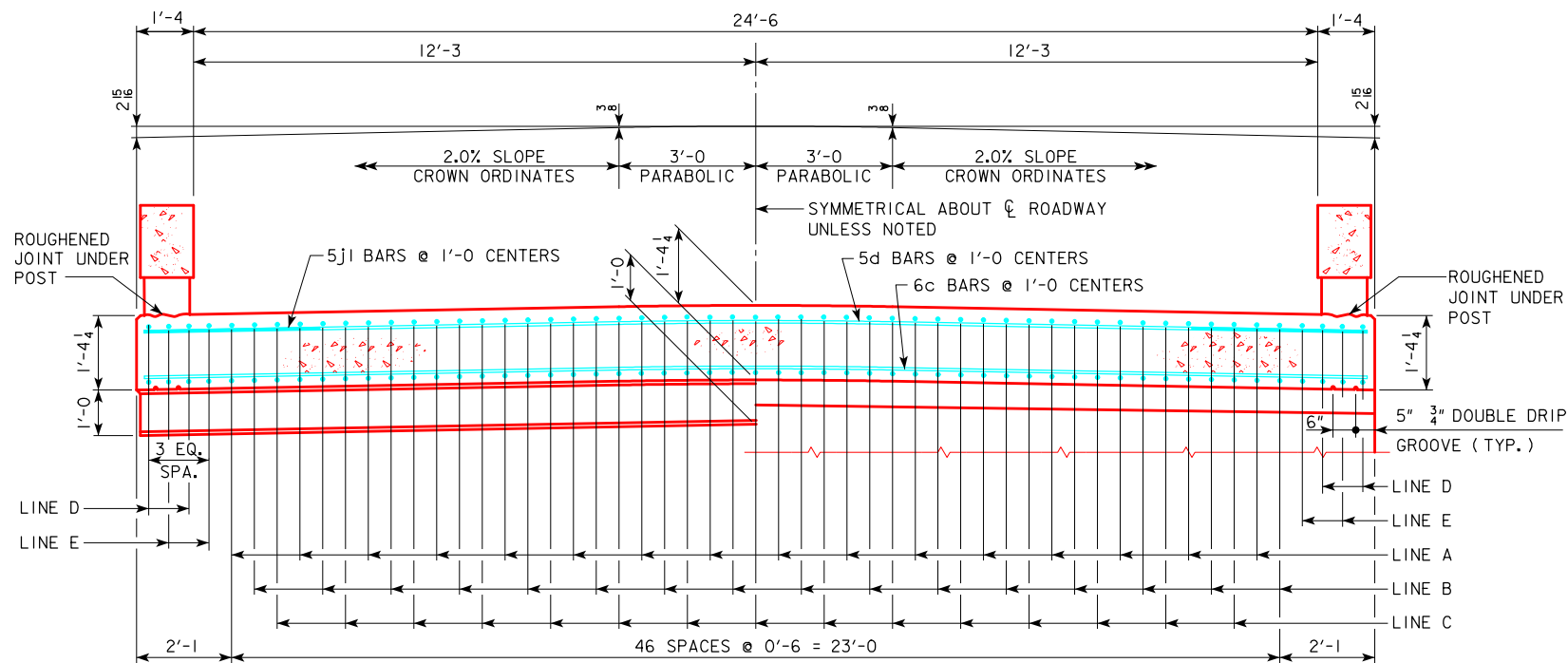
STANDARD DESIGN - 24'-0 ROADWAY, 3 SPAN BRIDGES

CONTINUOUS CONCRETE
SLAB BRIDGES

NOVEMBER, 2006

INDEX AND GENERAL NOTES

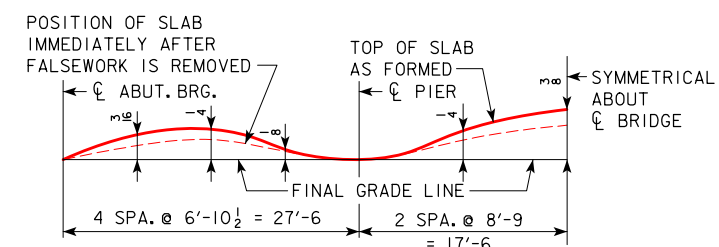
J24-01-06



HALF SECTION NEAR PIER

HALF SECTION NEAR ABUTMENT

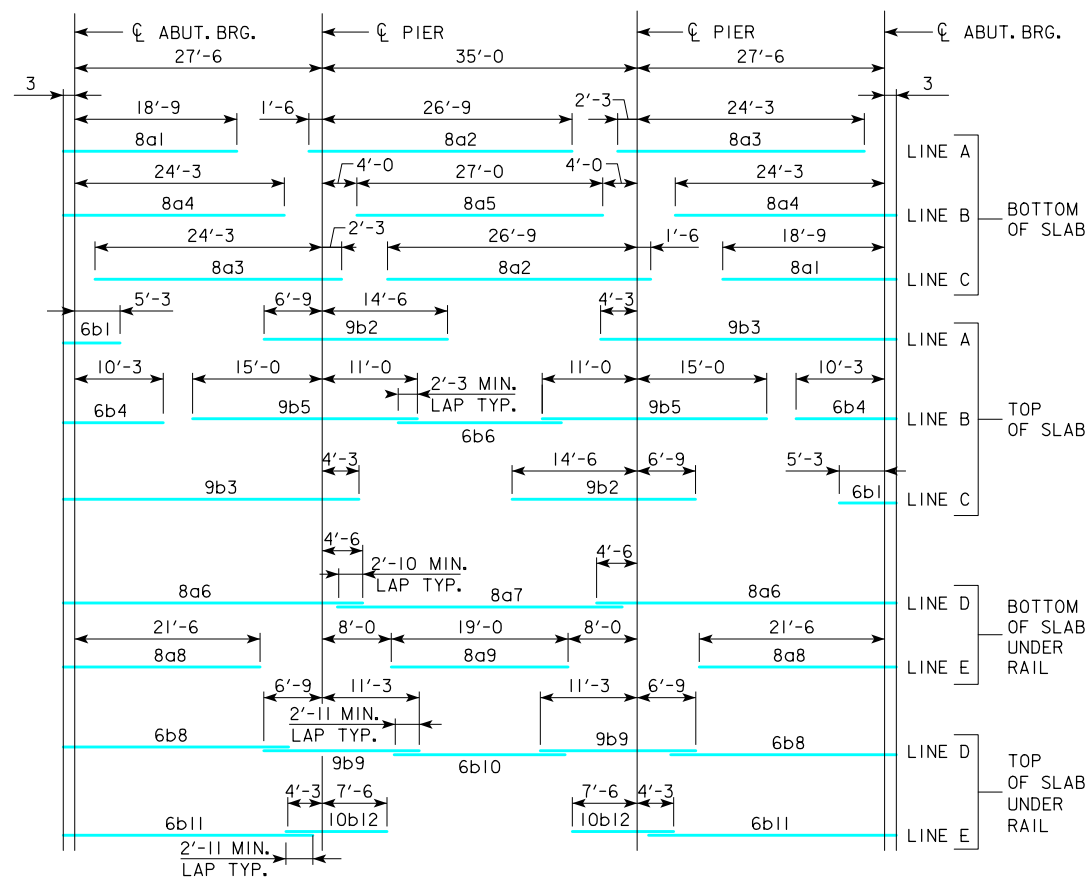
SLAB CROSS-SECTIONAL AREA
FOR OPEN RAIL = 36.79 SQ. FT.



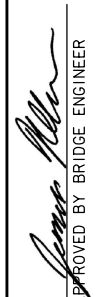
FORM CAMBER DIAGRAM

THIS DIAGRAM SHOWS THE FORM CAMBER REQUIRED TO COMPENSATE FOR THE ANTICIPATED ULTIMATE DEAD LOAD DEFLECTION. THE ABOVE DIMENSIONS DO NOT INCLUDE ANY ALLOWANCE FOR FORM DEFLECTION OR FALSEWORK SETTLEMENT.

NOTE:
TOP LONGITUDINAL REINFORCING STEEL IS TO BE PARALLEL TO AND 2 1/2" CLEAR BELOW TOP OF SLAB. BOTTOM LONGITUDINAL REINFORCING STEEL IS TO BE PARALLEL TO AND 1 1/2" CLEAR ABOVE BOTTOM OF SLAB. REINFORCING STEEL IS TO BE SECURELY WIRED IN PLACE AND ADEQUATELY SUPPORTED ON BAR CHAIRS BEFORE CONCRETE IS PLACED. I.M. 451.01 REQUIREMENTS SHALL APPLY FOR BAR CHAIRS.



PLACEMENT FOR LONGITUDINAL REINFORCEMENT

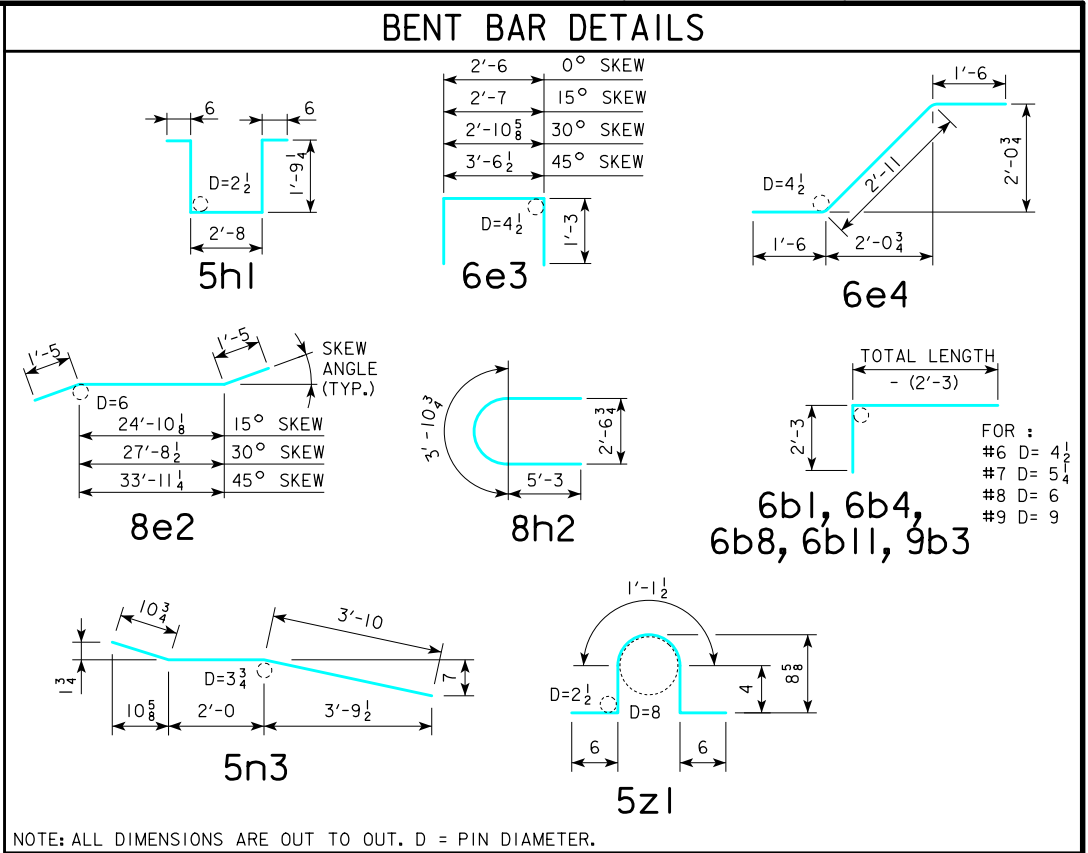
08-2022 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 24'-0" ROADWAY, 3 SPAN BRIDGES CONTINUOUS CONCRETE SLAB BRIDGES NOVEMBER, 2006	
		SUPERSTRUCTURE DETAILS 90'-0" BRIDGE	
		J24-06-06	

REVISED 07-09 - OPEN RAIL REINF-QTYS. CHANGED WHICH CHANGED TOTAL REINF-QTYS.
REVISED 08-2022-UPDATED BRIDGE ENGINEER SIGNATURE. CHANGED PAVING BLOCK LIFTING HOOP BAR MARK, (WAS 5x1).

BILL OF REINFORCING STEEL FOR SUPERSTRUCTURE - 90' BRIDGE														
SKEW			0°			15°			30°			45°		
LOCATION	SHAPE	BAR	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT
SLAB LONGITUDINAL BOTTOM		8a1	31	19'-0	1573	31	19'-0	1573	31	19'-0	1573	31	19'-0	1573
SLAB LONGITUDINAL BOTTOM		8a2	31	28'-3	2339	31	28'-3	2339	31	28'-3	2339	31	28'-3	2339
SLAB LONGITUDINAL BOTTOM		8a3	31	26'-6	2194	31	26'-6	2194	31	26'-6	2194	31	26'-6	2194
SLAB LONGITUDINAL BOTTOM		8a4	32	24'-6	2094	32	24'-6	2094	32	24'-6	2094	32	24'-6	2094
SLAB LONGITUDINAL BOTTOM		8a5	16	27'-0	1154	16	27'-0	1154	16	27'-0	1154	16	27'-0	1154
SLAB LONGITUDINAL BOTTOM, AT RAIL		8a6	8	32'-3	689	8	32'-3	689	8	32'-3	689	8	32'-3	689
SLAB LONGITUDINAL BOTTOM, AT RAIL		8a7	4	31'-8	339	4	31'-8	339	4	31'-8	339	4	31'-8	339
SLAB LONGITUDINAL BOTTOM, AT RAIL		8a8	8	21'-9	465	8	21'-9	465	8	21'-9	465	8	21'-9	465
SLAB LONGITUDINAL BOTTOM, AT RAIL		8a9	4	19'-0	203	4	19'-0	203	4	19'-0	203	4	19'-0	203
SLAB LONGITUDINAL TOP		6b1	31	7'-9	361	31	7'-9	361	31	7'-9	361	31	7'-9	361
SLAB LONGITUDINAL TOP		9b2	31	21'-3	2240	31	21'-3	2240	31	21'-3	2240	31	21'-3	2240
SLAB LONGITUDINAL TOP		9b3	31	34'-3	3610	31	34'-3	3610	31	34'-3	3610	31	34'-3	3610
SLAB LONGITUDINAL TOP		6b4	32	12'-9	613	32	12'-9	613	32	12'-9	613	32	12'-9	613
SLAB LONGITUDINAL TOP		9b5	32	26'-0	2829	32	26'-0	2829	32	26'-0	2829	32	26'-0	2829
SLAB LONGITUDINAL TOP		6b6	16	17'-6	421	16	17'-6	421	16	17'-6	421	16	17'-6	421
SLAB LONGITUDINAL TOP, AT RAIL		6b8	8	26'-2	315	8	26'-2	315	8	26'-2	315	8	26'-2	315
SLAB LONGITUDINAL TOP, AT RAIL		9b9	8	18'-0	490	8	18'-0	490	8	18'-0	490	8	18'-0	490
SLAB LONGITUDINAL TOP, AT RAIL		6b10	4	18'-4	111	4	18'-4	111	4	18'-4	111	4	18'-4	111
SLAB LONGITUDINAL TOP, AT RAIL		6b11	8	28'-8	345	8	28'-8	345	8	28'-8	345	8	28'-8	345
SLAB LONGITUDINAL TOP, AT RAIL		10b12	8	11'-9	405	8	11'-9	405	8	11'-9	405	8	11'-9	405
SLAB TRANSVERSE, BOTTOM		6c1	87	26'-10	3507	87	27'-9	3627	76	26'-10	3064	66	26'-10	2661
SLAB TRANSVERSE ENDS, BOTTOM		6c2	-	-	-	-	-	-	24	VARIES	579	44	VARIES	970
SLAB TRANSVERSE, TOP		5d1	87	26'-10	2435	87	27'-9	2519	76	26'-10	2128	66	26'-10	1848
SLAB TRANSVERSE ENDS, TOP		5d2	-	-	-	-	-	-	24	VARIES	402	44	VARIES	674
SLAB, TRANSVERSE AT ABUTMENT		8e1	18	26'-10	1290	-	-	-	-	-	-	-	-	-
SLAB, TRANSVERSE AT ABUTMENT		8e2	-	-	-	18	27'-8	1330	18	30'-7	1470	18	36'-9	1767
SLAB, HAIRPINS, AT ABUTMENT		6e3	60	5'-0	451	60	5'-1	459	60	5'-5	489	60	6'-1	549
SLAB, DIAGONALS, AT ABUTMENT		6e4	60	5'-11	534	60	5'-11	534	60	5'-11	534	60	5'-11	534
PIER CAP HOOPS		5h1	36	7'-3	273	36	7'-3	273	48	7'-3	363	60	7'-3	454
PIER CAP ENDS		8h2	4	14'-5	154	4	14'-5	154	4	14'-5	154	4	14'-5	154
PIER CAP, BOTTOM LONGITUDINAL		8h3	8	23'-10	510	8	24'-8	527	8	27'-6	588	8	33'-8	720
PIER CAP, TOP LONGITUDINAL		8h4	4	26'-10	287	4	27'-9	297	4	30'-11	331	4	37'-11	405
TOP OF SLAB, TRANSVERSE, AT RAIL		5j1	172	8'-6	1525	172	8'-6	1525	172	8'-6	1525	170	8'-6	1508
WING, VERTICAL		5m1	40	4'-5	185	40	4'-5	185	40	4'-5	185	40	4'-5	185
WING, HORIZONTAL BACK FACE		5n1	24	6'-8	167	24	6'-8	167	24	6'-8	167	24	6'-8	167
WING, HORIZONTAL TRAFFIC FACE		5n3	24	6'-9	169	24	6'-9	169	24	6'-9	169	24	6'-9	169
PAVING BLOCK LIFTING HOOPS		5z1	8	2'-10	24	8	2'-10	24	8	2'-10	24	8	2'-10	24
SUB TOTAL - LBS.					34,301			34,580			34,962			35,579
OPEN RAIL - SEE LIST ON RAIL SHEET J24-41-06					6330			6330			6330			6330
TOTAL - LBS. WITH MONOLITHIC PIER CAP AND OPEN RAIL					40,631			40,910			41,292			41,909
TOTAL - LBS. WITH NON-MONOLITHIC PIER CAP AND OPEN RAIL					39,407			39,659			39,856			40,176
SAME AS ABOVE EXCEPT ALL "h" BARS DELETED														

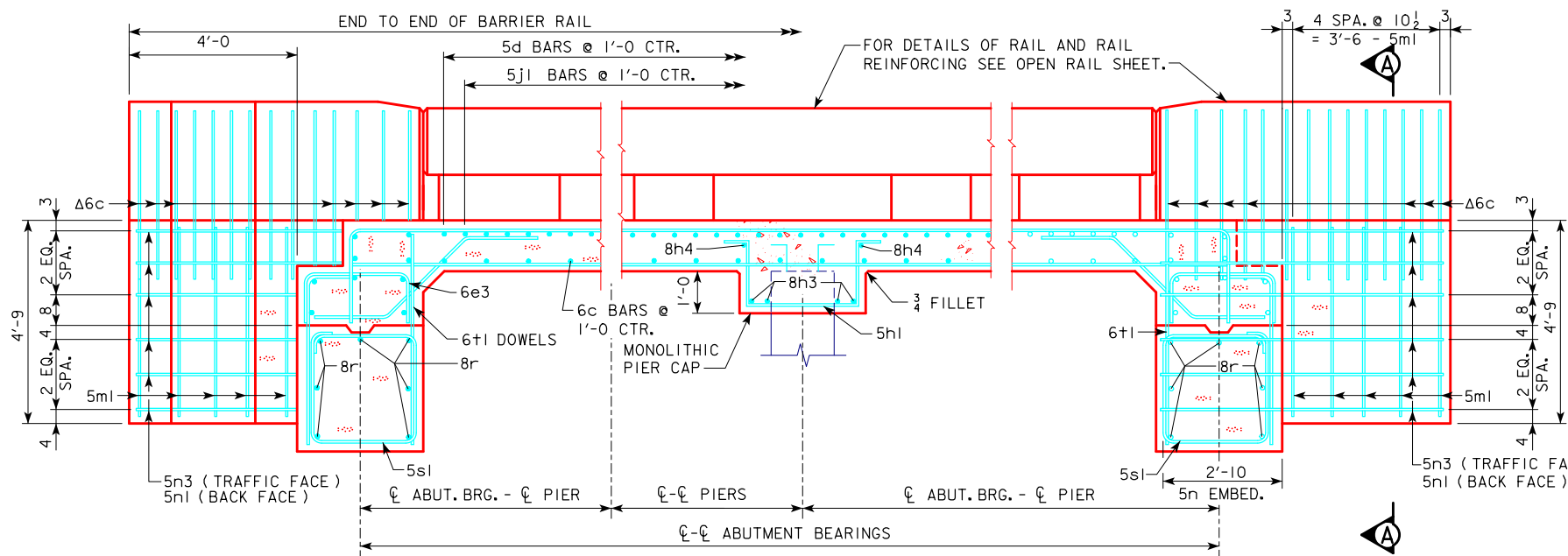
ESTIMATED QUANTITIES FOR SUPERSTRUCTURE - 90' BRIDGE										
			WITH MONOLITHIC PIER CAP				WITH NON-MONOLITHIC PIER CAP			
ITEM		SKEW	0°	15°	30°	45°	0°	15°	30°	45°
OPEN RAIL	*STRUCTURAL CONCRETE (BRIDGE) C.Y.		144.8	145.5	147.8	152.7	140.6	141.1	143.0	146.9
	REINFORCING STEEL LBS.		40,631	40,910	41,292	41,909	39,407	39,659	39,856	40,176
OPEN RAIL		LIN. FT.	202.0	202.2	202.9	204.5	202.0	202.2	202.9	204.5

* INCLUDES 4 WINGS @ 0.68 C.Y. EACH AND 2 TEMPORARY PAVING BLOCKS; EXCLUDES RAIL CONCRETE.

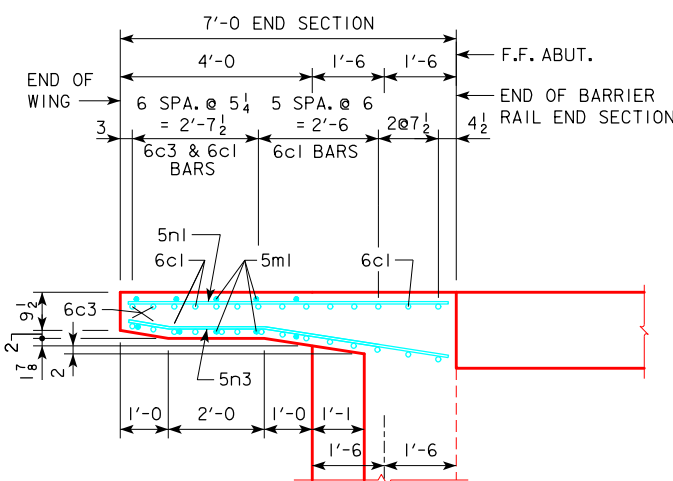


08-2022 LATEST REVISION DATE		APPROVED BY BRIDGE ENGINEER		
			STANDARD DESIGN - 24'-0 ROADWAY, 3 SPAN BRIDGES	
			CONTINUOUS CONCRETE SLAB BRIDGES NOVEMBER, 2006	
SUPERSTRUCTURE DETAILS 90'-0 BRIDGE			J24-07-06	

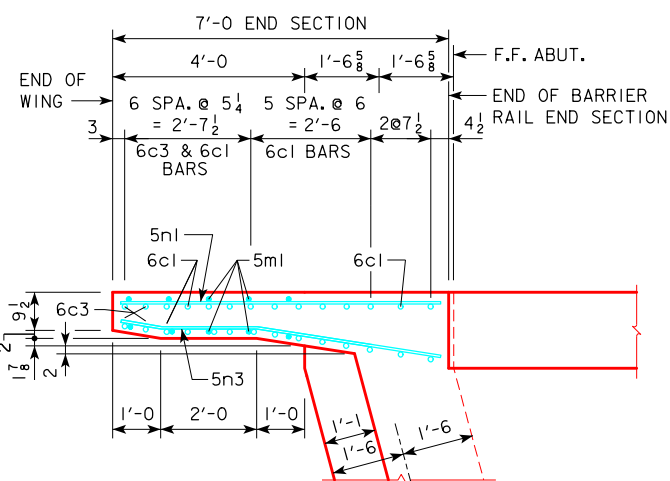
REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE. REVISED SUPERSTRUCTURE NOTES TO STATE: "SLAB FALSEWORK SHALL BE REMOVED PRIOR TO CONSTRUCTION OF THE BARRIER RAILS, UNLESS SLAB CONSTRUCTION IS STAGED." CHANGED PAVING BLOCK LIFTING HOOP BAR MARK, (WAS 5x1).



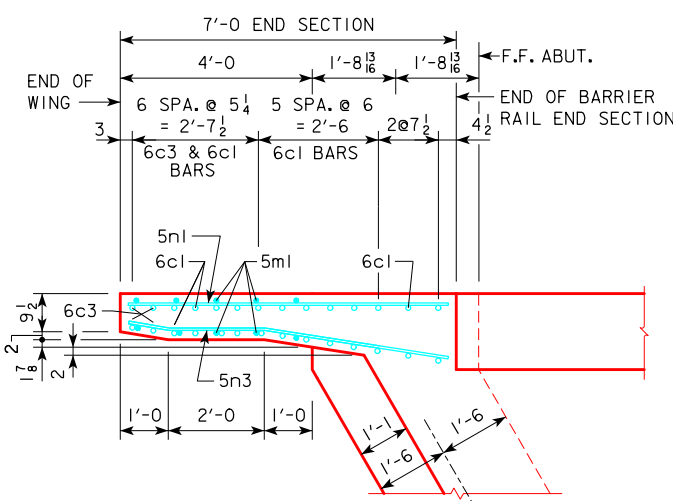
PART LONGITUDINAL SECTION NEAR GUTTER LINE



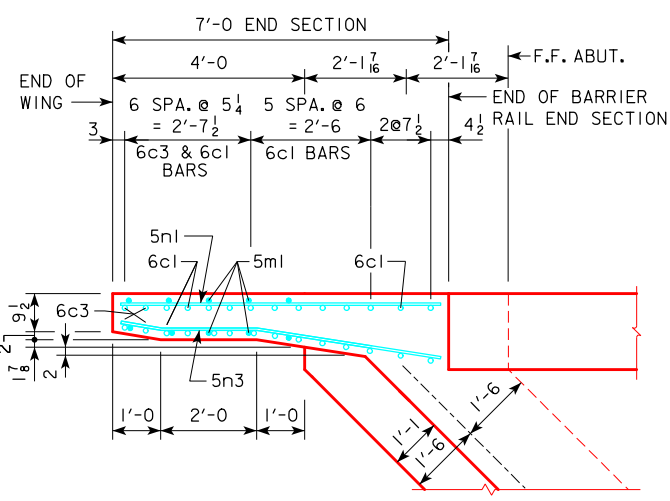
PART PLAN 0° SKEW
(RAILING NOT SHOWN)



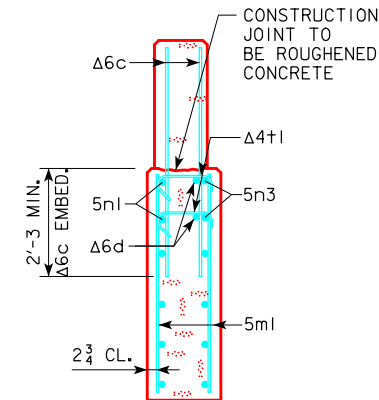
PART PLAN 15° SKEW
(RAILING NOT SHOWN)



PART PLAN 30° SKEW
(RAILING NOT SHOWN)



PART PLAN 45° SKEW
(RAILING NOT SHOWN)



SECTION A-A

Δ NOTE: SEE OPEN BARRIER RAIL DETAILS IN THESE PLANS FOR DETAILS OF BARRIER RAIL END SECTION.

NOTE: 5ml, 5n1, & 5n3 BARS ARE INCLUDED IN SUPERSTRUCTURE BAR LIST. 6c, 6d & 4+1 BARS ARE INCLUDED IN BARRIER RAIL BAR LIST.

SUPERSTRUCTURE NOTES:

THIS BRIDGE IS DESIGNED FOR HL-93 LOADING PLUS AN ALLOWANCE OF 20 POUNDS PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.

THE SLAB AS SHOWN INCLUDES A 1/2 INCH INTEGRAL WEARING SURFACE.

THE MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR SHALL BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN. ALL REINFORCING STEEL IS TO BE SECURELY WIRED IN PLACE. SEE "BAR CHAIR NOTE".

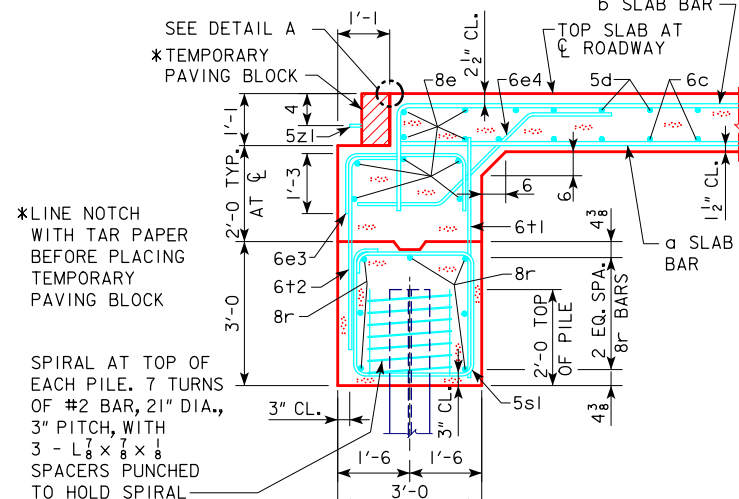
ALL REINFORCING SHALL BE GRADE 60.

THE CONCRETE SLAB IS TO BE PLACED WITH A MINIMUM OF CONSTRUCTION JOINTS. PROCEDURES FOR PLACING SLAB CONCRETE SHALL BE SUBMITTED FOR APPROVAL TOGETHER WITH A STATEMENT OF THE PROPOSED METHOD AND EVIDENCE THAT THE CONTRACTOR POSSESSES THE NECESSARY EQUIPMENT AND FACILITIES TO ACCOMPLISH THE REQUIRED RESULT. SLAB FALSEWORK SHALL BE REMOVED PRIOR TO CONSTRUCTION OF THE BARRIER RAILS, UNLESS SLAB CONSTRUCTION IS STAGED.

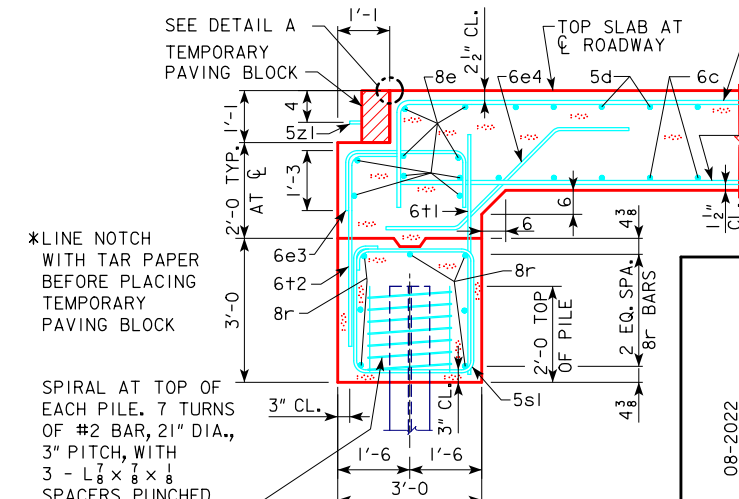
NOTE THAT WHEN PORTLAND CEMENT APPROACH PAVEMENT IS PLACED, COMPRESSIBLE JOINT MATERIAL MUST BE USED BETWEEN PAVEMENT AND END OF BRIDGE.

BAR CHAIR NOTE:

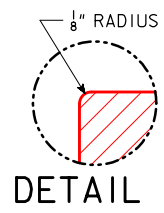
TOP MAT OF REINFORCING STEEL IS TO BE SUPPORTED BY INDIVIDUAL BAR CHAIRS SPACED AT NOT MORE THAN 3'-0 CENTERS LONGITUDINALLY AND TRANSVERSELY. THE BOTTOM MAT OF REINFORCING STEEL IS TO BE SUPPORTED BY INDIVIDUAL BAR CHAIRS SPACED AT NOT MORE THAN 3'-0 CENTERS LONGITUDINALLY AND TRANSVERSELY, OR BY CONTINUOUS ROWS OF BAR HIGH CHAIRS OR SLAB BOLSTERS SPACED 4'-0 APART. I.M. 451.01 REQUIREMENTS SHALL APPLY FOR BAR CHAIRS, BAR HIGH CHAIRS, AND SLAB BOLSTERS.



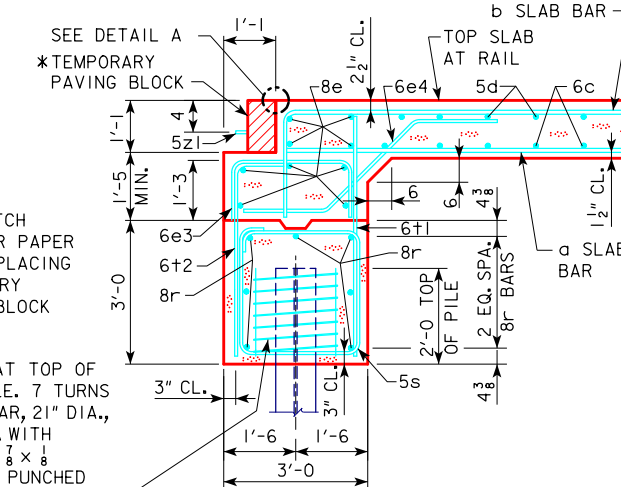
SECTION NORMAL TO ABUTMENT AT Δ
(BRIDGE LENGTHS 70'-110')



SECTION NORMAL TO ABUTMENT AT Δ
(BRIDGE LENGTHS 120'-0' - 150'-0')



DETAIL A



SECTION NORMAL TO ABUTMENT AT GUTTERLINE

08-2022
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER



STANDARD DESIGN - 24'-0 ROADWAY, 3 SPAN BRIDGES

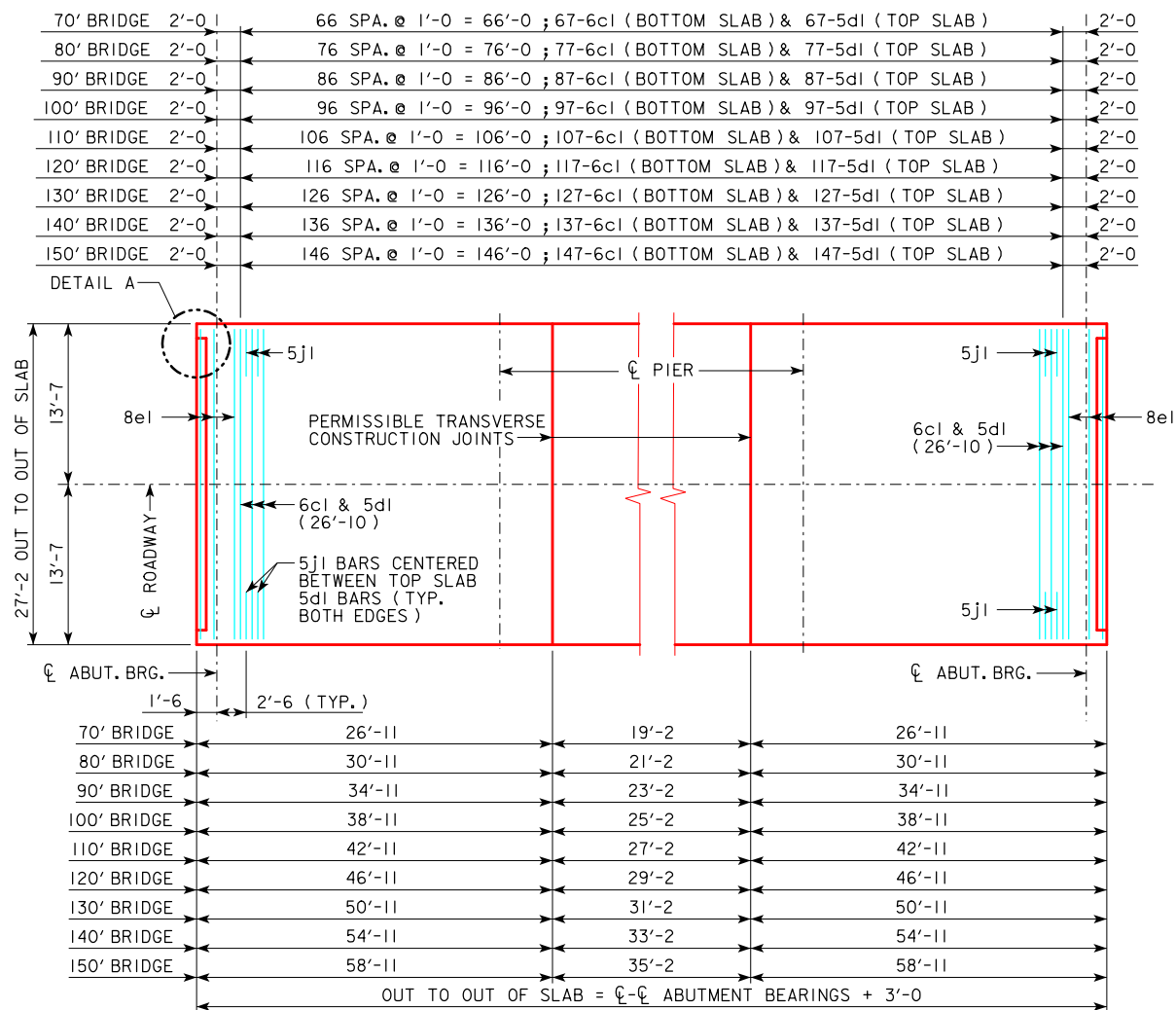
CONTINUOUS CONCRETE
SLAB BRIDGES

NOVEMBER, 2006

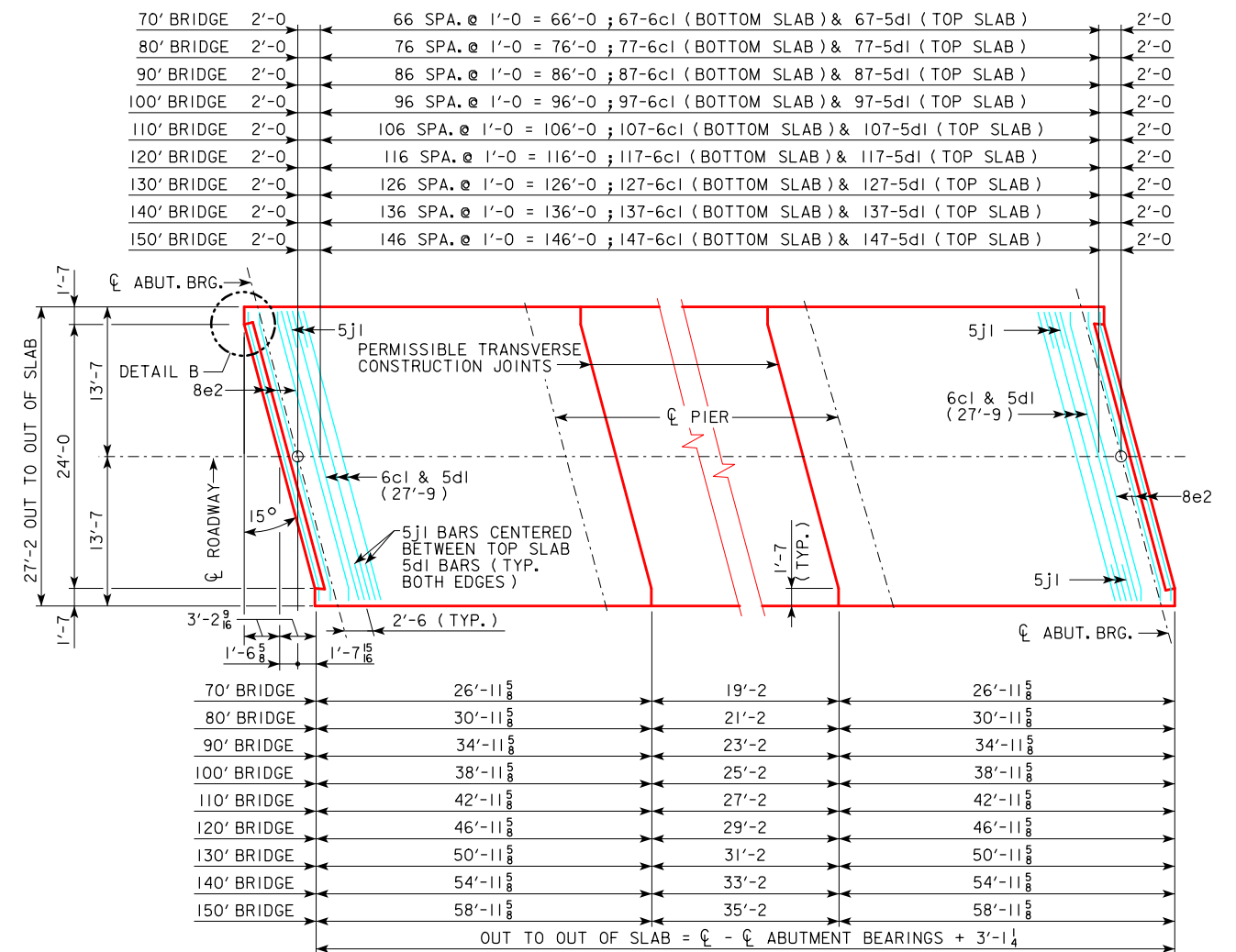
SUPERSTRUCTURE DETAILS
ALL BRIDGES

J24-20-06

REVISED 12-08 - REVISED PAVING NOTCH, ADDED DETAIL A. AND ADDED DETAIL B. ADDED TEMPORARY PAVING BLOCK DETAIL.
REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE. CHANGED PAVING BLOCK LIFTING HOOP BAR MARK, (WAS 5x1).

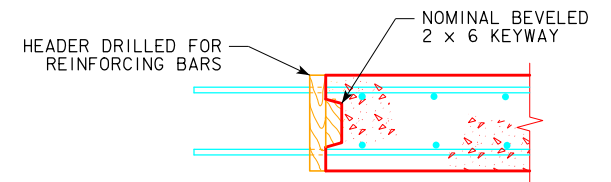


0° SKEW

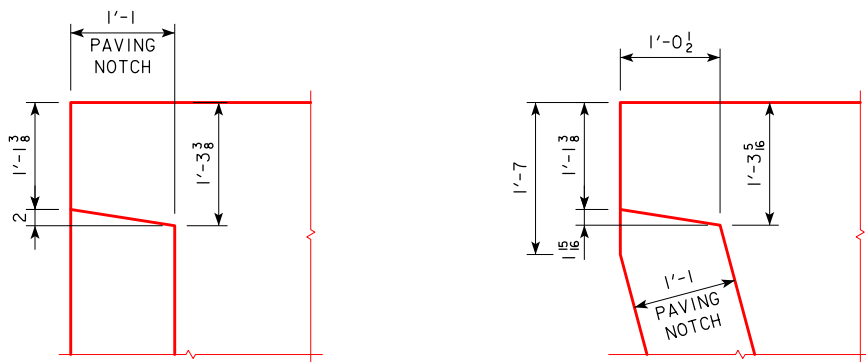


15° SKEW

TRANSVERSE REINFORCING STEEL LAYOUT

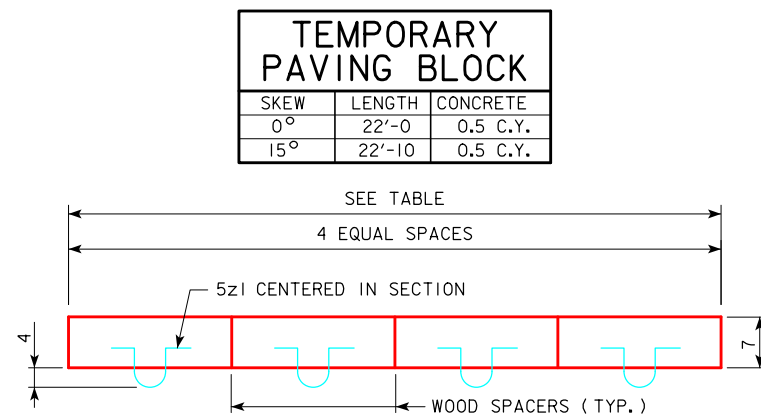


TRANSVERSE CONSTRUCTION JOINT



DETAIL A

DETAIL B

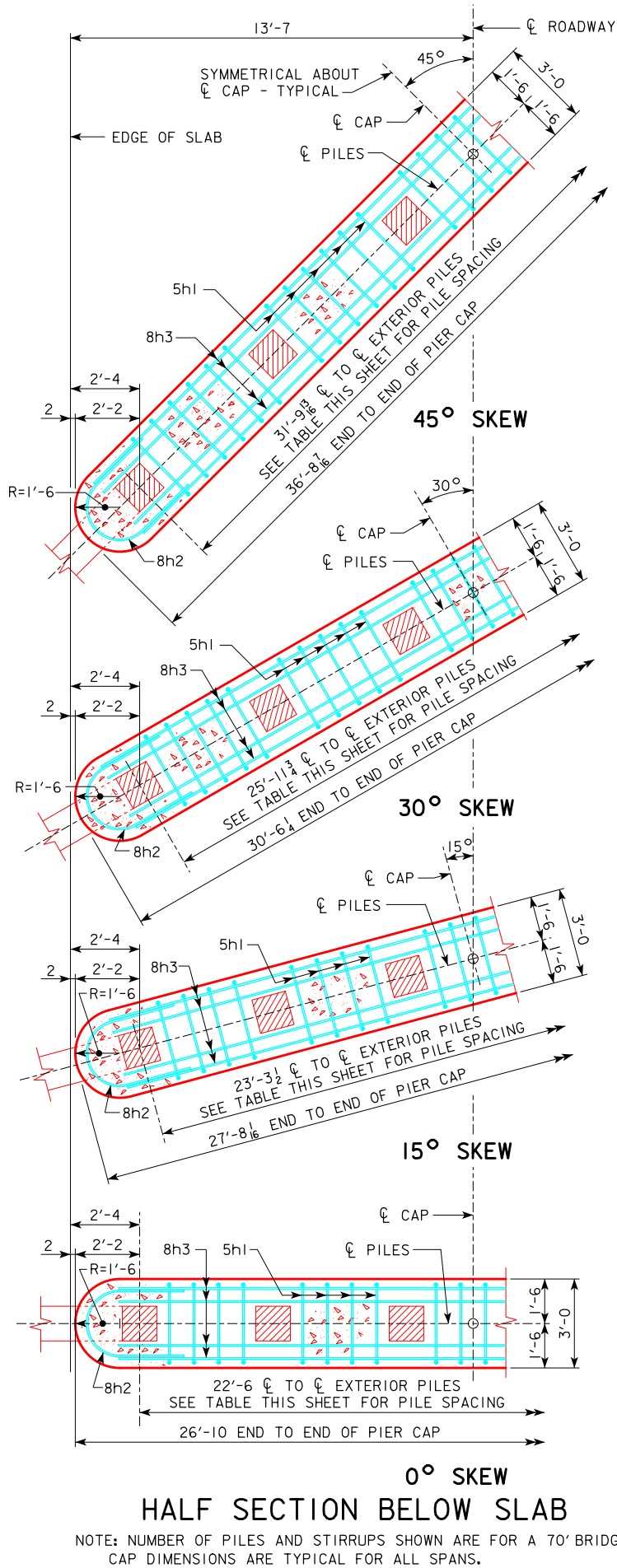


TEMPORARY PAVING BLOCK DETAIL

NOTE: TEMPORARY PAVING BLOCK TO BE USED WITH PAVED APPROACHES ONLY.
LINE NOTCH WITH TAR PAPER BEFORE PLACING TEMPORARY PAVING BLOCK.

08-2022 LATEST REVISION DATE		APPROVED BY BRIDGE ENGINEER		
			STANDARD DESIGN - 24'-0" ROADWAY, 3 SPAN BRIDGES	
			CONTINUOUS CONCRETE SLAB BRIDGES NOVEMBER, 2006	
SUPERSTRUCTURE DETAILS ALL BRIDGES 0° & 15° SKEW			J24-21-06	

CORRECTION 05-14 - CHANGED THE BAR LABEL FROM 5d1 TO 5h1 IN ENCIRCLED NOTE 1.
REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE.



NOTE: NUMBER OF PILES AND STIRRUPS SHOWN ARE FOR A 70' BRIDGE.
CAP DIMENSIONS ARE TYPICAL FOR ALL SPANS.

TYPICAL NUMBERS OF PILES AND SPACINGS AND FACTORED PIER LOADS

BRIDGE LENGTH	70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
① TYP. NO. OF PILES	6	6	7	8	9	9	10	10	10
TYP. PILE SPACES @ 0°	5 SPA. @ 4'-6	5 SPA. @ 4'-6	6 SPA. @ 3'-9	② 7 SPA. @ ABOUT 3'-3	③ 8 SPA. @ ABOUT 2'-10	③ 8 SPA. @ ABOUT 2'-10	③ 9 SPA. @ 2'-6	③ 9 SPA. @ 2'-6	③ 9 SPA. @ 2'-6
TYP. PILE SPACES @ 15°	5 SPA. @ ABOUT 4'-8	5 SPA. @ ABOUT 4'-8	6 SPA. @ ABOUT 3'-11	7 SPA. @ ABOUT 3'-4	② 8 SPA. @ ABOUT 2'-11	② 8 SPA. @ ABOUT 2'-11	③ 9 SPA. @ ABOUT 2'-7	③ 9 SPA. @ ABOUT 2'-7	③ 9 SPA. @ ABOUT 2'-7
TYP. PILE SPACES @ 30°	5 SPA. @ ABOUT 5'-2	5 SPA. @ ABOUT 5'-2	6 SPA. @ ABOUT 4'-4	7 SPA. @ ABOUT 3'-9	② 8 SPA. @ ABOUT 3'-3	② 8 SPA. @ 3'-3	② 9 SPA. @ ABOUT 2'-11	② 9 SPA. @ ABOUT 2'-11	② 9 SPA. @ ABOUT 2'-11
TYP. PILE SPACES @ 45°	5 SPA. @ ABOUT 6'-4	5 SPA. @ ABOUT 6'-4	6 SPA. @ ABOUT 5'-4	7 SPA. @ ABOUT 4'-7	8 SPA. @ ABOUT 4'-0	8 SPA. @ ABOUT 4'-0	9 SPA. @ ABOUT 3'-6	9 SPA. @ ABOUT 3'-6	9 SPA. @ ABOUT 3'-6
④ PU, STRENGTH I DESIGN LOAD FOR PIER (KIPS)	577 KIPS	637 KIPS	704 KIPS	776 KIPS	845 KIPS	927 KIPS	1008 KIPS	1092 KIPS	1185 KIPS

- ① THIS TYPICAL NUMBER OF PILES MAY NEED TO BE MODIFIED DEPENDING ON SELECTED PIOL PILE TYPE AND SIZE, HEIGHT, AND RESISTANCE. IF THE NUMBER OF PILES IS DIFFERENT THAN IN THE TABLE FOR THE BRIDGE LENGTH, THE NUMBER OF 5h1 BARS AND OTHER QUANTITIES NEED TO BE CHECKED AND ADJUSTED AS NEEDED. PILES 10 INCHES AND 12 INCHES IN SIZE MUST BE SPACED 2'-6 OR MORE, PILES 14 INCHES IN SIZE MUST BE SPACED 2'-11 OR MORE, AND PILES 16 INCHES IN SIZE MUST BE SPACED 3'-4 OR MORE.
- ② MAXIMUM PIOL PILE SIZE AT THIS SPACING IS 14 INCHES.
- ③ MAXIMUM PIOL PILE SIZE AT THIS SPACING IS 12 INCHES.
- ④ STRENGTH I PIER DESIGN LOAD INCLUDES DYNAMIC LOAD ALLOWANCE (1M), AND PIER CAP WEIGHT IS BASED ON 45° SKEW. USE THIS PU FOR DETERMINING NUMBER OF PILES AND PILE LENGTH.

PIER NOTES:

ALL MONOLITHIC PIER CAP REINFORCING AND CONCRETE IS INCLUDED IN SUPERSTRUCTURE ESTIMATE OF QUANTITIES.

THE MINIMUM CLEAR DISTANCE FROM THE FACE OF THE CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

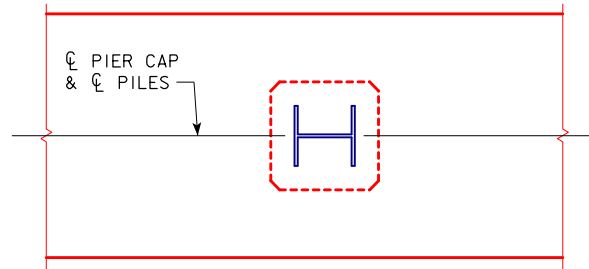
THE PIER PILES ARE TO BE DRIVEN TO FULL PENETRATION, IF PRACTICABLE, BUT IN NO CASE TO A BEARING VALUE LESS THAN THE PILE BEARING REQUIRED FOR EACH BRIDGE LENGTH AS SHOWN ON THIS SHEET. ADDITIONAL DRIVING CAPACITY MAY BE REQUIRED THROUGH SCOURABLE LAYERS. REFER TO GENERAL PLAN NOTES FOR ADDITIONAL INFORMATION.

CAP STEEL AS DETAILED ON PIOL STANDARD PILE DRAWING IS REQUIRED FOR MONOLITHIC PIER CAPS.

THE CONCRETE QUANTITIES ARE BASED ON THE USE OF TYPE 3 PILING. IF TYPE 1 OR TYPE 2 IS USED, THE CONCRETE QUANTITIES MAY BE ADJUSTED TO ACCOUNT FOR THE CONCRETE DISPLACED BY THE PILING.

ALL REINFORCING STEEL IS TO BE GRADE 60.

PIER PILING WAS DESIGNED FOR HL-93 LOADING WITH AN ALLOWANCE FOR 20 LBS. PER SQ. FT. FUTURE WEARING SURFACE.



PILE ORIENTATION DETAIL FOR TYPE 3 TRESTLE BENT PILES

08-2022
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER



STANDARD DESIGN - 24'-0 ROADWAY, 3 SPAN BRIDGES

CONTINUOUS CONCRETE
SLAB BRIDGES

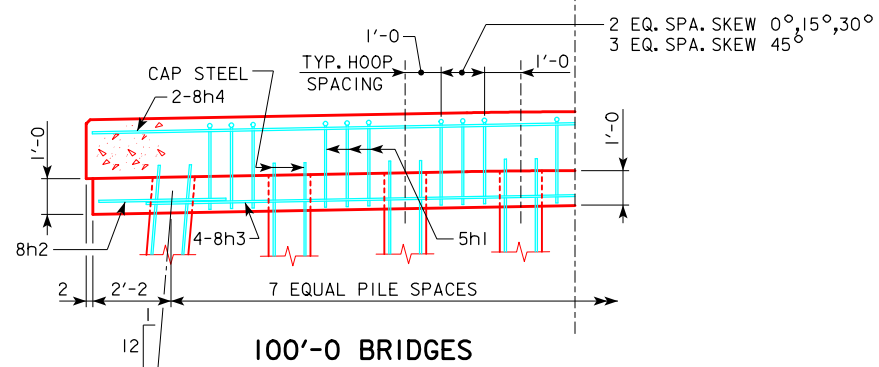
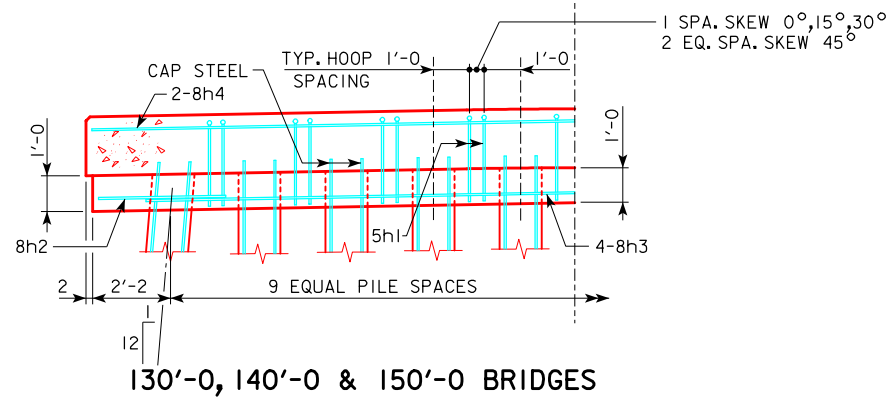
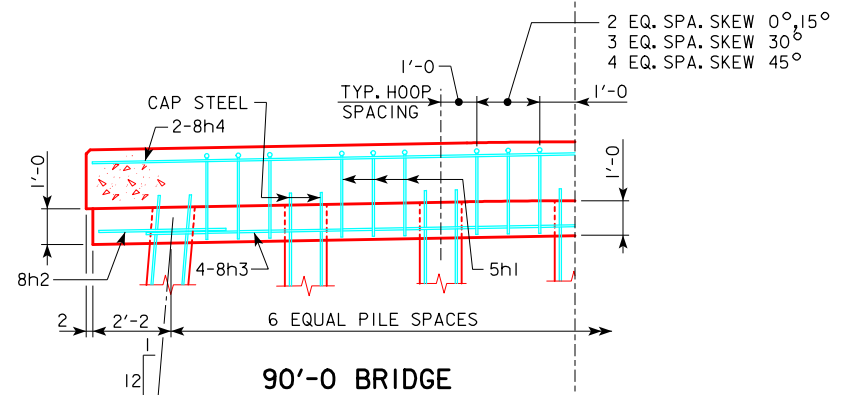
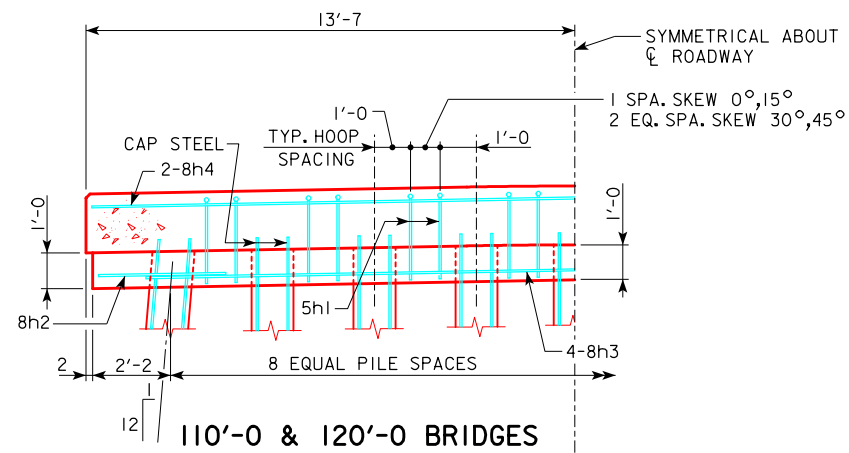
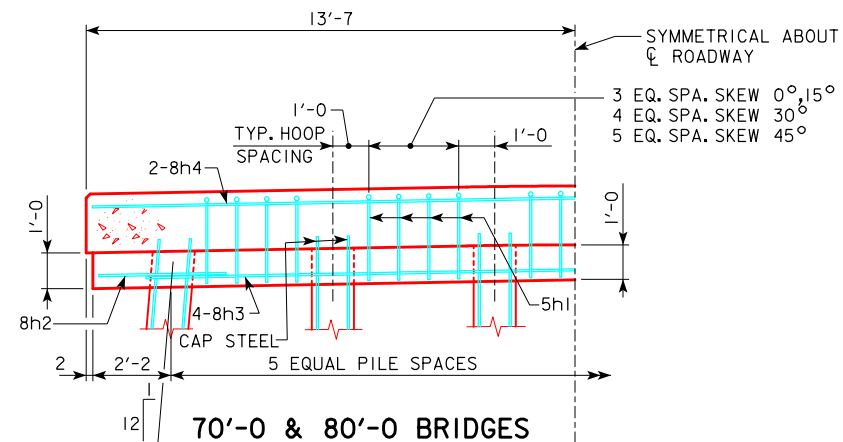
NOVEMBER, 2006

MONOLITHIC
PIER CAP DETAILS
ALL BRIDGES

J24-23-06

SHEET 1 OF 2

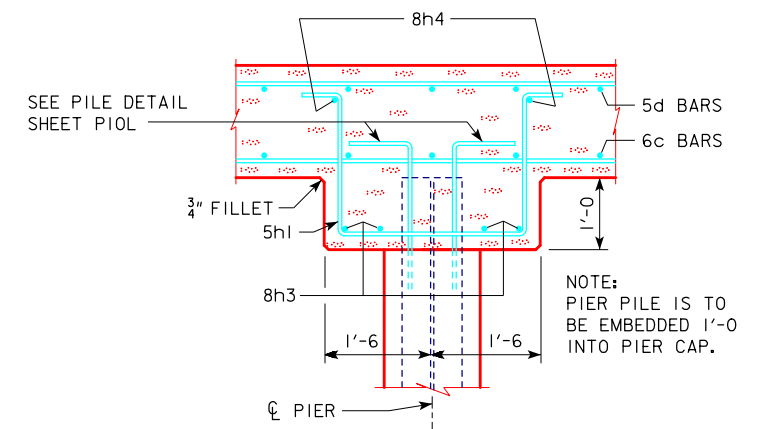
REVISED 12-08 - REVISED PILES REQUIRED FOR 110'-0 BRIDGE.
REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE.



HALF SECTION NEAR PIER

SHOWING STIRRUP SPACING AND NUMBER OF PILING

NOTE: BOTTOM OF CAP ELEVATIONS WILL BE REQUIRED AT THE
CL OF ROADWAY AND AT EACH EXTERIOR PILE.



TYPICAL CAP SECTION

08-2022
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER



STANDARD DESIGN - 24'-0 ROADWAY, 3 SPAN BRIDGES

CONTINUOUS CONCRETE SLAB BRIDGES

NOVEMBER, 2006

MONOLITHIC
PIER CAP DETAILS
ALL BRIDGES

J24-24-06

SHEET 2 OF 2

The diagram illustrates three proposed bridge layout options (A, B, and C) for a roadway. A central vertical dashed line represents the centerline (CL) of the roadway.

Option A: Shows a bridge layout with a total length of 24'-0" (3 pile spaces @ 8'-0"). The spacing between piles is 8'-0". The layout includes 6 equal spaces (EQ. SPA.) and 1'-0" end spaces. The bridge is labeled "70'-0, 80'-0, & 90'-0 BRIDGES".

Option B: Shows a bridge layout with a total length of 24'-0" (4 pile spaces @ 6'-0"). The spacing between piles is 6'-0". The layout includes 4 equal spaces (EQ. SPA.) and 1'-0" end spaces. The bridge is labeled "100'-0, 110'-0, 120'-0 & 130'-0 BRIDGES".

Option C: Shows a bridge layout with a total length of 24'-0" (5 pile spaces @ ABOUT 4'-9 5/8"). The spacing between piles is ABOUT 4'-9 5/8". The layout includes 3 equal spaces (EQ. SPA.) and 1'-0" end spaces. The bridge is labeled "100'-0, 110'-0, 120'-0 & 130'-0 BRIDGES".

Common dimensions and details across all options include:

- 1'-7" end spaces on the left and right sides.
- 12'-0" dimensions from the centerline to the start and end of the bridge layout.
- 1'-0" dimensions from the centerline to the start and end of the pile spaces.
- Typical 5-slug spacing (TYP. 5sl SPACING) between piles.
- Equal spaces (EQ. SPA.) between the pile spaces.

SECTION NORMAL
TO ABUTMENT AT C_L

SECTION A-A

SEE DETAIL A

*TEMPORARY PAVING BLOCK

TOP SLAB AT RAIL

SPRINKLER

8r

8s

6e3

6e2

6e4

6c

6d

6f

6g

6h

6i

6j

6k

6l

6m

6n

6o

6p

6q

6r

6s

6t

6u

6v

6w

6x

6y

6z

1'-1

1'-5 MIN.

1'-3

3'-0

3" CL.

1'-6

3'-0

1'-6

2'-0 TOP OF PILE

2 EQ. SPA.

8r BARS

4 3/8

1 1/2" CL.

a SLAB BAR

*LINE NOTCH WITH TAR PAPER BEFORE PLACING TEMPORARY PAVING BLOCK

SPIRAL AT TOP OF EACH PILE. 7 TURNS OF #2 BAR, 21" DIA., 3" PITCH, WITH 3 - L 7/8 x 7/8 x 1/8 SPACERS PUNCHED TO HOLD SPIRAL

SECTION NORMAL TO
ABUTMENT AT GUTTERLINE

ABUTMENT NOTES:

ALL PILING HP 10x42.

THE CONCRETE AND REINFORCING STEEL FOR THE WINGS IS INCLUDED WITH THE SUPERSTRUCTURE.

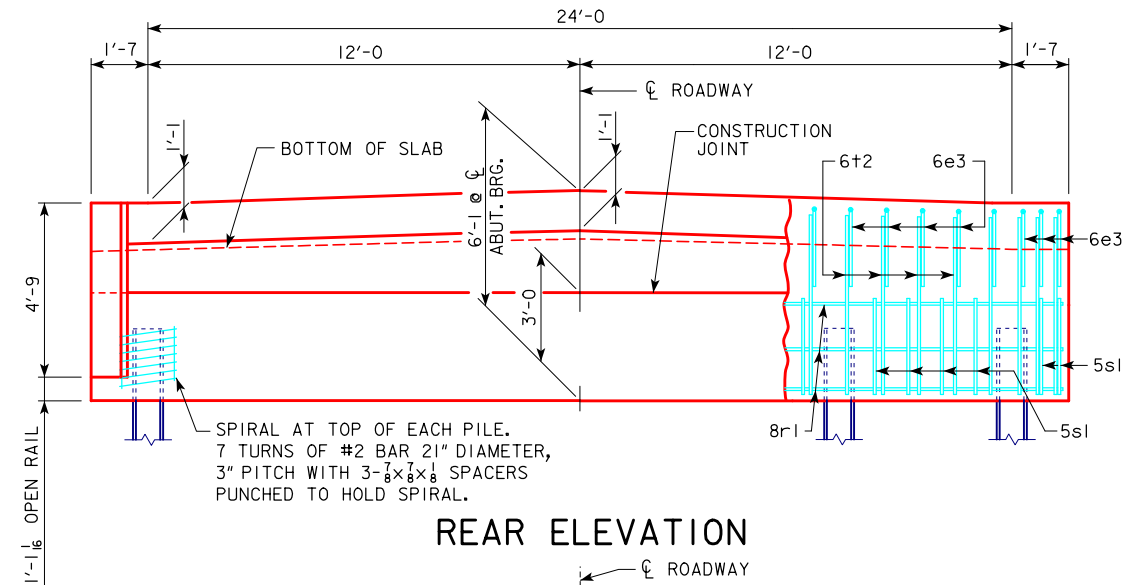
DETAILS ON THIS SHEET ARE TO BE USED ONLY WHEN ABUTMENTS ARE
PLACED ON STEEL PILES. IF ROCK IS ENCOUNTERED CLOSER THAN 12'
BELOW ABUTMENT FOOTING, SPECIAL ANALYSIS MAY BE REQUIRED.

THE MINIMUM CLEAR DISTANCE FROM THE FACE OF THE CONCRETE TO NEAR
REINFORCING BAR IS TO BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN.

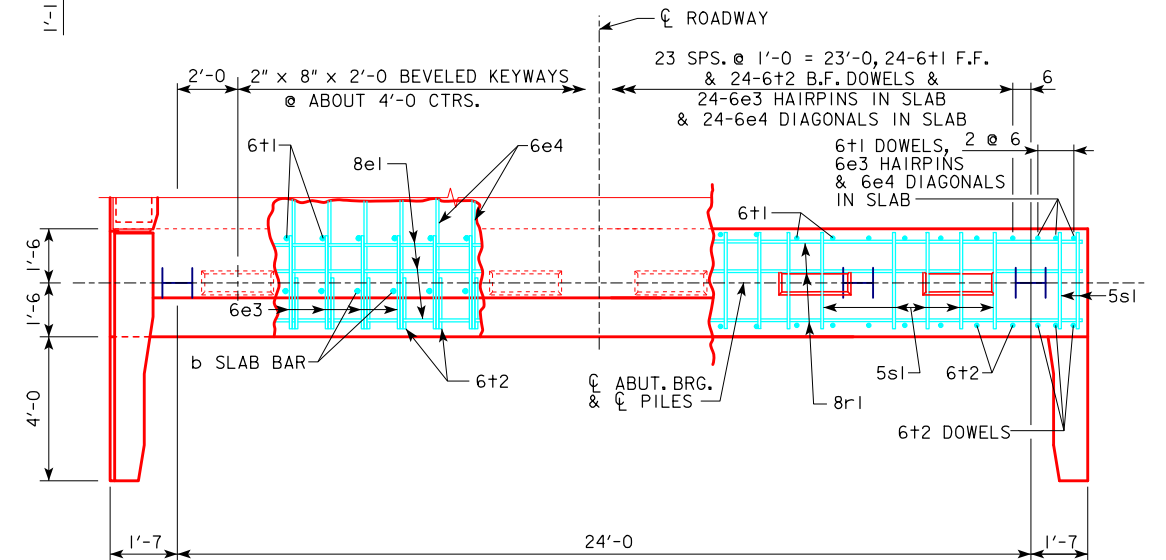
STEEL ABUTMENT PILES SHALL BE DRIVEN TO FULL PENETRATION IF PRACTICABLE BUT IN NO CASE TO A BEARING VALUE LESS THAN SHOWN IN DESIGN PLANS.

ALL REINFORCING STEEL IS TO BE GRADE 60.

ABUTMENT PILING WAS DESIGNED FOR HL-93 LOADING WITH AN ALLOWANCE FOR 20 LBS. PER SQ. FT. FUTURE WEARING SURFACE.



REAR ELEVATION



PLAN VIEW

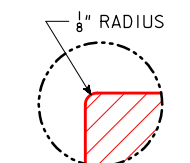
NOTE: WING REINFORCING
AND RAIL NOT SHOWN.

6e3, 6e4, AND 8e ARE INCLUDED
WITH SUPERSTRUCTURE QUANTITIES.

[illegible]

Δ INCLUDES DYNAMIC LOAD ALLOWANCE

NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.



DETAIL A

08-2022
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER



STANDARD DESIGN - 24'-0 ROADWAY, 3 SPAN BRIDGES

CONTINUOUS CONCRETE SLAB BRIDGES

NOVEMBER, 2006

0° ABUTMENT DETAILS
0° SKEW - STEEL PILING

J24-34-06

[illegible][illegible][illegible][illegible]

BENT BAR DETAILS

Diagram 1: 90° Bend

- Vertical dimension: 4'-1"
- Horizontal dimension: 1'-6"
- Bend radius: $D=4\frac{1}{2}$
- Reinforcement: 6+2

Diagram 2: Bent Bar with Skew

- Top segment: 1'-5"
- Bottom segment: 1'-5"
- Central segment: 24'-10 $\frac{1}{8}$ "
- Bend radius: $D=6$
- Skew angles: 15°, 30°, 45°
- Reinforcement: 8r2

Diagram 3: Bent Bar with Skew

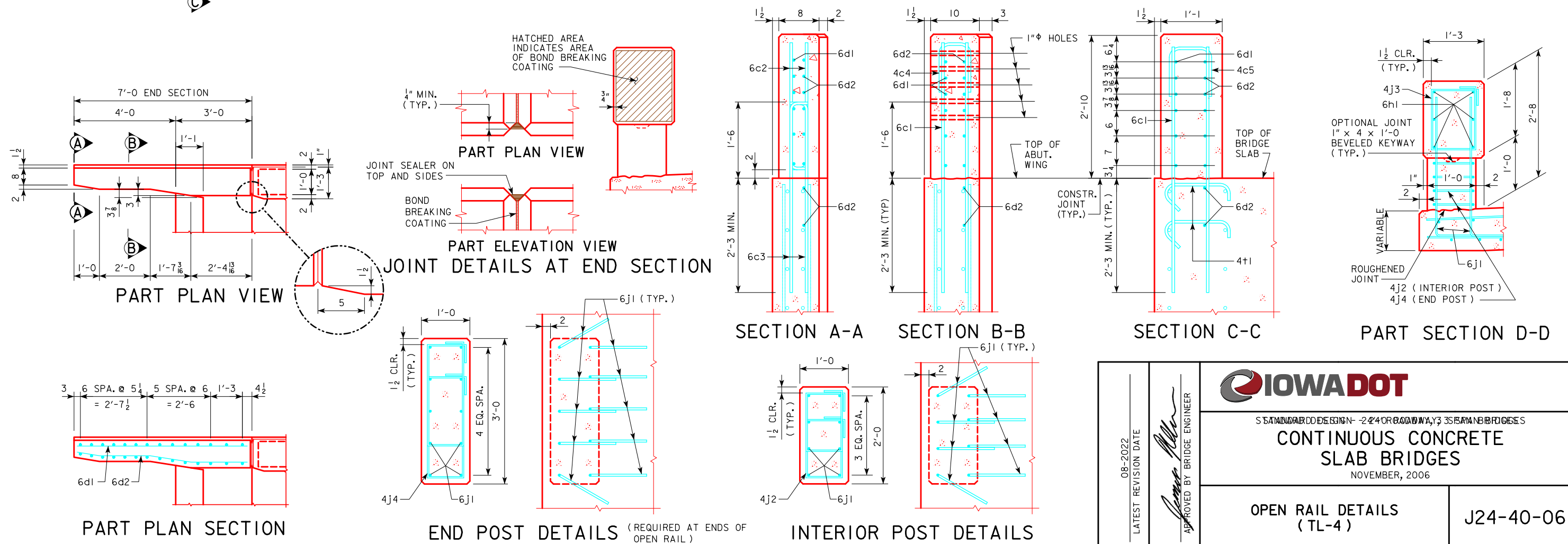
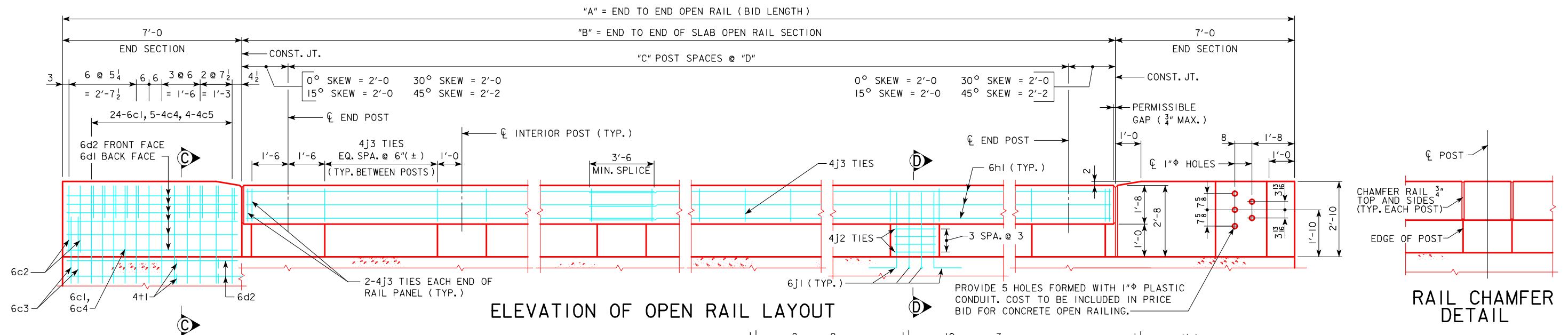
- Vertical dimension: 2'-6"
- Horizontal dimension: 2'-7 $\frac{1}{4}$ "
- Bend radius: $D=2\frac{1}{2}$
- Skew angles: 15°, 30°, 45°
- Reinforcement: 5s1 & 5s2

NOTE: DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.

	08-2022 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER		
			STANDARD DESIGN - 24'-0" ROADWAY, 3 SPAN BRIDGES CONTINUOUS CONCRETE SLAB BRIDGES NOVEMBER, 2006	
			ABUTMENT DETAILS STEEL PILING	J24-39-06

TABLE OF OPEN RAIL DIMENSIONS AND NUMBERS									
---	--	--	--	--	--	--	--	--	--

C-C ABUT. BRG		70'-0				80'-0				90'-0				100'-0				110'-0				120'-0				130'-0				140'-0				150'-0			
SKEW		0°	15°	30°	45°	0°	15°	30°	45°	0°	15°	30°	45°	0°	15°	30°	45°	0°	15°	30°	45°	0°	15°	30°	45°	0°	15°	30°	45°	0°	15°	30°	45°				
DIMENSION OR NUMBER	A (FT.-IN.)	81'-0	81'-1¼	81'-5½	82'-3	91'-0	91'-1¼	91'-5½	92'-3	101'-0	101'-1¼	101'-5½	102'-3	111'-0	111'-1¼	111'-5½	112'-3	121'-0	121'-1¼	121'-5½	122'-3	131'-0	131'-1¼	131'-5½	132'-3	141'-0	141'-1¼	141'-5½	142'-3	151'-0	151'-1¼	151'-5½	152'-3	161'-0	161'-1¼	161'-5½	162'-3
	B (FT.-IN.)	67'-0	67'-1¼	67'-5½	68'-3	77'-0	77'-1¼	77'-5½	78'-3	87'-0	87'-1¼	87'-5½	88'-3	97'-0	97'-1¼	97'-5½	98'-3	107'-0	107'-1¼	107'-5½	108'-3	117'-0	117'-1¼	117'-5½	118'-3	127'-0	127'-1¼	127'-5½	128'-3	137'-0	137'-1¼	137'-5½	138'-3	147'-0	147'-1¼	147'-5½	148'-3
	C	8	8	8	8	10	10	10	10	11	11	11	11	12	12	12	12	13	13	13	13	15	15	15	15	16	16	16	16	17	17	17	17	18	18	18	18
	D (FT.-IN.)	7'-10½	7'-10⅞	7'-11⅜	7'-11⅞	7'-3⅝	7'-3¾	7'-4⅜	7'-4⅞	7'-6⅑	7'-6⅞	7'-7⅒	7'-7⅑	7'-9	7'-9⅛	7'-9⅞	7'-9⅝	7'-11⅒	7'-11⅜	7'-11½	7'-11⅝	7'-6⅜	7'-6½	7'-6¾	7'-7⅛	7'-8¼	7'-8⅝	7'-8⅞	7'-8⅝	7'-9⅞	7'-9⅝	7'-10⅜	7'-10½	7'-11⅝	7'-11⅜	7'-11⅝	7'-11⅝



REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE. REMOVED NOTE STATING "ALL OPEN RAIL REINFORCING STEEL IS TO BE INCLUDED WITH THE SUPERSTRUCTURE REINFORCING STEEL." CORRECTED NUMBER OF 6j1 BARS FOR 130'-0, CHANGED NUMBER OF 6h1 BARS FROM 32 TO 36 FOR BRIDGE LENGTHS OF 80'-0, 90'-0, 100'-0, AND 110'-0.

REINFORCING STEEL-TWO OPEN RAILS

BRIDGE LENGTH			70'-0			80'-0			90'-0			100'-0			110'-0			120'-0			130'-0			140'-0			150'-0					
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT			
6c1	VERTICAL		96	4'-11	709	96	4'-11	709	96	4'-11	709	96	4'-11	709	96	4'-11	709	96	4'-11	709	96	4'-11	709	96	4'-11	709	96	4'-11	709			
6c2	VERTICAL		16	2'-10	68	16	2'-10	68	16	2'-10	68	16	2'-10	68	16	2'-10	68	16	2'-10	68	16	2'-10	68	16	2'-10	68	16	2'-10	68			
6c3	VERTICAL		16	4'-1	98	16	4'-1	98	16	4'-1	98	16	4'-1	98	16	4'-1	98	16	4'-1	98	16	4'-1	98	16	4'-1	98	16	4'-1	98			
4c4	VERTICAL HOOPS		20	2'-10	38	20	2'-10	38	20	2'-10	38	20	2'-10	38	20	2'-10	38	20	2'-10	38	20	2'-10	38	20	2'-10	38	20	2'-10	38			
4c5	VERTICAL HOOPS		16	3'-1	33	16	3'-1	33	16	3'-1	33	16	3'-1	33	16	3'-1	33	16	3'-1	33	16	3'-1	33	16	3'-1	33	16	3'-1	33			
6d1	HORIZONTAL		24	6'-8	240	24	6'-8	240	24	6'-8	240	24	6'-8	240	24	6'-8	240	24	6'-8	240	24	6'-8	240	24	6'-8	240	24	6'-8	240			
6d2	HORIZONTAL		32	6'-9	324	32	6'-9	324	32	6'-9	324	32	6'-9	324	32	6'-9	324	32	6'-9	324	32	6'-9	324	32	6'-9	324	32	6'-9	324			
6h1	LONGITUDINAL OPEN RAIL		24	35'-9	1289	36	28'-4	1532	36	31'-8	1712	36	35'-0	1893	36	38'-4	2073	48	32'-2	2319	48	34'-8	2499	48	37'-2	2680	60	32'-5	2921			
6j1	VERTICAL DOWELS OPEN RAIL		152	4'-6	1027	184	4'-7	1267	200	4'-8	1402	216	4'-9	1541	232	4'-10	1684	264	4'-11	1950	280	5'-1	2138	296	5'-2	2297	312	5'-3	2460			
4j2	HOOPS INTERIOR POSTS		112	4'-8	349	144	4'-8	449	160	4'-8	499	176	4'-8	549	192	4'-8	599	224	4'-8	698	240	4'-8	748	256	4'-8	798	272	4'-8	848			
4j3	HOOPS OPEN RAIL		212	5'-5	767	244	5'-5	883	290	5'-5	1049	316	5'-5	1143	342	5'-5	1237	394	5'-5	1426	420	5'-5	1520	446	5'-5	1614	472	5'-5	1708			
4j4	HOOPS END POSTS		32	6'-5	137	32	6'-5	137	32	6'-5	137	32	6'-5	137	32	6'-5	137	32	6'-5	137	32	6'-5	137	32	6'-5	137	32	6'-5	137			
4t1	WING FOOTING TIE BARS		16	VARIABLE	21	16	VARIABLE	21	16	VARIABLE	21	16	VARIABLE	21	16	VARIABLE	21	16	VARIABLE	21	16	VARIABLE	21	16	VARIABLE	21	16	VARIABLE	21			
(INCLUDE WITH SUPERSTRUCTURE REINFORCING)			TOTAL (LBS.)			5100			5799			6330			6794			7261			8061			8573			9057			9605		

REINFORCING QUANTITIES SHOWN ARE BASED ON 45° SKEW BID LENGTHS.

BENT BAR DETAILS

4c4 & 4c5

6c2 & 6c3

6d2

6j1

4j2, 4j3, 4j4

4t1

6j1 BARS		
BRIDGE	"a"	LENGTH
70'	3'-6	4'-6
80'	3'-7	4'-7
90'	3'-8	4'-8
100'	3'-9	4'-9
110'	3'-10	4'-10
120'	3'-11	4'-11
130'	4'-1	5'-1
140'	4'-2	5'-2
150'	4'-3	5'-3

NOTE: ALL DIMENSIONS ARE OUT TO OUT.
D = PIN DIAMETER

OPEN RAIL NOTES:

- MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.
- COST OF THE JOINT SEALER AND BOND BREAKER SHALL BE CONSIDERED INCIDENTAL TO OTHER CONSTRUCTION.
- THE CONCRETE OPEN RAIL IS TO BE BID ON A LINEAL FOOT BASIS MEASURED FROM END TO END OF RAIL. THE NUMBER OF LINEAL FEET OF OPEN RAIL INSTALLED WILL BE PAID FOR AT THE CONTRACT PRICE PER LINEAL FOOT. PRICE BID FOR "CONCRETE OPEN RAILING, TL-4" SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, EXCLUDING REINFORCING STEEL, AND ALL OF THE EQUIPMENT AND LABOR REQUIRED TO CONSTRUCT THE RAIL IN ACCORDANCE WITH THESE PLANS AND CURRENT SPECIFICATIONS.
- ALL OPEN RAIL CONCRETE IS TO BE CLASS C.
- THE JOINT SEALER SHALL BE LIGHT GRAY NONSAG LATEX CAULKING SEALER MARKETED FOR OUTDOOR USE. NO TESTING OR CERTIFICATION IS REQUIRED.
- TOP OF THE OPEN RAIL IS TO BE PARALLEL TO THEORETICAL ∇ GRADE.

IF CONDUIT IS REQUIRED IN THIS PLAN, THE RIGID STEEL CONDUIT, JUNCTION BOXES AND FITTINGS, INCLUDING LABOR AND ANY ADDITIONAL WORK TO DO THE INSTALLATION IS CONSIDERED INCIDENTAL TO THE COST OF THE RAILING.

CONCRETE PLACEMENT QUANTITIES NOTE: THESE VALUES TO BE USED FOR ALL SKEWS.

BRIDGE LENGTH	70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
*STANDARD SECTION CU. YDS.	12.2	14.0	15.7	17.4	19.1	21.0	22.7	24.4	26.0
END SECTION 4 @ 0.687 CU. YDS.	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
TOTAL CU. YDS.	15.0	16.8	18.5	20.2	21.9	23.8	25.5	27.2	28.8

* CONCRETE QUANTITIES SHOWN ARE BASED ON 45° SKEW BID LENGTHS.

CONCRETE OPEN RAIL QUANTITIES

BRIDGE LENGTH		UNIT	70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
CONCRETE OPEN RAILING, TL-4	0° SKEW	L.F.	162.0	182.0	202.0	222.0	242.0	262.0	282.0	302.0	322.0
CONCRETE OPEN RAILING, TL-4	15° SKEW	L.F.	162.2	182.2	202.2	222.2	242.2	262.2	282.2	302.2	322.2
CONCRETE OPEN RAILING, TL-4	30° SKEW	L.F.	162.9	182.9	202.9	222.9	242.9	262.9	282.9	302.9	322.9
CONCRETE OPEN RAILING, TL-4	45° SKEW	L.F.	164.5	184.5	204.5	224.5	244.5	264.5	284.5	304.5	324.5

08-2022
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

STANDARD DESIGN - 24'-0 ROADWAY, 3 SPAN BRIDGES

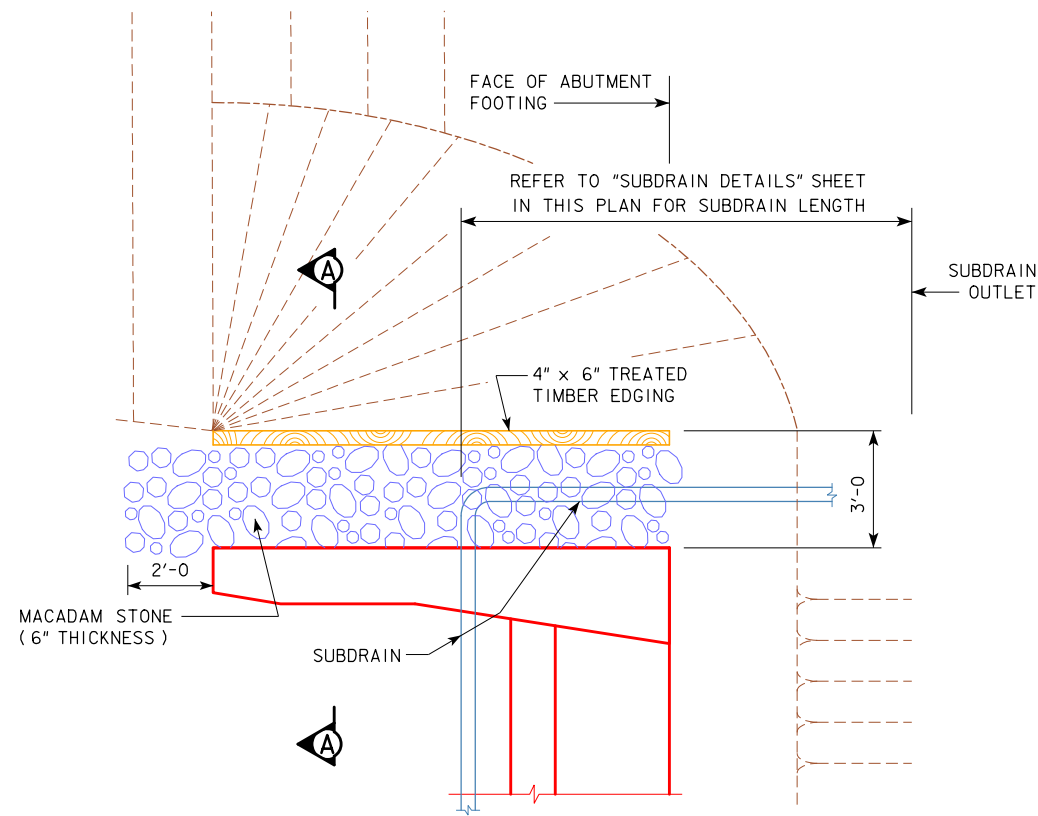
CONTINUOUS CONCRETE
SLAB BRIDGES

NOVEMBER, 2006

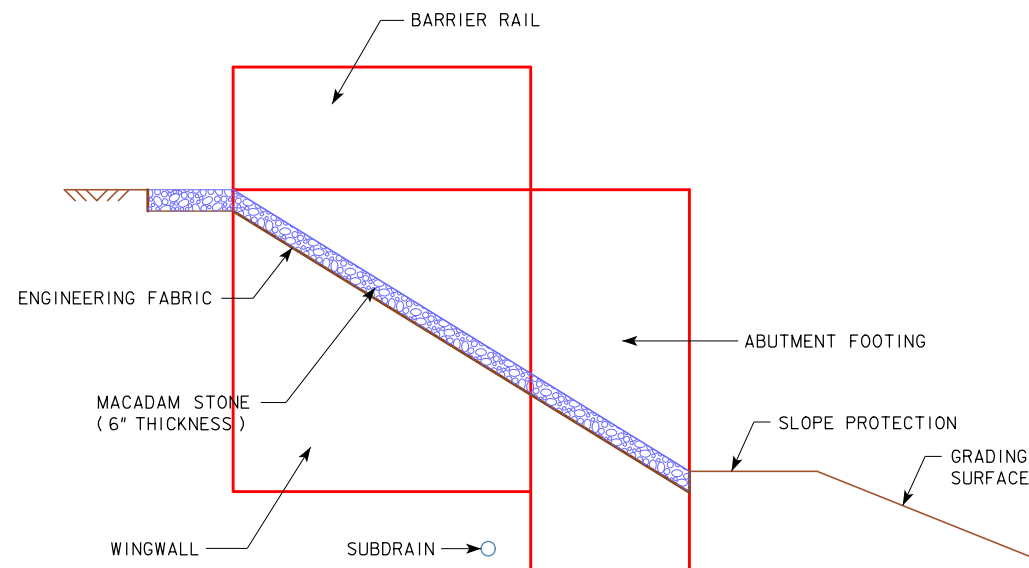
OPEN RAIL DETAILS
(TL-4)

J24-41-06

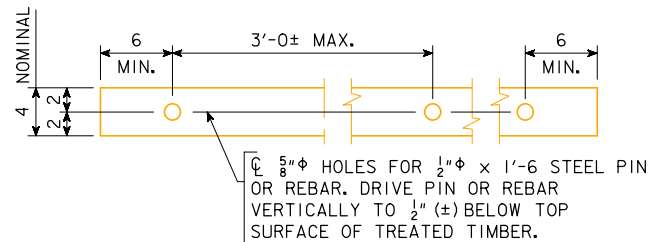
REVISED 09-14 - THE AREA OF MACADAM STONE WAS EXTENDED 2'-0" IN FRONT OF THE BRIDGE WING.
REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE.



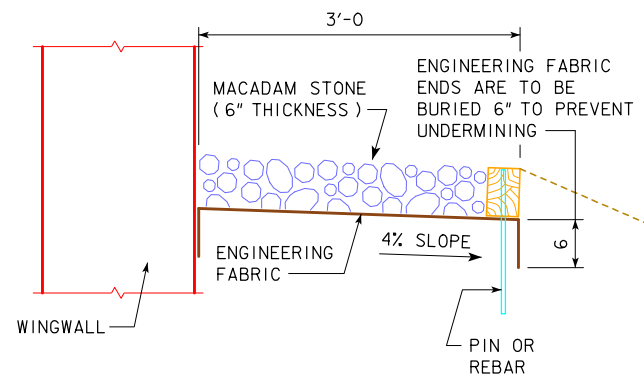
TOP VIEW OF WING ARMORING



PROFILE VIEW OF WING ARMORING



4" x 6" TREATED TIMBER EDGING DETAILS



SECTION A-A

SUBDRAIN NOTES:

SEE J24-42-06 AND "SITUATION PLAN" SHEETS FOR DETAILS OF PLACING ALL SUBDRAINS AND SUBDRAIN OUTLETS REQUIRED FOR THIS STRUCTURE.

THE BRIDGE CONTRACTOR IS TO INSTALL SUBDRAINS BEHIND THE ABUTMENT. THE SUBDRAINS SHALL BE 4" IN DIAMETER AND IN ACCORDANCE WITH ARTICLE 4143.01, B, OF THE STANDARD SPECIFICATIONS. THE SUBDRAIN OUTLET SHALL CONSIST OF A 6'-0" LENGTH OF PIPE WITH A REMOVABLE RODENT GUARD.

THE DIMENSIONS SHOWN FOR THE PROPOSED SUBDRAINS ARE BASED ON THE PROPOSED GRADING LAYOUT OF BRIDGE BERMS. THE DIMENSIONS SHOWN ARE FOR ESTIMATING ONLY. REQUIRED LENGTHS AND GENERAL LOCATIONS OF SUBDRAINS ARE SUBJECT TO CHANGE DUE TO FIELD ADJUSTMENTS OF THE GRADING LAYOUT.

THE COST OF FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), GRANULAR BACKFILL, POROUS BACKFILL, AND SUBDRAIN OUTLET IS TO BE INCLUDED IN THE PRICE BID FOR "STRUCTURAL CONCRETE (BRIDGE)". NO EXTRA PAYMENT WILL BE MADE.

MACADAM STONE WING ARMORING NOTES:

MACADAM STONE SHALL BE PLACED ALONG THE SIDE OF THE WING AND ABUTMENT FOOTING. THIS IS TYPICAL AT EACH CORNER OF THE BRIDGE UNLESS OTHERWISE NOTED IN THE PLANS. THE MACADAM STONE AT THESE LOCATIONS SHALL BE UNDERLAYED WITH ENGINEERING FABRIC IN ACCORDANCE WITH ARTICLE 4196.01, B, 3, OF THE STANDARD SPECIFICATIONS.

THE BRIDGE BERM FORESLOPE SHALL BE COMPACTED AND SHAPED AS SHOWN ON THESE PLANS, THE SITUATION PLAN AND AS DIRECTED BY THE ENGINEER. THE BERM FORESLOPE SHALL BE FIRM WHEN THE ENGINEERING FABRIC AND MACADAM STONE ARE PLACED.

THE ENGINEERING FABRIC SHALL BE IN ACCORDANCE WITH ARTICLE 4196.01, B, 3, OF THE STANDARD SPECIFICATIONS. IF THE ENGINEERING FABRIC IS LAPPED THE LAPS SHALL BE A MINIMUM OF ONE FOOT IN LENGTH, SHINGLE FASHION WITH UP SLOPE LAP PIECE ON TOP AND STAPLED FOR CONTINUITY.

THE MACADAM STONE SHALL BE IN ACCORDANCE WITH ARTICLE 4122.02, OF THE STANDARD SPECIFICATIONS, COARSE MATERIAL (NO CHOKE STONE IS ALLOWED).

WOOD PRESERVATIVE TREATMENT FOR THE TIMBER EDGING SHALL MEET THE REQUIREMENTS FOR GUARDRAIL POSTS, SAWED FOUR SIDES, IN ACCORDANCE WITH SECTION 4161 OF THE STANDARD SPECIFICATIONS.

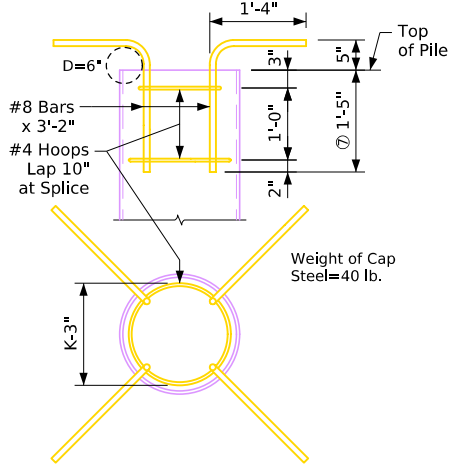
THE MACADAM STONE SHALL BE DEPOSITED, SPREAD, CONSOLIDATED AND SHAPED BY MECHANICAL OR HAND METHODS THAT WILL PROVIDE UNIFORM DEPTH AND DENSITY AND PROVIDE UNIFORM SURFACE APPEARANCE.

PAYMENT FOR THE BRIDGE WING ARMORING SHALL BE INCIDENTAL TO THE BID ITEM "STRUCTURAL CONCRETE (BRIDGE)" AND SHALL INCLUDE COSTS OF ALL MATERIAL AND LABOR TO CONSTRUCT THE WING ARMORING AS SHOWN ON THESE PLANS.

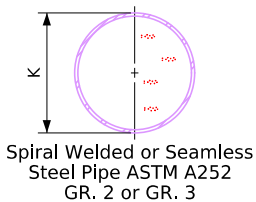
08-2022 LATEST REVISION DATE	 STANDARD DESIGN - 24'-0" ROADWAY, 3 SPAN BRIDGES CONTINUOUS CONCRETE SLAB BRIDGES NOVEMBER, 2006		
		APPROVED BY BRIDGE ENGINEER 	
		WING ARMORING DETAILS	J24-43-06

Revised 03-2022: Updated Spiral Requirements To ASTM A1054 Grade 70 (was ASTM A82).
Revised 06-2025: Corrected Types and Added Note ⑥. This note was missing when the sheet was updated and re-issued on 11-2023 (the note was on the previous version of this sheet).
MiscellaneousBridges.dgn - P10L - This Sheet Re-issued 11-2023. Sheet Format Update.

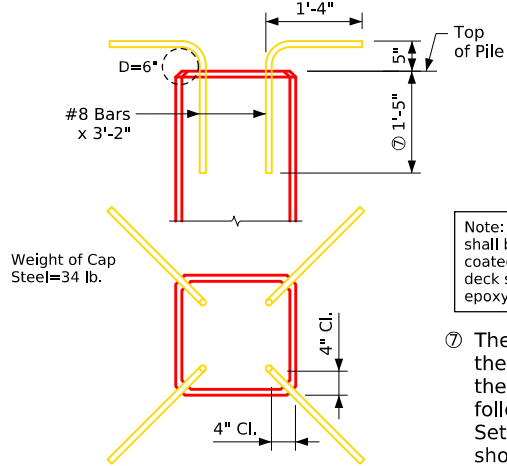
Cast in Place



Cap Steel Details



Prestressed



Cap Steel Details

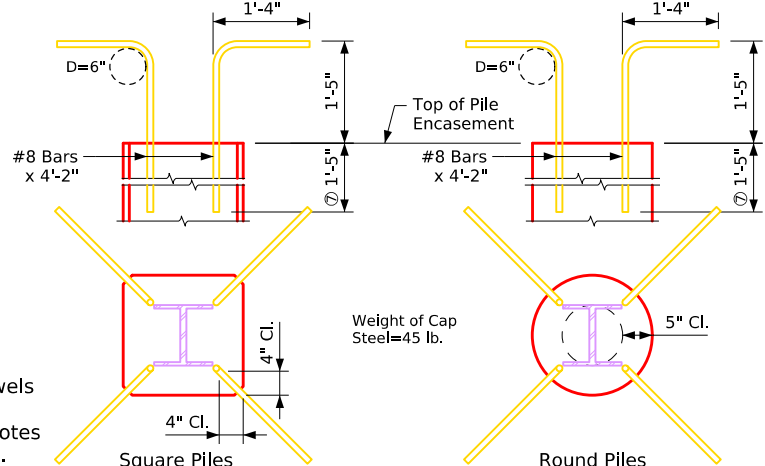
16" $\square$ 8 - $\frac{1}{2}$ " $\varnothing$ Strands,
14" $\square$ 8 - $\frac{1}{16}$ " $\varnothing$ Strands
or 8 - $\frac{1}{2}$ " $\varnothing$ Strands
with Total Initial
Prestress of 174k

1" Fillet (Typ.)
at Top of Pile

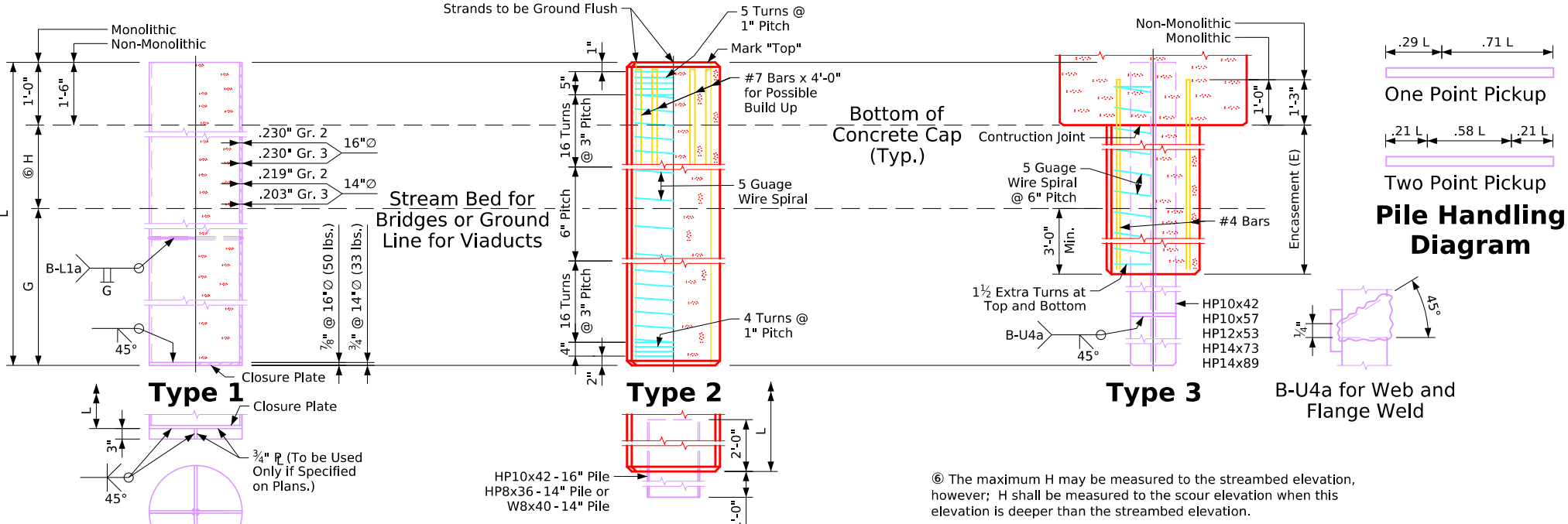
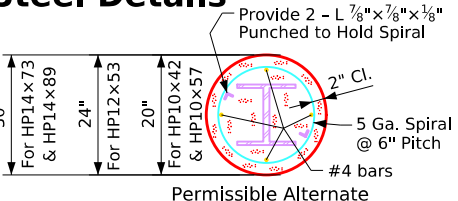
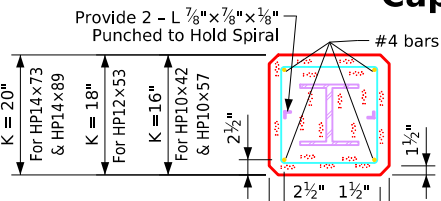
Note: The #8 bars
shall be epoxy
coated when the
deck steel is
epoxy coated.

⑦ The Contractor has
the option to install
the cap steel as dowels
following the Dowel
Setting Procedure notes
shown on this sheet.

Concrete Encased Steel H Pile



Cap Steel Details



Steel Driving Points ASTM A36

K Dimension	in	14 $\varnothing$	16 $\varnothing$
G Min. Below Ground	ft	24	27
⑥ H Max. Above Ground	ft	18	22
Shell ASTM A-252		Gr. 2	Gr. 3
Concrete (L=40')	cy	1.49	1.49
Concrete 1' Change	cy	0.0372	0.0373
① Wt. of Shell (L=40')	lb	1325	1231
Wt. of Shell 1' Change	lb	32.26	29.94
f _c	ksi	4.0	4.0
⑤ Nominal Resistance P _n	kips	119	137

Steel Driving Points

Strand Strength	270k
K Dimension	in
G Min. Below Ground	ft
⑥ H Max. Above Ground	ft
Concrete (L=40')	cy
Concrete 1' Change	cy
② Reinforcing (L=40')	lb
Reinforcing 1' Change	lb
Max. L 1 Pt. Pick-Up	ft
Max. L 2 Pt. Pick-Up	ft
f _c	ksi
⑤ Nominal Resistance P _n	kips
③ Initial Prestress	kips

⑥ The maximum H may be measured to the streambed elevation, however; H shall be measured to the scour elevation when this elevation is deeper than the streambed elevation.

Steel H Pile		HP10×42	HP10×57	HP12×53	HP14×73	HP14×89	
G Min. Below Ground		ft	18	18	21	24	24
⑥ H Max. Above Ground W/ Monolithic		ft	19	19	23	28	29
⑥ H Max. Above Ground W/ Non-Monolithic		ft	15	16	20	25	26
Square	Concrete (E=18')	cy	1.12	1.10	1.41	1.74	1.72
	Concrete 1' Change	cy	0.062	0.061	0.078	0.097	0.096
	④ Reinforcing (E=18')	lb	96	96	99	103	103
	④ Reinforcing 1' Change	lb	4.98	4.98	5.13	5.28	5.28
Round	Concrete (E=18')	cy	1.40	1.38	2.02	3.17	3.15
	Concrete 1' Change	cy	0.078	0.076	0.112	0.176	0.175
	④ Reinforcing (E=18')	lb	97	97	102	110	110
	④ Reinforcing 1' Change	lb	5.02	5.02	5.26	5.62	5.62
⑤ Nominal Resistance Pn		kips	154	208	192	265	324
Fc = 4.0 ksi							

④ Includes Weight of Punched L 7/8" x 7/8" x 1/8"
⑤ See Bridge Design Manual 6.6.4.2 for Additional Information

General Notes:

Except as noted elsewhere, material, construction, driving and extensions or build ups when necessary shall be in accordance with Standard Specifications of the Iowa D.O.T. and current Supplemental Specifications and Special Provisions applicable.
Cap steel shall be as detailed on this sheet (D=Pin Diameter). It shall be used if pile embedment is less than 1'-6".
"Nominal resistance P_n", "G", and "H" as given in tables are recommended design values for ordinary conditions, but may be modified for special conditions on any given job.

Nominal resistance P_n and pile size required shall in all cases be as specified on the plans.

Nominal resistance P_n shown are for friction resistance except for Type 3 piling where the resistance values shown could be either friction or point resistance.

Cost of all driving points and cap steel is to be included in the price bid per linear foot for piling.

Wire spiral shall conform to ASTM A1064 Grade 70.

Cast in Place Pile Notes:

Shell thicknesses shown are minimum requirements. The method of driving steel shell piles shall be adapted to the type and thickness of shell specified. Any shells which have been improperly driven, broken or are otherwise defective shall be removed and replaced by the bridge Contractor.

All cast in place piles shall have a closure plate. Driving points shall be used if specified on the plans.

Prestressed Pile Notes:

Except as otherwise noted all exposed corners 90° or sharper shall be filleted 3/4". Driving points for prestressed piles, if called for on the plans, shall be as detailed. Heads of prestressed piles to be finished smooth and normal to axis of pile.

Bidding Notes:

The plans shall designate the size of pile to be used. They shall also specify the type, either Type 1, Type 2, or Type 3. If the option of Type 1 or 2 is given on the plans, the Contractor shall choose the type to be used. If Type 3 is specified, Type 3 shall be used, but the Contractor may choose the shape of the encasement. It should be kept in mind that for a given size and resistance value, length may vary with the shape (square or round).

Piles shall be bid designating the size, type and length.

Type 1 piling will be bid per linear foot of pile.

Type 2 piling will be bid per linear foot of pile.

Type 3 piling will be bid per linear foot of pile and linear foot of encasement. Price bid for encasement shall be full payment for necessary excavation and for furnishing and placing all material.

Dowel Setting Procedure:

If cap steel is required for the prestressed piles, the #8 deformed bars are to be set as dowels into the piles with polymer grout in accordance with Article 2301.03, E, of the Standard Specifications or by the following procedure.

A - Drill hole approximately twice the diameter of the dowel bar and to the depth indicated.

B - Fill hole with water and allow to stand long enough to thoroughly saturate the surrounding concrete (about four hours).

C - Blow out all free water and fill hole 2/3 full of mortar.

D - Insert dowel by driving, if necessary, and manipulate or tap with a hammer to consolidate mortar and secure complete embedment.

E - Add more mortar, if necessary, to fill hole.

F - Mortar shall consist of equal parts portland cement and sand with just enough water to make a workable mix.

One Point Pickup

Two Point Pickup

Pile Handling Diagram

B-U4a for Web and
Flange Weld

Approved By:

James Miller
Bridge Engineer

Latest Revision
Date: 06-2025

LRFD Trestle Pile Bents - P10L

FILE NO.	ENGLISH	DESIGN TEAM	LRFD Designed Trestle Pile Bents	Standard Sheet P10L	COUNTY	PROJECT NUMBER	SHEET NUMBER
11:03:49 AM	6/13/2025	bklloss	pw:\NTP\wint1.dot.int.lan:PWMain\Documents\Highway\Bridge\Standards\Bridges\MiscellaneousBridges.dgn				