

REVISED 06-2013; THE GENERAL NOTES AND SPECIFICATIONS MOVED TO STANDARD SHEET J30-01A-06.
REVISED 09-2020; UPDATED BRIDGE ENGINEER SIGNATURE.

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09-2020 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER		
		STANDARD DESIGN - 30' ROADWAY, 3 SPAN BRIDGES CONTINUOUS CONCRETE SLAB BRIDGES NOVEMBER, 2006	
		INDEX SHEET	J30-01-06

REVISED 06-2013; THIS STANDARD RENAMED TO J30-01A-06. INDEX SHEET INFORMATION ON STANDARD J30-01-06.
REVISED 09-2020; UPDATED BRIDGE ENGINEER SIGNATURE.

GENERAL NOTES:

THE J30-06 BRIDGE STANDARDS, IF PROPERLY USED, PROVIDE THE STRUCTURAL PLANS NECESSARY TO CONSTRUCT THREE SPAN 30’ 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

FOR CLARITY, MOST SECTIONS SHOWN ON THE FOLLOWING SHEETS ARE DRAWN WITH BARRIER RAIL ONLY. THESE SECTIONS WILL BE IDENTICAL FOR OPEN RAIL DESIGN WITH ANY MODIFICATIONS SHOWN ON SHEET J30-43-06 AND J30-44-06.

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 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 J30 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 E177, 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 OFFICE OF BRIDGES AND STRUCTURES WEB SITE: [HTTP://WWW.IOWADOT.GOV/BRIDGE/INDEX.HTM](http://www.iowadot.gov/bridge/index.htm).

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, OFFICE OF BRIDGES AND STRUCTURES WEB SITE.

THESE STANDARDS CAN BE USED FOR BRIDGES WITH OR WITHOUT EPOXY COATED REINFORCING. REINFORCING BAR LAP LENGTHS ARE BASED ON THE USE OF EPOXY COATED REINFORCING, BUT NEED NOT BE MODIFIED IF NON-COATED BARS ARE TO BE USED. THE DESIGNER SHALL SPECIFY THE APPROPRIATE BID ITEM NO. FOR THE EPOXY COATED OR NON-EPOXY COATED REINFORCING.

IT IS RECOMMENDED THAT THE EPOXY COATED REINFORCING OPTION BE USED IF IT IS ANTICIPATED THAT THE BRIDGE DECK AND/OR THE BRIDGE APPROACHES WILL BE CHEMICALLY TREATED FOR THE REMOVAL OF ICE OR SNOW.

IF EPOXY COATED BARS ARE USED IN THE DECK, THEN ALL BARS USED IN THE ABUTMENT (FOOTING AND BACKWALL), CAP, AND BARRIER RAILS SHALL BE EPOXY COATED.

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 ⅝ INCH 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.

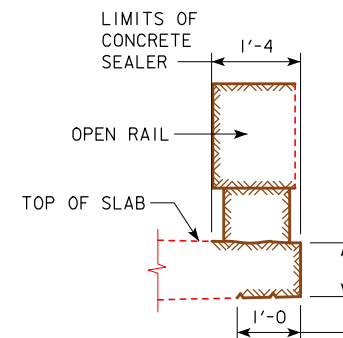
09-2020
LATEST REVISION DATE


APPROVED BY BRIDGE ENGINEER


STANDARD DESIGN - 30’ ROADWAY, 3 SPAN BRIDGES
**CONTINUOUS CONCRETE
SLAB BRIDGES**
NOVEMBER, 2006

GENERAL NOTES

J30-01A-06



CONCRETE SEALER SHALL BE APPLIED TO BOTH SIDES OF BRIDGE SLAB ON THE TOP, EDGE OF SLAB AND UNDER THE SLAB. THE CONCRETE SEALER SHALL ALSO BE APPLIED TO THE OPEN RAIL ON THE TOP, TRAFFIC FACE SIDE, BOTTOM OF RAIL, AND ON ALL SIDES OF THE OPEN RAIL POSTS.

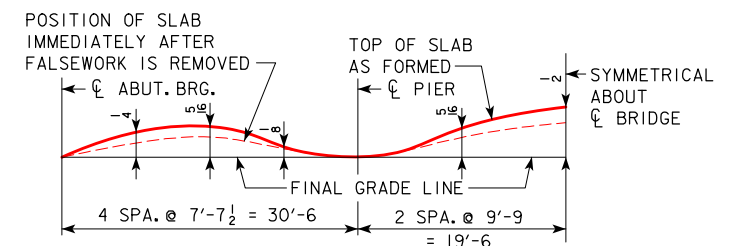
THE CONCRETE SEALER LIMITS ARE SHOWN IN THE DETAIL AND SHALL APPLY TO THE FULL LENGTH OF BRIDGE. CONCRETE SEALER SHALL BE APPLIED IN ACCORDANCE WITH ARTICLE 2403.03, P. 3 OF THE STANDARD SPECIFICATIONS.

* NOTE: DOUBLE DRIP GROOVES FOR OPEN RAIL OPTION ONLY.

SLAB CROSS-SECTIONAL AREA
FOR OPEN RAIL = 48.37 SQ. FT.

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

SLAB CROSS-SECTIONAL AREA
FOR BARRIER RAIL = 48.42 SQ. FT.



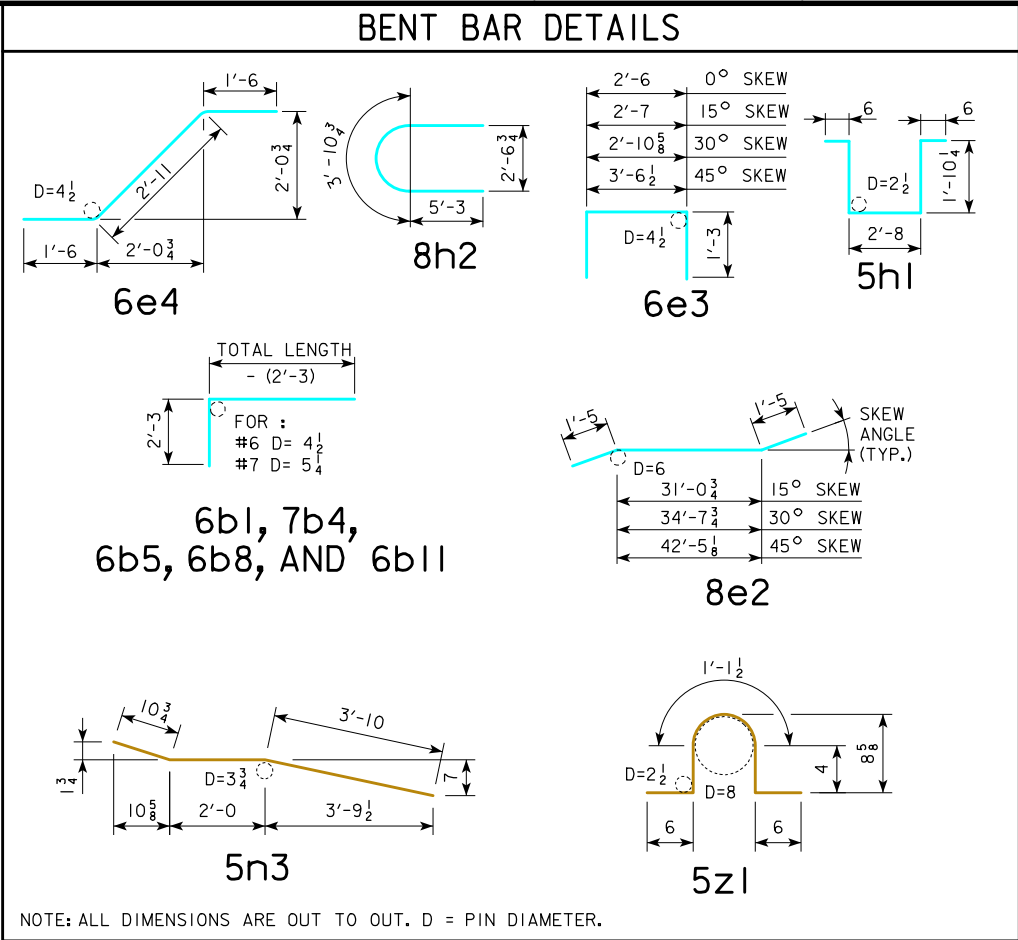
THIS DIAGRAM SHOWS THE FORM CAMBER REQUIRED TO COMPENSATE FOR THE ANTICIPATED ULTIMATE DEAD LOAD DEFLECTION. THE ABOVE DIMENSIONS DO NOT INCLUDE ANY ALLOWANCE FOR FORM DEFLECTION OR FALSEWORK SETTLEMENT.

09-2020 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER		
		STANDARD DESIGN - 30' ROADWAY, 3 SPAN BRIDGES CONTINUOUS CONCRETE SLAB BRIDGES NOVEMBER, 2006	
		SUPERSTRUCTURE DETAILS 100'-0 BRIDGE NON-EPOXY COATED REINFORCING	J30-08B-06

REVISED 07-2009; OPEN RAIL REINF. QTY'S. CHANGED WHICH CHANGED TOTAL REINF. QTY'S.
REVISED 09-2020; UPDATED BRIDGE ENGINEER SIGNATURE. CHANGED PAVING BLOCK LIFTING HOOP BAR MARK, (WAS 5x1).

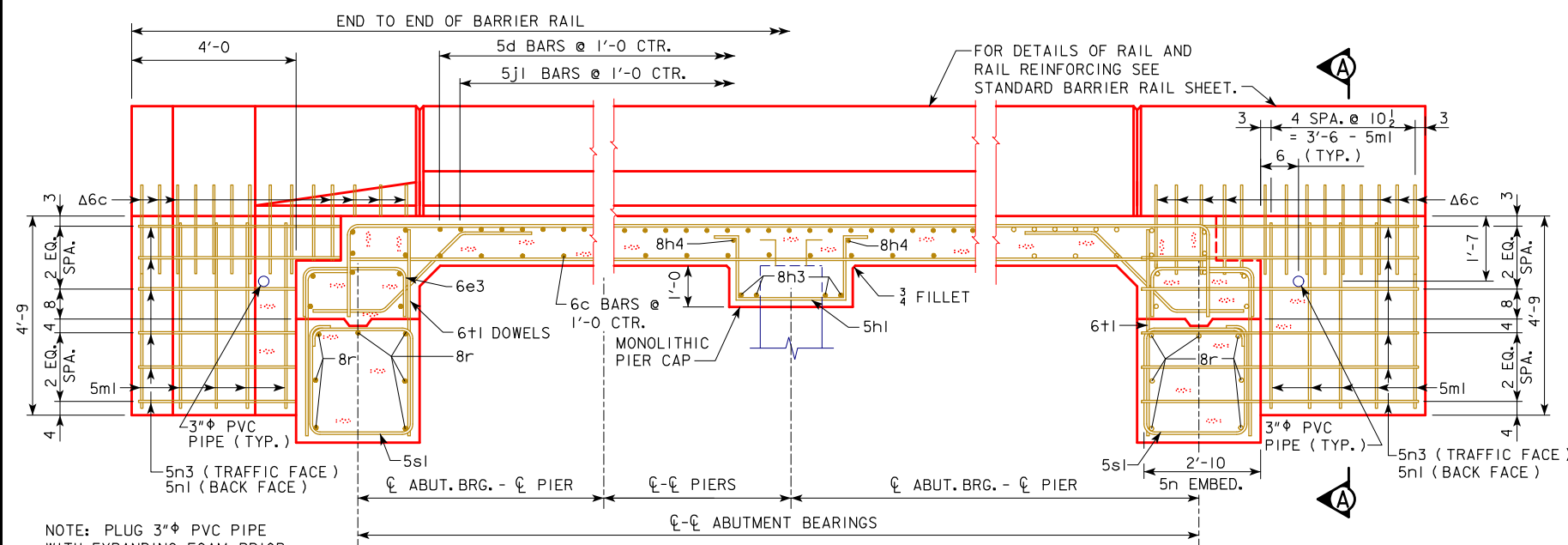
BILL OF REINFORCING STEEL FOR SUPERSTRUCTURE - 100' BRIDGE																		
LOCATION \ SKEW		SHAPE	0°				15°				30°				45°			
			BAR	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT			
SLAB LONGITUDINAL BOTTOM			8a1	39	21'-3	2213	39	21'-3	2213	39	21'-3	2213	39	21'-3	2213			
SLAB LONGITUDINAL BOTTOM			8a2	39	31'-5	3272	39	31'-5	3272	39	31'-5	3272	39	31'-5	3272			
SLAB LONGITUDINAL BOTTOM			8a3	39	29'-6	3072	39	29'-6	3072	39	29'-6	3072	39	29'-6	3072			
SLAB LONGITUDINAL BOTTOM			9a4	40	27'-6	3740	40	27'-6	3740	40	27'-6	3740	40	27'-6	3740			
SLAB LONGITUDINAL BOTTOM			9a5	20	29'-6	2006	20	29'-6	2006	20	29'-6	2006	20	29'-6	2006			
SLAB LONGITUDINAL BOTTOM, AT RAIL			8a6	8	35'-9	764	8	35'-9	764	8	35'-9	764	8	35'-9	764			
SLAB LONGITUDINAL BOTTOM, AT RAIL			8a7	4	34'-8	371	4	34'-8	371	4	34'-8	371	4	34'-8	371			
SLAB LONGITUDINAL BOTTOM, AT RAIL			8a8	8	24'-0	513	8	24'-0	513	8	24'-0	513	8	24'-0	513			
SLAB LONGITUDINAL BOTTOM, AT RAIL			8a9	4	20'-6	219	4	20'-6	219	4	20'-6	219	4	20'-6	219			
SLAB LONGITUDINAL TOP			6b1	39	6'-9	396	39	6'-9	396	39	6'-9	396	39	6'-9	396			
SLAB LONGITUDINAL TOP			10b2	39	24'-9	4154	39	24'-9	4154	39	24'-9	4154	39	24'-9	4154			
SLAB LONGITUDINAL TOP			10b3	39	25'-6	4280	39	25'-6	4280	39	25'-6	4280	39	25'-6	4280			
SLAB LONGITUDINAL TOP			7b4	39	16'-8	1329	39	16'-8	1329	39	16'-8	1329	39	16'-8	1329			
SLAB LONGITUDINAL TOP			6b5	40	13'-6	812	40	13'-6	812	40	13'-6	812	40	13'-6	812			
SLAB LONGITUDINAL TOP			9b6	40	21'-3	2890	40	21'-3	2890	40	21'-3	2890	40	21'-3	2890			
SLAB LONGITUDINAL TOP			6b7	20	27'-6	827	20	27'-6	827	20	27'-6	827	20	27'-6	827			
SLAB LONGITUDINAL TOP, AT RAIL			6b8	8	25'-8	309	8	25'-8	309	8	25'-8	309	8	25'-8	309			
SLAB LONGITUDINAL TOP, AT RAIL			9b9	8	22'-0	599	8	22'-0	599	8	22'-0	599	8	22'-0	599			
SLAB LONGITUDINAL TOP, AT RAIL			6b10	4	21'-4	129	4	21'-4	129	4	21'-4	129	4	21'-4	129			
SLAB LONGITUDINAL TOP, AT RAIL			6b11	8	27'-11	336	8	27'-11	336	8	27'-11	336	8	27'-11	336			
SLAB LONGITUDINAL TOP, AT RAIL			10b12	8	17'-0	586	8	17'-0	586	8	17'-0	586	8	17'-0	586			
SLAB TRANSVERSE, BOTTOM			6c1	97	32'-10	4784	97	34'-0	4954	84	32'-10	4143	70	32'-10	3453			
SLAB TRANSVERSE ENDS, BOTTOM			6c2	-	-	-	-	-	-	30	VARIES	797	56	VARIES	1486			
SLAB TRANSVERSE, TOP			5d1	97	32'-10	3322	97	34'-0	3440	84	32'-10	2877	70	32'-10	2398			
SLAB TRANSVERSE ENDS, TOP			5d2	-	-	-	-	-	-	30	VARIES	553	56	VARIES	1032			
SLAB, TRANSVERSE AT ABUTMENT			8e1	18	32'-10	1578	-	-	-	-	-	-	-	-	-			
SLAB, TRANSVERSE AT ABUTMENT			8e2	-	-	-	18	33'-11	1631	18	37'-6	1803	18	45'-4	2179			
SLAB, HAIRPINS, AT ABUTMENT			6e3	72	5'-0	541	72	5'-1	550	72	5'-5	586	72	6'-1	658			
SLAB, DIAGONALS, AT ABUTMENT			6e4	72	5'-11	640	72	5'-11	640	72	5'-11	640	72	5'-11	640			
PIER CAP HOOPS			5h1	48	7'-5	372	48	7'-5	372	64	7'-5	496	64	7'-5	496			
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	29'-10	638	8	30'-11	661	8	34'-5	736	8	42'-2	901			
PIER CAP, TOP LONGITUDINAL			8h4	4	32'-10	351	4	34'-0	364	4	37'-11	405	4	46'-6	497			
TOP OF SLAB, TRANSVERSE, AT RAIL			5j1	192	8'-6	1703	192	8'-6	1703	192	8'-6	1703	190	8'-6	1685			
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	10	2'-10	30	10	2'-10	30	10	2'-10	30	10	2'-10	30			
SUB TOTAL - LBS.						47,451			47,837			48,261			48,947			
BARRIER RAIL - SEE LIST ON RAIL SHEET J30-41-06						6461			6461			6461			6461			
OPEN RAIL - SEE LIST ON RAIL SHEET J30-44-06						6794			6794			6794			6794			
TOTAL - LBS.		WITH MONOLITHIC PIER CAP	WITH BARRIER RAIL			53,912			54,298			54,722			55,408			
			WITH OPEN RAIL			54,245			54,631			55,055			55,741			
TOTAL - LBS.		WITH NON-MONOLITHIC PIER CAP	WITH BARRIER RAIL			52,397			52,747			52,931			53,360			
			WITH OPEN RAIL			52,730			53,080			53,264			53,693			
SAME AS ABOVE EXCEPT ALL "h" BARS DELETED																		

ESTIMATED QUANTITIES FOR SUPERSTRUCTURE - 100' BRIDGE											
ITEM			SKEW	WITH MONOLITHIC PIER CAP				WITH NON-MONOLITHIC PIER CAP			
				0°	15°	30°	45°	0°	15°	30°	45°
WITH	*STRUCTURAL CONCRETE (BRIDGE)	C.Y.	205.6	206.4	209.1	215.0	201.1	201.6	203.9	208.6	
BARRIER RAIL	REINFORCING STEEL	LBS.	53,912	54,298	54,722	55,408	52,397	52,747	52,931	53,360	
CONCRETE BARRIER OR OPEN RAIL			LIN. FT.	222.0	222.2	222.9	224.5	222.0	222.2	222.9	224.5
WITH	*STRUCTURAL CONCRETE (BRIDGE)	C.Y.	205.4	206.2	208.9	214.8	200.8	201.4	203.7	208.4	
OPEN RAIL	REINFORCING STEEL	LBS.	54,245	54,631	55,055	55,741	52,730	53,080	53,264	53,693	
* INCLUDES 4 WINGS @ 0.68 C.Y.EACH AND 2 TEMPORARY PAVING BLOCKS; EXCLUDES RAIL CONCRETE.											

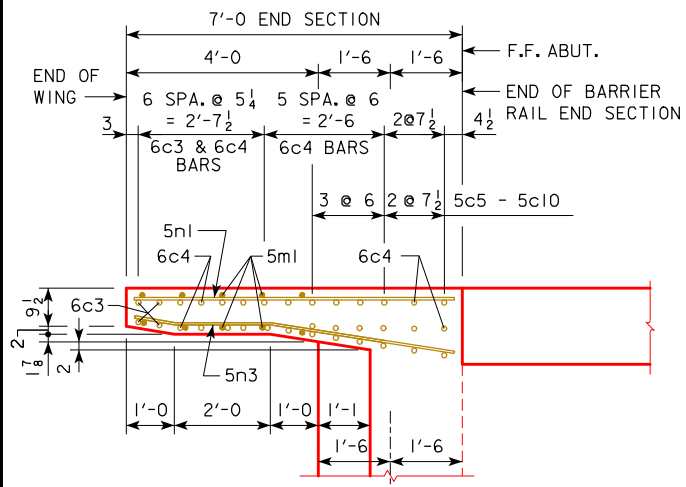


09-2020 LATEST REVISION DATE			
		STANDARD DESIGN - 30' ROADWAY, 3 SPAN BRIDGES	
		CONTINUOUS CONCRETE SLAB BRIDGES NOVEMBER, 2006	
SUPERSTRUCTURE DETAILS 100'-0 BRIDGE NON-EPOXY COATED REINFORCING		J30-09B-06	

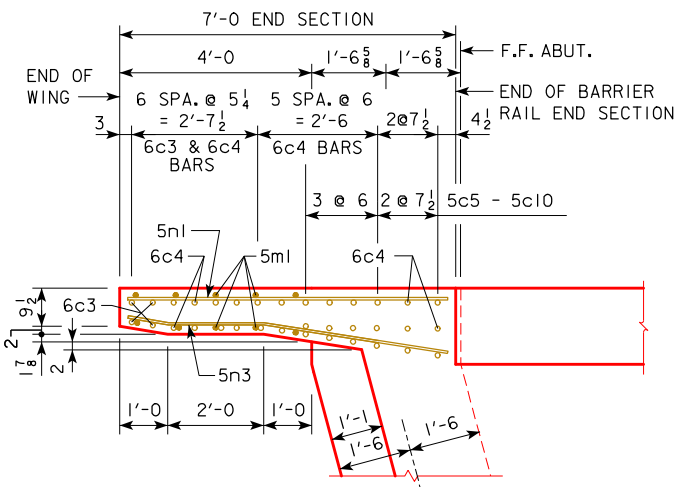
REVISED 06-2012: I.M. REQUIREMENT ADDED TO BAR CHAIR NOTE.
REVISED 09-2020: UPDATED BRIDGE ENGINEER SIGNATURE.
UNLESS SLAB CONSTRUCTION IS STAGED, CHANGED PAVING BLOCK LIFTING HOOP BAR MARK, (WAS 5x1).



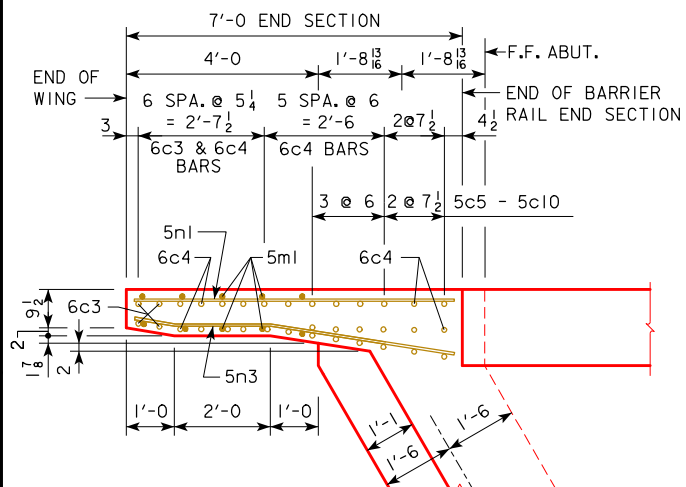
PART LONGITUDINAL SECTION NEAR GUTTER LINE



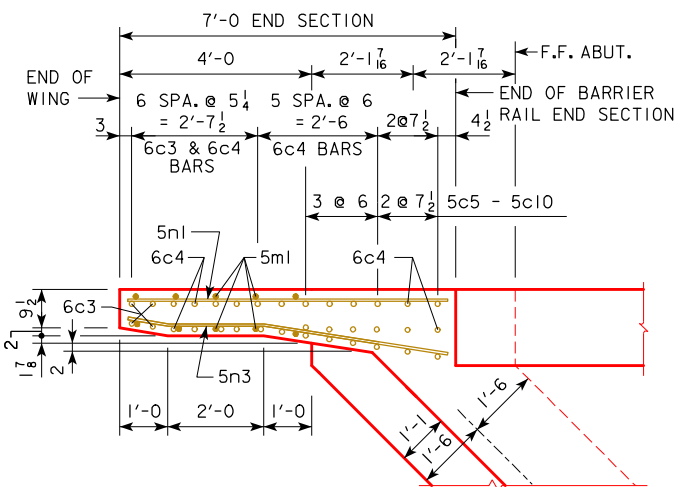
PART PLAN 0° SKEW
(RAILING NOT SHOWN)



PART PLAN 15° SKEW
(RAILING NOT SHOWN)

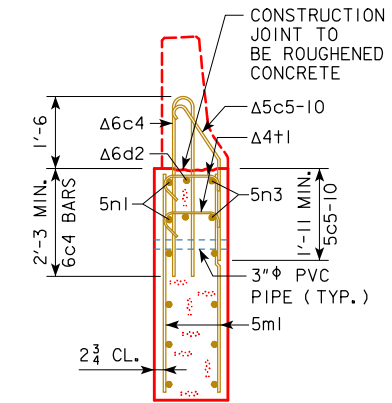


PART PLAN 30° SKEW
(RAILING NOT SHOWN)



PART PLAN 45° SKEW
(RAILING NOT SHOWN)

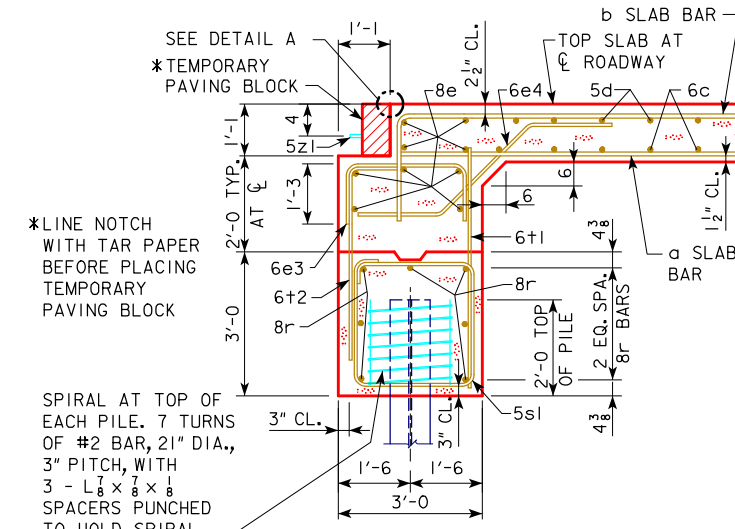
NOTE: REINFORCING LAYOUT IN PART PLANS 0°, 15°, 30° & 45° SKEWS ARE FOR BARRIER RAIL ONLY. SEE SHEET J30-43-06 FOR OPEN RAIL.



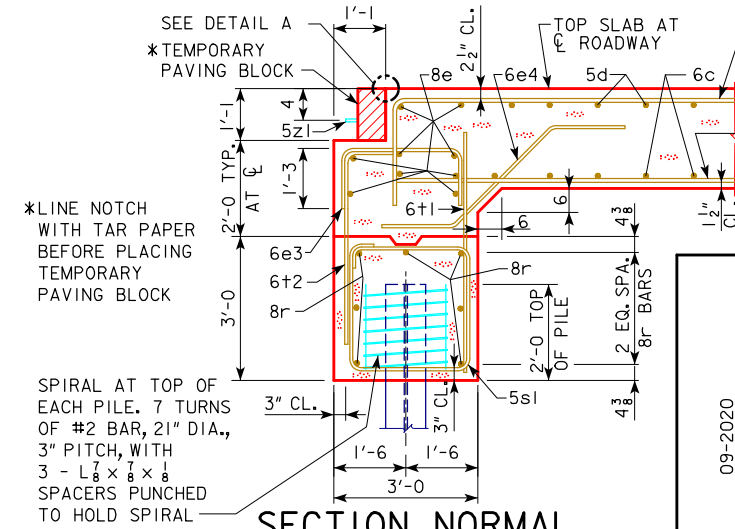
SECTION A-A

Δ NOTE: SEE END SECTION DETAILS IN THESE PLANS FOR DETAILS OF BARRIER RAIL END SECTION. REINFORCING BARS 6c3, 6c4, 5c5-10, 6d2 & 4+1 ARE INCLUDED IN THE SUPERSTRUCTURE QUANTITIES.

NOTE: 5m1, 5n1 & 5n3 BARS ARE INCLUDED IN SUPERSTRUCTURE BAR LIST. 5c, 6c, 6d & 4+1 BARS ARE INCLUDED IN BARRIER RAIL BAR LIST.



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



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

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.

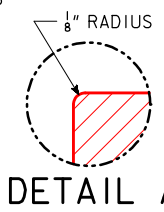
THE CONCRETE SLAB IS TO BE PLACED WITH A MINIMUM OF CONSTRUCTION JOINTS. PROCEDURES FOR PLACING SLAB CONCRETE SHALL BE SUBMITTED FOR APPROVAL TOGETHER WITH A STATEMENT OF THE PROPOSED METHOD AND EVIDENCE THAT THE CONTRACTOR POSSESSES THE NECESSARY EQUIPMENT AND FACILITIES TO ACCOMPLISH THE REQUIRED RESULT.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

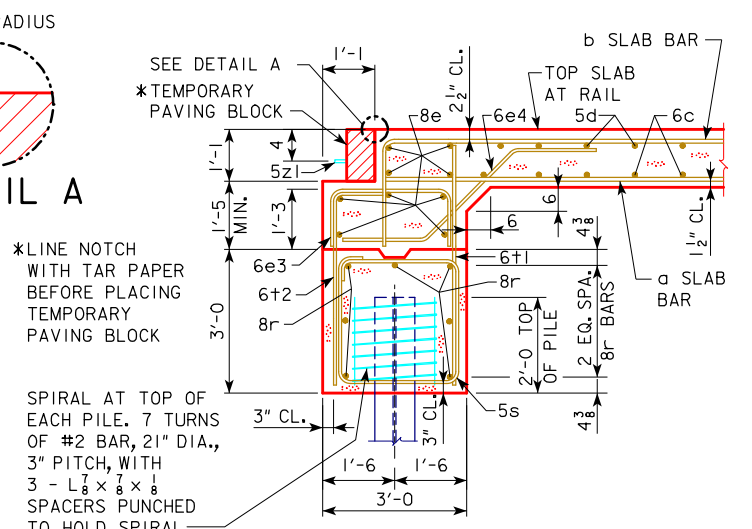
COST OF FURNISHING AND PLACING 3" PVC PIPE IN EACH WING IS INCLUDED IN THE PRICE BID FOR STRUCTURAL CONCRETE.

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.



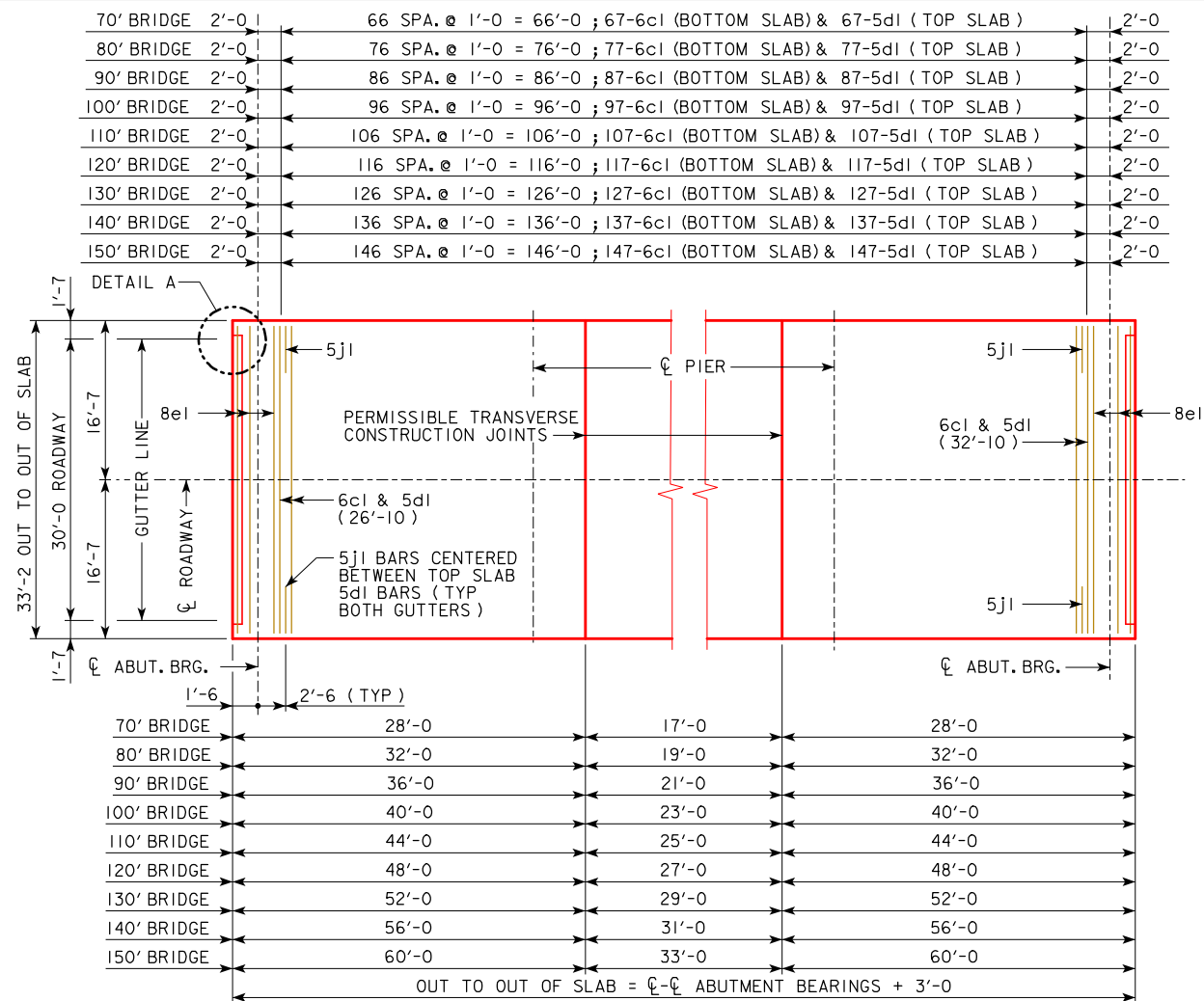
DETAIL A



SECTION NORMAL TO ABUTMENT AT GUTTERLINE

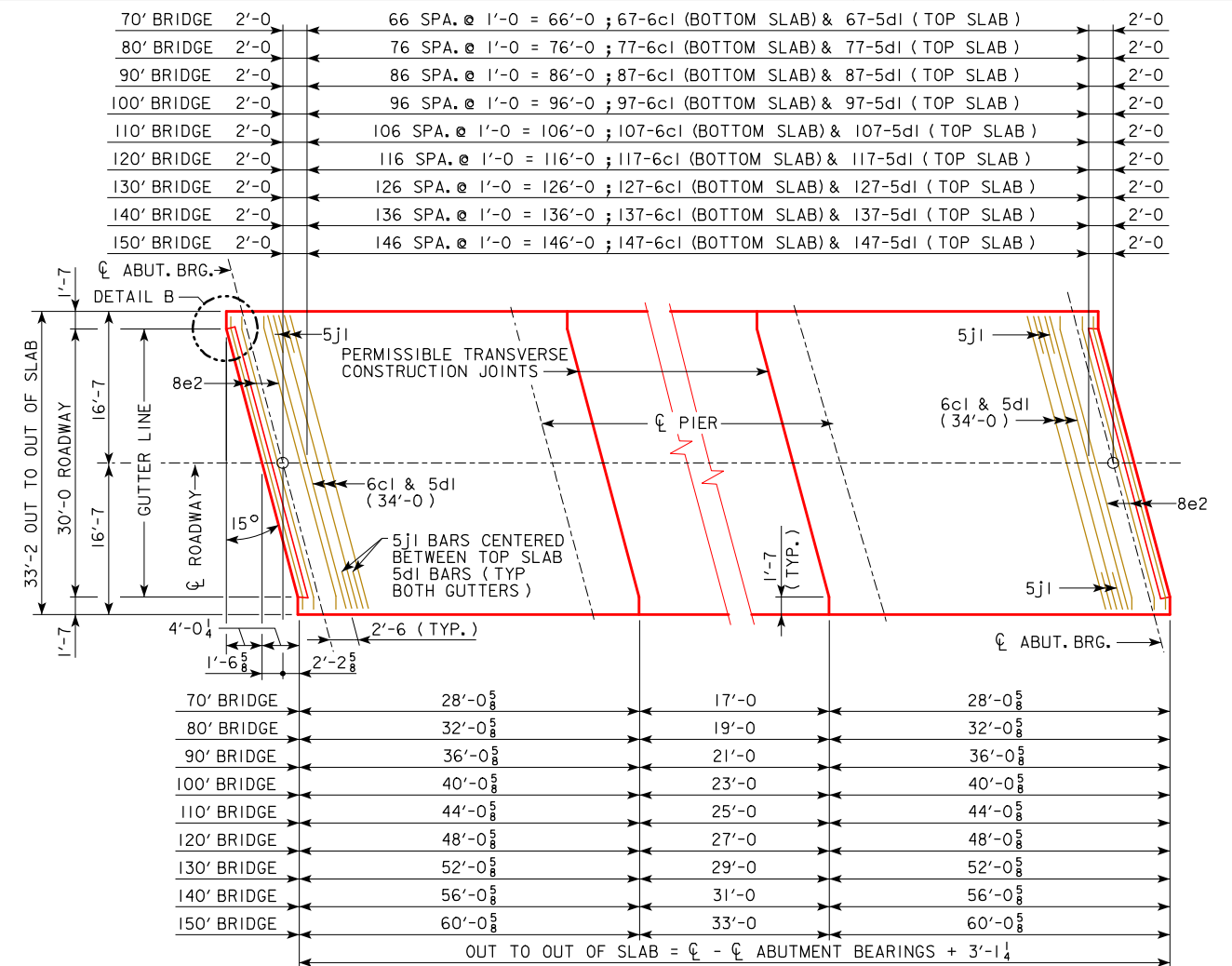
STANDARD DESIGN - 30' ROADWAY, 3 SPAN BRIDGES	
CONTINUOUS CONCRETE SLAB BRIDGES	
NOVEMBER, 2006	
SUPERSTRUCTURE DETAILS ALL BRIDGES	J30-20-06

REVISED 07-2009; CHANGED THE DRAIN ANGLES DETAILS ON SECTION A-A.
REVISED 09-2020; UPDATED BRIDGE ENGINEER SIGNATURE. CHANGED PAVING BLOCK LIFTING HOOP BAR MARK, (WAS 5x1).

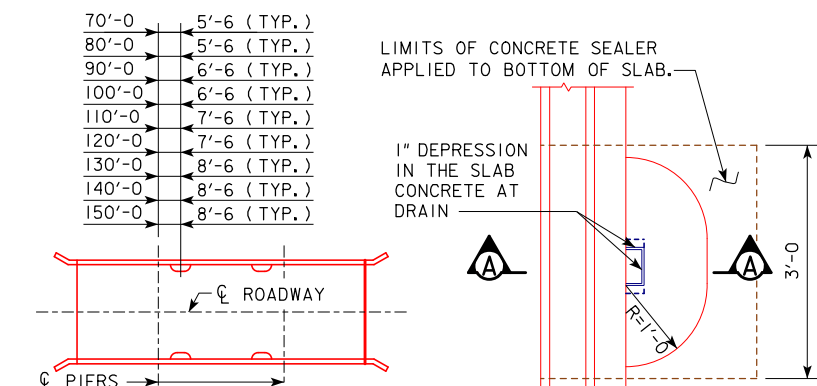


0° SKEW

TRANSVERSE REINFORCING STEEL LAYOUT



15° SKEW



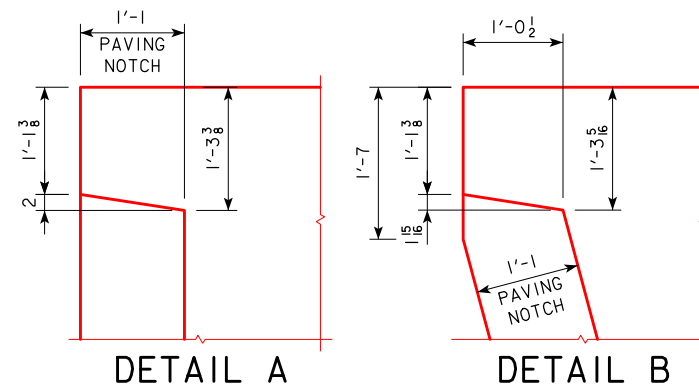
FLOOR DRAIN LOCATION

NOTE: 4" x 8" OUTSIDE DIMENSION ROLLED TUBE WITH 1/4" WALL THICKNESS MAY BE SUBSTITUTED FOR THE WELDED DRAIN SHOWN.

FLOOR DRAIN DETAILS

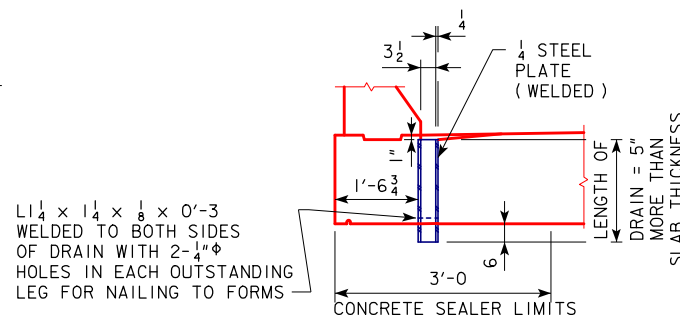
(USE FOR BARRIER RAIL ONLY, NOT REQUIRED FOR OPEN RAIL)

NOTE: DRAINS ARE TO BE GALVANIZED. INCLUDE COST OF DRAINS IN PRICE BID FOR "STRUCTURAL CONCRETE". 4 DRAINS REQUIRED.

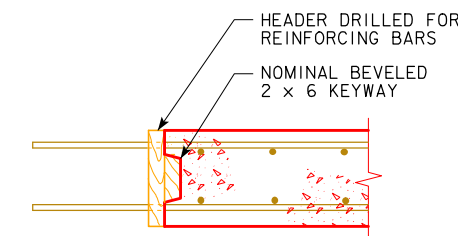


DETAIL A

DETAIL B



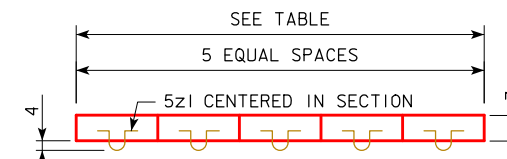
SECTION A-A



TRANSVERSE CONSTRUCTION JOINT

WEIGHT OF ONE FLOOR DRAIN			
SPAN	WEIGHT, LBS.	SPAN	WEIGHT, LBS.
70'-0"	32	120'-0"	41
80'-0"	33	130'-0"	43
90'-0"	35	140'-0"	45
100'-0"	37	150'-0"	48
110'-0"	39		

TEMPORARY PAVING BLOCK		
SKEW	LENGTH	CONCRETE
0°	28'-0"	0.7 C.Y.
15°	29'-0"	0.7 C.Y.

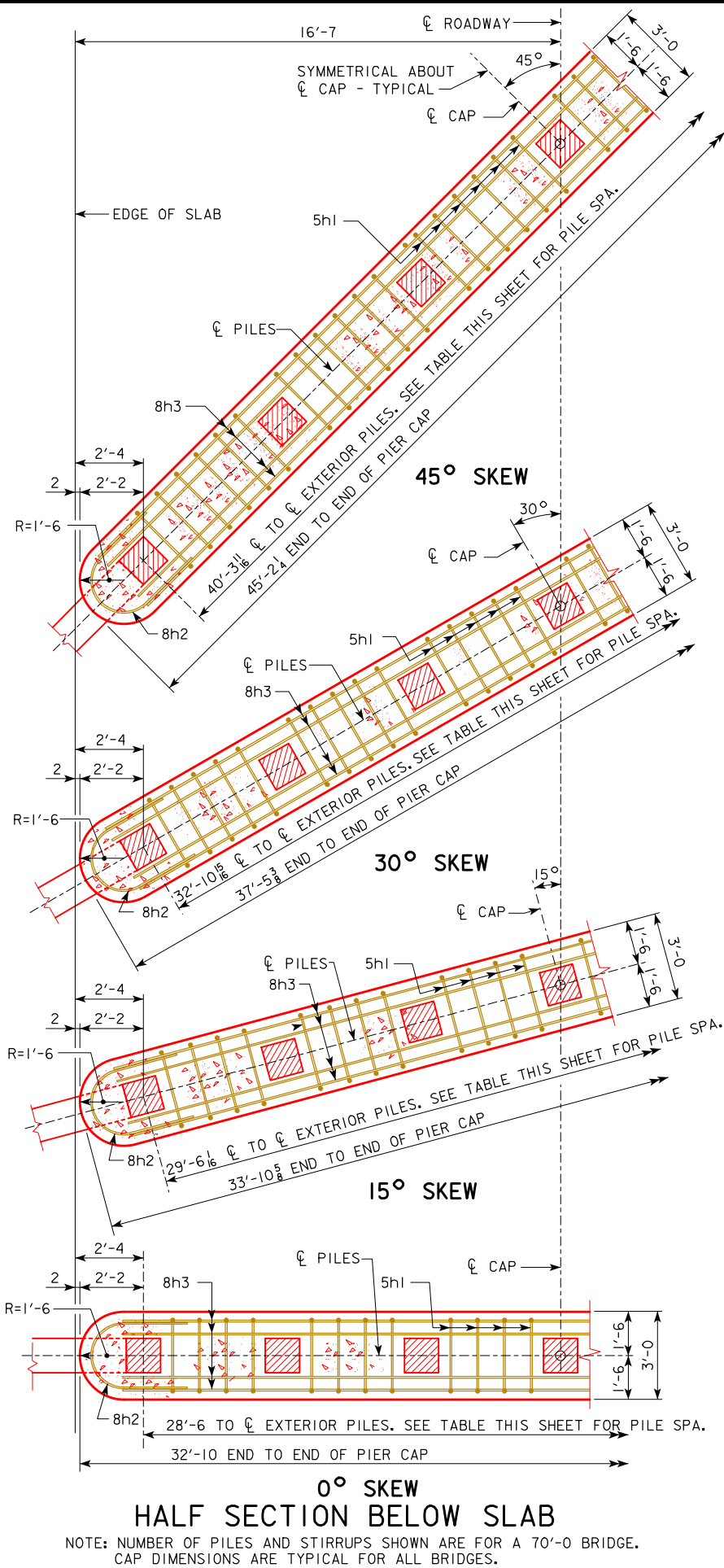


TEMPORARY PAVING BLOCK DETAIL

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

09-2020 LATEST REVISION DATE			
		STANDARD DESIGN - 30' ROADWAY, 3 SPAN BRIDGES	
		CONTINUOUS CONCRETE SLAB BRIDGES	
		NOVEMBER, 2006	
SUPERSTRUCTURE DETAILS ALL BRIDGES		J30-21-06	
0° & 15° SKEW			

REVISED 05-2014: CHANGED THE BAR LABEL FROM 5d1 TO 5h1 IN ENCIRCLED NOTE 1.
REVISED 09-2020: UPDATED BRIDGE ENGINEER SIGNATURE.



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	7	7	8	9	10	11	12	12	12
TYP. PILE SPACES @ 0°	6 SPA. @ 4'-9	6 SPA. @ 4'-9	7 SPA. @ ABOUT 4'-11(-)	8 SPA. @ ABOUT 3'-7(-)	② 9 SPA. @ 3'-2	③ 10 SPA. @ ABOUT 2'-10(+)	③ 11 SPA. @ ABOUT 2'-7(+)	③ 11 SPA. @ ABOUT 2'-7(+)	③ 11 SPA. @ ABOUT 2'-7(+)
TYP. PILE SPACES @ 15°	6 SPA. @ ABOUT 4'-11(+)	6 SPA. @ ABOUT 4'-11(+)	7 SPA. @ ABOUT 4'-3(-)	8 SPA. @ ABOUT 3'-8(+)	② 9 SPA. @ ABOUT 3'-3(+)	② 10 SPA. @ ABOUT 2'-11(+)	③ 11 SPA. @ ABOUT 2'-8(+)	③ 11 SPA. @ ABOUT 2'-8(+)	③ 11 SPA. @ ABOUT 2'-8(+)
TYP. PILE SPACES @ 30°	6 SPA. @ ABOUT 5'-6(-)	6 SPA. @ ABOUT 5'-6(-)	7 SPA. @ ABOUT 4'-8(+)	8 SPA. @ ABOUT 4'-1(+)	9 SPA. @ ABOUT 3'-8(-)	② 10 SPA. @ ABOUT 3'-3(+)	② 11 SPA. @ ABOUT 3'-0(-)	② 11 SPA. @ ABOUT 3'-0(-)	② 11 SPA. @ ABOUT 3'-0(-)
TYP. PILE SPACES @ 45°	6 SPA. @ ABOUT 6'-9(-)	6 SPA. @ ABOUT 6'-9(-)	7 SPA. @ ABOUT 5'-9(+)	8 SPA. @ ABOUT 5'-0(+)	9 SPA. @ ABOUT 4'-6(-)	10 SPA. @ ABOUT 4'-0(+)	11 SPA. @ ABOUT 3'-8(-)	11 SPA. @ ABOUT 3'-8(-)	11 SPA. @ ABOUT 3'-8(-)
④ PU, STRENGTH I DESIGN LOAD FOR PIER (KIPS)	631 KIPS	699 KIPS	776 KIPS	860 KIPS	942 KIPS	1039 KIPS	1134 KIPS	1234 KIPS	1346 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.

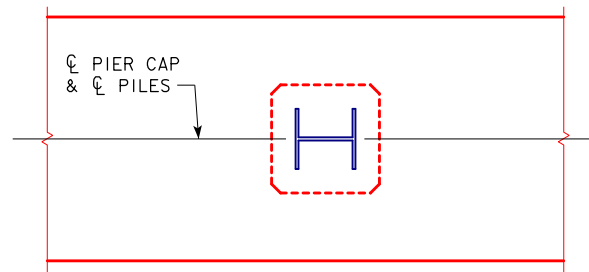
THE PIER PILES ARE TO BE DRIVEN TO FULL PENETRATION, IF PRACTICABLE, BUT IN NO CASE TO A BEARING VALUE LESS THAN THE PILE BEARING REQUIRED FOR EACH BRIDGE LENGTH AS SHOWN ON THIS SHEET. ADDITIONAL DRIVING CAPACITY MAY BE REQUIRED THROUGH SCOURABLE LAYERS. REFER TO GENERAL PLAN NOTES FOR ADDITIONAL INFORMATION.

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

09-2020
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, 3 SPAN BRIDGES

**CONTINUOUS CONCRETE
SLAB BRIDGES**

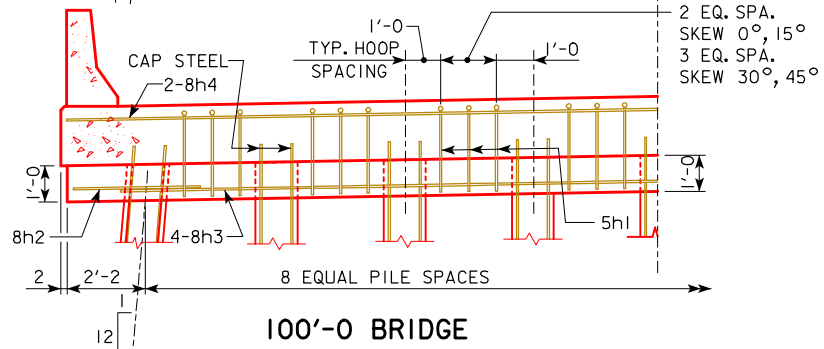
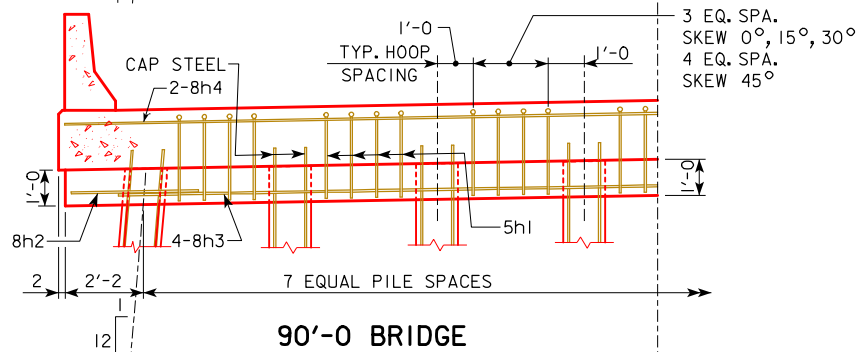
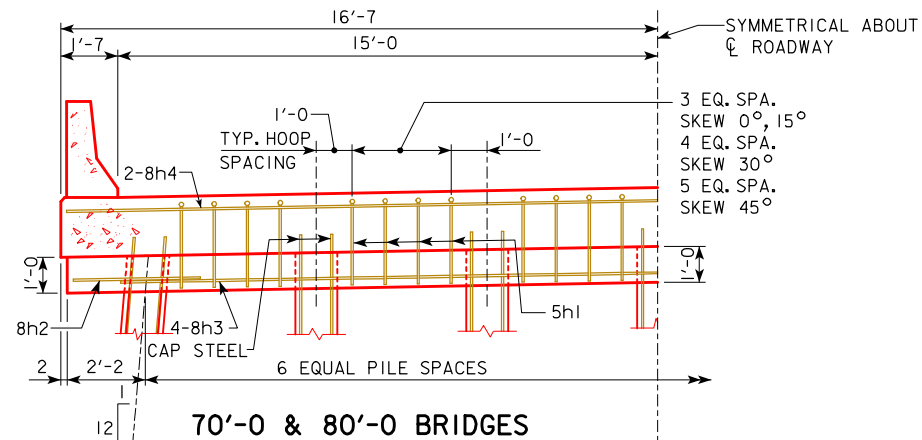
NOVEMBER, 2006

**MONOLITHIC PIER CAP DETAILS
ALL BRIDGES**

J30-23-06

SHEET 1 OF 2

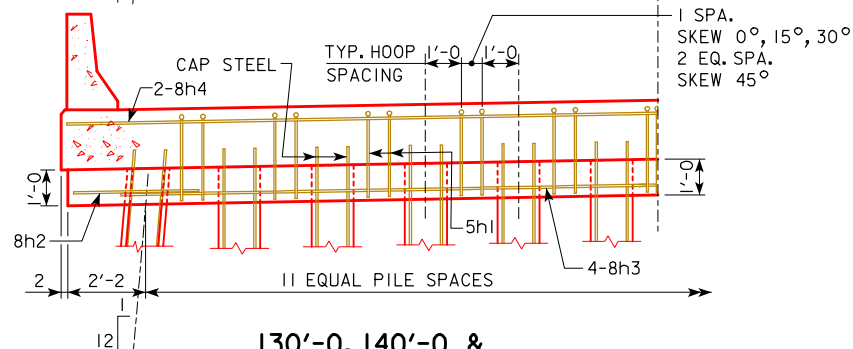
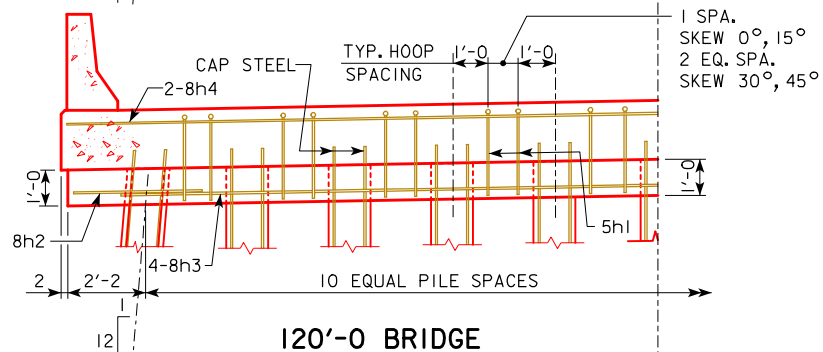
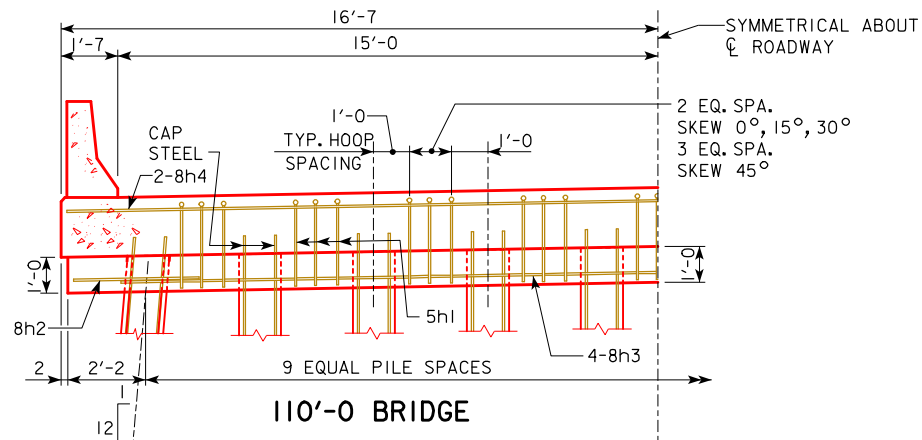
REVISED 07-2009; CHANGED THE DRAIN ANGLES DETAILS ON SECTION A-A.
REVISED 09-2020; UPDATED BRIDGE ENGINEER SIGNATURE.



HALF SECTION NEAR PIER

SHOWING STIRRUP SPACING AND NUMBER OF PILING

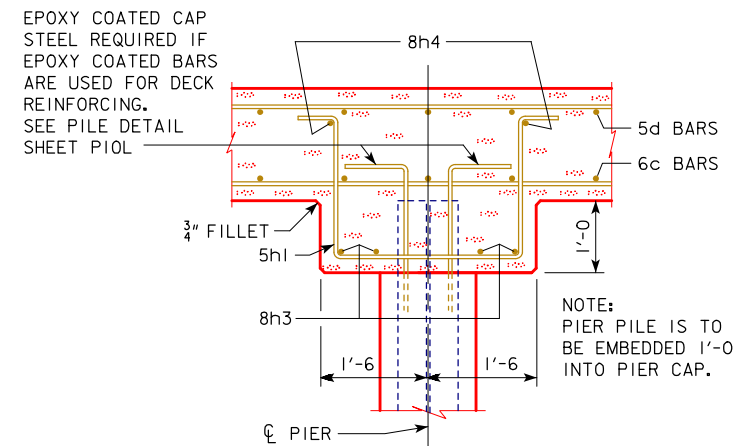
NOTE: BOTTOM OF CAP ELEVATIONS WILL BE REQUIRED AT THE CL OF ROADWAY AND AT EACH EXTERIOR PILE.



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

09-2020
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, 3 SPAN BRIDGES

**CONTINUOUS CONCRETE
SLAB BRIDGES**

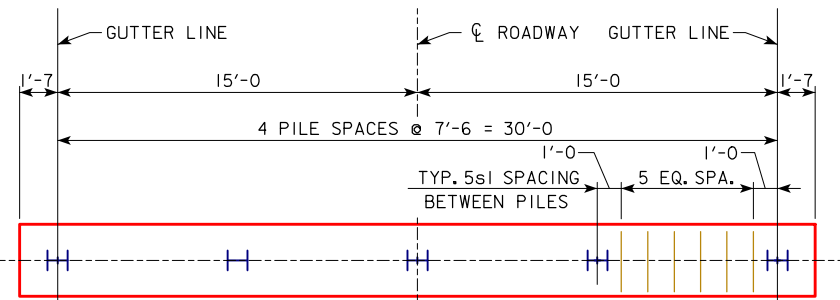
NOVEMBER, 2006

**MONOLITHIC PIER CAP DETAILS
ALL BRIDGES**

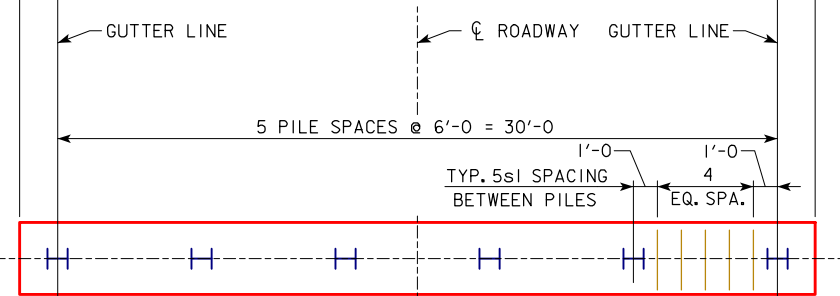
J30-24-06

SHEET 2 OF 2

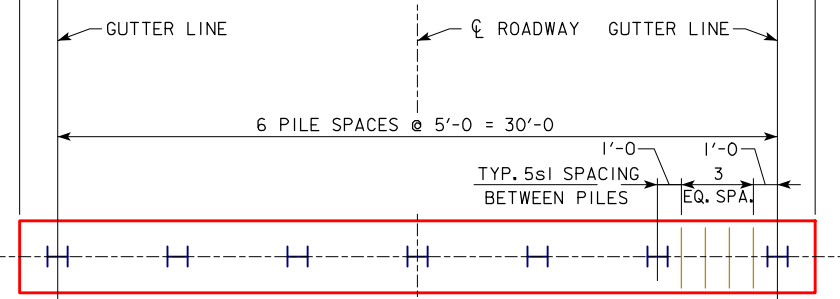
REVISED 06-2013; REVISION FOR LRFD PILE DESIGN.
REVISED 09-2020; UPDATED BRIDGE ENGINEER SIGNATURE. CHANGED PAVING BLOCK LIFTING HOOP BAR MARK, (WAS 5x1).



70'-0, 80'-0, 90'-0, 100'-0, & 110'-0 BRIDGES



120'-0 & 130'-0 BRIDGES



140'-0 & 150'-0 BRIDGES

PILE PLAN - 0° SKEW STEEL PILING

ABUTMENT NOTES:

ALL PILING HP 10x42.

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

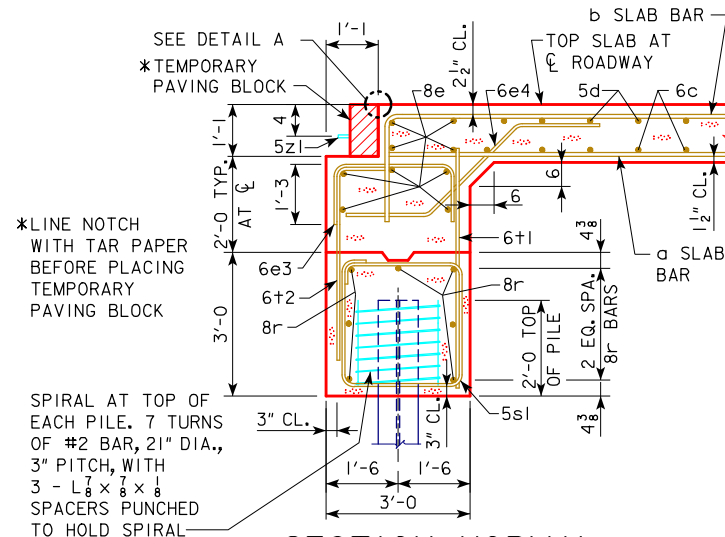
DETAILS ON THIS SHEET ARE TO BE USED ONLY WHEN ABUTMENTS ARE PLACED ON STEEL PILES. IF ROCK IS ENCOUNTERED CLOSER THAN 12'-0 BELOW ABUTMENT FOOTING, SPECIAL ANALYSIS MAY BE REQUIRED.

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.



REVISED 07-2009; CONCRETE QUANTITIES CHANGED.
REVISED 09-2020; UPDATED BRIDGE ENGINEER SIGNATURE.

BILL OF REINFORCING STEEL - ONE ABUTMENT - 0° SKEW																					
BRIDGE LENGTH				70'-0		80'-0		90'-0		100'-0		110'-0		120'-0		130'-0		140'-0		150'-0	
MARK	LOCATION	SHAPE	LENGTH	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT
8r1	ABUTMENT FOOTING LONGITUDINAL		32'-10	7	614	7	614	7	614	7	614	7	614	7	614	7	614	7	614	7	614
5s1	ABUTMENT FOOTING HOOPS		11'-0	28	321	28	321	28	321	28	321	28	321	29	333	29	333	28	321	28	321
6+1	FOOTING TO SLAB DOWELS		5'-0	36	270	36	270	36	270	36	270	36	270	36	270	36	270	36	270	36	270
6+2	FOOTING TO SLAB DOWELS		5'-7	36	302	36	302	36	302	36	302	36	302	36	302	36	302	36	302	36	302
#2	PILE SPIRAL		38'-6	5	32	5	32	5	32	5	32	5	32	6	39	6	39	7	45	7	45
	SPIRAL SPACERS - L $\frac{7}{8}$ X $\frac{7}{8}$ X $\frac{1}{8}$ X 0.70		1'-10	15	19	15	19	15	19	15	19	15	19	18	23	18	23	21	27	21	27
REINFORCING STEEL - TOTAL (LBS.)					1558		1558		1558		1558		1558		1581		1581		1579		1579

BILL OF REINFORCING STEEL - ONE ABUTMENT - 15° SKEW																					
BRIDGE LENGTH				70'-0		80'-0		90'-0		100'-0		110'-0		120'-0		130'-0		140'-0		150'-0	
MARK	LOCATION	SHAPE	LENGTH	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT
8r2	ABUTMENT FOOTING LONGITUDINAL		33'-11	7	634	7	634	7	634	7	634	7	634	7	634	7	634	7	634	7	634
5s1	ABUTMENT FOOTING HOOPS		11'-0	24	275	24	275	24	275	24	275	24	275	25	287	25	287	24	275	24	275
5s2	ABUTMENT FOOTING HOOPS		11'-3	4	47	4	47	4	47	4	47	4	47	4	47	4	47	4	47	4	47
6+1	FOOTING TO SLAB DOWELS		5'-0	36	270	36	270	36	270	36	270	36	270	36	270	36	270	36	270	36	270
6+2	FOOTING TO SLAB DOWELS		5'-7	36	302	36	302	36	302	36	302	36	302	36	302	36	302	36	302	36	302
#2	PILE SPIRAL		38'-6	5	32	5	32	5	32	5	32	5	32	5	32	6	39	6	39	7	45
	SPIRAL SPACERS - L $\frac{7}{8}$ X $\frac{7}{8}$ X $\frac{1}{8}$ X 0.70		1'-10	15	19	15	19	15	19	15	19	15	19	18	23	18	23	21	27	21	27
REINFORCING STEEL - TOTAL (LBS.)					1579		1579		1579		1579		1579		1602		1602		1600		1600

BILL OF REINFORCING STEEL - ONE ABUTMENT - 30° SKEW																					
BRIDGE LENGTH				70'-0		80'-0		90'-0		100'-0		110'-0		120'-0		130'-0		140'-0		150'-0	
MARK	LOCATION	SHAPE	LENGTH	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT
8r-2	ABUTMENT FOOTING LONGITUDINAL		37'-6	7	701	7	701	7	701	7	701	7	701	7	701	7	701	7	701	7	701
5s1	ABUTMENT FOOTING HOOPS		11'-0	30	344	30	344	30	344	30	344	30	344	30	344	30	344	30	344	30	344
5s2	ABUTMENT FOOTING HOOPS		11'-11	4	50	4	50	4	50	4	50	4	50	4	50	4	50	4	50	4	50
6+1	FOOTING TO SLAB DOWELS		5'-0	36	270	36	270	36	270	36	270	36	270	36	270	36	270	36	270	36	270
6+2	FOOTING TO SLAB DOWELS		5'-7	36	302	36	302	36	302	36	302	36	302	36	302	36	302	36	302	36	302
#2	PILE SPIRAL		38'-6	6	39	6	39	6	39	6	39	6	39	6	39	6	39	7	45	7	45
	SPIRAL SPACERS - L $\frac{7}{8}$ X $\frac{7}{8}$ X $\frac{1}{8}$ X 0.70		1'-10	18	23	18	23	18	23	18	23	18	23	18	23	18	23	21	27	21	27
REINFORCING STEEL - TOTAL (LBS.)					1729		1729		1729		1729		1729		1729		1729		1739		1739

BILL OF REINFORCING STEEL - ONE ABUTMENT - 45° SKEW																					
BRIDGE LENGTH				70'-0		80'-0		90'-0		100'-0		110'-0		120'-0		130'-0		140'-0		150'-0	
MARK	LOCATION	SHAPE	LENGTH	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT
8r2	ABUTMENT FOOTING LONGITUDINAL		45'-3	7	846	7	846	7	846	7	846	7	846	7	846	7	846	7	846	7	846
5s1	ABUTMENT FOOTING HOOPS		11'-0	42	482	42	482	42	482	42	482	42	482	42	482	42	482	42	482	42	482
5s2	ABUTMENT FOOTING HOOPS		13'-6	4	56	4	56	4	56	4	56	4	56	4	56	4	56	4	56	4	56
6+1	FOOTING TO SLAB DOWELS		5'-0	36	270	36	270	36	270	36	270	36	270	36	270	36	270	36	270	36	270
6+2	FOOTING TO SLAB DOWELS		5'-7	36	302	36	302	36	302	36	302	36	302	36	302	36	302	36	302	36	302
#2	PILE SPIRAL		38'-6	7	45	7	45	7	45	7	45	7	45	7	45	7	45	7	45	8	51
	SPIRAL SPACERS - L $\frac{7}{8}$ X $\frac{7}{8}$ X $\frac{1}{8}$ X 0.70		1'-10	21	27	21	27	21	27	21	27	21	27	21	27	21	27	21	27	24	31
REINFORCING STEEL - TOTAL (LBS.)					2028		2028		2028		2028		2028		2028		2028		2028		2038

NOTE: THE PILE SPIRALS AND SPIRAL SPACERS ARE TO BE NON-COATED REINFORCING BUT MAY BE EPOXY COATED AT THE CONTRACTORS OPTION AND EXPENSE.

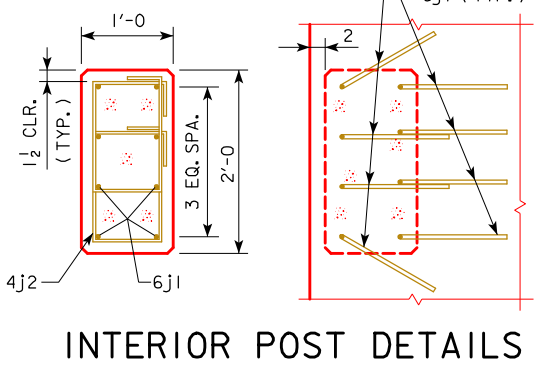
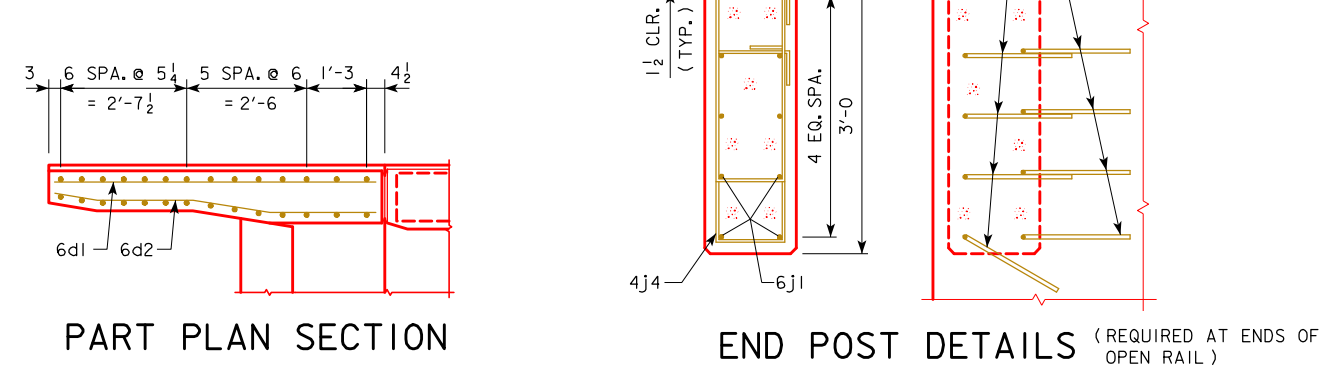
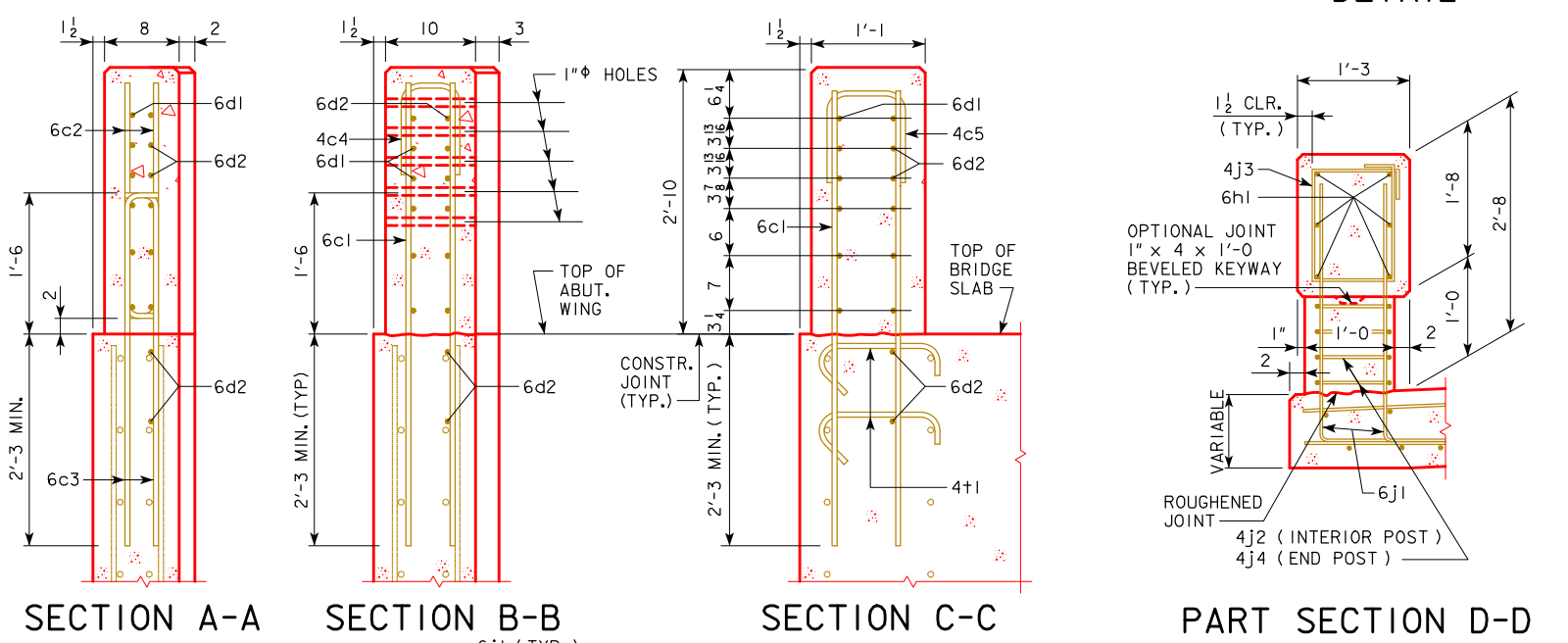
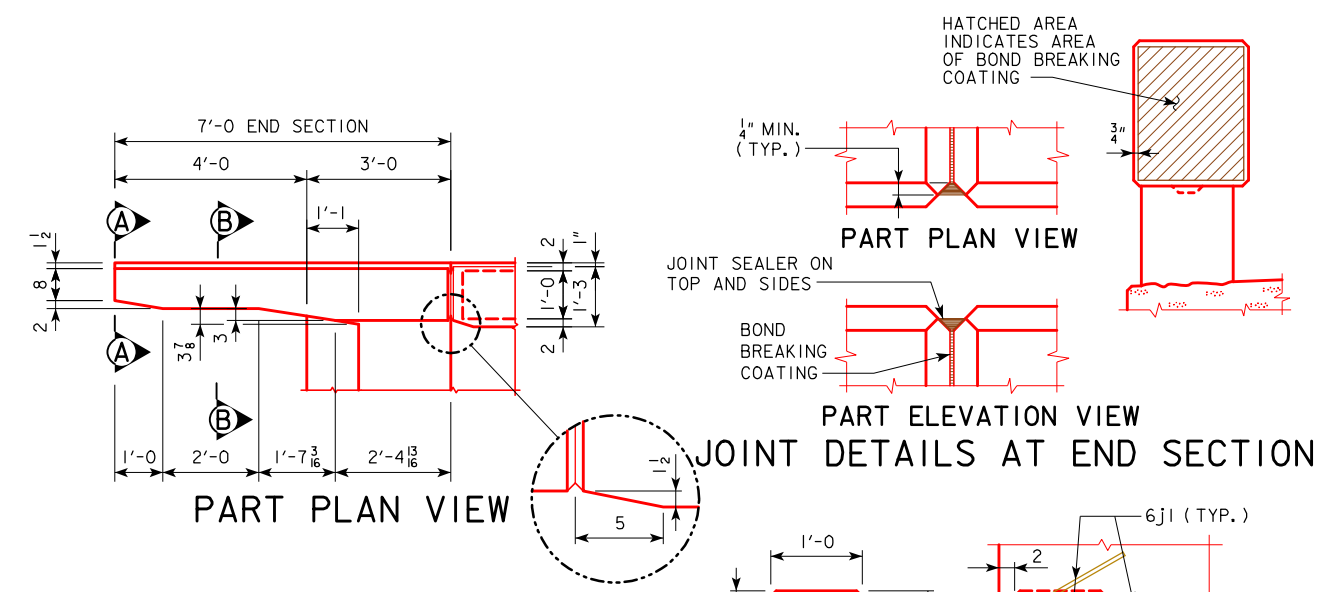
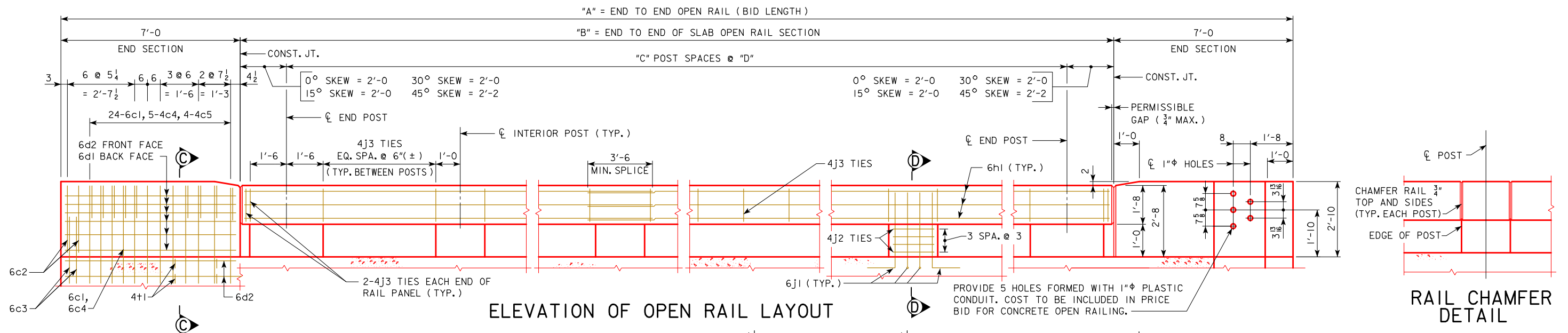
ESTIMATED QUANTITIES - ONE ABUT. - 0° SKEW											
LOCATION		UNIT	QUANTITY								
BRIDGE LENGTH			70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
STRUCTURAL CONCRETE (BRIDGE)		C.Y.	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1
REINFORCING STEEL		LBS.	1558	1558	1558	1558	1558	1581	1581	1579	1579
STEEL PILING HP 10x42		NO.	5	5	5	5	5	6	6	7	7
PREBORE HOLES		FT.	-	-	-	-	-	-	-	70	70

ESTIMATED QUANTITIES - ONE ABUT. - 15° SKEW											
LOCATION		UNIT	QUANTITY								
BRIDGE LENGTH			70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
STRUCTURAL CONCRETE (BRIDGE)		C.Y.	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5
REINFORCING STEEL		LBS.	1579	1579	1579	1579	1579	1602	1602	1600	1600
STEEL PILING HP 10x42		NO.	5	5	5	5	5	6	6	7	7
PREBORE HOLES		FT.	-	-	-	-	-	-	-	70	70

ESTIMATED QUANTITIES - ONE ABUT. - 30° SKEW											
LOCATION		UNIT	QUANTITY								
BRIDGE LENGTH			70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
STRUCTURAL CONCRETE (BRIDGE)		C.Y.	12.8	12.8	12.8	12.8	12.8	12.8	12.8	12.8	12.8
REINFORCING STEEL		LBS.	1729	1729	1729	1729	1729	1729	1729	1739	1739
STEEL PILING HP 10x42		NO.	6	6	6	6	6	6	6	7	7
PREBORE HOLES		FT.	-	-	-	-	-	-	-	70	70

TABLE OF OPEN RAIL DIMENSIONS AND NUMBERS									
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ℓ-ℓ		70'-0				80'-0				90'-0				100'-0				110'-0				120'-0				130'-0				140'-0				150'-0			
SKREW		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°	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'-10½	7'-11¾	7'-11¾	7'-3⅝	7'-3¾	7'-4¾	7'-4¾	7'-6⅞	7'-6⅞	7'-7⅞	7'-7⅞	7'-9	7'-9⅞	7'-9⅞	7'-9⅞	7'-11½	7'-11¾	7'-11½	7'-11½	7'-6¾	7'-6¾	7'-6¾	7'-7⅞	7'-8¼	7'-8⅝	7'-8⅝	7'-8⅝	7'-9⅞	7'-9⅞	7'-10¾	7'-10¾	7'-11⅝	7'-11¾	7'-11⅝	7'-11⅝



09-2020 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER		
		STANDARD DESIGN - 30' ROADWAY, 3 SPAN BRIDGES CONTINUOUS CONCRETE SLAB BRIDGES NOVEMBER, 2006	
		OPEN RAIL DETAILS (TL-4)	J30-43-06

REVISED 07-2009: NUMBER OF 6d1 & 6d2 BARS CHANGED AND IS REFLECTED IN THE WEIGHT CHANGE.
REVISED 07-2016: REMOVED OPEN RAIL NOTE STATING "ALL OPEN RAIL REINFORCING STEEL IS TO BE INCLUDED WITH THE SUPERSTRUCTURE REINFORCING STEEL."
REVISED 09-2020: UPDATED BRIDGE ENGINEER SIGNATURE.

EPOXY 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			
4+1	WING FOOTING TIE BARS		16	VARIES	21	16	VARIES	21	16	VARIES	21	16	VARIES	21	16	VARIES	21	16	VARIES	21	16	VARIES	21	16	VARIES	21	16	VARIES	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.

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

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	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	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	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	324.5

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.

IF PLANS SPECIFY THAT THE REINFORCING STEEL IN THE SLAB BE EPOXY COATED, ALL OPEN RAIL REINFORCING STEEL SHALL ALSO BE EPOXY COATED. OTHERWISE THE OPEN RAIL REINFORCING SHALL NOT BE EPOXY COATED.

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 C 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.

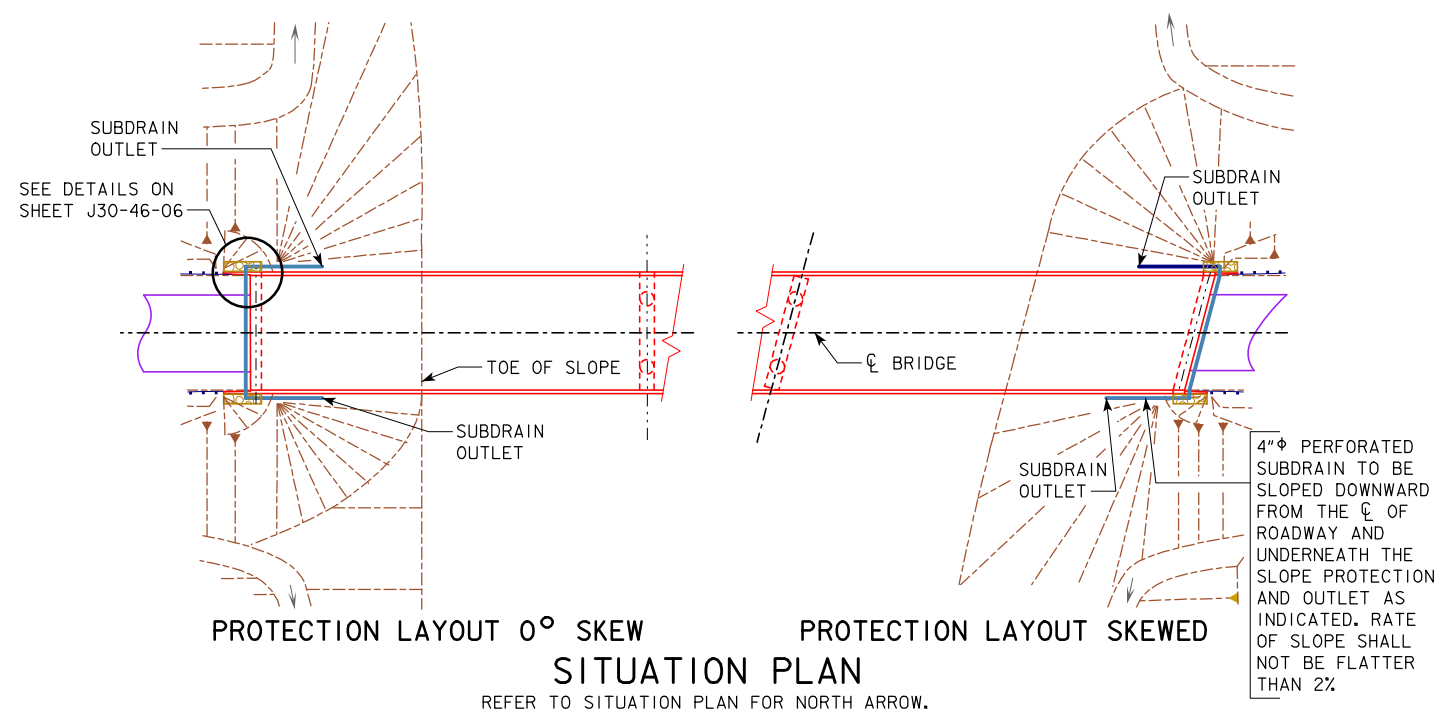
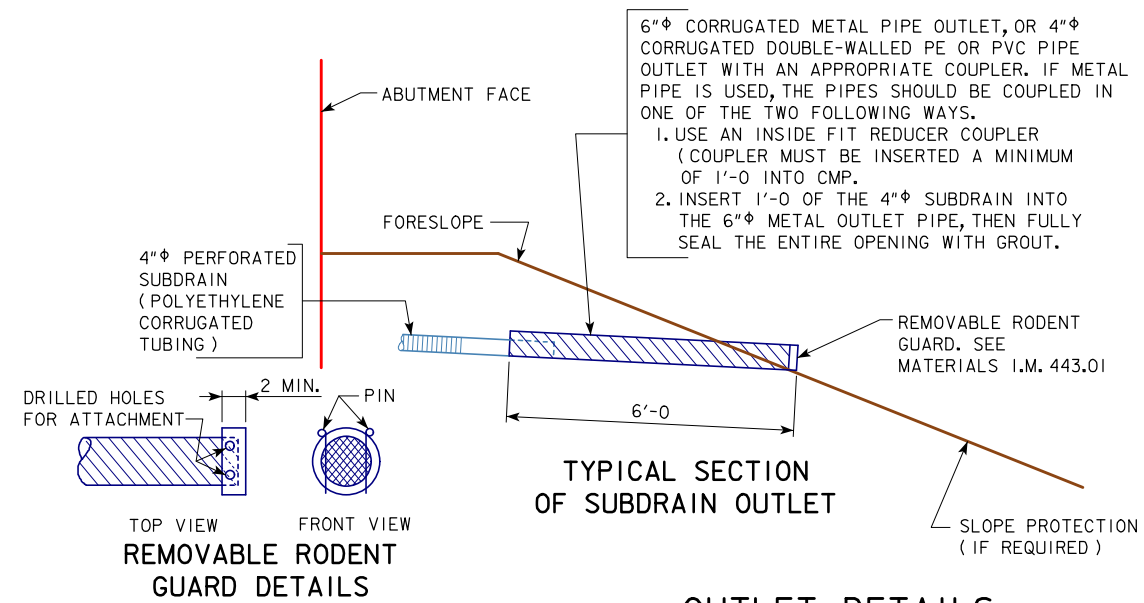
09-2020
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

STANDARD DESIGN - 30' ROADWAY, 3 SPAN BRIDGES
**CONTINUOUS CONCRETE
SLAB BRIDGES**
NOVEMBER, 2006

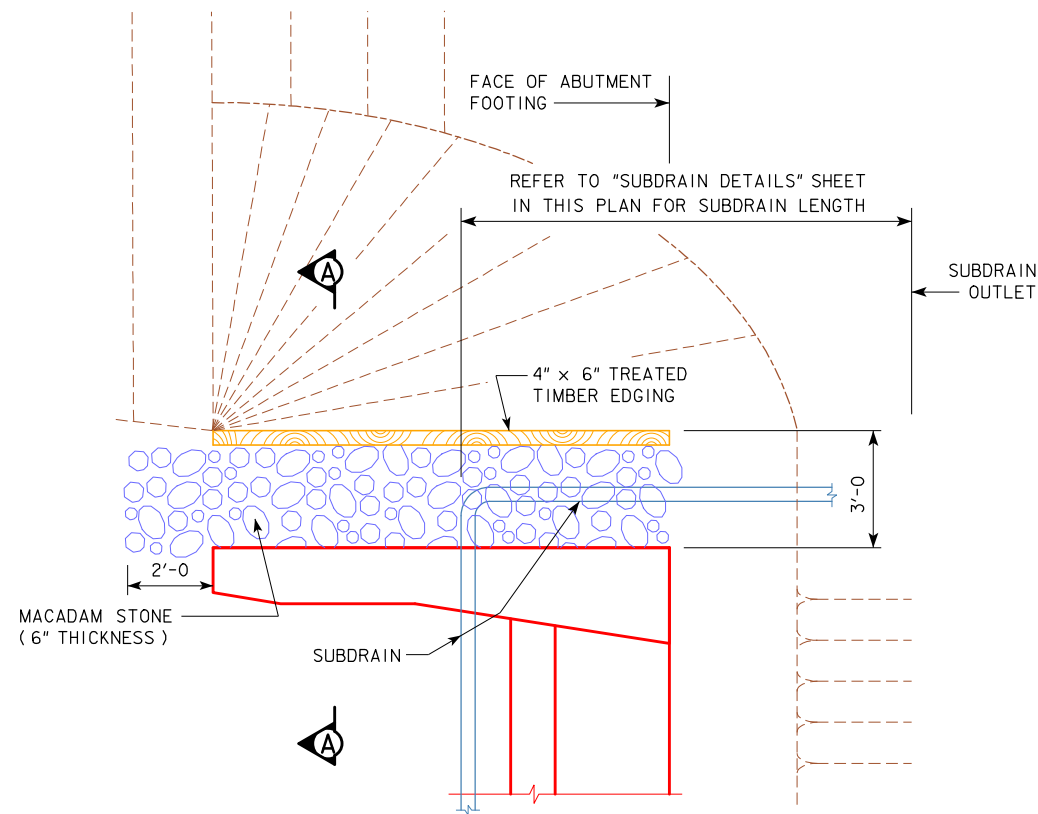
OPEN RAIL DETAILS
(TL-4)

J30-44-06

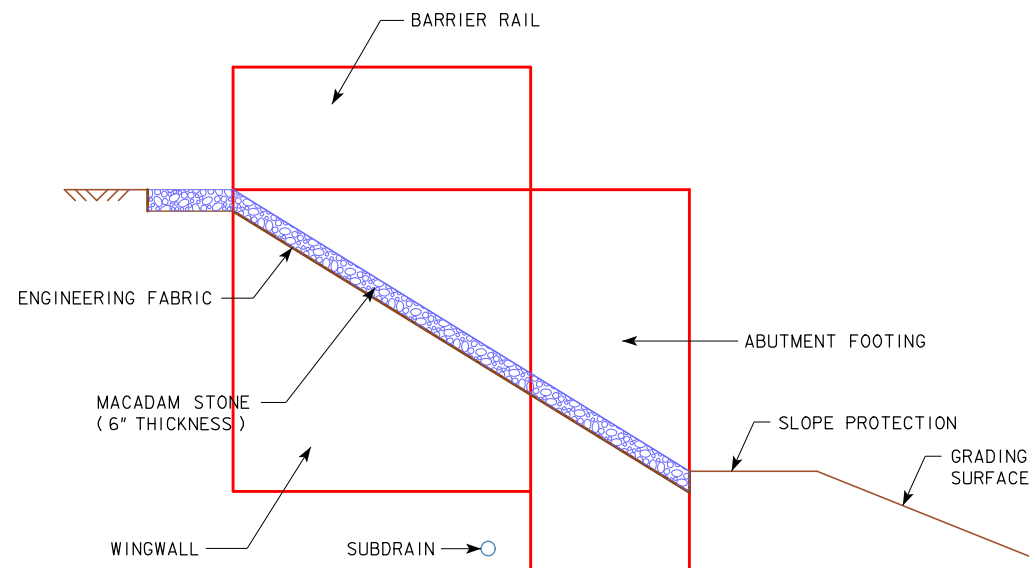


09-2020 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER		
		STANDARD DESIGN - 30' ROADWAY, 3 SPAN BRIDGES CONTINUOUS CONCRETE SLAB BRIDGES NOVEMBER, 2006	
		SUBDRAIN DETAILS	J30-45-06

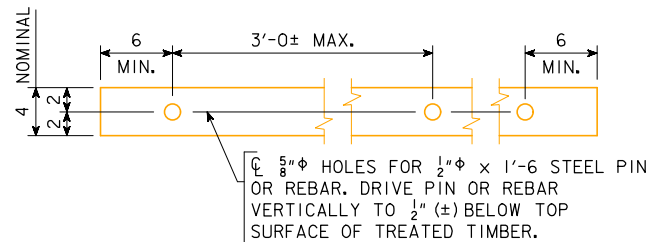
REVISED 09-2014: THE AREA OF MACADAM STONE WAS EXTENDED 2'-0" IN FRONT OF THE BRIDGE WING.
REVISED 09-2020: UPDATED BRIDGE ENGINEER SIGNATURE.



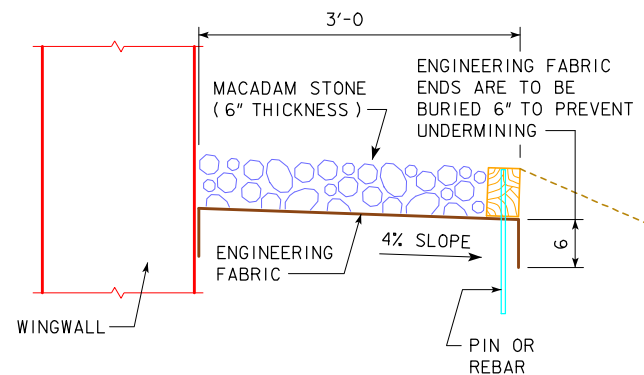
TOP VIEW OF WING ARMORING



PROFILE VIEW OF WING ARMORING



4" x 6" TREATED TIMBER EDGING DETAILS



SECTION A-A

SUBDRAIN NOTES:

SEE J30-45-06 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 BE 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 AND BE 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.

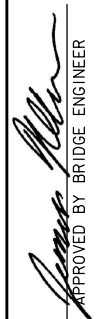
THE ENGINEERING FABRIC SHALL BE IN ACCORDANCE WITH ARTICLE 4196.01, B, 3, OF THE STANDARD SPECIFICATIONS. IF THE ENGINEERING FABRIC IS LAPPED THE LAPS SHALL BE A MINIMUM OF ONE FOOT IN LENGTH, SHINGLE FASHION WITH UP SLOPE LAP PIECE ON TOP AND STAPLED FOR CONTINUITY.

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

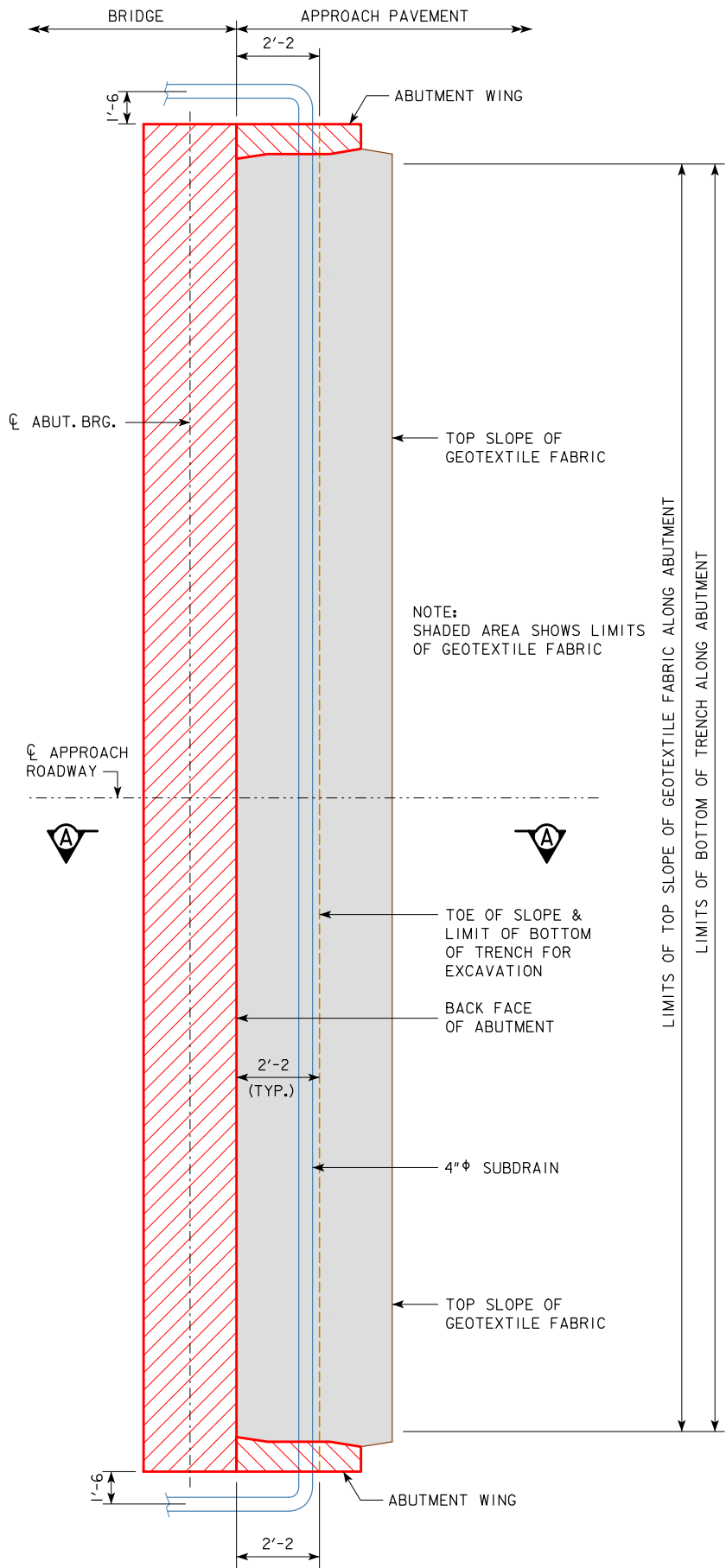
WOOD PRESERVATIVE TREATMENT FOR THE TIMBER EDGING SHALL MEET THE REQUIREMENTS FOR GUARDRAIL POSTS, SAWED FOUR SIDES, AND BE IN ACCORDANCE WITH SECTION 4161, OF THE STANDARD SPECIFICATIONS.

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.

09-2020 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER		
		STANDARD DESIGN - 30' ROADWAY, 3 SPAN BRIDGES CONTINUOUS CONCRETE SLAB BRIDGES NOVEMBER, 2006	
		WING ARMORING DETAILS	J30-46-06

REVISED 09-2014: THE TECHNICAL DATA INFORMATION TABLE WAS REMOVED AND A NOTE ADDED TO REFER TO THE STANDARDS SPECIFICATIONS FOR THIS INFORMATION.
REVISED 07-2016: CHANGED THE BRIDGE APPROACH PAVEMENT STANDARD TO "BR" (WAS "RK").
REVISED 09-2020: UPDATED BRIDGE ENGINEER SIGNATURE.



ABUTMENT PLAN

ABUTMENT BACKFILL PROCESS:

THE BASE OF THE EXCAVATION SUBGRADE BEHIND THE ABUTMENT IS TO BE GRADED WITH A 4% SLOPE AWAY FROM THE ABUTMENT FOOTING AND A 2% CROSS SLOPE IN THE DIRECTION OF THE SUBDRAIN OUTLET. THIS EXCAVATION SHAPING IS TO BE DONE PRIOR TO BEGINNING INSTALLATION OF THE GEOTEXTILE AND BACKFILL MATERIAL.

AFTER THE SUBGRADE HAS BEEN SHAPED, THE GEOTEXTILE FABRIC SHALL BE INSTALLED IN ACCORDANCE WITH THE DETAILS SHOWN. THE FABRIC IS INTENDED TO BE INSTALLED IN THE BASE OF THE EXCAVATION AND EXTENDED VERTICALLY UP THE ABUTMENT BACKWALL, ABUTMENT WING WALLS, AND EXCAVATION FACE TO A HEIGHT THAT WILL BE APPROXIMATELY 1 TO 2 FOOT HIGHER THAN THE HEIGHT OF THE POROUS BACKFILL PLACEMENT AS SHOWN IN THE "BACKFILL DETAILS" ON THIS SHEET. THE STRIPS OF THE FABRIC PLACED SHALL OVERLAP APPROXIMATELY 1 FOOT AND SHALL BE PINNED IN PLACE. THE FABRIC SHALL BE ATTACHED TO THE ABUTMENT BY USING LATH FOLDED IN THE FABRIC AND SECURED TO THE CONCRETE WITH SHALLOW CONCRETE NAILS. THE FABRIC PLACED AGAINST THE EXCAVATION FACE SHALL BE PINNED.

WHEN THE FABRIC IS IN PLACE, THE SUBDRAIN SHALL BE INSTALLED DIRECTLY ON THE FABRIC AT THE TOE OF THE REAR EXCAVATION SLOPE. A SLOT WILL NEED TO BE CUT IN THE FABRIC AT THE POINT WHERE THE SUBDRAIN EXITS THE FABRIC NEAR THE END OF THE ABUTMENT WING WALL.

POROUS BACKFILL IS THEN PLACED AND LEVELED, NO COMPACTION IS REQUIRED.

THE REMAINING WORK INVOLVES BACKFILLING WITH FLOODABLE BACKFILL, SURFACE FLOODING, AND VIBRATORY COMPACTION. THE FLOODABLE BACKFILL MATERIAL SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. THE FLOODABLE BACKFILL SHALL BE PLACED IN INDIVIDUAL LIFTS, SURFACE FLOODED, AND COMPACTED WITH VIBRATORY COMPACTION TO ENSURE FULL CONSOLIDATION. LIMIT THE LOOSE LIFTS TO NO MORE THAN 2 FEET OF THICKNESS.

START SURFACE FLOODING FOR EACH FLOODABLE BACKFILL LIFT AT THE HIGH POINT OF THE SUBDRAIN AND PROGRESS TO THE LOW POINT WHERE THE SUBDRAIN EXITS THE FABRIC. TO ENSURE UNIFORM SURFACE FLOODING, WATER RUNNING FULL IN A 2-INCH DIAMETER HOSE SHOULD BE SPRAYED IN SUCCESSIVE 6-FOOT TO 8-FOOT INCREMENTS FOR 5 MINUTES WITHIN EACH INCREMENT.

FLOODABLE BACKFILL LIFT PLACEMENT, FLOODING, AND COMPACTION SHALL PROGRESS UNTIL THE REQUIRED FULL THICKNESS OF THE ABUTMENT BACKFILL HAS BEEN COMPLETED.

WATER REQUIRED FOR FLOODING, SUBDRAINS, POROUS BACKFILL, FLOODABLE BACKFILL, AND GEOTEXTILE FABRIC FURNISHED AT THE BRIDGE ABUTMENTS WILL NOT BE MEASURED SEPARATELY FOR PAYMENT.

THE COST OF WATER REQUIRED FOR FLOODING, SUBDRAINS, POROUS BACKFILL, FLOODABLE BACKFILL, AND GEOTEXTILE FABRIC FURNISHED AT THE BRIDGE ABUTMENTS SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR STRUCTURAL CONCRETE.

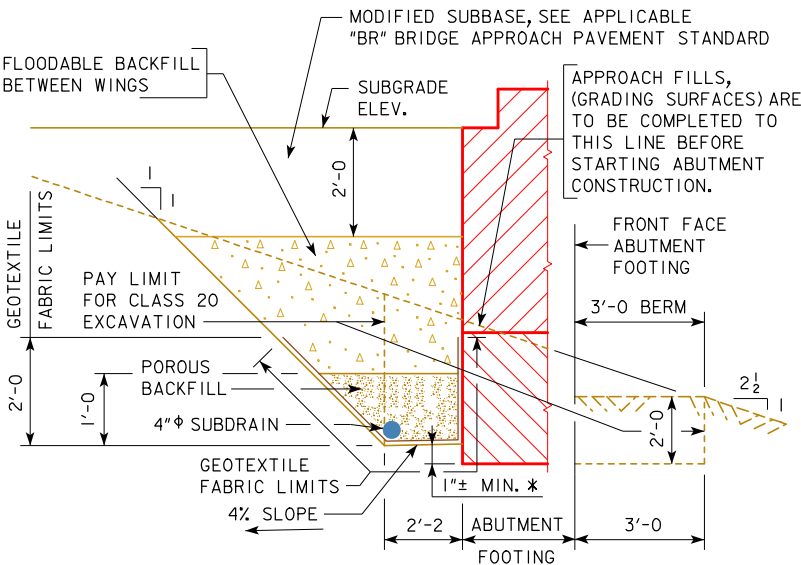
NOTE:
SEE SUBDRAIN DETAILS SHEET FOR DETAILS NOT SHOWN ON THIS SHEET WHICH ARE PERTINENT TO THIS STRUCTURE.

NOTE:

SUBDRAIN SHALL SLOPE DOWNWARD 2% FROM CL APPROACH ROADWAY WHEN OUTLETTING BOTH SIDES OF THE ABUTMENT.

SUBDRAIN SHALL SLOPE DOWNWARD 2% FROM HIGH END WHEN OUTLETTING AT ONE END OF THE ABUTMENT.

THE GEOTEXTILE FABRIC SHALL BE IN ACCORDANCE WITH ARTICLE 4196.01, B, 6 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.



SECTION A-A
BACKFILL DETAILS

NOTE: GEOTEXTILE FABRIC WILL BE ATTACHED TO FACE OF ABUTMENT FOOTING AND WINGS.

* DIMENSION VARIES DUE TO 2% SUBDRAIN SLOPE.

09-2020
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

IOWA DOT Highway Division

STANDARD DESIGN - 30' ROADWAY, 3 SPAN BRIDGES

**CONTINUOUS CONCRETE
SLAB BRIDGES**

DECEMBER, 2008

**ABUTMENT BACKFILL
DETAILS**
FOR 0° SKEWS

J30-47-06

Diagram illustrating the reinforcement details for a 10' diameter cap steel. The cap is 1'-4" thick. The reinforcement consists of 8 bars (3'-2" x 3'-2") and 4 hoops (Lap 10' at Splice). The weight of the cap steel is 40 lb. The diagram also shows a cross-section of the cap, indicating a 1'-4" thickness and a 1'-5" diameter. The top of the pile is shown at the top of the cap.

Weight of Cap Steel=34 lb.

Notes:
 ⑦ The steel should be coated with an epoxy.

Spiral Welded or Seamless
Steel Pipe ASTM A252
GR. 2 or GR. 3

□ 8 - $\frac{1}{2}$ " $\varnothing$ Strands,
 □ 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

#7 Bars

K

$2\frac{1}{2}"$

$K + \frac{1}{4}"$

$K - \frac{3}{4}"$

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 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.

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.

Prestressed Pile Notes:
Except as otherwise noted all exposed corners 90° or sharper shall be filleted $\frac{3}{4}$ ".
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.

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.

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 manip

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.

K Dimension	in	140	160		
G Min, Below Ground	ft	24	27		
H Max, Above Ground	ft	18	22		
Shell ASTM A-252		Gr. 2	Gr. 3	Gr. 2	Gr. 3
Concrete (L=40")	cy	1.49	1.49	1.95	1.95
Concrete 1' Change	cy	0.0372	0.0373	0.0488	0.0488
1# Wt. of Shell (L=40")	lb	1325	1231	1600	1600
Wt. of Shell 1' Change	lb	32.26	29.94	38.77	38.77
f'c	ksi	4.0	4.0	4.0	4.0
5 Nominal Resistance Pn	kips	119	119	137	137

Strand Strength	270k	
K Dimension	in	14 1/2 16 1/2
G Min, Below Ground	ft	24 27
⑥ H Max, Above Ground	ft	18 22
Concrete (L=40")	cy	2.01 2.62
Concrete 1" Change	cy	0.050 0.066
② Reinforcing (L=40")	lb	232 280
Reinforcing 1" Change	lb	3.93 5.10
Max. L 1 Pt. Pick-Up	ft	57 60
Max. L 2 Pt. Pick-Up	ft	82 86
f'c	ksf	5.0 5.0
⑤ Nominal Resistance Pn	kips	127 146
③ Initial Prestress	kips	174 231

Steel H Pile		HP10x42	HP10x57	HP12x53	HP14x73	HP14x89	
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
	Concrete (E=18')	cy	1.40	1.38	2.02	3.17	3.15
Round	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
	Pc = 4.0 ksf						

By: James R. Allen
Bridge Engineer

LRFD Trestle Pile Bents - P10L