



**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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J24-03-06	SUPERSTRUCTURE DETAILS 70'-0 BRIDGE
J24-04-06	SUPERSTRUCTURE DETAILS 80'-0 BRIDGE
J24-05-06	SUPERSTRUCTURE DETAILS 80'-0 BRIDGE
J24-06-06	SUPERSTRUCTURE DETAILS 90'-0 BRIDGE
J24-07-06	SUPERSTRUCTURE DETAILS 90'-0 BRIDGE
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J24-45-06	ABUTMENT BACKFILL DETAILS - 15°, 30°, & 45° SKEWS

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-1 (SRL-1)

• PILE BENTS: STANDARD CONCRETE-FILLED STEEL PIPE PILES (PIOL), STANDARD PRESTRESSED CONCRETE PILES (PIOL), OR STANDARD H-PILES (PIOL AND SRL-1)

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-1 (SRL-1) REPLACES THE 50 TON STEEL PILE DESIGNATION.

FOR MORE INFORMATION ON SRL-1, 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 (5d IS ⅝" 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:

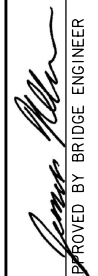

DESIGN: AASHTO LRFD, SERIES OF 2004 WITH INTERIM 2005.

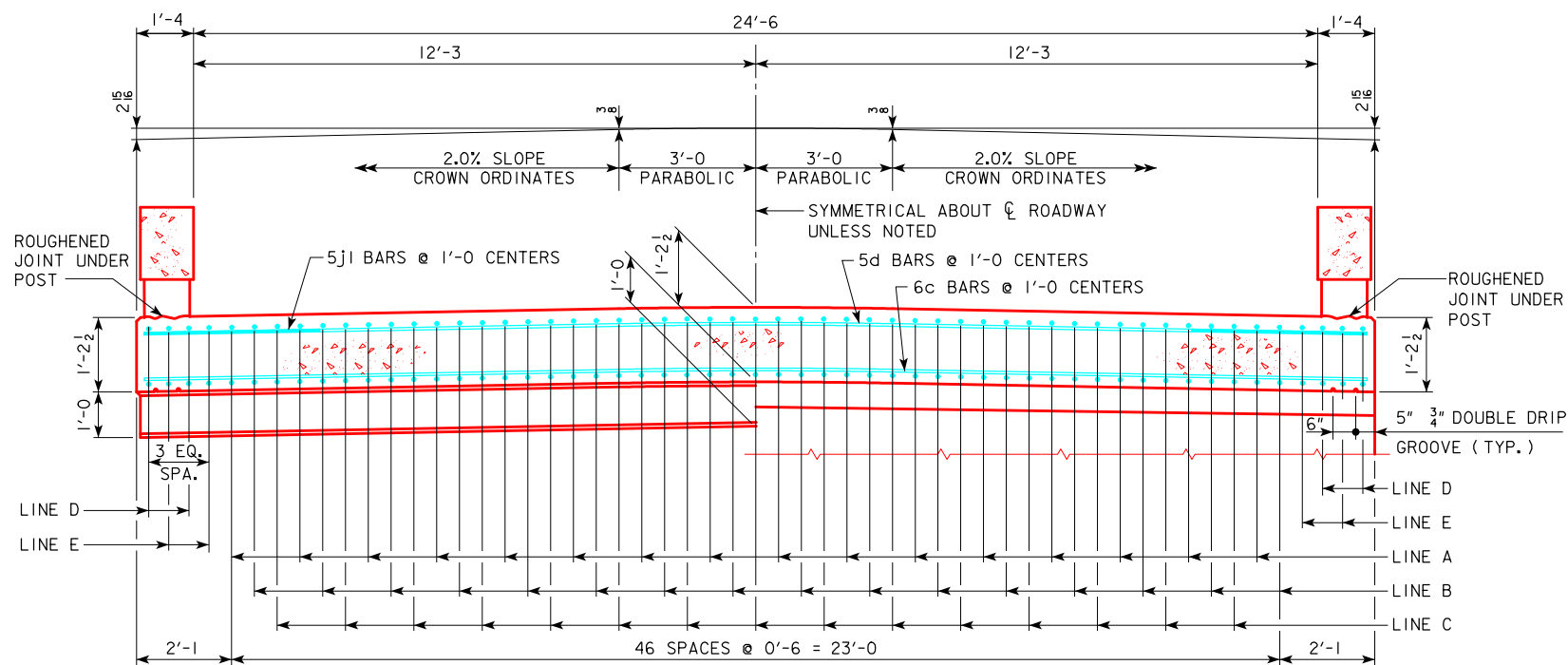
CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2012, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

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.

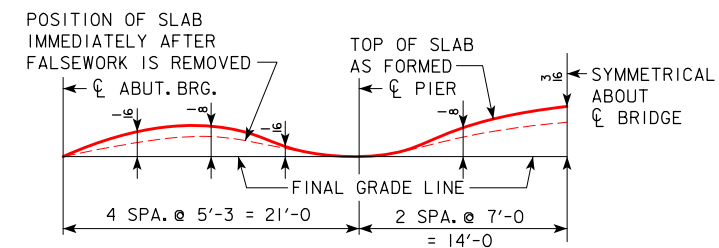
08-2022 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER 		
		STANDARD DESIGN - 24'-0 ROADWAY, 3 SPAN BRIDGES	
		CONTINUOUS CONCRETE SLAB BRIDGES NOVEMBER, 2006	
INDEX AND GENERAL NOTES		J24-01-06	



HALF SECTION NEAR PIER HALF SECTION NEAR ABUTMENT

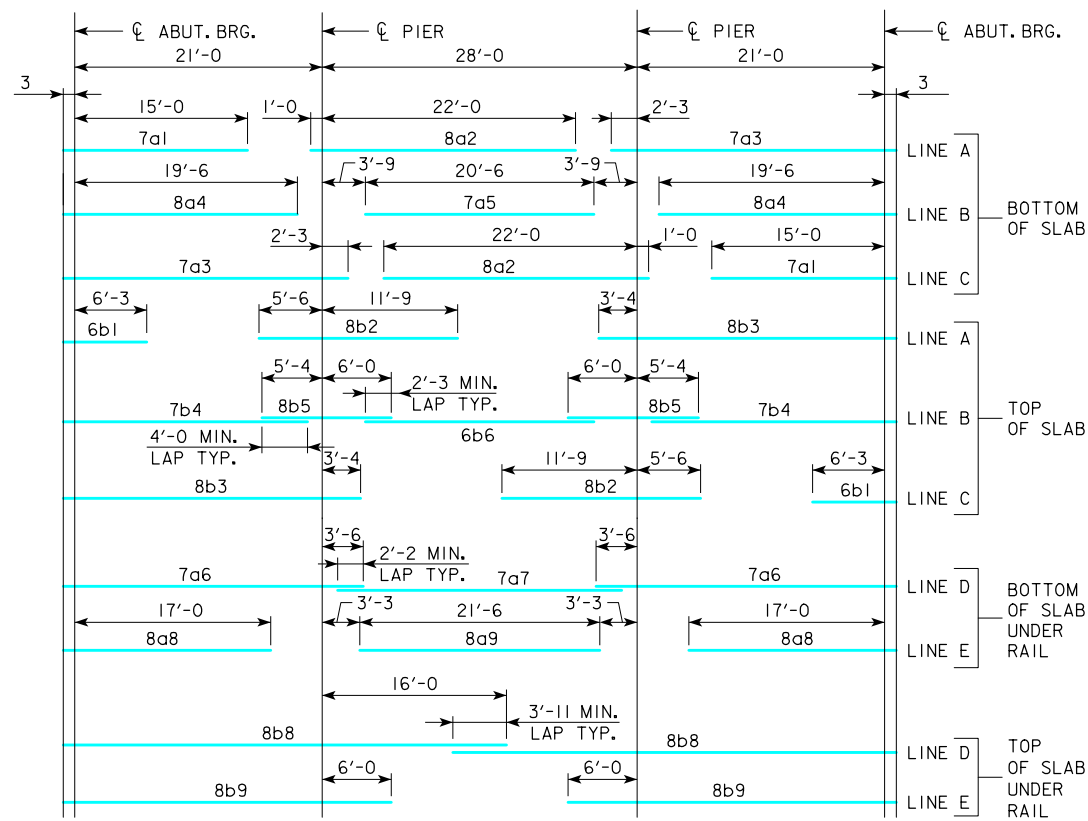
SLAB CROSS-SECTIONAL AREA
FOR OPEN RAIL = 32.83 SQ. FT.

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.



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.



PLACEMENT FOR LONGITUDINAL REINFORCEMENT

REVISED 06-12 - UPDATE TO NEW BRIDGE ENGINEER SIGNATURE
REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE.

08-2022 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER <i>[Signature]</i>	IOWADOT	
		STANDARD DESIGN - 24'-0" ROADWAY, 3 SPAN BRIDGES	
		CONTINUOUS CONCRETE SLAB BRIDGES	
		NOVEMBER, 2006	
		SUPERSTRUCTURE DETAILS 70'-0" BRIDGE	J24-02-06

BILL OF REINFORCING STEEL FOR SUPERSTRUCTURE - 70' BRIDGE

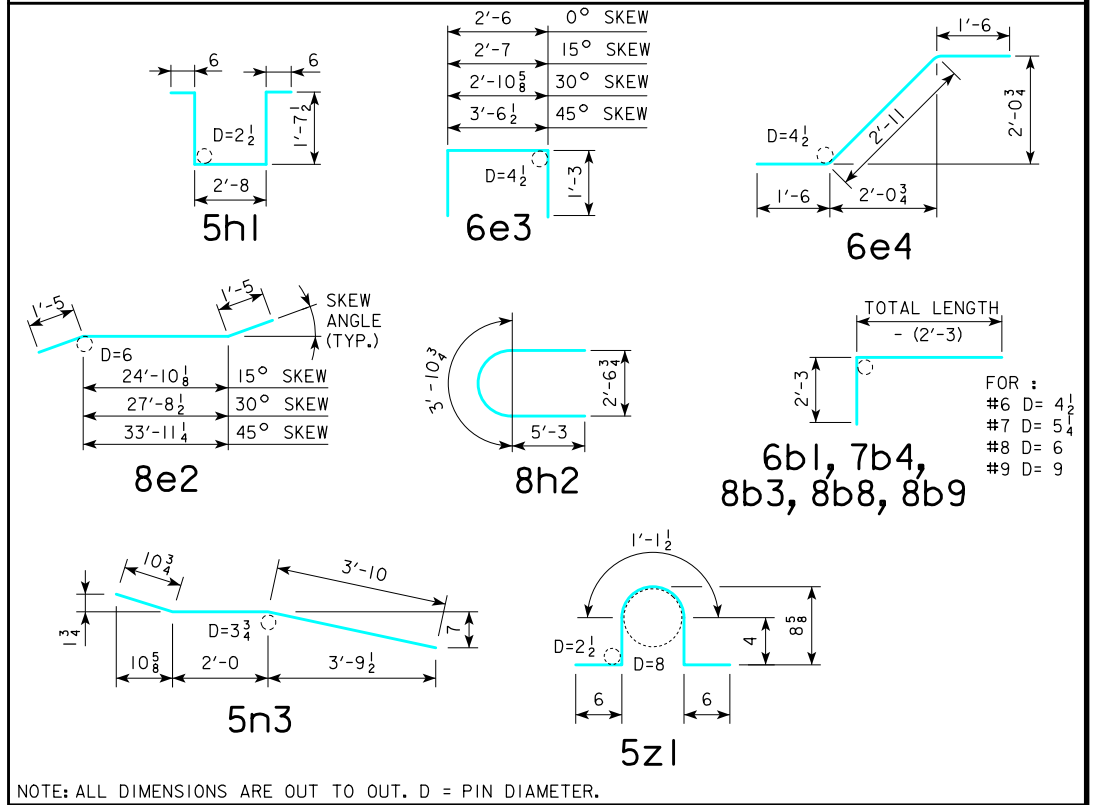
LOCATION	SKEW	SHAPE	BAR	0°		15°		30°		45°					
				NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT
SLAB LONGITUDINAL BOTTOM			7a1	31	15'-3	967	31	15'-3	967	31	15'-3	967	31	15'-3	967
SLAB LONGITUDINAL BOTTOM			8a2	31	23'-0	1904	31	23'-0	1904	31	23'-0	1904	31	23'-0	1904
SLAB LONGITUDINAL BOTTOM			7a3	31	23'-6	1490	31	23'-6	1490	31	23'-6	1490	31	23'-6	1490
SLAB LONGITUDINAL BOTTOM			8a4	32	19'-9	1688	32	19'-9	1688	32	19'-9	1688	32	19'-9	1688
SLAB LONGITUDINAL BOTTOM			7a5	16	20'-6	671	16	20'-6	671	16	20'-6	671	16	20'-6	671
SLAB LONGITUDINAL BOTTOM, AT RAIL			7a6	8	24'-9	405	8	24'-9	405	8	24'-9	405	8	24'-9	405
SLAB LONGITUDINAL BOTTOM, AT RAIL			7a7	4	25'-4	208	4	25'-4	208	4	25'-4	208	4	25'-4	208
SLAB LONGITUDINAL BOTTOM, AT RAIL			8a8	8	17'-3	369	8	17'-3	369	8	17'-3	369	8	17'-3	369
SLAB LONGITUDINAL BOTTOM, AT RAIL			8a9	4	21'-6	230	4	21'-6	230	4	21'-6	230	4	21'-6	230
SLAB LONGITUDINAL TOP			6b1	31	8'-9	408	31	8'-9	408	31	8'-9	408	31	8'-9	408
SLAB LONGITUDINAL TOP			8b2	31	17'-3	1428	31	17'-3	1428	31	17'-3	1428	31	17'-3	1428
SLAB LONGITUDINAL TOP			8b3	31	26'-10	2221	31	26'-10	2221	31	26'-10	2221	31	26'-10	2221
SLAB LONGITUDINAL TOP			7b4	32	22'-2	1450	32	22'-2	1450	32	22'-2	1450	32	22'-2	1450
SLAB LONGITUDINAL TOP			8b5	32	11'-4	969	32	11'-4	969	32	11'-4	969	32	11'-4	969
SLAB LONGITUDINAL TOP			6b6	16	20'-6	493	16	20'-6	493	16	20'-6	493	16	20'-6	493
SLAB LONGITUDINAL TOP, AT RAIL			8b8	8	39'-6	844	8	39'-6	844	8	39'-6	844	8	39'-6	844
SLAB LONGITUDINAL TOP, AT RAIL			8b9	8	29'-6	631	8	29'-6	631	8	29'-6	631	8	29'-6	631
SLAB TRANSVERSE, BOTTOM			6c1	67	26'-10	2701	67	27'-9	2793	56	26'-10	2258	46	26'-10	1854
SLAB TRANSVERSE ENDS, BOTTOM			6c2	-	-	-	-	-	-	24	VARIES	579	44	VARIES	970
SLAB TRANSVERSE, TOP			5d1	67	26'-10	1876	67	27'-9	1940	56	26'-10	1568	46	26'-10	1288
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	40	6'-11	289	40	6'-11	289	50	6'-11	361	60	6'-11	433
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	132	8'-6	1171	132	8'-6	1171	132	8'-6	1171	130	8'-6	1153
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.						26,184			26,415			26,826			27,422
OPEN RAIL - SEE LIST ON RAIL SHEET J24-41-06						5100			5100			5100			5100
TOTAL - LBS. WITH MONOLITHIC PIER CAP AND OPEN RAIL						31,284			31,515			31,926			32,522
TOTAL - LBS. WITH NON-MONOLITHIC PIER CAP AND OPEN RAIL						30,044			30,248			30,492			30,810
SAME AS ABOVE EXCEPT ALL "h" BARS DELETED															

ESTIMATED QUANTITIES FOR SUPERSTRUCTURE - 70' BRIDGE

ITEM	SKEW	WITH MONOLITHIC PIER CAP				WITH NON-MONOLITHIC PIER CAP			
		0°	15°	30°	45°	0°	15°	30°	45°
OPEN RAIL	*STRUCTURAL CONCRETE (BRIDGE) C.Y.	107.7	108.4	110.8	115.8	103.5	104.0	106.0	110.0
OPEN RAIL	REINFORCING STEEL LBS.	31,284	31,515	31,926	32,522	30,044	30,248	30,492	30,810
OPEN RAIL	LIN. FT.	162.0	162.2	162.9	164.5	162.0	162.2	162.9	164.5

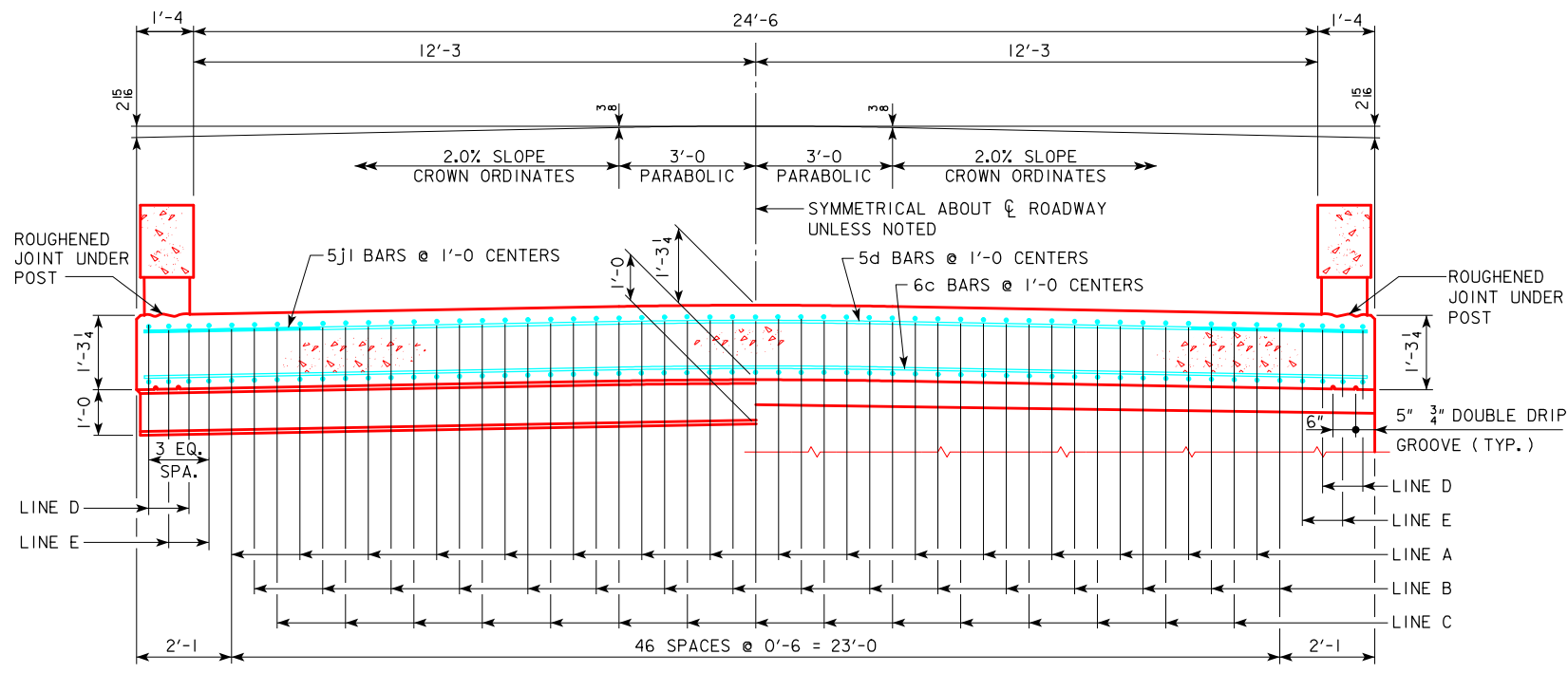
* INCLUDES 4 WINGS @ 0.68 C.Y. EACH AND 2 TEMPORARY PAVING BLOCKS; EXCLUDES RAIL CONCRETE.

BENT BAR DETAILS



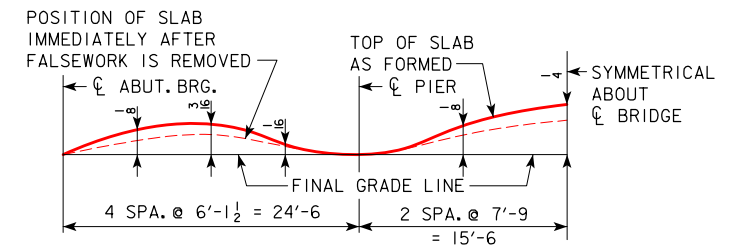
REVISED 07-09 - OPEN RAIL REINF. QTY. CHANGED WHICH CHANGED TOTAL REINF. QTY. REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE. CHANGED PAVING BLOCK LIFTING HOOP BAR MARK, (WAS 5x1).

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 70'-0 BRIDGE
		J24-03-06



HALF SECTION NEAR PIER HALF SECTION NEAR ABUTMENT

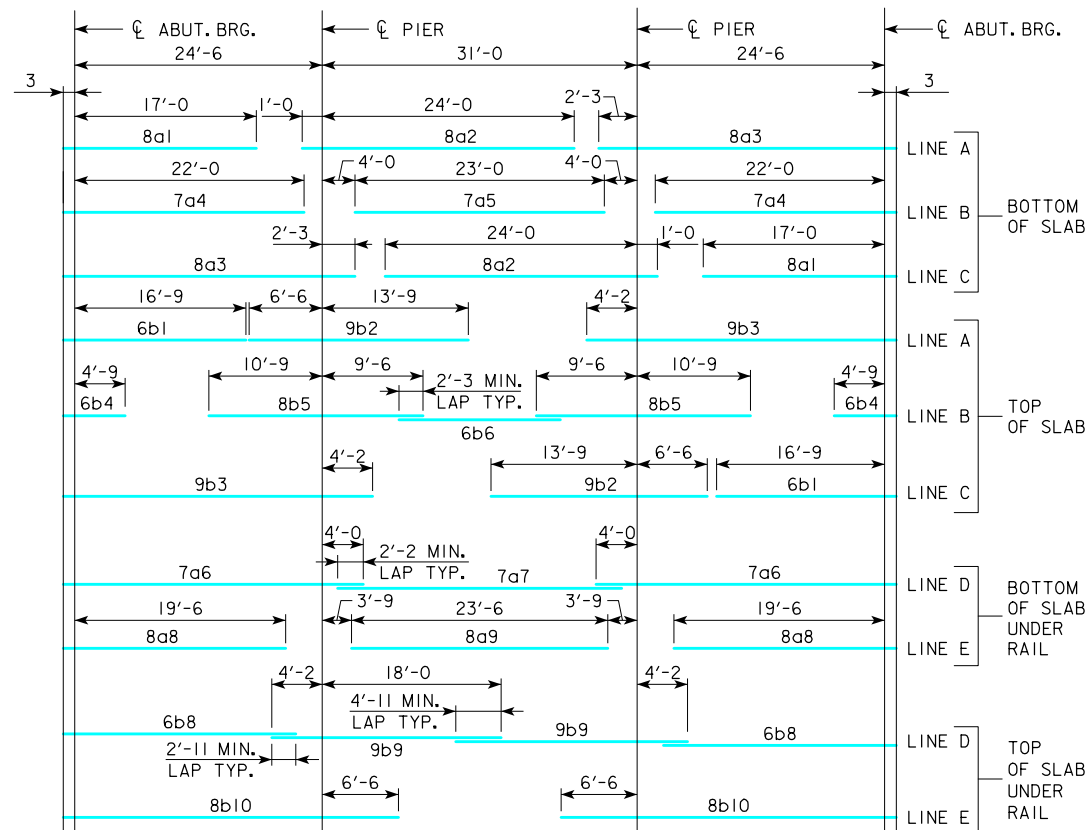
SLAB CROSS-SECTIONAL AREA
FOR OPEN RAIL = 34.53 SQ. FT.



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

REVISED 06-12 - I.M. REQUIREMENT ADDED TO BAR CHAIR NOTE.
REVISED 08-2022 - UPDATED BRIDGE ENGINEER SIGNATURE.

08-2022 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER <i>[Signature]</i>	IOWA DOT	
		STANDARD DESIGN - 24'-0" ROADWAY, 3 SPAN BRIDGES CONTINUOUS CONCRETE SLAB BRIDGES NOVEMBER, 2006	
SUPERSTRUCTURE DETAILS 80'-0" BRIDGE		J24-04-06	

BILL OF REINFORCING STEEL FOR SUPERSTRUCTURE - 80' BRIDGE

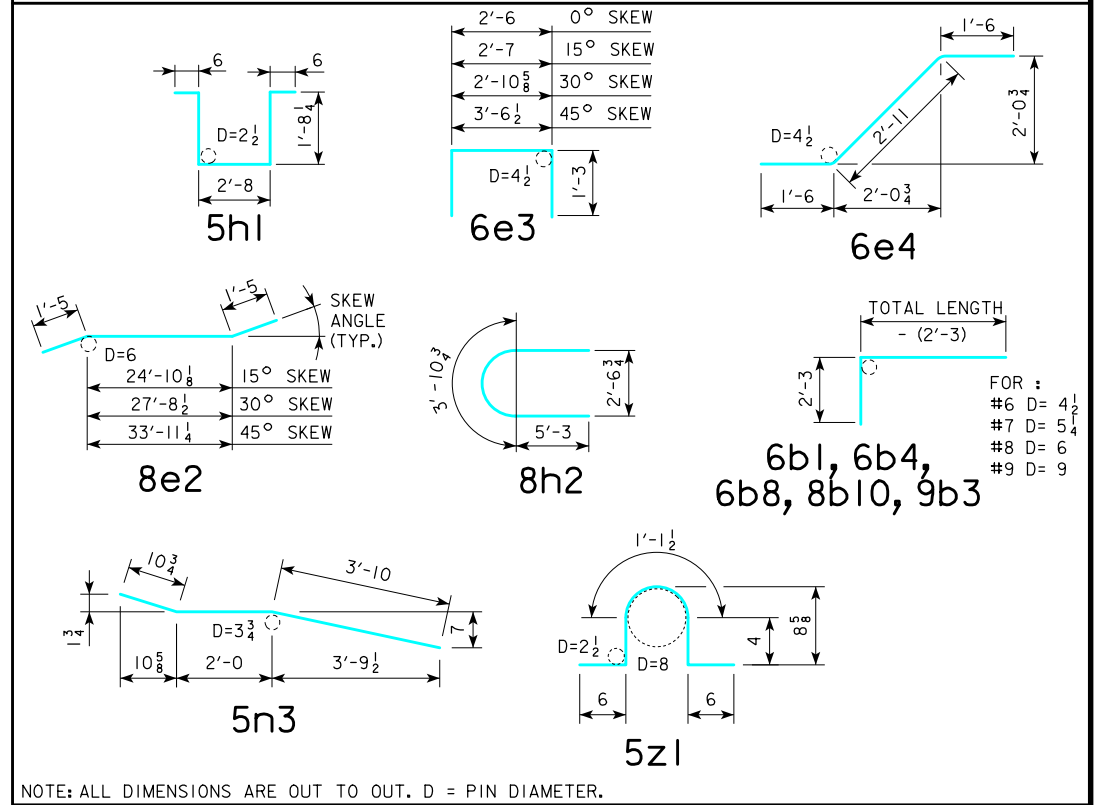
LOCATION	SKEW	SHAPE	BAR	0°		15°		30°		45°					
				NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT
SLAB LONGITUDINAL BOTTOM			8a1	31	17'-3	1428	31	17'-3	1428	31	17'-3	1428	31	17'-3	1428
SLAB LONGITUDINAL BOTTOM			8a2	31	25'-0	2070	31	25'-0	2070	31	25'-0	2070	31	25'-0	2070
SLAB LONGITUDINAL BOTTOM			8a3	31	27'-0	2235	31	27'-0	2235	31	27'-0	2235	31	27'-0	2235
SLAB LONGITUDINAL BOTTOM			7a4	32	22'-3	1456	32	22'-3	1456	32	22'-3	1456	32	22'-3	1456
SLAB LONGITUDINAL BOTTOM			7a5	16	23'-0	753	16	23'-0	753	16	23'-0	753	16	23'-0	753
SLAB LONGITUDINAL BOTTOM, AT RAIL			7a6	8	28'-9	471	8	28'-9	471	8	28'-9	471	8	28'-9	471
SLAB LONGITUDINAL BOTTOM, AT RAIL			7a7	4	27'-4	224	4	27'-4	224	4	27'-4	224	4	27'-4	224
SLAB LONGITUDINAL BOTTOM, AT RAIL			8a8	8	19'-9	422	8	19'-9	422	8	19'-9	422	8	19'-9	422
SLAB LONGITUDINAL BOTTOM, AT RAIL			8a9	4	23'-6	251	4	23'-6	251	4	23'-6	251	4	23'-6	251
SLAB LONGITUDINAL TOP			6b1	31	19'-3	897	31	19'-3	897	31	19'-3	897	31	19'-3	897
SLAB LONGITUDINAL TOP			9b2	31	20'-3	2135	31	20'-3	2135	31	20'-3	2135	31	20'-3	2135
SLAB LONGITUDINAL TOP			9b3	31	31'-2	3285	31	31'-2	3285	31	31'-2	3285	31	31'-2	3285
SLAB LONGITUDINAL TOP			6b4	32	7'-3	349	32	7'-3	349	32	7'-3	349	32	7'-3	349
SLAB LONGITUDINAL TOP			8b5	32	20'-3	1731	32	20'-3	1731	32	20'-3	1731	32	20'-3	1731
SLAB LONGITUDINAL TOP			6b6	16	16'-6	397	16	16'-6	397	16	16'-6	397	16	16'-6	397
SLAB LONGITUDINAL TOP, AT RAIL			6b8	8	25'-9	310	8	25'-9	310	8	25'-9	310	8	25'-9	310
SLAB LONGITUDINAL TOP, AT RAIL			9b9	8	22'-2	603	8	22'-2	603	8	22'-2	603	8	22'-2	603
SLAB LONGITUDINAL TOP, AT RAIL			8b10	8	33'-6	716	8	33'-6	716	8	33'-6	716	8	33'-6	716
SLAB TRANSVERSE, BOTTOM			6c1	77	26'-10	3104	77	27'-9	3210	66	26'-10	2661	56	26'-10	2258
SLAB TRANSVERSE ENDS, BOTTOM			6c2	-	-	-	-	-	-	24	VARIES	579	44	VARIES	970
SLAB TRANSVERSE, TOP			5d1	77	26'-10	2156	77	27'-9	2229	66	26'-10	1848	56	26'-10	1568
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
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	40	7'-1	296	40	7'-1	296	50	7'-1	370	60	7'-1	444
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	152	8'-6	1348	152	8'-6	1348	152	8'-6	1348	150	8'-6	1330
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.						30,408			30,662			31,052			31,651
OPEN RAIL - SEE LIST ON RAIL SHEET J24-41-06						5799			5799			5799			5799
TOTAL - LBS. WITH MONOLITHIC PIER CAP AND OPEN RAIL						36,207			36,461			36,851			37,450
TOTAL - LBS. WITH NON-MONOLITHIC PIER CAP AND OPEN RAIL						34,960			35,187			35,408			35,727
SAME AS ABOVE EXCEPT ALL "h" BARS DELETED															

ESTIMATED QUANTITIES FOR SUPERSTRUCTURE - 80' BRIDGE

ITEM	SKEW	WITH MONOLITHIC PIER CAP				WITH NON-MONOLITHIC PIER CAP			
		0°	15°	30°	45°	0°	15°	30°	45°
OPEN RAIL	*STRUCTURAL CONCRETE (BRIDGE) C.Y.	124.7	125.4	127.8	132.7	120.5	121.0	123.0	126.9
OPEN RAIL	REINFORCING STEEL LBS.	36,207	36,461	36,851	37,450	34,960	35,187	35,408	35,727
OPEN RAIL	LIN. FT.	182.0	182.2	182.9	184.5	182.0	182.2	182.9	184.5

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

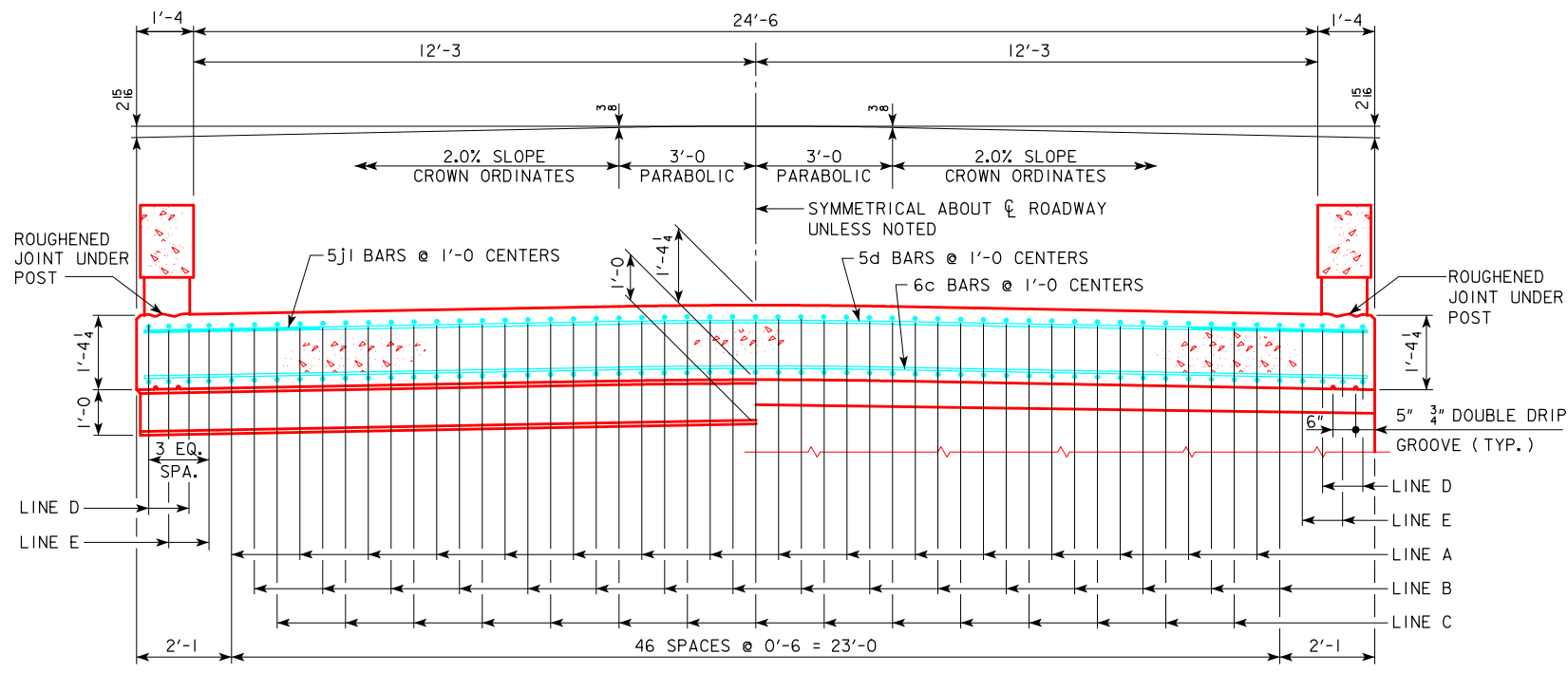
BENT BAR DETAILS



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

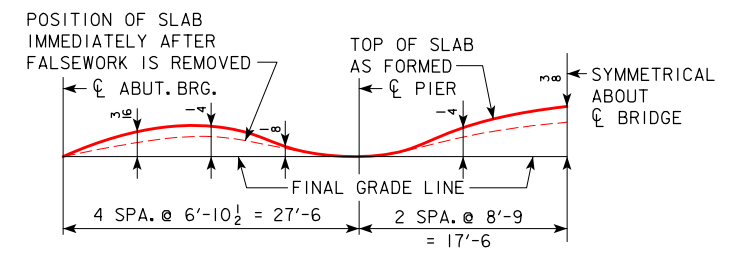
REVISED 07-09 - OPEN RAIL REINF. QTY'S. CHANGED WHICH CHANGED TOTAL REINF. QTY'S. REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE. CHANGED PAVING BLOCK LIFTING HOOP BAR MARK, (WAS 5x1).

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 80'-0 BRIDGE J24-05-06
		SUPERSTRUCTURE DETAILS 80'-0 BRIDGE	



HALF SECTION NEAR PIER HALF SECTION NEAR ABUTMENT

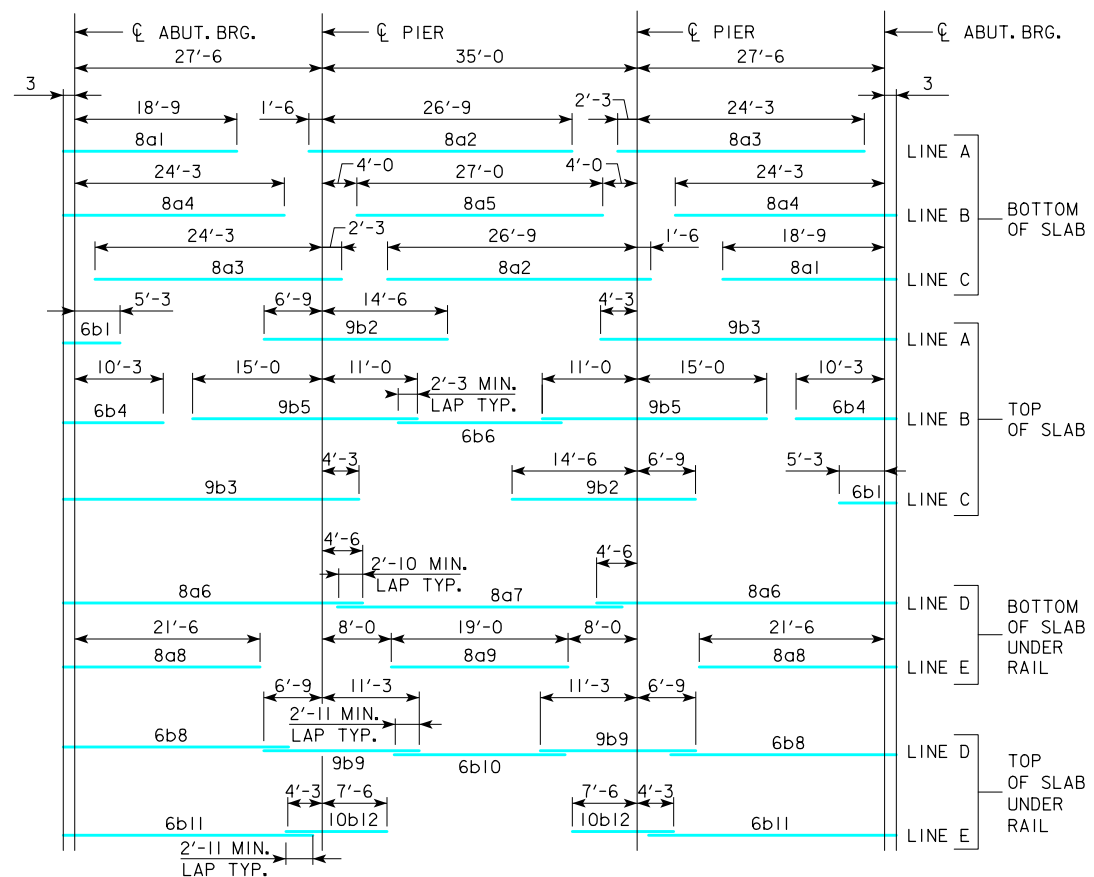
SLAB CROSS-SECTIONAL AREA
FOR OPEN RAIL = 36.79 SQ. FT.



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

REVISED 06-12 - I.M. REQUIREMENT ADDED TO BAR CHAIR NOTE.
REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE.

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

BILL OF REINFORCING STEEL FOR SUPERSTRUCTURE - 90' BRIDGE

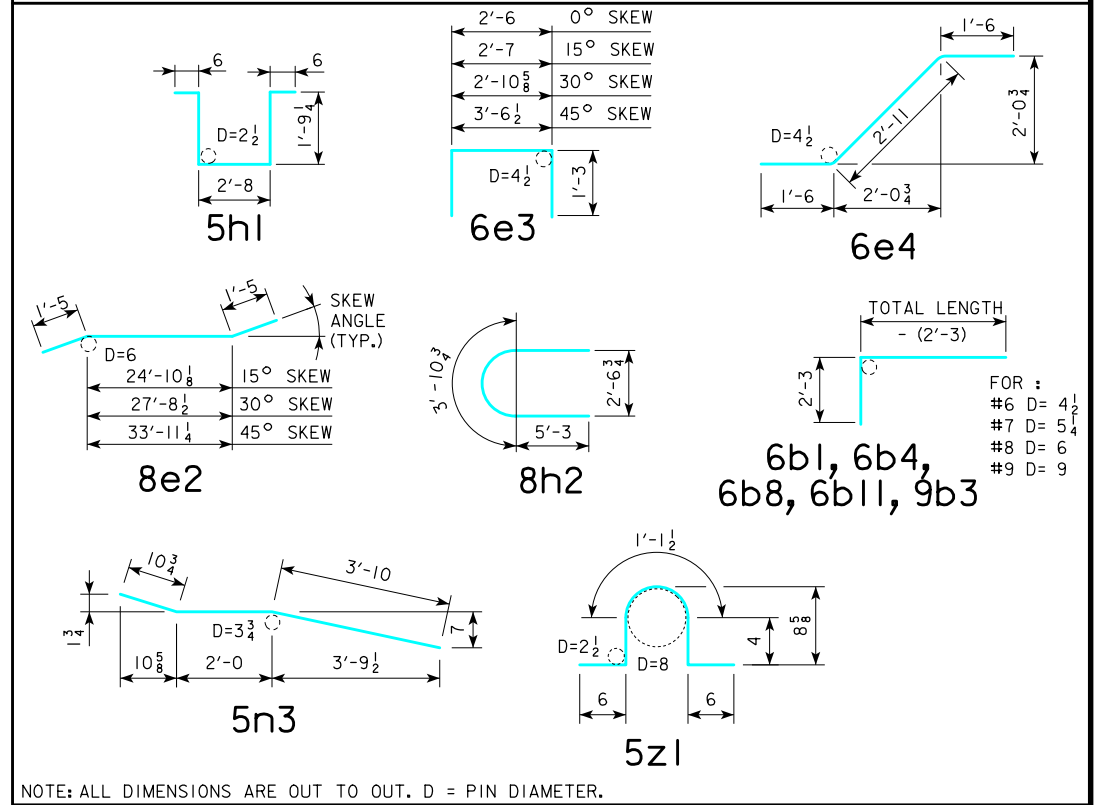
LOCATION	SKEW	SHAPE	BAR	0°		15°		30°		45°					
				NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT
SLAB LONGITUDINAL BOTTOM			8a1	31	19'-0	1573	31	19'-0	1573	31	19'-0	1573	31	19'-0	1573
SLAB LONGITUDINAL BOTTOM			8a2	31	28'-3	2339	31	28'-3	2339	31	28'-3	2339	31	28'-3	2339
SLAB 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			9b1	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

ITEM	SKEW	WITH MONOLITHIC PIER CAP				WITH NON-MONOLITHIC PIER CAP			
		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
OPEN RAIL	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

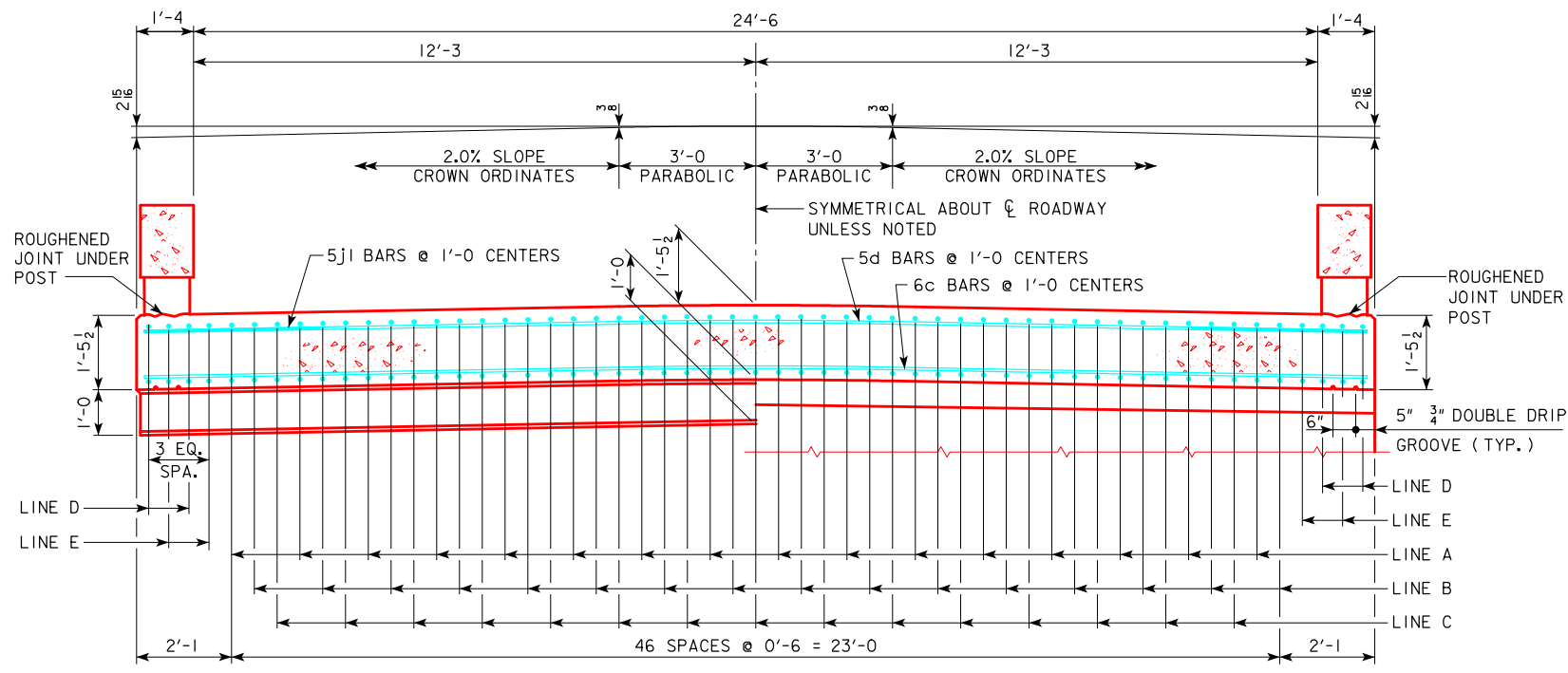
* INCLUDES 4 WINGS @ 0.68 C.Y. EACH AND 2 TEMPORARY PAVING BLOCKS; EXCLUDES RAIL CONCRETE.

BENT BAR DETAILS



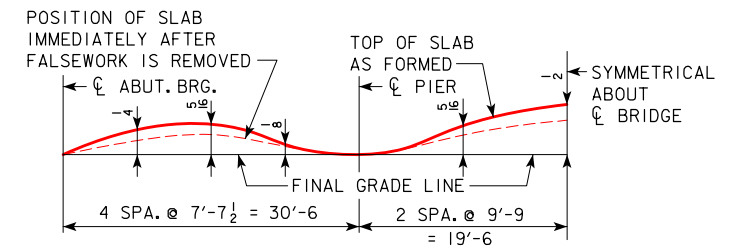
REVISED 07-09 - OPEN RAIL REINF. QTY'S. CHANGED WHICH CHANGED TOTAL REINF. QTY'S. REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE. CHANGED PAVING BLOCK LIFTING HOOP BAR MARK, (WAS 5x1).

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



HALF SECTION NEAR PIER HALF SECTION NEAR ABUTMENT

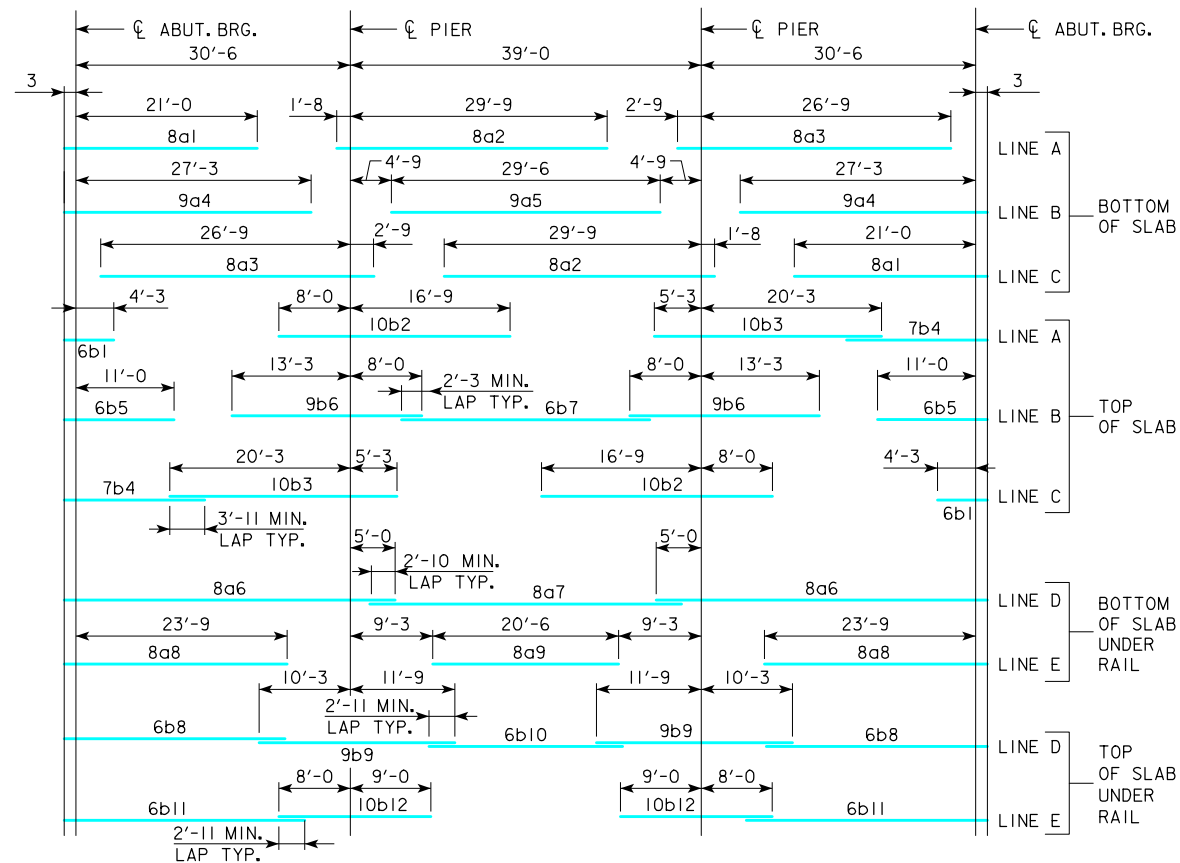
SLAB CROSS-SECTIONAL AREA
FOR OPEN RAIL = 39.62 SQ. FT.



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

REVISED 06-12 - I.M. REQUIREMENT ADDED TO BAR CHAIR NOTE.
REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE.

08-2022 LATEST REVISION DATE		APPROVED BY BRIDGE ENGINEER	IOWA DOT	
			STANDARD DESIGN - 24'-0 ROADWAY, 3 SPAN BRIDGES	
			CONTINUOUS CONCRETE SLAB BRIDGES	
			NOVEMBER, 2006	
			SUPERSTRUCTURE DETAILS 100'-0 BRIDGE	J24-08-06

BILL OF REINFORCING STEEL FOR SUPERSTRUCTURE - 100' BRIDGE

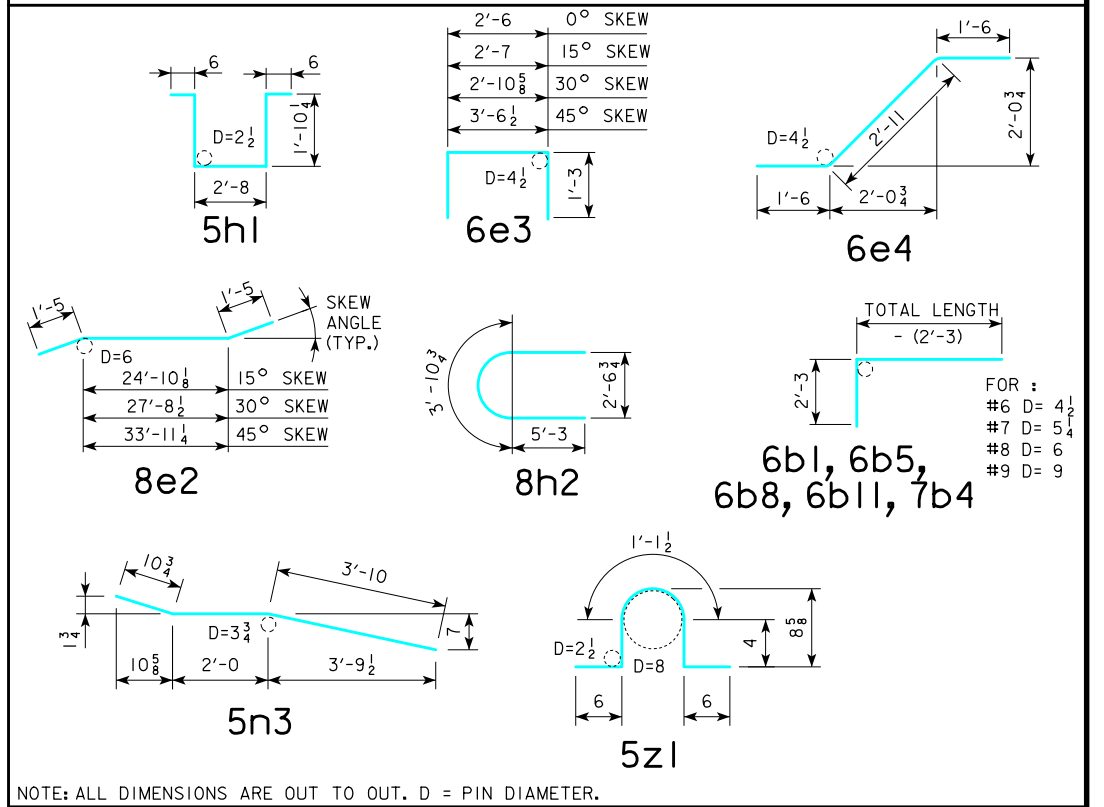
LOCATION	SKEW	SHAPE	BAR	0°		15°		30°		45°					
				NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT
SLAB LONGITUDINAL BOTTOM			8a1	31	21'-3	1759	31	21'-3	1759	31	21'-3	1759	31	21'-3	1759
SLAB LONGITUDINAL BOTTOM			8a2	31	31'-5	2601	31	31'-5	2601	31	31'-5	2601	31	31'-5	2601
SLAB LONGITUDINAL BOTTOM			8a3	31	29'-6	2442	31	29'-6	2442	31	29'-6	2442	31	29'-6	2442
SLAB LONGITUDINAL BOTTOM			9a4	32	27'-6	2992	32	27'-6	2992	32	27'-6	2992	32	27'-6	2992
SLAB LONGITUDINAL BOTTOM			9a5	16	29'-6	1605	16	29'-6	1605	16	29'-6	1605	16	29'-6	1605
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	31	6'-9	315	31	6'-9	315	31	6'-9	315	31	6'-9	315
SLAB LONGITUDINAL TOP			10b2	31	24'-9	3302	31	24'-9	3302	31	24'-9	3302	31	24'-9	3302
SLAB LONGITUDINAL TOP			10b3	31	25'-6	3402	31	25'-6	3402	31	25'-6	3402	31	25'-6	3402
SLAB LONGITUDINAL TOP			7b4	31	16'-8	1057	31	16'-8	1057	31	16'-8	1057	31	16'-8	1057
SLAB LONGITUDINAL TOP			6b5	32	13'-6	649	32	13'-6	649	32	13'-6	649	32	13'-6	649
SLAB LONGITUDINAL TOP			9b6	32	21'-3	2312	32	21'-3	2312	32	21'-3	2312	32	21'-3	2312
SLAB LONGITUDINAL TOP			6b7	16	27'-6	661	16	27'-6	661	16	27'-6	661	16	27'-6	661
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	26'-10	3910	97	27'-9	4044	86	26'-10	3467	76	26'-10	3064
SLAB TRANSVERSE ENDS, BOTTOM			6c2	-	-	-	-	-	-	24	VARIES	579	44	VARIES	970
SLAB TRANSVERSE, TOP			5d1	97	26'-10	2715	97	27'-9	2808	86	26'-10	2407	76	26'-10	2128
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	42	7'-5	325	42	7'-5	325	42	7'-5	325	56	7'-5	434
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	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	8	2'-10	24	8	2'-10	24	8	2'-10	24	8	2'-10	24
SUB TOTAL - LBS.						39,347			39,649			39,917			40,552
OPEN RAIL - SEE LIST ON RAIL SHEET J24-41-06						6794			6794			6794			6794
TOTAL - LBS. WITH MONOLITHIC PIER CAP AND OPEN RAIL						46,141			46,443			46,711			47,346
TOTAL - LBS. WITH NON-MONOLITHIC PIER CAP AND OPEN RAIL						44,865			45,140			45,313			45,633
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°
OPEN RAIL	*STRUCTURAL CONCRETE (BRIDGE) C.Y.	168.6	169.2	171.6	176.3	164.4	164.9	166.7	170.5
OPEN RAIL	REINFORCING STEEL LBS.	46,141	46,443	46,711	47,346	44,865	45,140	45,313	45,633
OPEN RAIL	LIN. FT.	222.0	222.2	222.9	224.5	222.0	222.2	222.9	224.5

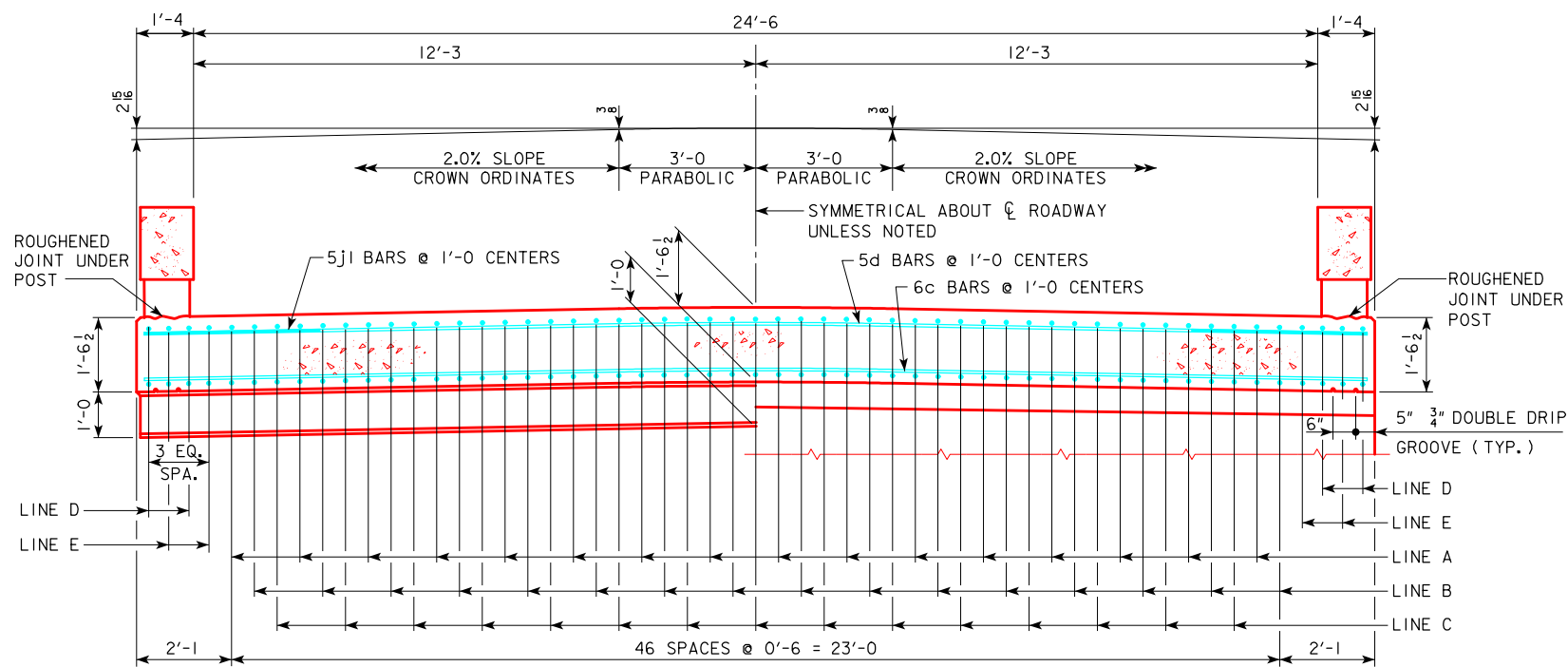
* INCLUDES 4 WINGS @ 0.68 C.Y. EACH AND 2 TEMPORARY PAVING BLOCKS; EXCLUDES RAIL CONCRETE.

BENT BAR DETAILS



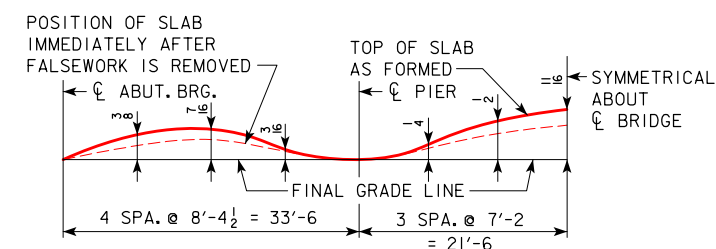
REVISED 07-09 - OPEN RAIL REINF. QTY'S. CHANGED WHICH CHANGED TOTAL REINF. QTY'S. CHANGED PAVING BLOCK LIFTING HOOP BAR MARK, (WAS 5x1).
REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE. CHANGED PAVING BLOCK LIFTING HOOP BAR MARK, (WAS 5x1).

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 100'-0 BRIDGE
J24-09-06	



HALF SECTION NEAR PIER HALF SECTION NEAR ABUTMENT

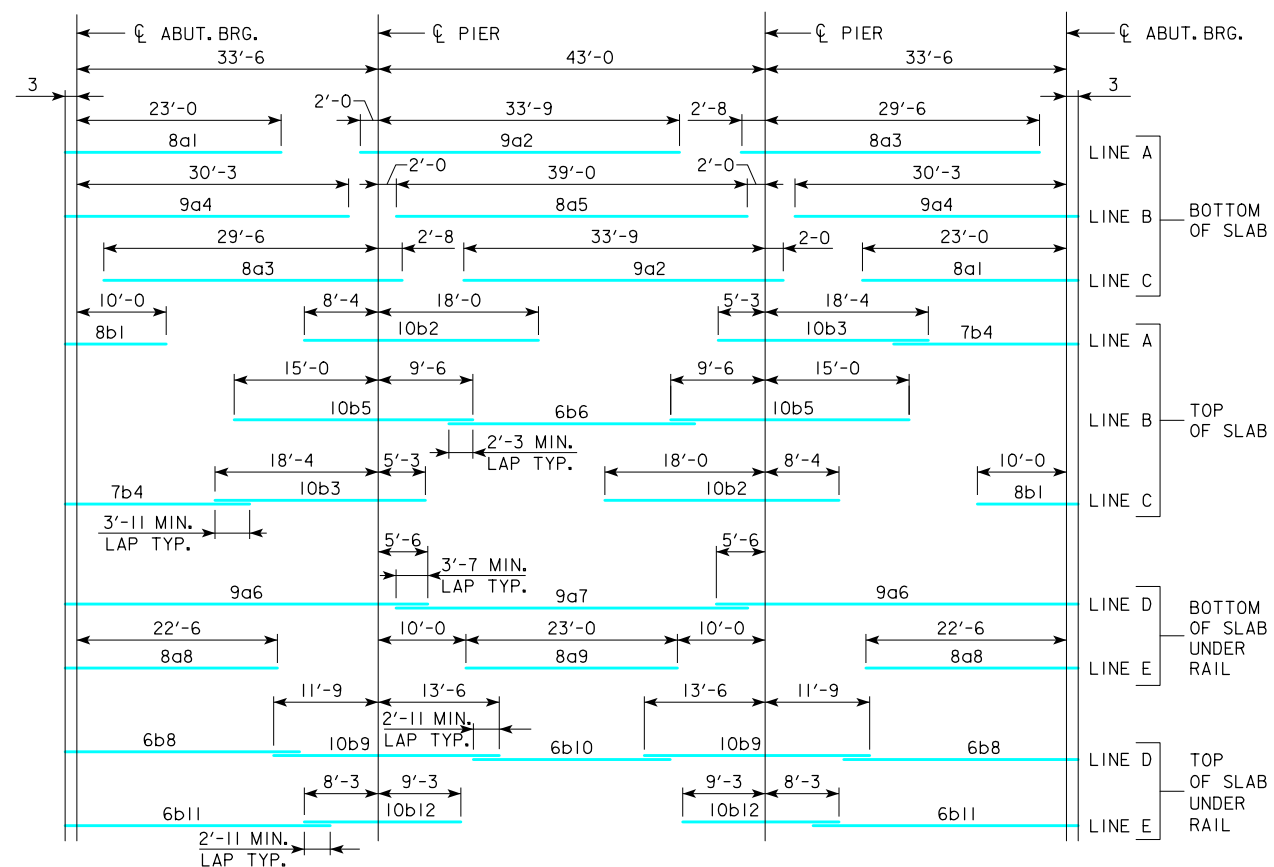
SLAB CROSS-SECTIONAL AREA
FOR OPEN RAIL = 41.88 SQ. FT.



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

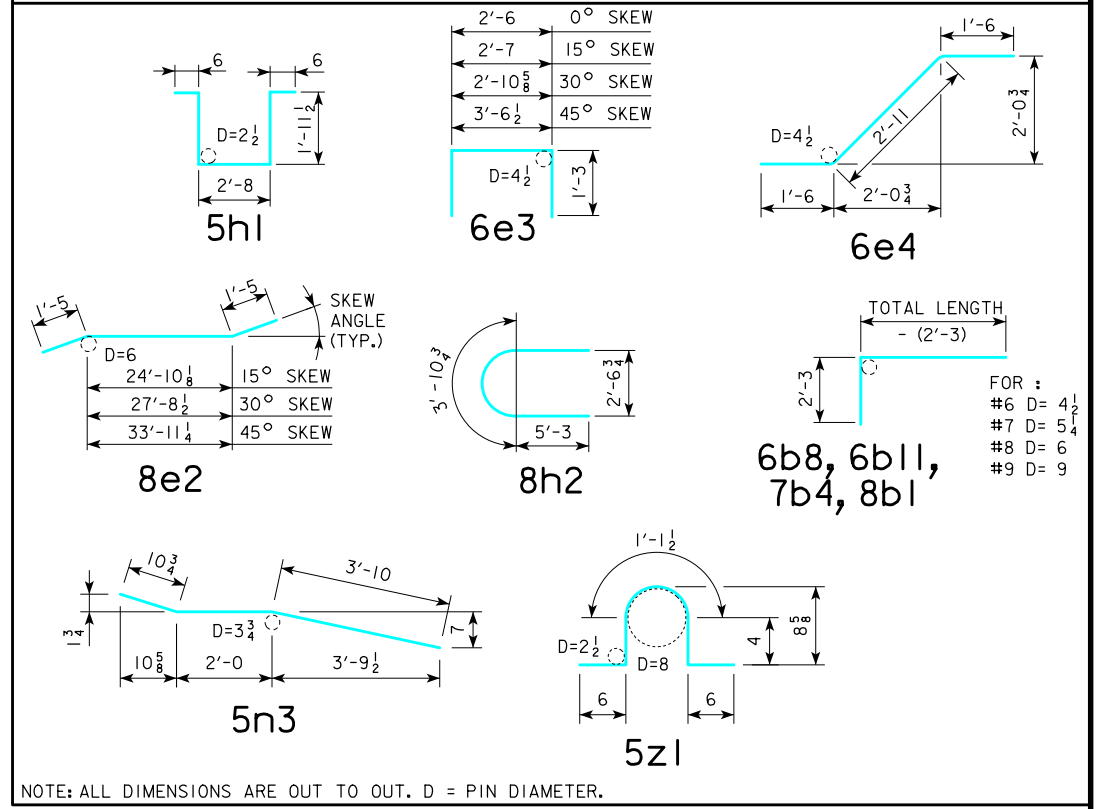
REVISED 06-12 - I.M. REQUIREMENT ADDED TO BAR CHAIR NOTE.
REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE.

08-2022 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER 	IOWA DOT	
		STANDARD DESIGN - 24'-0 ROADWAY, 3 SPAN BRIDGES CONTINUOUS CONCRETE SLAB BRIDGES NOVEMBER, 2006	
SUPERSTRUCTURE DETAILS 110'-0 BRIDGE		J24-10-06	

BILL OF REINFORCING STEEL FOR SUPERSTRUCTURE - 110' BRIDGE

LOCATION	SKEW	SHAPE	BAR	0°		15°		30°		45°					
				NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT
SLAB LONGITUDINAL BOTTOM			8a1	31	23'-3	1925	31	23'-3	1925	31	23'-3	1925	31	23'-3	1925
SLAB LONGITUDINAL BOTTOM			9a2	31	35'-9	3769	31	35'-9	3769	31	35'-9	3769	31	35'-9	3769
SLAB LONGITUDINAL BOTTOM			8a3	31	32'-2	2663	31	32'-2	2663	31	32'-2	2663	31	32'-2	2663
SLAB LONGITUDINAL BOTTOM			9a4	32	30'-6	3319	32	30'-6	3319	32	30'-6	3319	32	30'-6	3319
SLAB LONGITUDINAL BOTTOM			8a5	16	39'-0	1667	16	39'-0	1667	16	39'-0	1667	16	39'-0	1667
SLAB LONGITUDINAL BOTTOM, AT RAIL			9a6	8	39'-3	1068	8	39'-3	1068	8	39'-3	1068	8	39'-3	1068
SLAB LONGITUDINAL BOTTOM, AT RAIL			9a7	4	39'-2	533	4	39'-2	533	4	39'-2	533	4	39'-2	533
SLAB LONGITUDINAL BOTTOM, AT RAIL			8a8	8	22'-9	486	8	22'-9	486	8	22'-9	486	8	22'-9	486
SLAB LONGITUDINAL BOTTOM, AT RAIL			8a9	4	23'-0	246	4	23'-0	246	4	23'-0	246	4	23'-0	246
SLAB LONGITUDINAL TOP			8b1	31	12'-6	1035	31	12'-6	1035	31	12'-6	1035	31	12'-6	1035
SLAB LONGITUDINAL TOP			10b2	31	26'-4	3513	31	26'-4	3513	31	26'-4	3513	31	26'-4	3513
SLAB LONGITUDINAL TOP			10b3	31	23'-7	3146	31	23'-7	3146	31	23'-7	3146	31	23'-7	3146
SLAB LONGITUDINAL TOP			7b4	31	21'-7	1368	31	21'-7	1368	31	21'-7	1368	31	21'-7	1368
SLAB LONGITUDINAL TOP			10b5	32	24'-6	3374	32	24'-6	3374	32	24'-6	3374	32	24'-6	3374
SLAB LONGITUDINAL TOP			6b6	16	28'-6	685	16	28'-6	685	16	28'-6	685	16	28'-6	685
SLAB LONGITUDINAL TOP, AT RAIL			6b8	8	27'-2	327	8	27'-2	327	8	27'-2	327	8	27'-2	327
SLAB LONGITUDINAL TOP, AT RAIL			10b9	8	25'-3	870	8	25'-3	870	8	25'-3	870	8	25'-3	870
SLAB LONGITUDINAL TOP, AT RAIL			6b10	4	21'-10	132	4	21'-10	132	4	21'-10	132	4	21'-10	132
SLAB LONGITUDINAL TOP, AT RAIL			6b11	8	30'-8	369	8	30'-8	369	8	30'-8	369	8	30'-8	369
SLAB LONGITUDINAL TOP, AT RAIL			10b12	8	17'-6	603	8	17'-6	603	8	17'-6	603	8	17'-6	603
SLAB TRANSVERSE, BOTTOM			6c1	107	26'-10	4313	107	27'-9	4460	96	26'-10	3870	86	26'-10	3467
SLAB TRANSVERSE ENDS, BOTTOM			6c2	-	-	-	-	-	-	24	VARIES	579	44	VARIES	970
SLAB TRANSVERSE, TOP			5d1	107	26'-10	2995	107	27'-9	3097	96	26'-10	2687	86	26'-10	2407
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	32	7'-7	254	32	7'-7	254	48	7'-7	380	48	7'-7	380
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	212	8'-6	1880	212	8'-6	1880	212	8'-6	1880	210	8'-6	1862
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.						44,311			44,635			45,007			45,532
OPEN RAIL - SEE LIST ON RAIL SHEET J24-41-06						7261			7261			7261			7261
TOTAL - LBS. WITH MONOLITHIC PIER CAP AND OPEN RAIL						51,572			51,896			52,268			52,793
TOTAL - LBS. WITH NON-MONOLITHIC PIER CAP AND OPEN RAIL						50,367			50,664			50,815			51,134
SAME AS ABOVE EXCEPT ALL "h" BARS DELETED															

BENT BAR DETAILS



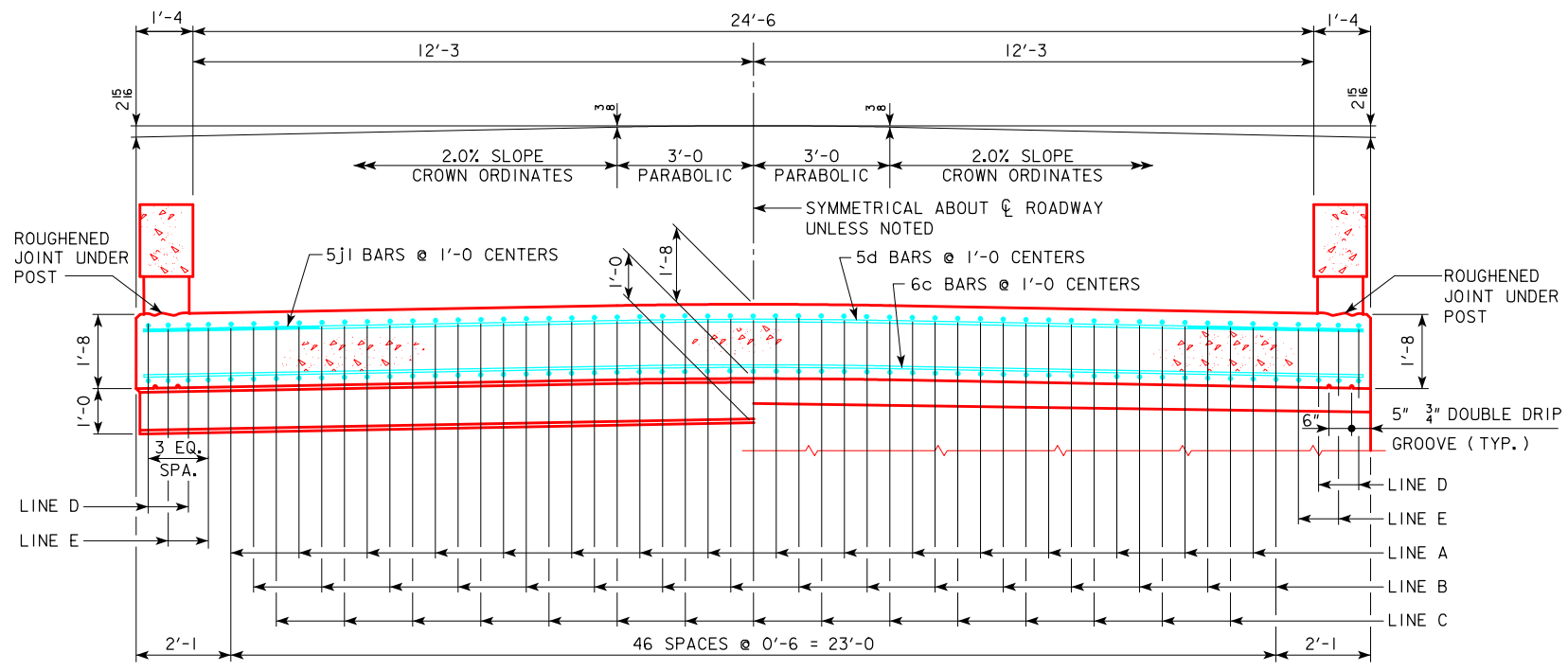
ESTIMATED QUANTITIES FOR SUPERSTRUCTURE - 110' BRIDGE

ITEM	SKEW	WITH MONOLITHIC PIER CAP				WITH NON-MONOLITHIC PIER CAP			
		0°	15°	30°	45°	0°	15°	30°	45°
OPEN RAIL	*STRUCTURAL CONCRETE (BRIDGE) C.Y.	192.3	192.9	195.2	199.9	188.1	188.5	190.3	194.1
OPEN RAIL	REINFORCING STEEL LBS.	51,572	51,896	52,268	52,793	50,367	50,664	50,815	51,134
OPEN RAIL	LIN. FT.	242.0	242.2	242.9	244.5	242.0	242.2	242.9	244.5

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

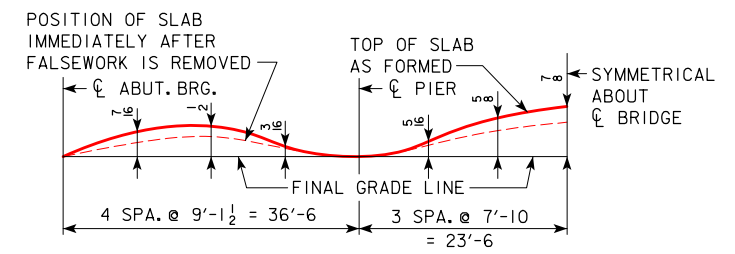
REVISED 07-09 - OPEN RAIL REINF. QTY'S. CHANGED WHICH CHANGED TOTAL REINF. QTY'S. REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE. CHANGED PAVING BLOCK LIFTING HOOP BAR MARK, (WAS 5x1).

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 110'-0 BRIDGE		J24-11-06



HALF SECTION NEAR PIER HALF SECTION NEAR ABUTMENT

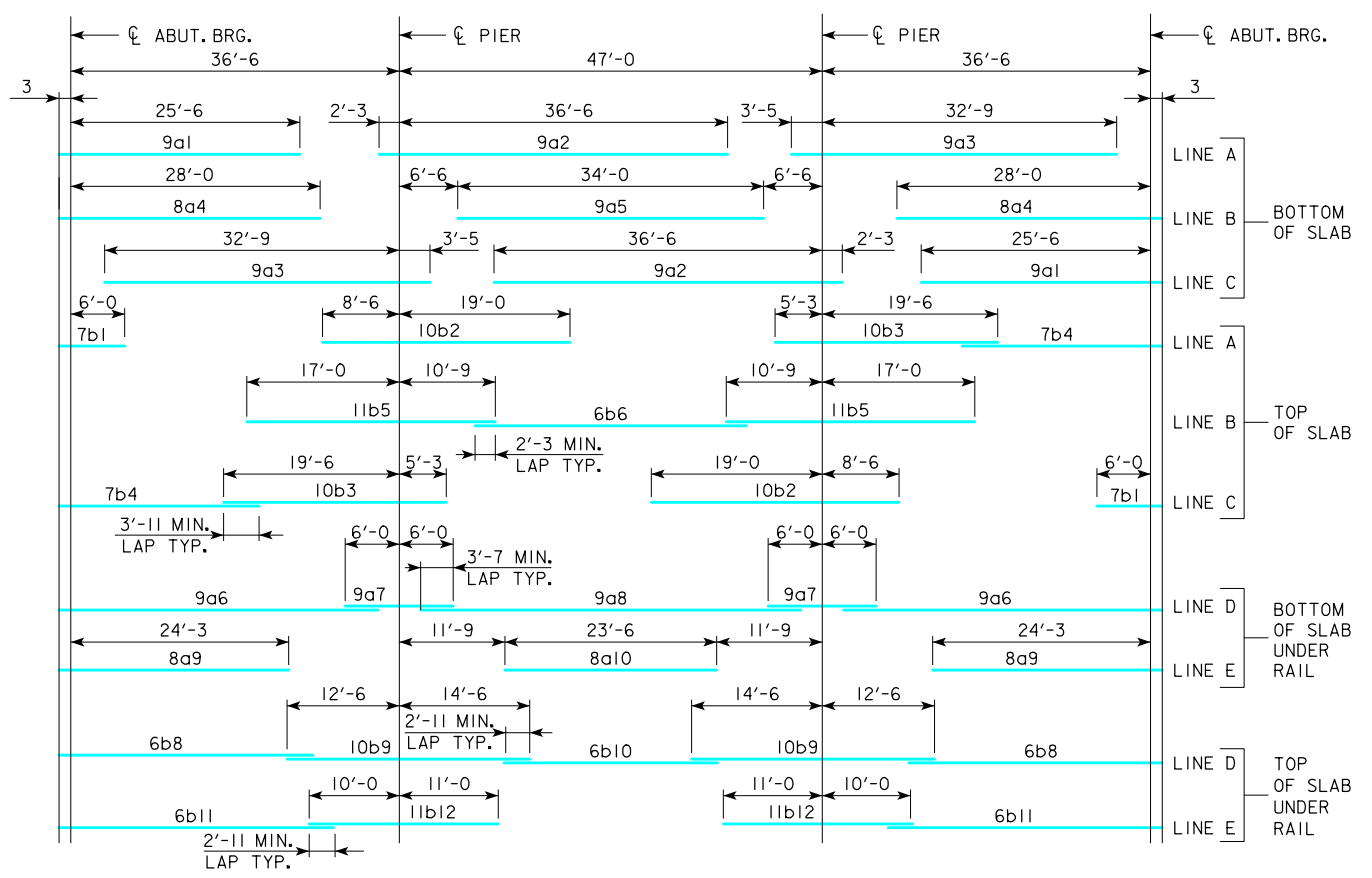
SLAB CROSS-SECTIONAL AREA FOR OPEN RAIL = 45.28 SQ. FT.



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

REVISED 06-12 - I.M. REQUIREMENT ADDED TO BAR CHAIR NOTE.
REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE.

08-2022 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER <i>[Signature]</i>		
		STANDARD DESIGN - 24'-0" ROADWAY, 3 SPAN BRIDGES CONTINUOUS CONCRETE SLAB BRIDGES NOVEMBER, 2006	
SUPERSTRUCTURE DETAILS 120'-0" BRIDGE		J24-12-06	

BILL OF REINFORCING STEEL FOR SUPERSTRUCTURE - 120' BRIDGE

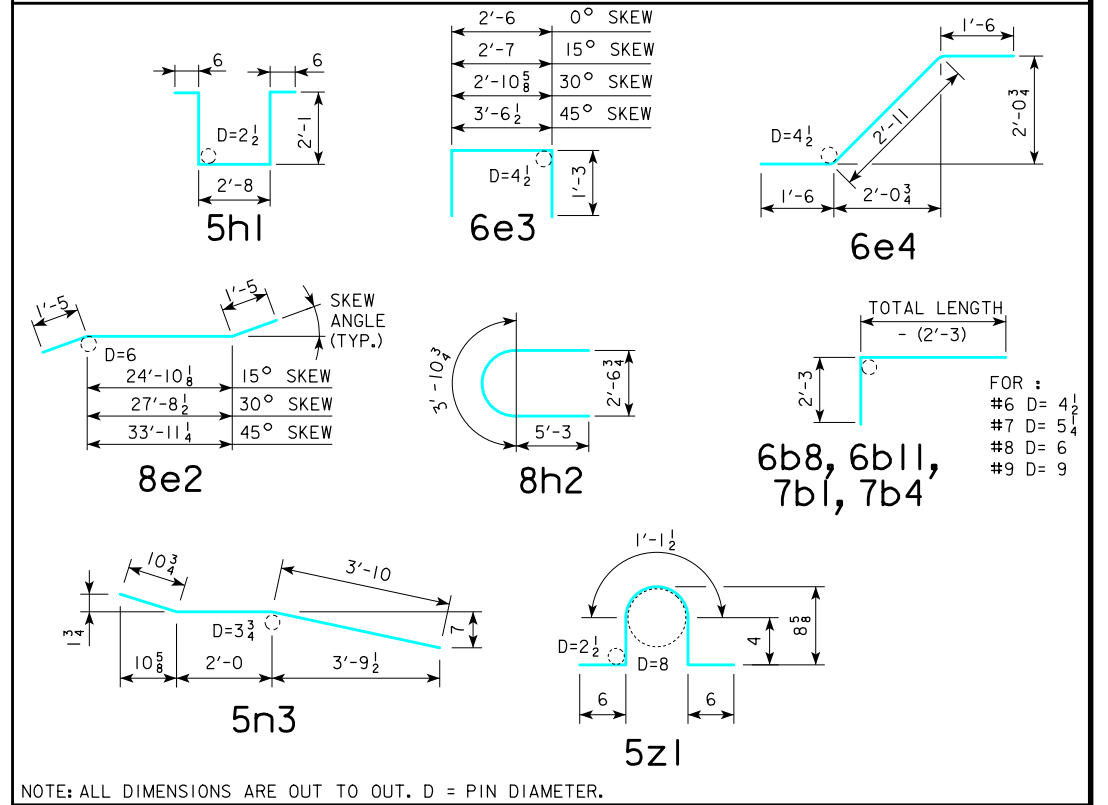
LOCATION	SKEW	SHAPE	BAR NO.	0°		15°		30°		45°				
				LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT
SLAB LONGITUDINAL BOTTOM		9a1	31	25'-9"	2715	31	25'-9"	2715	31	25'-9"	2715	31	25'-9"	2715
SLAB LONGITUDINAL BOTTOM		9a2	31	38'-9"	4085	31	38'-9"	4085	31	38'-9"	4085	31	38'-9"	4085
SLAB LONGITUDINAL BOTTOM		9a3	31	36'-2"	3812	31	36'-2"	3812	31	36'-2"	3812	31	36'-2"	3812
SLAB LONGITUDINAL BOTTOM		8a4	32	28'-3"	2414	32	28'-3"	2414	32	28'-3"	2414	32	28'-3"	2414
SLAB LONGITUDINAL BOTTOM		9a5	16	34'-0"	1850	16	34'-0"	1850	16	34'-0"	1850	16	34'-0"	1850
SLAB LONGITUDINAL BOTTOM, AT RAIL		9a6	8	34'-4"	934	8	34'-4"	934	8	34'-4"	934	8	34'-4"	934
SLAB LONGITUDINAL BOTTOM, AT RAIL		9a7	8	12'-0"	327	8	12'-0"	327	8	12'-0"	327	8	12'-0"	327
SLAB LONGITUDINAL BOTTOM, AT RAIL		9a8	4	42'-2"	574	4	42'-2"	574	4	42'-2"	574	4	42'-2"	574
SLAB LONGITUDINAL BOTTOM, AT RAIL		8a9	8	24'-6"	524	8	24'-6"	524	8	24'-6"	524	8	24'-6"	524
SLAB LONGITUDINAL BOTTOM, AT RAIL		8a10	4	23'-6"	251	4	23'-6"	251	4	23'-6"	251	4	23'-6"	251
SLAB LONGITUDINAL TOP		7b1	31	8'-6"	539	31	8'-6"	539	31	8'-6"	539	31	8'-6"	539
SLAB LONGITUDINAL TOP		10b2	31	27'-6"	3669	31	27'-6"	3669	31	27'-6"	3669	31	27'-6"	3669
SLAB LONGITUDINAL TOP		10b3	31	24'-9"	3302	31	24'-9"	3302	31	24'-9"	3302	31	24'-9"	3302
SLAB LONGITUDINAL TOP		7b4	31	23'-5"	1484	31	23'-5"	1484	31	23'-5"	1484	31	23'-5"	1484
SLAB LONGITUDINAL TOP		11b5	32	27'-9"	4718	32	27'-9"	4718	32	27'-9"	4718	32	27'-9"	4718
SLAB LONGITUDINAL TOP		6b6	16	30'-0"	721	16	30'-0"	721	16	30'-0"	721	16	30'-0"	721
SLAB LONGITUDINAL TOP, AT RAIL		6b8	8	29'-5"	354	8	29'-5"	354	8	29'-5"	354	8	29'-5"	354
SLAB LONGITUDINAL TOP, AT RAIL		10b9	8	27'-0"	930	8	27'-0"	930	8	27'-0"	930	8	27'-0"	930
SLAB LONGITUDINAL TOP, AT RAIL		6b10	4	23'-10"	144	4	23'-10"	144	4	23'-10"	144	4	23'-10"	144
SLAB LONGITUDINAL TOP, AT RAIL		6b11	8	31'-11"	384	8	31'-11"	384	8	31'-11"	384	8	31'-11"	384
SLAB LONGITUDINAL TOP, AT RAIL		11b12	8	21'-0"	893	8	21'-0"	893	8	21'-0"	893	8	21'-0"	893
SLAB TRANSVERSE, BOTTOM		6c1	117	26'-10"	4716	117	27'-9"	4877	106	26'-10"	4273	96	26'-10"	3870
SLAB TRANSVERSE ENDS, BOTTOM		6c2	-	-	-	-	-	-	24	VARIES	579	44	VARIES	970
SLAB TRANSVERSE, TOP		5d1	117	26'-10"	3275	117	27'-9"	3387	106	26'-10"	2967	96	26'-10"	2687
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	32	7'-10"	262	32	7'-10"	262	48	7'-10"	393	48	7'-10"	393
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	232	8'-6"	2057	232	8'-6"	2057	232	8'-6"	2057	230	8'-6"	2040
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.					48,705		49,053		49,406		49,932			
OPEN RAIL - SEE LIST ON RAIL SHEET J24-41-06					8061		8061		8061		8061			
TOTAL - LBS. WITH MONOLITHIC PIER CAP AND OPEN RAIL					56,766		57,114		57,467		57,993			
TOTAL - LBS. WITH NON-MONOLITHIC PIER CAP AND OPEN RAIL					55,553		55,874		56,001		56,321			
SAME AS ABOVE EXCEPT ALL "h" BARS DELETED														

ESTIMATED QUANTITIES FOR SUPERSTRUCTURE - 120' BRIDGE

ITEM	SKEW	WITH MONOLITHIC PIER CAP				WITH NON-MONOLITHIC PIER CAP			
		0°	15°	30°	45°	0°	15°	30°	45°
OPEN RAIL	*STRUCTURAL CONCRETE (BRIDGE) C.Y.	222.5	223.1	225.3	229.9	218.3	218.7	220.5	224.1
OPEN RAIL	REINFORCING STEEL LBS.	56,766	57,114	57,467	57,993	55,553	55,874	56,001	56,321
OPEN RAIL	LIN. FT.	262.0	262.2	262.9	264.5	262.0	262.2	262.9	264.5

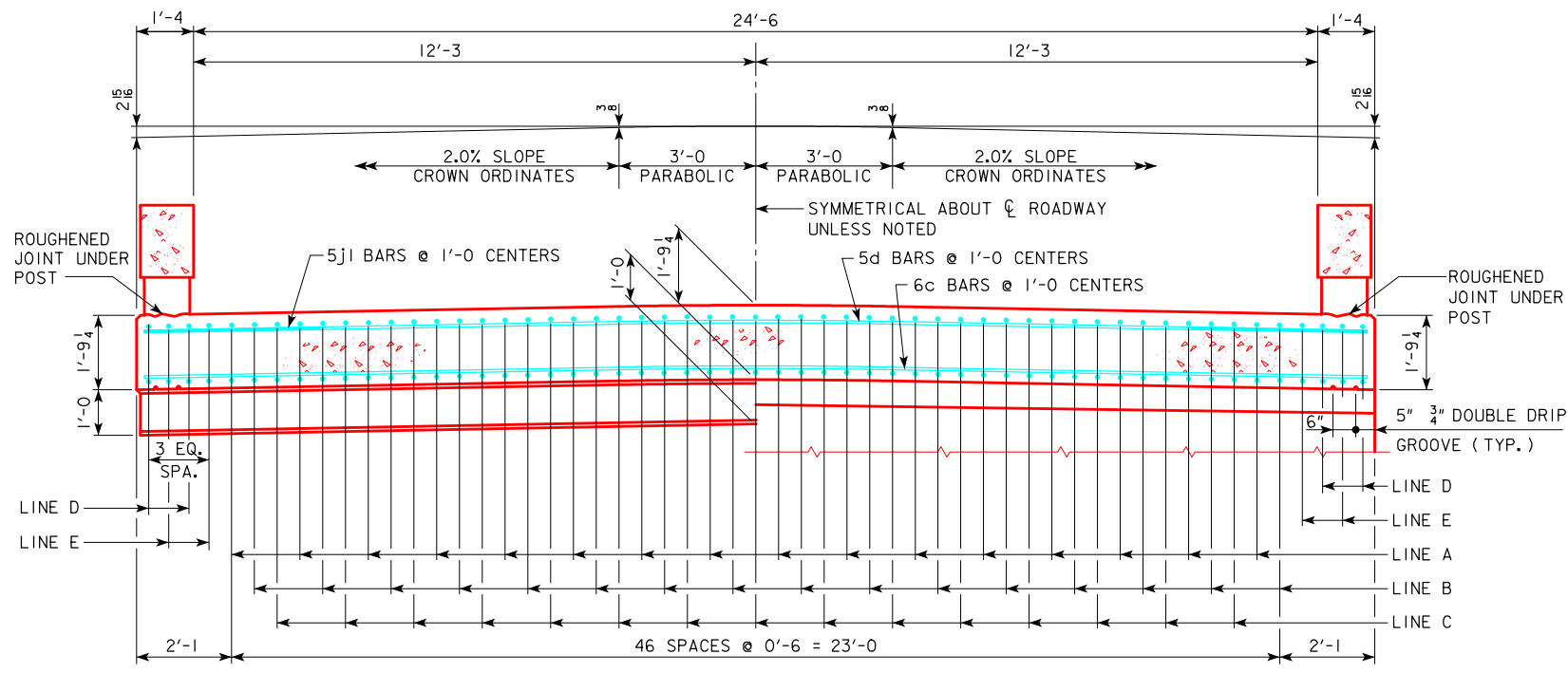
* INCLUDES 4 WINGS @ 0.68 C.Y. EACH AND 2 TEMPORARY PAVING BLOCKS; EXCLUDES RAIL CONCRETE.

BENT BAR DETAILS



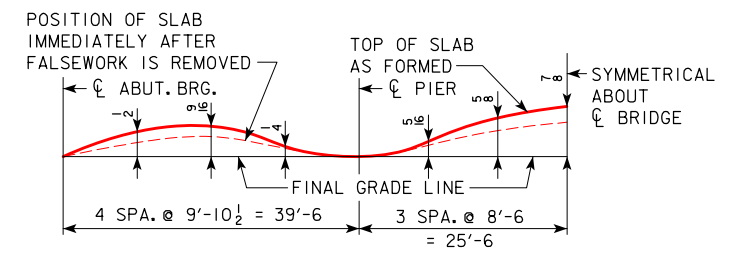
REVISED 07-09 - OPEN RAIL REINF. QTY. CHANGED WHICH CHANGED TOTAL REINF. QTY. REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE. CHANGED PAVING BLOCK LIFTING HOOP BAR MARK, (WAS 5x1).

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 120'-0 BRIDGE		J24-13-06



HALF SECTION NEAR PIER HALF SECTION NEAR ABUTMENT

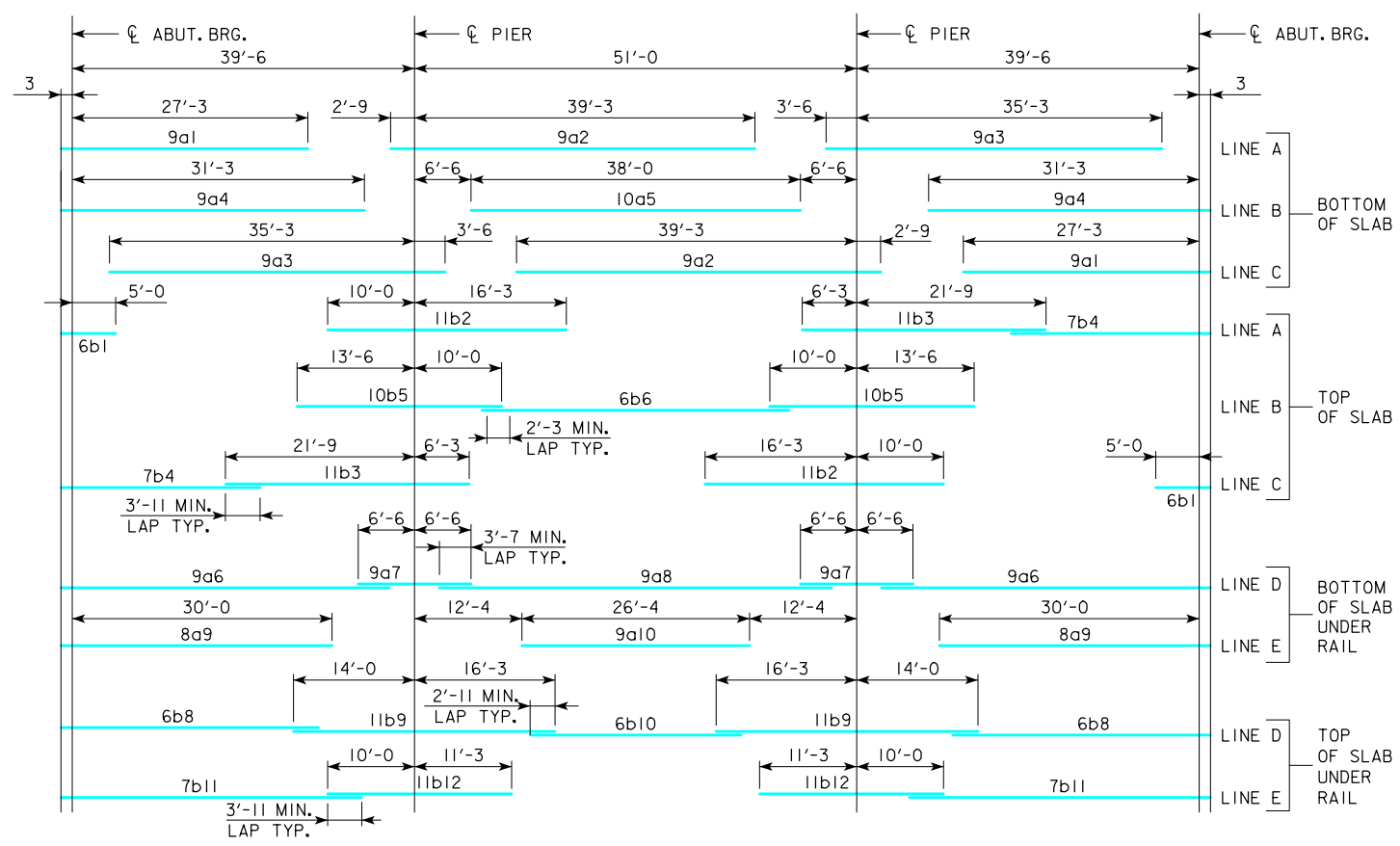
SLAB CROSS-SECTIONAL AREA
FOR OPEN RAIL = 48.11 SQ. FT.



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

REVISED 06-12 - I.M. REQUIREMENT ADDED TO BAR CHAIR NOTE.
REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE.

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 130'-0 BRIDGE		J24-14-06	

BILL OF REINFORCING STEEL FOR SUPERSTRUCTURE - 130' BRIDGE

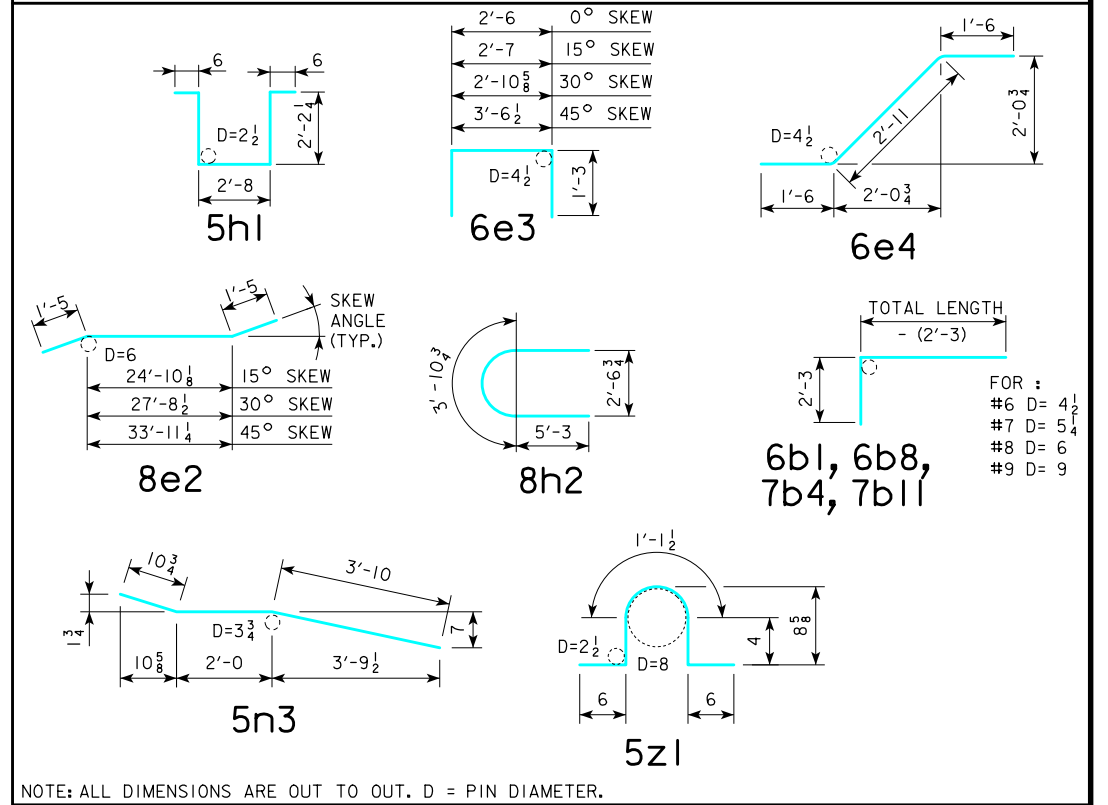
LOCATION	SKEW	SHAPE	BAR	0°			15°			30°			45°		
				NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT
SLAB LONGITUDINAL BOTTOM			9a1	31	27'-6	2899	31	27'-6	2899	31	27'-6	2899	31	27'-6	2899
SLAB LONGITUDINAL BOTTOM			9a2	31	42'-0	4427	31	42'-0	4427	31	42'-0	4427	31	42'-0	4427
SLAB LONGITUDINAL BOTTOM			9a3	31	38'-9	4085	31	38'-9	4085	31	38'-9	4085	31	38'-9	4085
SLAB LONGITUDINAL BOTTOM			9a4	32	31'-6	3428	32	31'-6	3428	32	31'-6	3428	32	31'-6	3428
SLAB LONGITUDINAL BOTTOM			10a5	16	38'-0	2617	16	38'-0	2617	16	38'-0	2617	16	38'-0	2617
SLAB LONGITUDINAL BOTTOM, AT RAIL			9a6	8	36'-10	1002	8	36'-10	1002	8	36'-10	1002	8	36'-10	1002
SLAB LONGITUDINAL BOTTOM, AT RAIL			9a7	8	13'-0	354	8	13'-0	354	8	13'-0	354	8	13'-0	354
SLAB LONGITUDINAL BOTTOM, AT RAIL			9a8	4	45'-2	615	4	45'-2	615	4	45'-2	615	4	45'-2	615
SLAB LONGITUDINAL BOTTOM, AT RAIL			8a9	8	30'-3	647	8	30'-3	647	8	30'-3	647	8	30'-3	647
SLAB LONGITUDINAL BOTTOM, AT RAIL			9a10	4	26'-4	359	4	26'-4	359	4	26'-4	359	4	26'-4	359
SLAB LONGITUDINAL TOP			6b1	31	7'-6	350	31	7'-6	350	31	7'-6	350	31	7'-6	350
SLAB LONGITUDINAL TOP			11b2	31	26'-3	4324	31	26'-3	4324	31	26'-3	4324	31	26'-3	4324
SLAB LONGITUDINAL TOP			11b3	31	28'-0	4612	31	28'-0	4612	31	28'-0	4612	31	28'-0	4612
SLAB LONGITUDINAL TOP			7b4	31	24'-2	1532	31	24'-2	1532	31	24'-2	1532	31	24'-2	1532
SLAB LONGITUDINAL TOP			10b5	32	23'-6	3236	32	23'-6	3236	32	23'-6	3236	32	23'-6	3236
SLAB LONGITUDINAL TOP			6b6	16	35'-6	854	16	35'-6	854	16	35'-6	854	16	35'-6	854
SLAB LONGITUDINAL TOP, AT RAIL			6b8	8	30'-11	372	8	30'-11	372	8	30'-11	372	8	30'-11	372
SLAB LONGITUDINAL TOP, AT RAIL			11b9	8	30'-3	1286	8	30'-3	1286	8	30'-3	1286	8	30'-3	1286
SLAB LONGITUDINAL TOP, AT RAIL			6b10	4	24'-4	147	4	24'-4	147	4	24'-4	147	4	24'-4	147
SLAB LONGITUDINAL TOP, AT RAIL			7b11	8	35'-11	588	8	35'-11	588	8	35'-11	588	8	35'-11	588
SLAB LONGITUDINAL TOP, AT RAIL			11b12	8	21'-3	904	8	21'-3	904	8	21'-3	904	8	21'-3	904
SLAB TRANSVERSE, BOTTOM			6c1	127	26'-10	5119	127	27'-9	5294	116	26'-10	4676	106	26'-10	4273
SLAB TRANSVERSE ENDS, BOTTOM			6c2	-	-	-	-	-	-	24	VARIES	579	44	VARIES	970
SLAB TRANSVERSE, TOP			5d1	127	26'-10	3555	127	27'-9	3676	116	26'-10	3247	106	26'-10	2967
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	8'-1	304	36	8'-1	304	36	8'-1	304	54	8'-1	456
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	252	8'-6	2235	252	8'-6	2235	252	8'-6	2235	250	8'-6	2217
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.						53,622			53,993			54,192			54,869
OPEN RAIL - SEE LIST ON RAIL SHEET J24-41-06						8573			8573			8573			8573
TOTAL - LBS. WITH MONOLITHIC PIER CAP AND OPEN RAIL						62,195			62,566			62,765			63,442
TOTAL - LBS. WITH NON-MONOLITHIC PIER CAP AND OPEN RAIL						60,940			61,284			61,388			61,707
SAME AS ABOVE EXCEPT ALL "h" BARS DELETED															

ESTIMATED QUANTITIES FOR SUPERSTRUCTURE - 130' BRIDGE

ITEM	SKEW	WITH MONOLITHIC PIER CAP				WITH NON-MONOLITHIC PIER CAP			
		0°	15°	30°	45°	0°	15°	30°	45°
OPEN RAIL	*STRUCTURAL CONCRETE (BRIDGE) C.Y.	252.6	253.2	255.4	259.9	248.4	248.8	250.5	254.1
OPEN RAIL	REINFORCING STEEL LBS.	62,195	62,566	62,765	63,442	60,940	61,284	61,388	61,707
OPEN RAIL	LIN. FT.	282.0	282.2	282.9	284.5	282.0	282.2	282.9	284.5

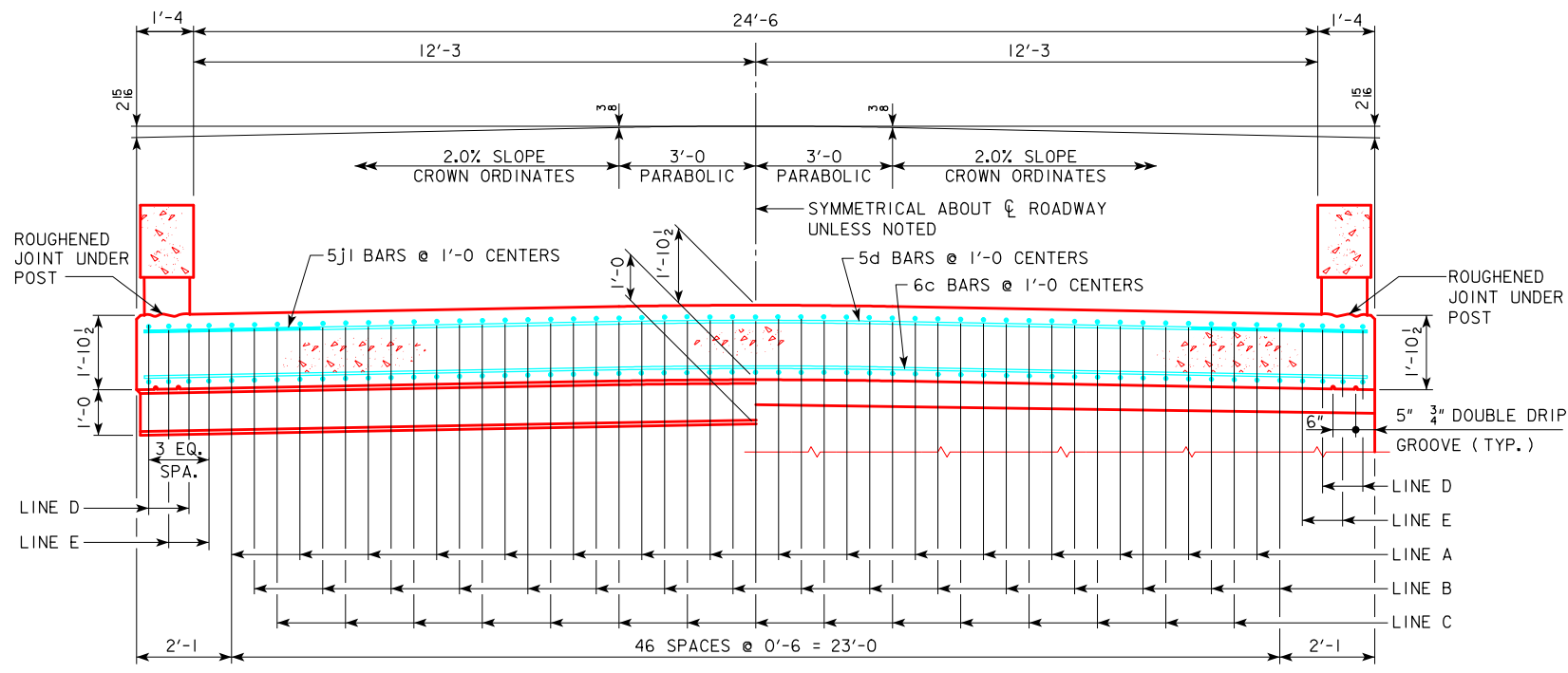
* INCLUDES 4 WINGS @ 0.68 C.Y. EACH AND 2 TEMPORARY PAVING BLOCKS; EXCLUDES RAIL CONCRETE.

BENT BAR DETAILS



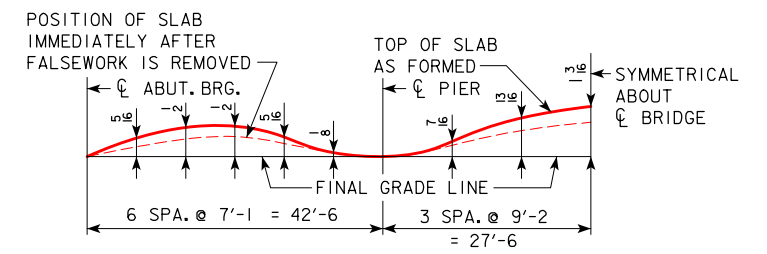
REVISED 07-09 - OPEN RAIL REINF. QTY'S. CHANGED WHICH CHANGED TOTAL REINF. QTY'S. REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE. CHANGED PAVING BLOCK LIFTING HOOP BAR MARK, (WAS 5x1).

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 130'-0 BRIDGE	J24-15-06
	SUPERSTRUCTURE DETAILS 130'-0 BRIDGE	



HALF SECTION NEAR PIER HALF SECTION NEAR ABUTMENT

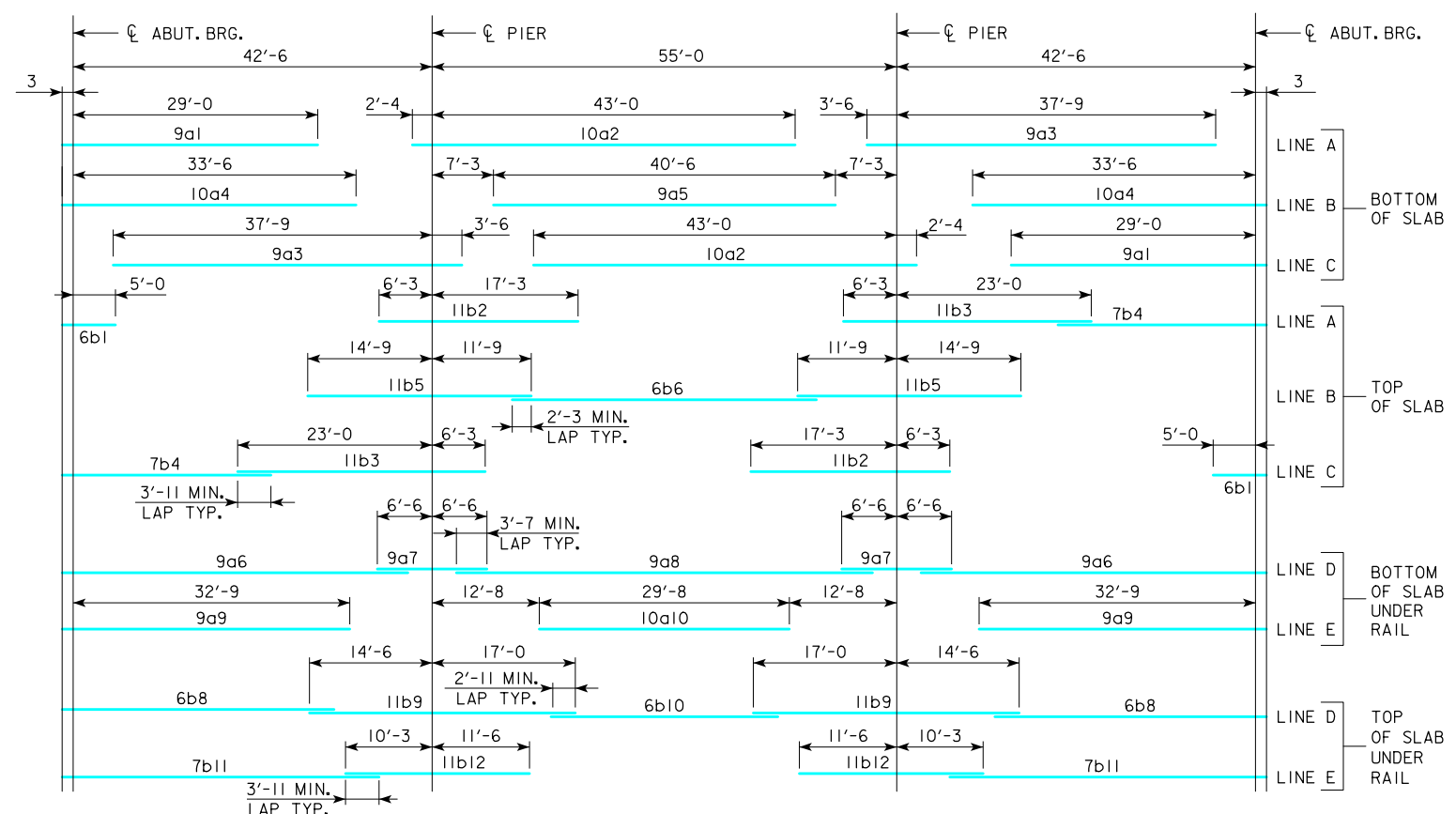
SLAB CROSS-SECTIONAL AREA FOR OPEN RAIL = 50.94 SQ. FT.



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

REVISED 06-12 - I.M. REQUIREMENT ADDED TO BAR CHAIR NOTE.
REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE.

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 140'-0 BRIDGE	J24-16-06

BILL OF REINFORCING STEEL FOR SUPERSTRUCTURE - 140' BRIDGE

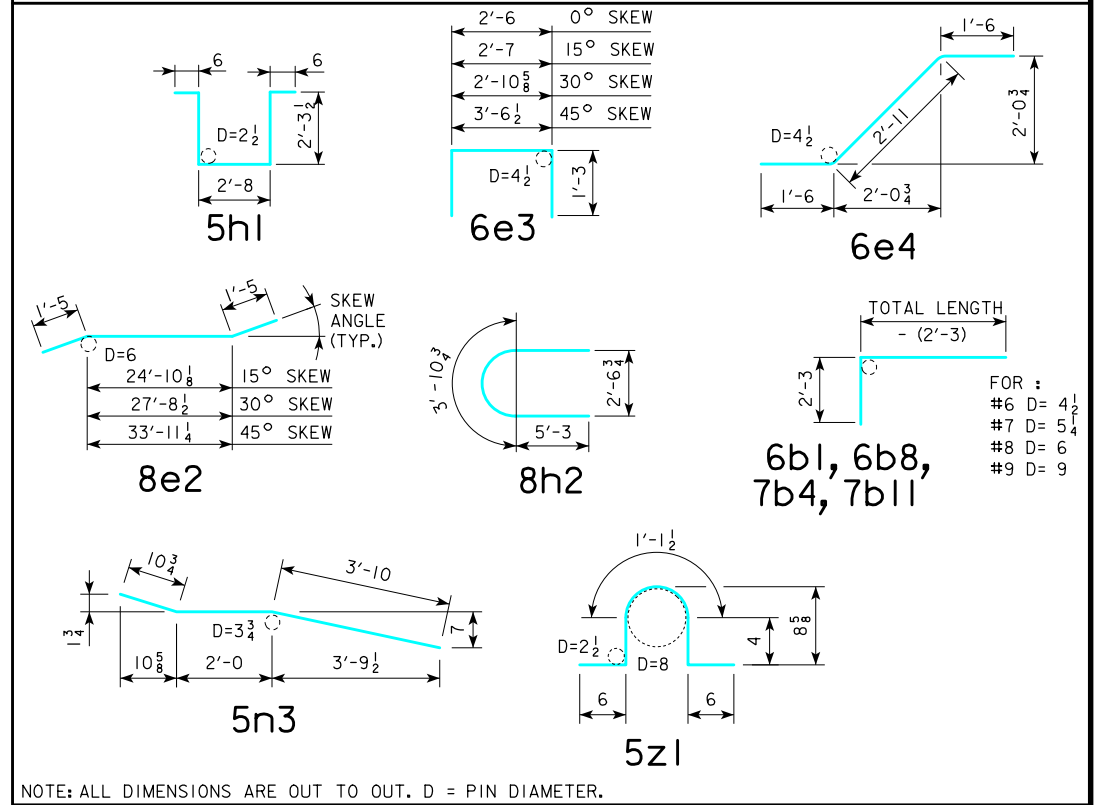
LOCATION	SKEW	SHAPE	BAR NO.	0°		15°		30°		45°				
				LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT
SLAB LONGITUDINAL BOTTOM		9a1	31	29'-3	3083	31	29'-3	3083	31	29'-3	3083	31	29'-3	3083
SLAB LONGITUDINAL BOTTOM		10a2	31	45'-4	6048	31	45'-4	6048	31	45'-4	6048	31	45'-4	6048
SLAB LONGITUDINAL BOTTOM		9a3	31	41'-3	4348	31	41'-3	4348	31	41'-3	4348	31	41'-3	4348
SLAB LONGITUDINAL BOTTOM		10a4	32	33'-9	4648	32	33'-9	4648	32	33'-9	4648	32	33'-9	4648
SLAB LONGITUDINAL BOTTOM		9a5	16	40'-6	2204	16	40'-6	2204	16	40'-6	2204	16	40'-6	2204
SLAB LONGITUDINAL BOTTOM, AT RAIL		9a6	8	39'-10	1084	8	39'-10	1084	8	39'-10	1084	8	39'-10	1084
SLAB LONGITUDINAL BOTTOM, AT RAIL		9a7	8	13'-0	354	8	13'-0	354	8	13'-0	354	8	13'-0	354
SLAB LONGITUDINAL BOTTOM, AT RAIL		9a8	4	49'-2	669	4	49'-2	669	4	49'-2	669	4	49'-2	669
SLAB LONGITUDINAL BOTTOM, AT RAIL		9a9	8	33'-0	898	8	33'-0	898	8	33'-0	898	8	33'-0	898
SLAB LONGITUDINAL BOTTOM, AT RAIL		10a10	4	29'-8	511	4	29'-8	511	4	29'-8	511	4	29'-8	511
SLAB LONGITUDINAL TOP		6b1	31	7'-6	350	31	7'-6	350	31	7'-6	350	31	7'-6	350
SLAB LONGITUDINAL TOP		11b2	31	23'-6	3871	31	23'-6	3871	31	23'-6	3871	31	23'-6	3871
SLAB LONGITUDINAL TOP		11b3	31	29'-3	4818	31	29'-3	4818	31	29'-3	4818	31	29'-3	4818
SLAB LONGITUDINAL TOP		7b4	31	25'-11	1643	31	25'-11	1643	31	25'-11	1643	31	25'-11	1643
SLAB LONGITUDINAL TOP		11b5	32	26'-6	4506	32	26'-6	4506	32	26'-6	4506	32	26'-6	4506
SLAB LONGITUDINAL TOP		6b6	16	36'-0	866	16	36'-0	866	16	36'-0	866	16	36'-0	866
SLAB LONGITUDINAL TOP, AT RAIL		6b8	8	33'-5	402	8	33'-5	402	8	33'-5	402	8	33'-5	402
SLAB LONGITUDINAL TOP, AT RAIL		11b9	8	31'-6	1339	8	31'-6	1339	8	31'-6	1339	8	31'-6	1339
SLAB LONGITUDINAL TOP, AT RAIL		6b10	4	26'-10	162	4	26'-10	162	4	26'-10	162	4	26'-10	162
SLAB LONGITUDINAL TOP, AT RAIL		7b11	8	38'-8	633	8	38'-8	633	8	38'-8	633	8	38'-8	633
SLAB LONGITUDINAL TOP, AT RAIL		11b12	8	21'-9	925	8	21'-9	925	8	21'-9	925	8	21'-9	925
SLAB TRANSVERSE, BOTTOM		6c1	137	26'-10	5522	137	27'-9	5711	126	26'-10	5079	116	26'-10	4676
SLAB TRANSVERSE ENDS, BOTTOM		6c2	-	-	-	-	-	-	24	VARIES	579	44	VARIES	970
SLAB TRANSVERSE, TOP		5d1	137	26'-10	3835	137	27'-9	3966	126	26'-10	3527	116	26'-10	3247
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	8'-3	310	36	8'-3	310	36	8'-3	310	54	8'-3	465
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	272	8'-6	2412	272	8'-6	2412	272	8'-6	2412	270	8'-6	2394
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.					59,212		59,607		59,782		60,462			
OPEN RAIL - SEE LIST ON RAIL SHEET J24-41-06					9057		9057		9057		9057			
TOTAL - LBS. WITH MONOLITHIC PIER CAP AND OPEN RAIL					68,269		68,664		68,839		69,519			
TOTAL - LBS. WITH NON-MONOLITHIC PIER CAP AND OPEN RAIL					67,008		67,376		67,456		67,775			
SAME AS ABOVE EXCEPT ALL "h" BARS DELETED														

ESTIMATED QUANTITIES FOR SUPERSTRUCTURE - 140' BRIDGE

ITEM	SKEW	WITH MONOLITHIC PIER CAP				WITH NON-MONOLITHIC PIER CAP			
		0°	15°	30°	45°	0°	15°	30°	45°
OPEN RAIL	*STRUCTURAL CONCRETE (BRIDGE) C.Y.	284.7	285.3	287.5	291.9	280.5	281.0	282.7	286.1
OPEN RAIL	REINFORCING STEEL LBS.	68,269	68,664	68,839	69,519	67,008	67,376	67,456	67,775
OPEN RAIL	LIN. FT.	302.0	302.2	302.9	304.5	302.0	302.2	302.9	304.5

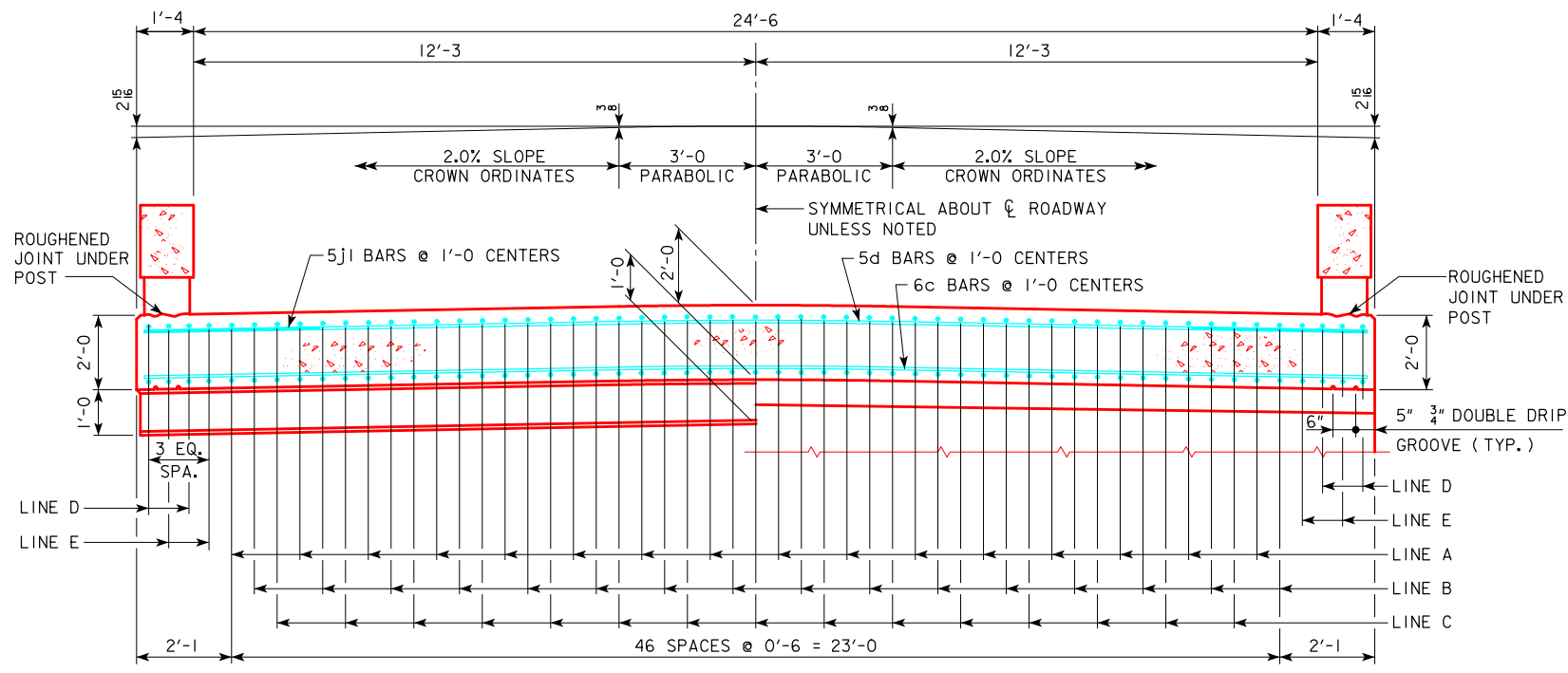
* INCLUDES 4 WINGS @ 0.68 C.Y. EACH AND 2 TEMPORARY PAVING BLOCKS; EXCLUDES RAIL CONCRETE.

BENT BAR DETAILS



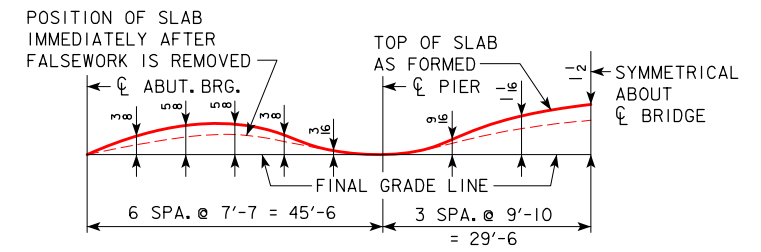
REVISED 07-09 - OPEN RAIL REINF. QTY'S. CHANGED WHICH CHANGED TOTAL REINF. QTY'S. REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE. CHANGED PAVING BLOCK LIFTING HOOP BAR MARK, (WAS 5x1).

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 140'-0 BRIDGE		J24-17-06



HALF SECTION NEAR PIER HALF SECTION NEAR ABUTMENT

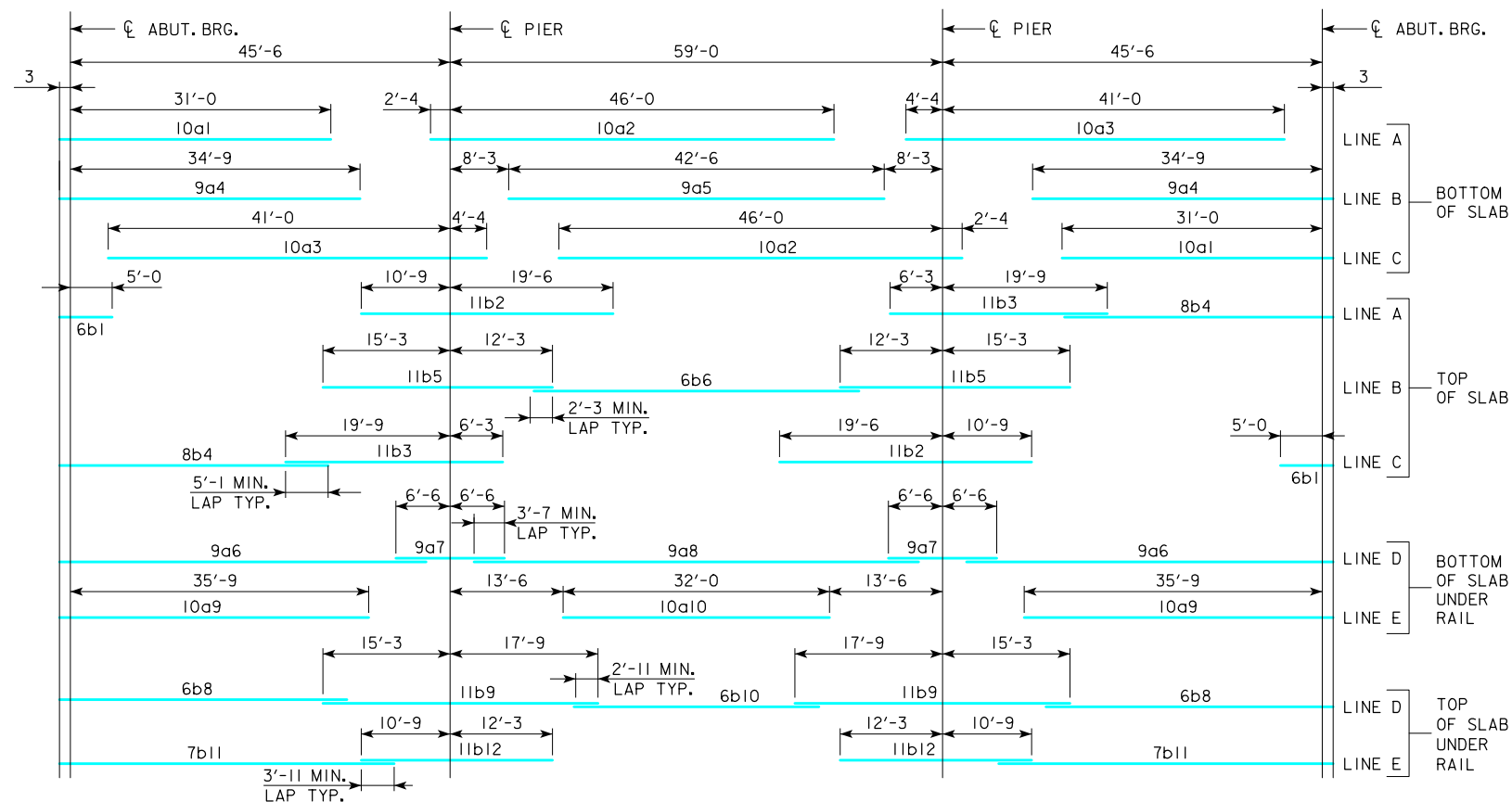
SLAB CROSS-SECTIONAL AREA
FOR OPEN RAIL = 54.33 SQ. FT.



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\"/>



PLACEMENT FOR LONGITUDINAL REINFORCEMENT

REVISED 06-12 - I.M. REQUIREMENT ADDED TO BAR CHAIR NOTE.
REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE. CHANGED PAVING BLOCK LIFTING HOOP BAR MARK, (WAS .5x1).

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 150'-0 BRIDGE
J24-18-06	

BILL OF REINFORCING STEEL FOR SUPERSTRUCTURE - 150' BRIDGE

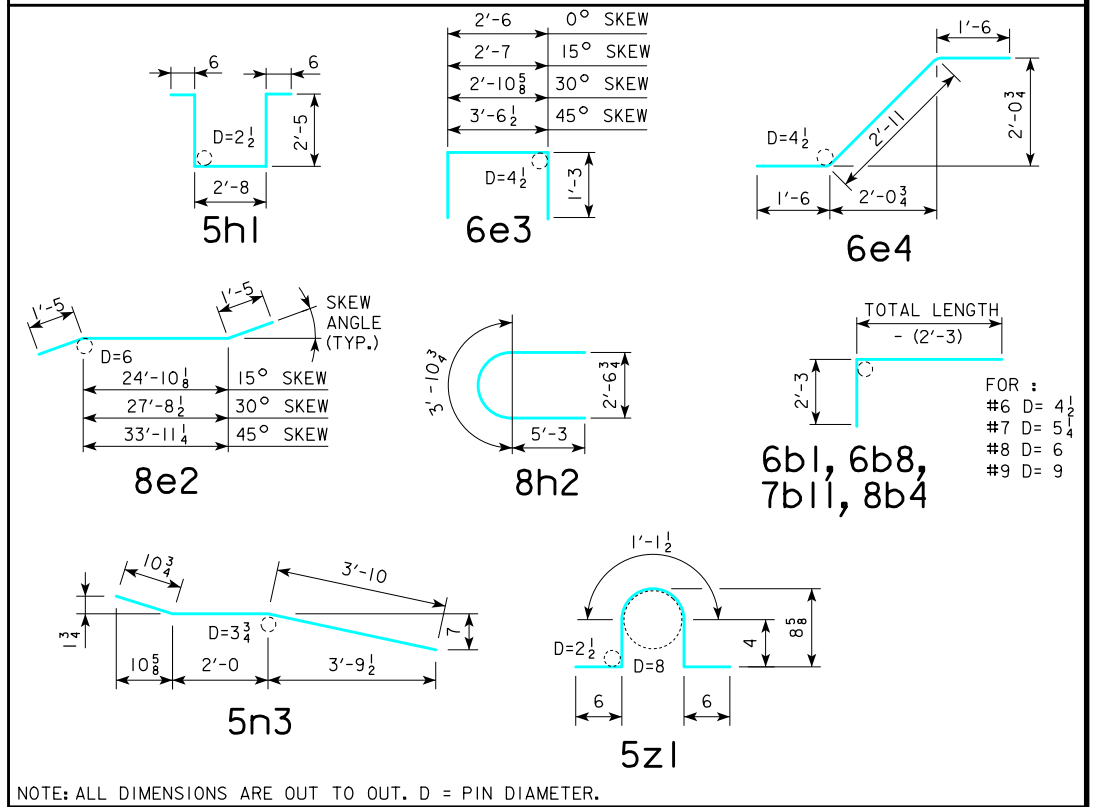
LOCATION	SKEW	SHAPE	0°				15°				30°				45°			
			NO.	LENGTH	WEIGHT		NO.	LENGTH	WEIGHT		NO.	LENGTH	WEIGHT		NO.	LENGTH	WEIGHT	
SLAB LONGITUDINAL BOTTOM		10a1	31	31'-3	4169	31	31'-3	4169	31	31'-3	4169	31	31'-3	4169				
SLAB LONGITUDINAL BOTTOM		10a2	31	48'-4	6448	31	48'-4	6448	31	48'-4	6448	31	48'-4	6448				
SLAB LONGITUDINAL BOTTOM		10a3	31	45'-4	6048	31	45'-4	6048	31	45'-4	6048	31	45'-4	6048				
SLAB LONGITUDINAL BOTTOM		9a4	32	35'-0	3808	32	35'-0	3808	32	35'-0	3808	32	35'-0	3808				
SLAB LONGITUDINAL BOTTOM		9a5	16	42'-6	2312	16	42'-6	2312	16	42'-6	2312	16	42'-6	2312				
SLAB LONGITUDINAL BOTTOM, AT RAIL		9a6	8	42'-10	1166	8	42'-10	1166	8	42'-10	1166	8	42'-10	1166				
SLAB LONGITUDINAL BOTTOM, AT RAIL		9a7	8	13'-0	354	8	13'-0	354	8	13'-0	354	8	13'-0	354				
SLAB LONGITUDINAL BOTTOM, AT RAIL		9a8	4	53'-2	724	4	53'-2	724	4	53'-2	724	4	53'-2	724				
SLAB LONGITUDINAL BOTTOM, AT RAIL		10a9	8	36'-0	1240	8	36'-0	1240	8	36'-0	1240	8	36'-0	1240				
SLAB LONGITUDINAL BOTTOM, AT RAIL		10a10	4	32'-0	551	4	32'-0	551	4	32'-0	551	4	32'-0	551				
SLAB LONGITUDINAL TOP		6b1	31	7'-6	350	31	7'-6	350	31	7'-6	350	31	7'-6	350				
SLAB LONGITUDINAL TOP		11b2	31	30'-3	4983	31	30'-3	4983	31	30'-3	4983	31	30'-3	4983				
SLAB LONGITUDINAL TOP		11b3	31	26'-0	4283	31	26'-0	4283	31	26'-0	4283	31	26'-0	4283				
SLAB LONGITUDINAL TOP		8b4	31	33'-4	2759	31	33'-4	2759	31	33'-4	2759	31	33'-4	2759				
SLAB LONGITUDINAL TOP		11b5	32	27'-6	4676	32	27'-6	4676	32	27'-6	4676	32	27'-6	4676				
SLAB LONGITUDINAL TOP		6b6	16	39'-0	938	16	39'-0	938	16	39'-0	938	16	39'-0	938				
SLAB LONGITUDINAL TOP, AT RAIL		6b8	8	35'-8	429	8	35'-8	429	8	35'-8	429	8	35'-8	429				
SLAB LONGITUDINAL TOP, AT RAIL		11b9	8	33'-0	1403	8	33'-0	1403	8	33'-0	1403	8	33'-0	1403				
SLAB LONGITUDINAL TOP, AT RAIL		6b10	4	29'-4	177	4	29'-4	177	4	29'-4	177	4	29'-4	177				
SLAB LONGITUDINAL TOP, AT RAIL		7b11	8	41'-2	674	8	41'-2	674	8	41'-2	674	8	41'-2	674				
SLAB LONGITUDINAL TOP, AT RAIL		11b12	8	23'-0	978	8	23'-0	978	8	23'-0	978	8	23'-0	978				
SLAB TRANSVERSE, BOTTOM		6c1	147	26'-10	5925	147	27'-9	6128	136	26'-10	5482	126	26'-10	5079				
SLAB TRANSVERSE ENDS, BOTTOM		6c2	-	-	-	-	-	-	24	VARIES	579	44	VARIES	970				
SLAB TRANSVERSE, TOP		5d1	147	26'-10	4115	147	27'-9	4255	136	26'-10	3807	126	26'-10	3527				
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	8'-6	320	36	8'-6	320	36	8'-6	320	54	8'-6	479				
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	292	8'-6	2589	292	8'-6	2589	292	8'-6	2589	290	8'-6	2571				
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.					65,190			65,608			65,760			66,444				
OPEN RAIL - SEE LIST ON RAIL SHEET J24-41-06					9605			9605			9605			9605				
TOTAL - LBS. WITH MONOLITHIC PIER CAP AND OPEN RAIL					74,795			75,213			75,365			76,049				
TOTAL - LBS. WITH NON-MONOLITHIC PIER CAP AND OPEN RAIL					73,524			73,915			73,972			74,291				
SAME AS ABOVE EXCEPT ALL "h" BARS DELETED																		

ESTIMATED QUANTITIES FOR SUPERSTRUCTURE - 150' BRIDGE

ITEM	SKEW	WITH MONOLITHIC PIER CAP				WITH NON-MONOLITHIC PIER CAP			
		0°	15°	30°	45°	0°	15°	30°	45°
OPEN RAIL	*STRUCTURAL CONCRETE (BRIDGE) C.Y.	322.1	322.7	324.8	329.1	317.9	318.3	320.0	323.3
OPEN RAIL	REINFORCING STEEL LBS.	74,795	75,213	75,365	76,049	73,524	73,915	73,972	74,291
OPEN RAIL	LIN. FT.	322.0	322.2	322.9	324.5	322.0	322.2	322.9	324.5

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

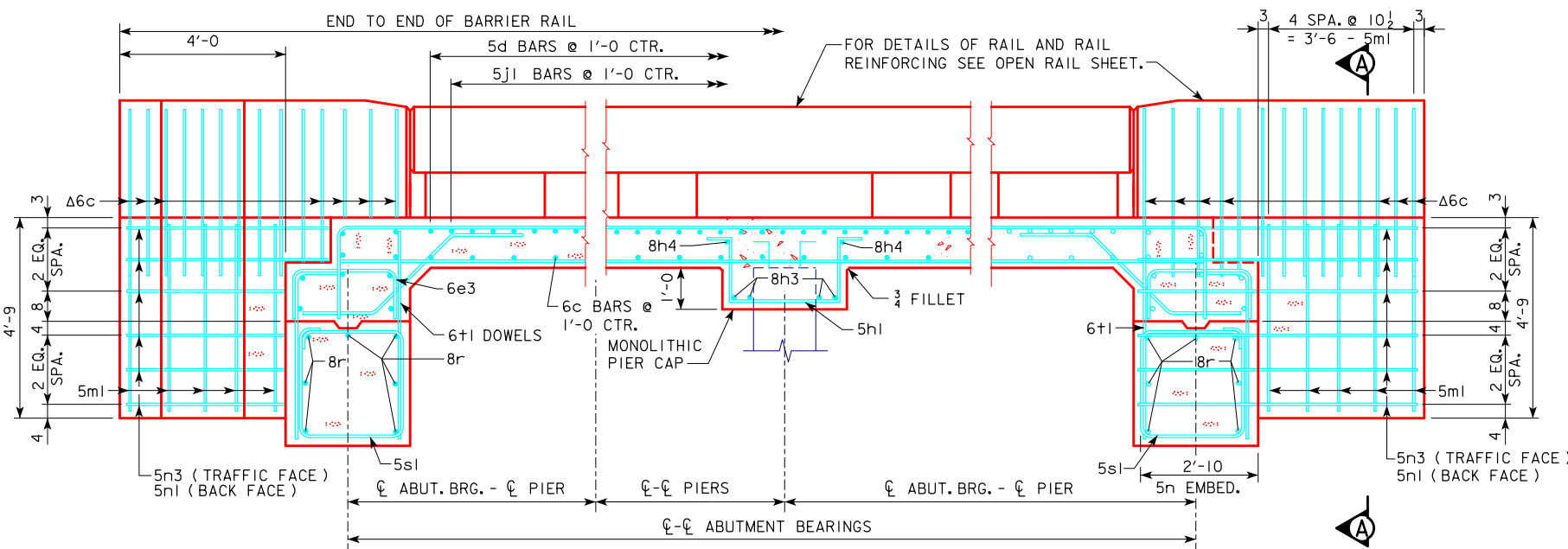
BENT BAR DETAILS



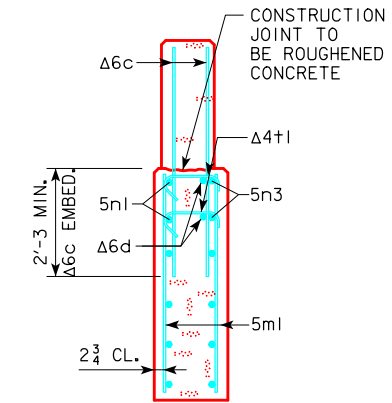
REVISED 07-09 - OPEN RAIL REINF. QTY'S. CHANGED WHICH CHANGED TOTAL REINF. QTY'S. REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE. CHANGED PAVING BLOCK LIFTING HOOP BAR MARK, (WAS 5x1).

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 150'-0 BRIDGE		J24-19-06

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

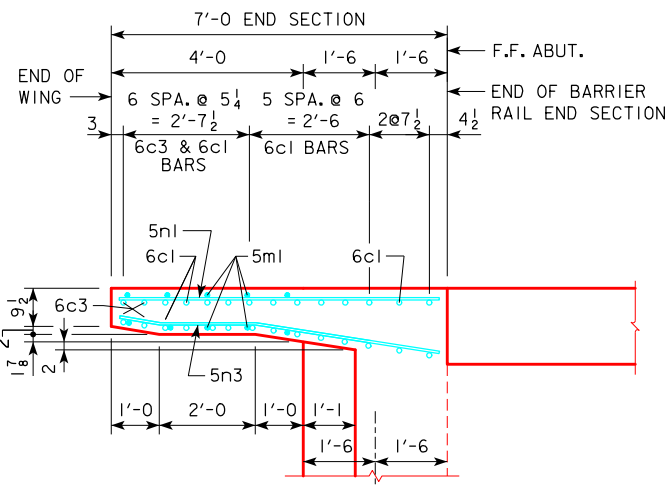


SECTION A-A

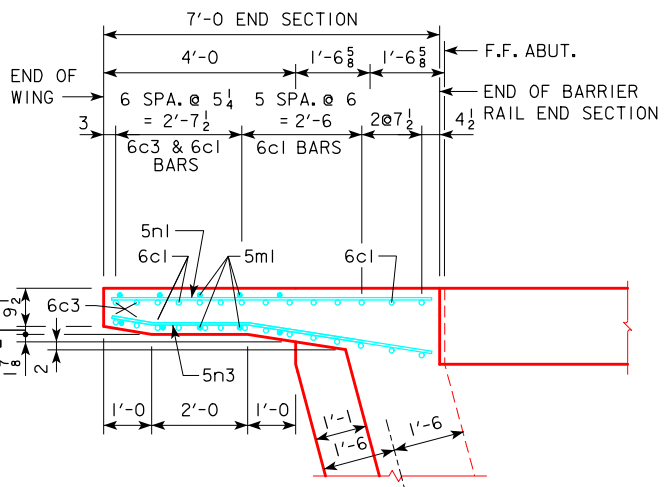
NOTE: SEE OPEN BARRIER RAIL DETAILS IN THESE PLANS FOR DETAILS OF BARRIER RAIL END SECTION.
NOTE: 5m1, 5n1, & 5n3 BARS ARE INCLUDED IN SUPERSTRUCTURE BAR LIST. 6c, 6d & 4+1 BARS ARE INCLUDED IN BARRIER RAIL BAR LIST.

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.

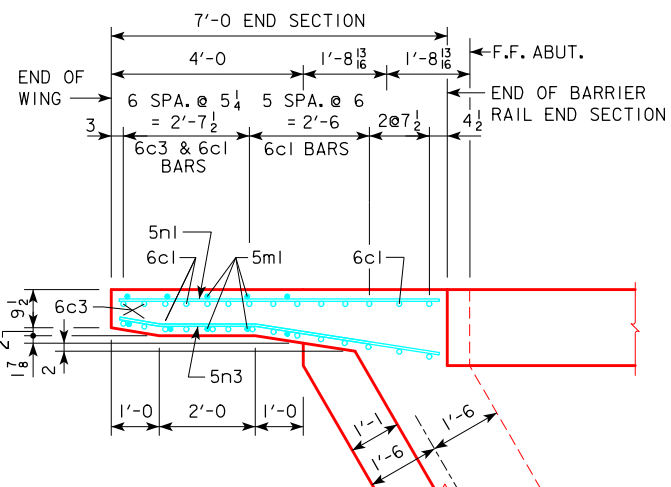
BAR CHAIR NOTE:
TOP MAT OF REINFORCING STEEL IS TO BE SUPPORTED BY INDIVIDUAL BAR CHAIRS SPACED AT NOT MORE THAN 3'-0 CENTERS LONGITUDINALLY AND TRANSVERSELY. THE BOTTOM MAT OF REINFORCING STEEL IS TO BE SUPPORTED BY INDIVIDUAL BAR CHAIRS SPACED AT NOT MORE THAN 3'-0 CENTERS LONGITUDINALLY AND TRANSVERSELY, 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.



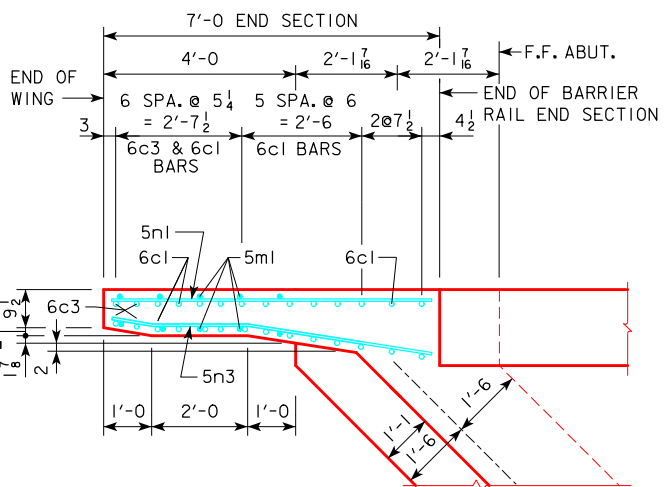
PART PLAN 0° SKEW
(RAILING NOT SHOWN)



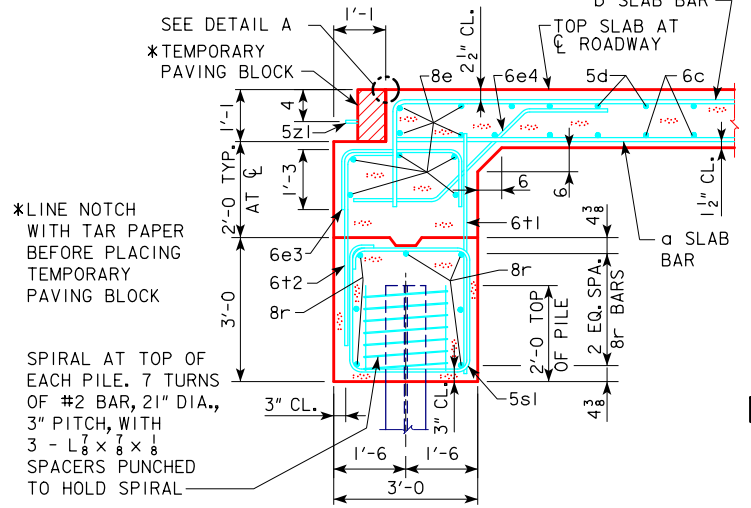
PART PLAN 15° SKEW
(RAILING NOT SHOWN)



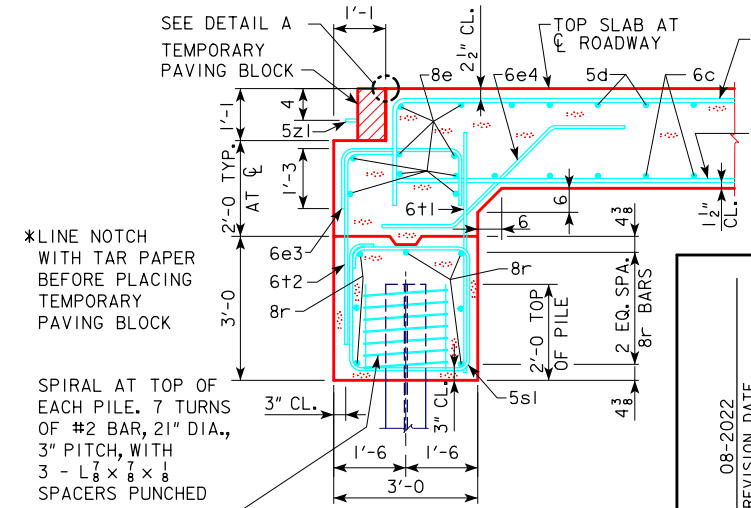
PART PLAN 30° SKEW
(RAILING NOT SHOWN)



PART PLAN 45° SKEW
(RAILING NOT SHOWN)



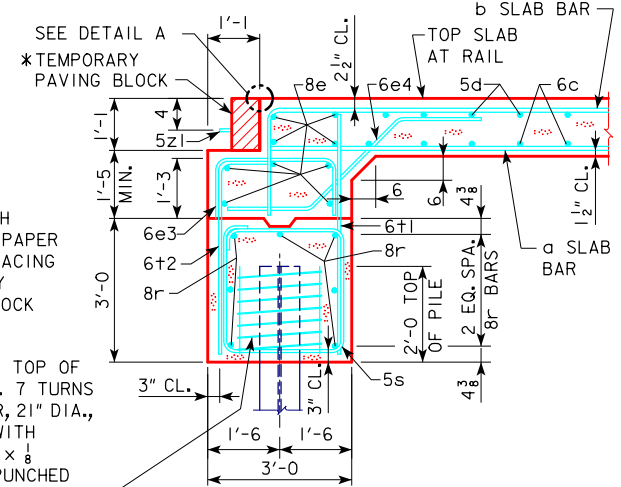
SECTION NORMAL TO ABUTMENT AT CL
(BRIDGE LENGTHS 70'-110')



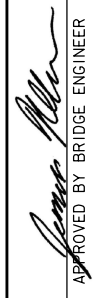

SECTION NORMAL TO ABUTMENT AT CL
(BRIDGE LENGTHS 120'-0 - 150-0')



DETAIL A

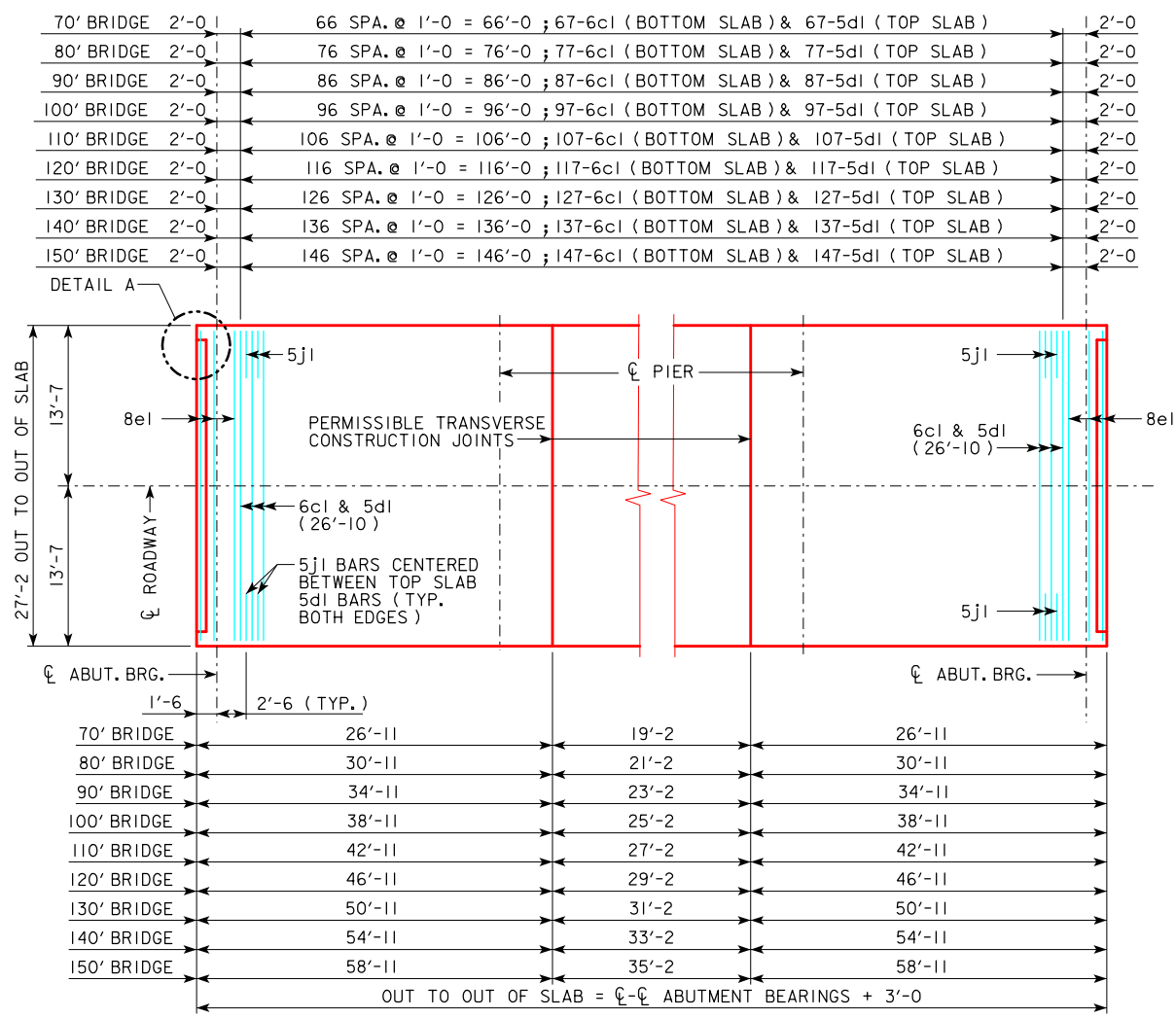


SECTION NORMAL TO ABUTMENT AT GUTTERLINE

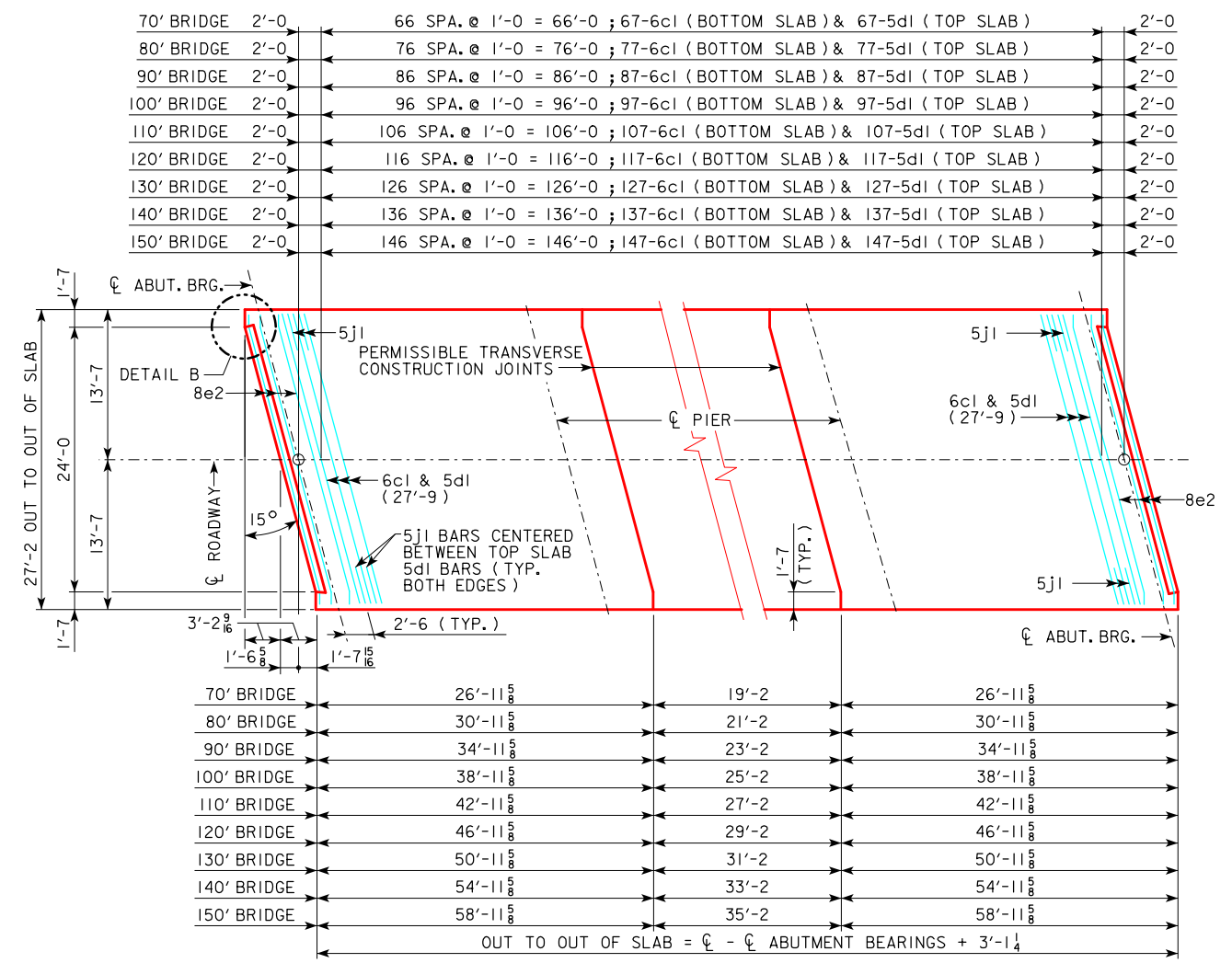
08-2022 LATEST REVISION DATE  APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 24'-0 ROADWAY, 3 SPAN BRIDGES CONTINUOUS CONCRETE SLAB BRIDGES NOVEMBER, 2006
	SUPERSTRUCTURE DETAILS ALL BRIDGES

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).

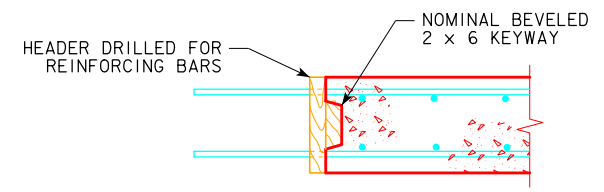


0° SKEW

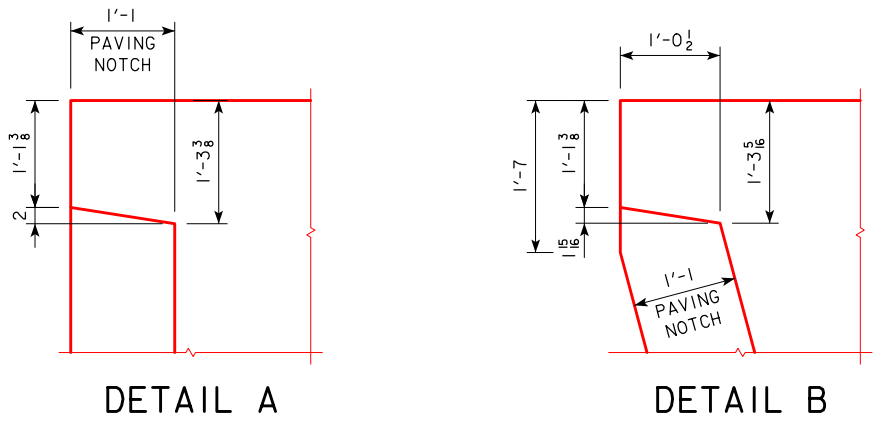


15° SKEW

TRANSVERSE REINFORCING STEEL LAYOUT



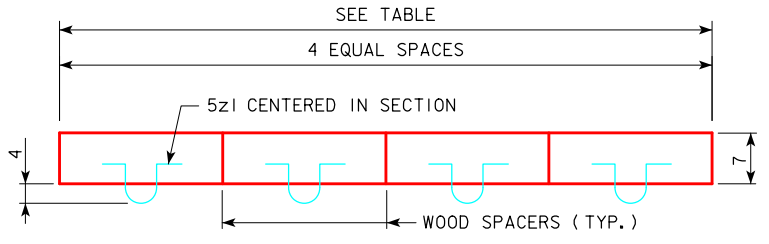
TRANSVERSE CONSTRUCTION JOINT



DETAIL A

DETAIL B

TEMPORARY PAVING BLOCK		
SKEW	LENGTH	CONCRETE
0°	22'-0	0.5 C.Y.
15°	22'-10	0.5 C.Y.



TEMPORARY PAVING BLOCK DETAIL

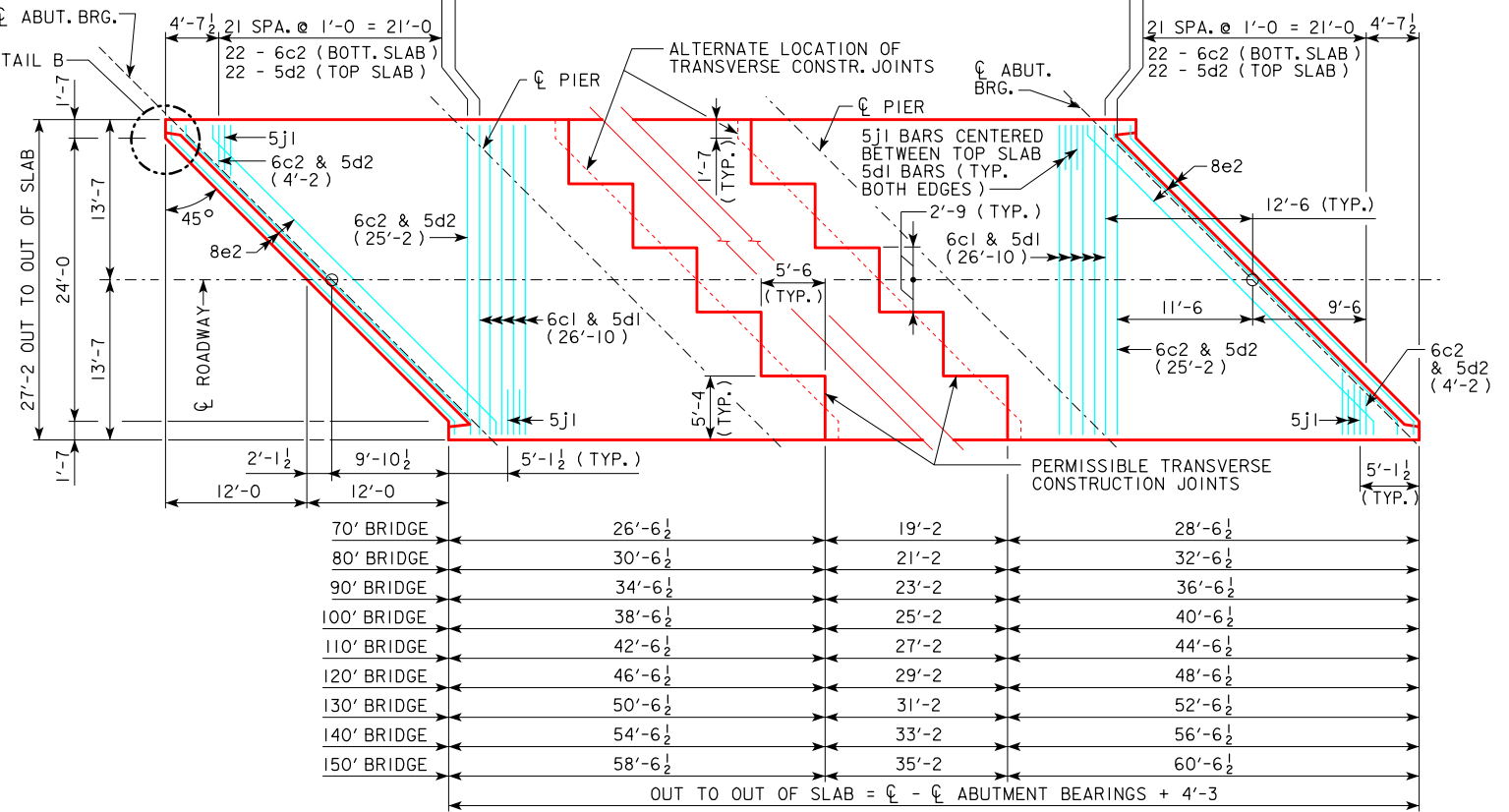
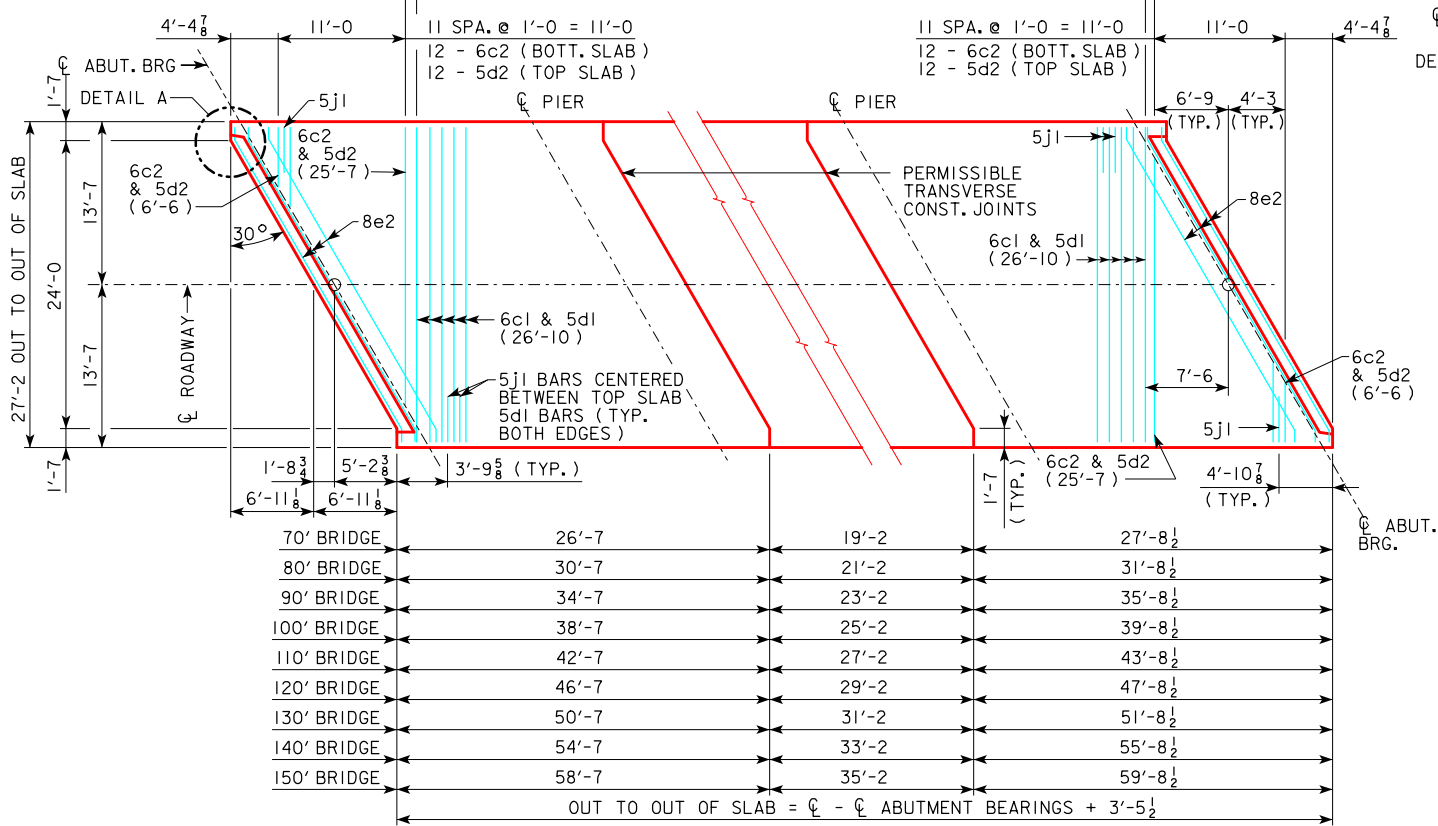
NOTE: TEMPORARY PAVING BLOCK TO BE USED WITH PAVED APPROACHES ONLY. LINE NOTCH WITH TAR PAPER BEFORE PLACING TEMPORARY PAVING BLOCK.

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

REVISED 12-08 - REVISED PAVING NOTCH, TRANSVERSE REINFORCING AND 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).

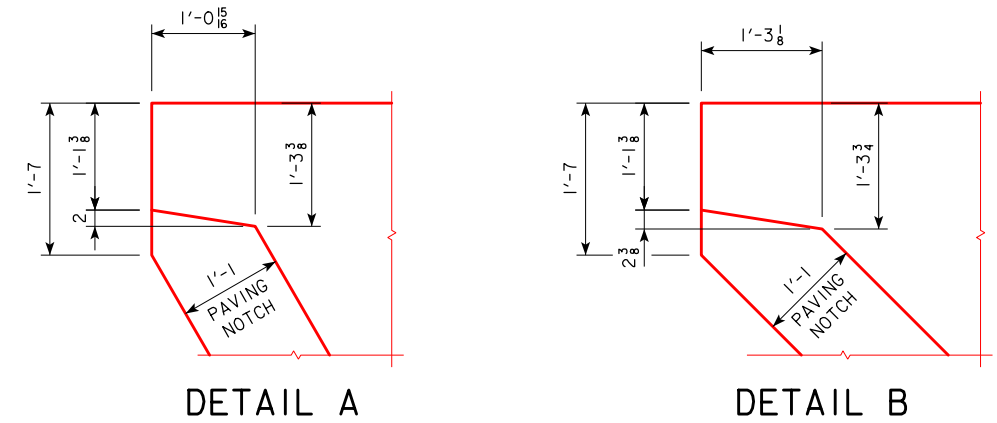
70' BRIDGE	9	55 SPA. @ 1'-0" = 55'-0"; 56-6c1 (BOTTOM SLAB) & 56-5d1 (TOP SLAB)	9
80' BRIDGE	9	65 SPA. @ 1'-0" = 65'-0"; 66-6c1 (BOTTOM SLAB) & 66-5d1 (TOP SLAB)	9
90' BRIDGE	9	75 SPA. @ 1'-0" = 75'-0"; 76-6c1 (BOTTOM SLAB) & 76-5d1 (TOP SLAB)	9
100' BRIDGE	9	85 SPA. @ 1'-0" = 85'-0"; 86-6c1 (BOTTOM SLAB) & 86-5d1 (TOP SLAB)	9
110' BRIDGE	9	95 SPA. @ 1'-0" = 95'-0"; 96-6c1 (BOTTOM SLAB) & 96-5d1 (TOP SLAB)	9
120' BRIDGE	9	105 SPA. @ 1'-0" = 105'-0"; 106-6c1 (BOTTOM SLAB) & 106-5d1 (TOP SLAB)	9
130' BRIDGE	9	115 SPA. @ 1'-0" = 115'-0"; 116-6c1 (BOTTOM SLAB) & 116-5d1 (TOP SLAB)	9
140' BRIDGE	9	125 SPA. @ 1'-0" = 125'-0"; 126-6c1 (BOTTOM SLAB) & 126-5d1 (TOP SLAB)	9
150' BRIDGE	9	135 SPA. @ 1'-0" = 135'-0"; 136-6c1 (BOTTOM SLAB) & 136-5d1 (TOP SLAB)	9

70' BRIDGE	1'-0"	45 SPA. @ 1'-0" = 45'-0"; 46-6c1 (BOTT. SLAB) & 46-5d1 (TOP SLAB)	1'-0"
80' BRIDGE	1'-0"	55 SPA. @ 1'-0" = 55'-0"; 56-6c1 (BOTT. SLAB) & 56-5d1 (TOP SLAB)	1'-0"
90' BRIDGE	1'-0"	65 SPA. @ 1'-0" = 65'-0"; 66-6c1 (BOTT. SLAB) & 66-5d1 (TOP SLAB)	1'-0"
100' BRIDGE	1'-0"	75 SPA. @ 1'-0" = 75'-0"; 76-6c1 (BOTT. SLAB) & 76-5d1 (TOP SLAB)	1'-0"
110' BRIDGE	1'-0"	85 SPA. @ 1'-0" = 85'-0"; 86-6c1 (BOTT. SLAB) & 86-5d1 (TOP SLAB)	1'-0"
120' BRIDGE	1'-0"	95 SPA. @ 1'-0" = 95'-0"; 96-6c1 (BOTT. SLAB) & 96-5d1 (TOP SLAB)	1'-0"
130' BRIDGE	1'-0"	105 SPA. @ 1'-0" = 105'-0"; 106-6c1 (BOTT. SLAB) & 106-5d1 (TOP SLAB)	1'-0"
140' BRIDGE	1'-0"	115 SPA. @ 1'-0" = 115'-0"; 116-6c1 (BOTT. SLAB) & 116-5d1 (TOP SLAB)	1'-0"
150' BRIDGE	1'-0"	125 SPA. @ 1'-0" = 125'-0"; 126-6c1 (BOTT. SLAB) & 126-5d1 (TOP SLAB)	1'-0"

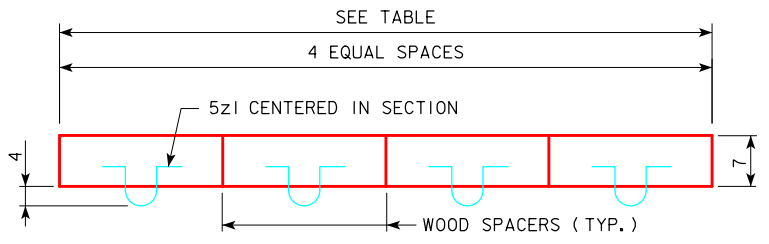


TRANSVERSE REINFORCING STEEL LAYOUT

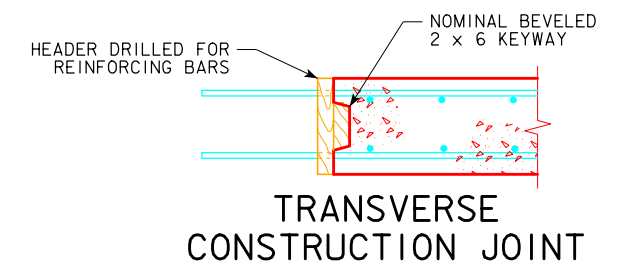
NOTE: 5d2 BARS ARE TO PASS UNDER 8e2 BARS IN CONFLICT AREAS ON 30° & 45° SKEW BRIDGES.



TEMPORARY PAVING BLOCK		
SKEW	LENGTH	CONCRETE
30°	25'-9"	0.6 C.Y.
45°	31'-11"	0.7 C.Y.

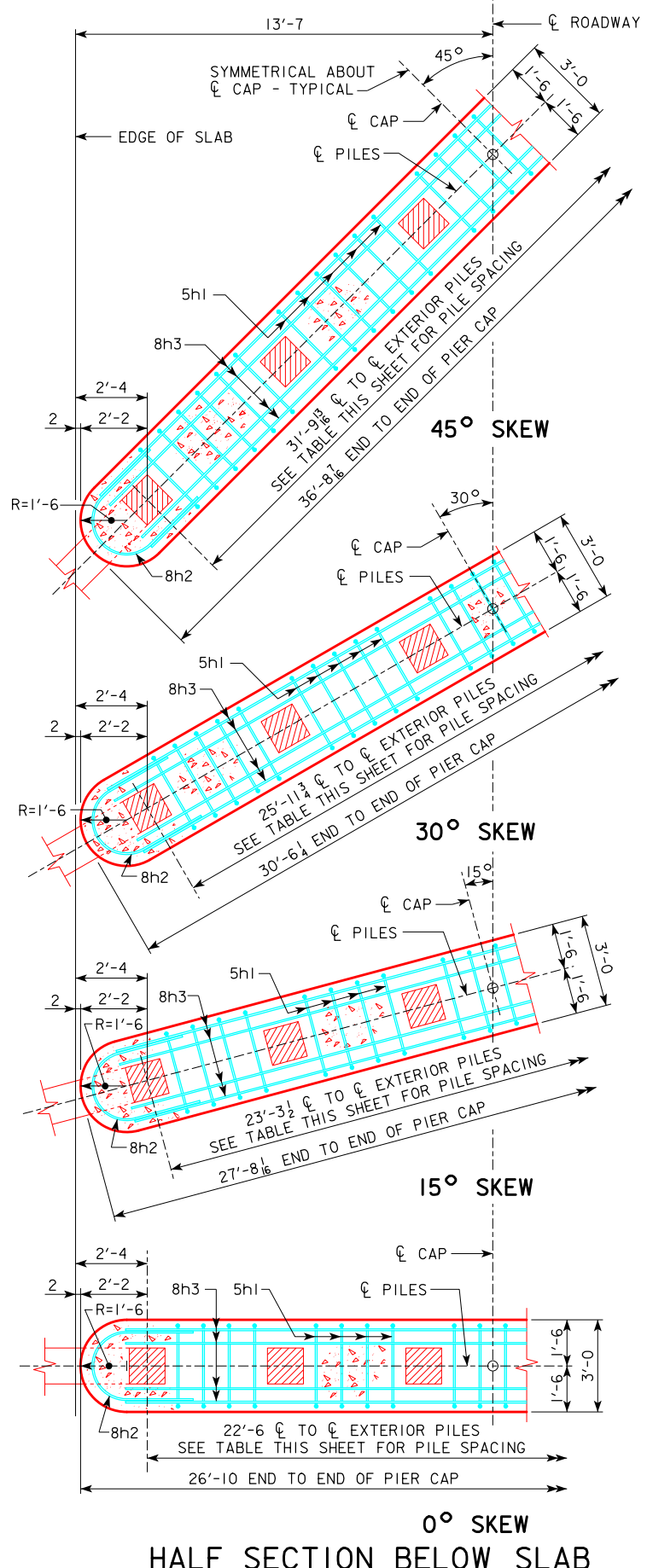


NOTE: TEMPORARY PAVING BLOCK TO BE USED WITH PAVED APPROACHES ONLY. LINE NOTCH WITH TAR PAPER BEFORE PLACING TEMPORARY PAVING BLOCK.



08-2022 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER	IOWADOT	
		STANDARD DESIGN - 24'-0" ROADWAY, 3 SPAN BRIDGES	
		CONTINUOUS CONCRETE SLAB BRIDGES NOVEMBER, 2006	
SUPERSTRUCTURE DETAILS ALL BRIDGES		J24-22-06	
30° & 45° SKEW			

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 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 PILE SIZE AT THIS SPACING IS 14 INCHES.
- ③ MAXIMUM 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.

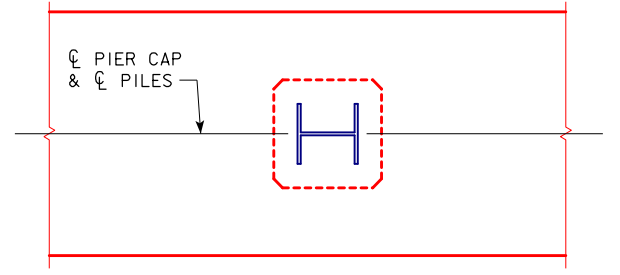
THE PIER PILES ARE TO BE DRIVEN TO FULL PENETRATION, IF PRACTICABLE, BUT IN NO CASE TO A BEARING VALUE LESS THAN THE PILE BEARING REQUIRED FOR EACH BRIDGE LENGTH AS SHOWN ON THIS SHEET. ADDITIONAL DRIVING CAPACITY MAY BE REQUIRED THROUGH SCOURABLE LAYERS. REFER TO GENERAL PLAN NOTES FOR ADDITIONAL INFORMATION.

CAP STEEL AS DETAILED ON PILE 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.

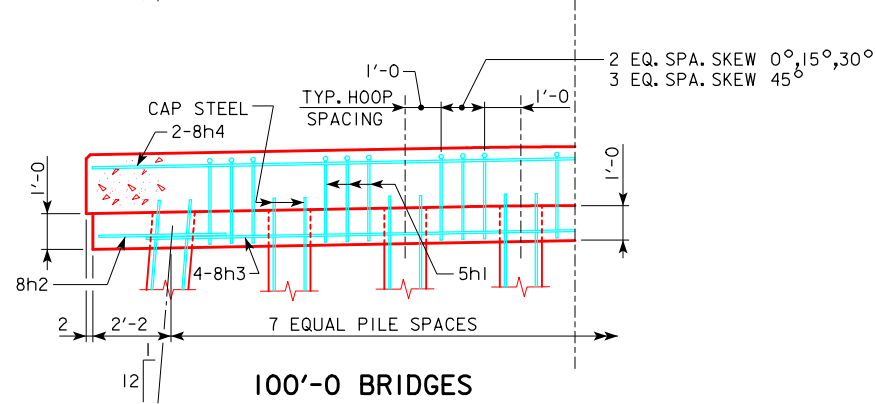
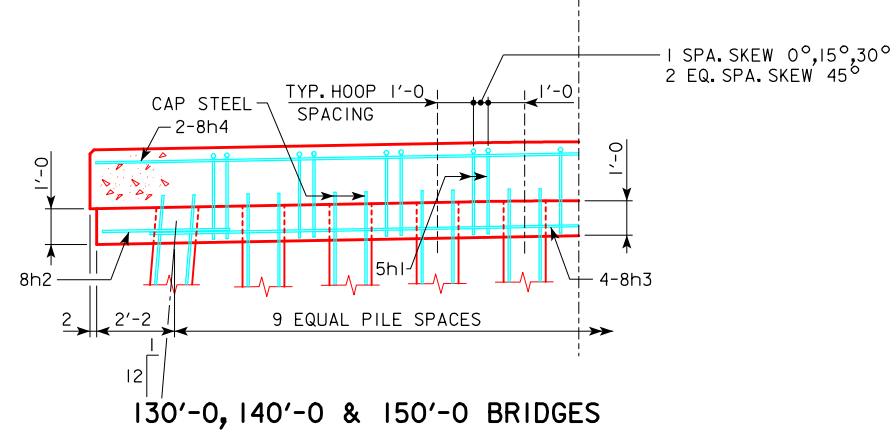
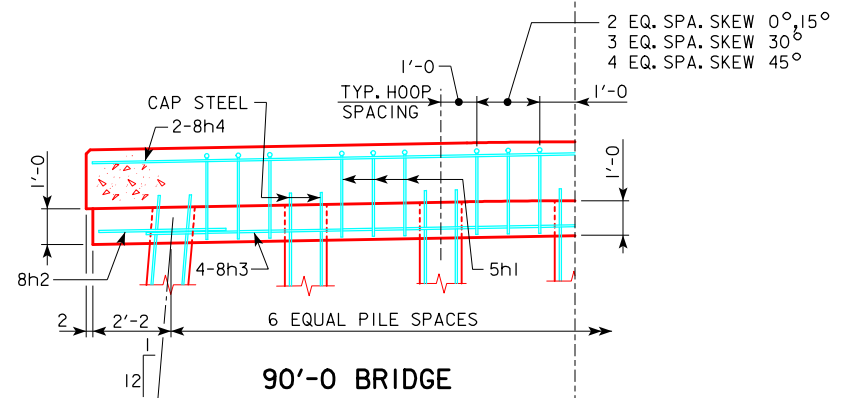
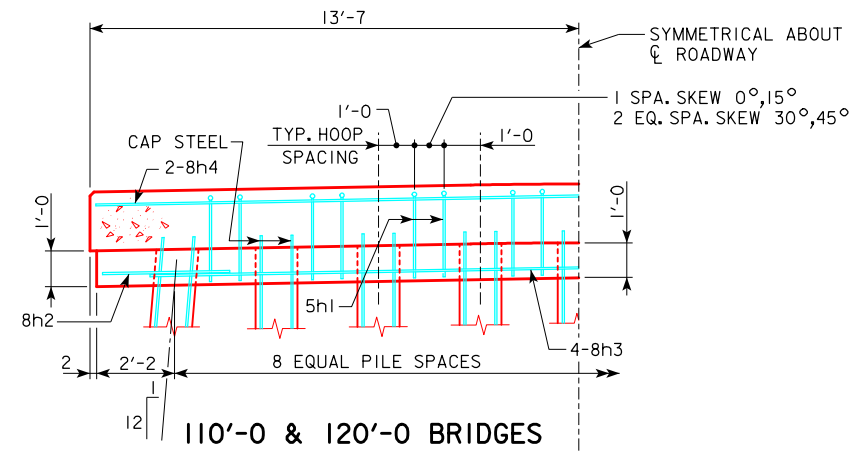
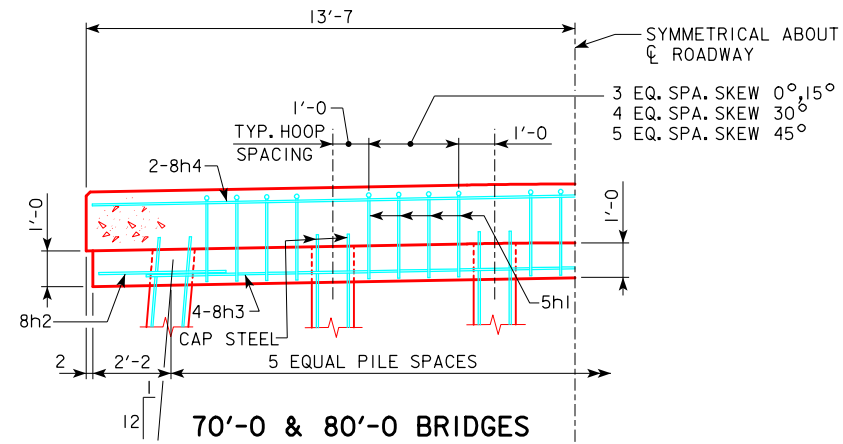
ALL REINFORCING STEEL IS TO BE GRADE 60.

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

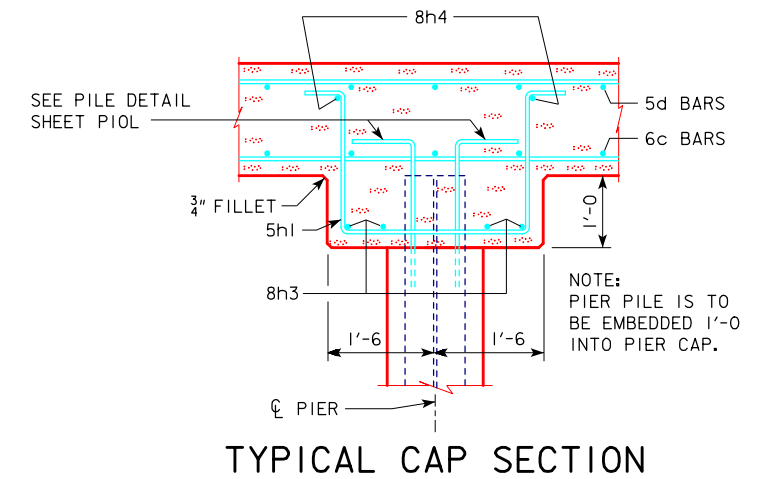


PILE ORIENTATION DETAIL FOR TYPE 3 TRESTLE BENT PILES

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	



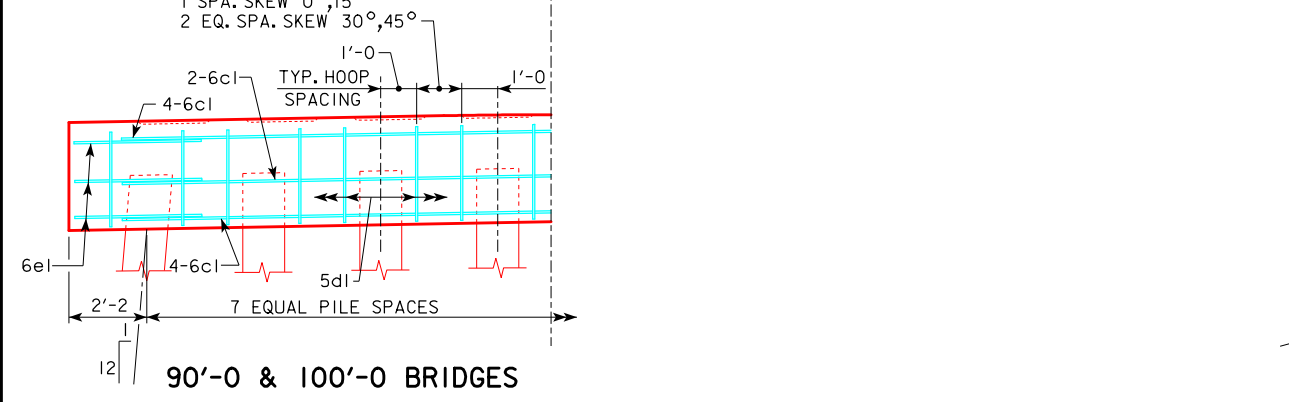
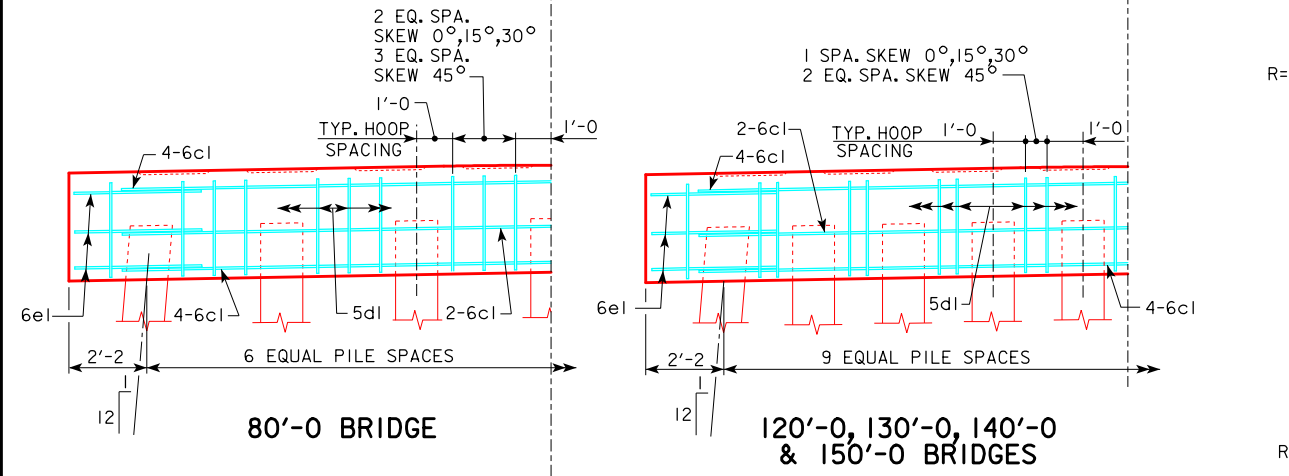
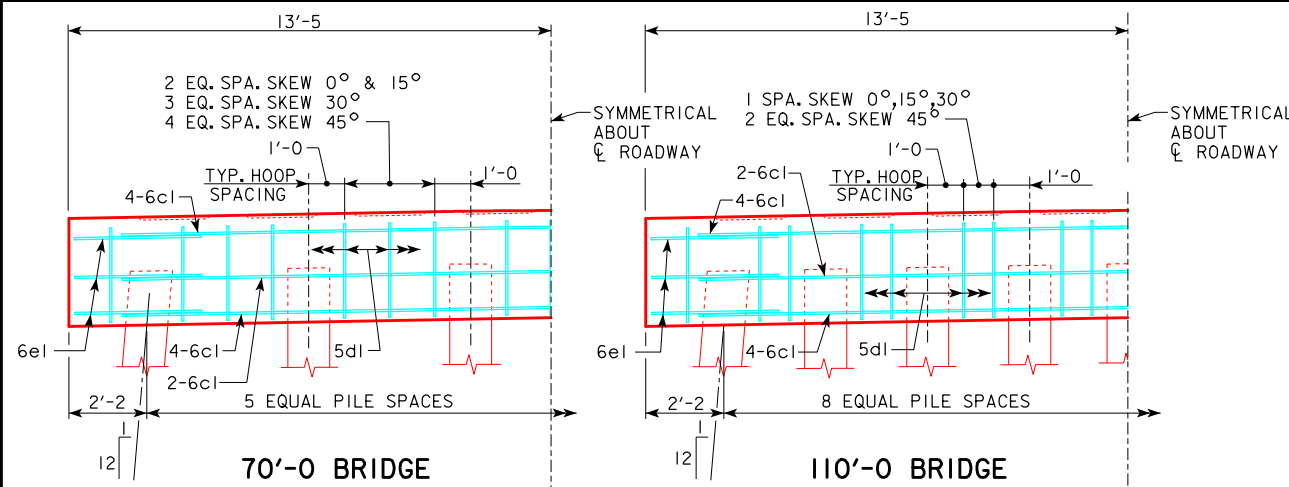
HALF SECTION NEAR PIER
SHOWING STIRRUP SPACING AND NUMBER OF PILING
NOTE: BOTTOM OF CAP ELEVATIONS WILL BE REQUIRED AT THE ϕ OF ROADWAY AND AT EACH EXTERIOR PILE.



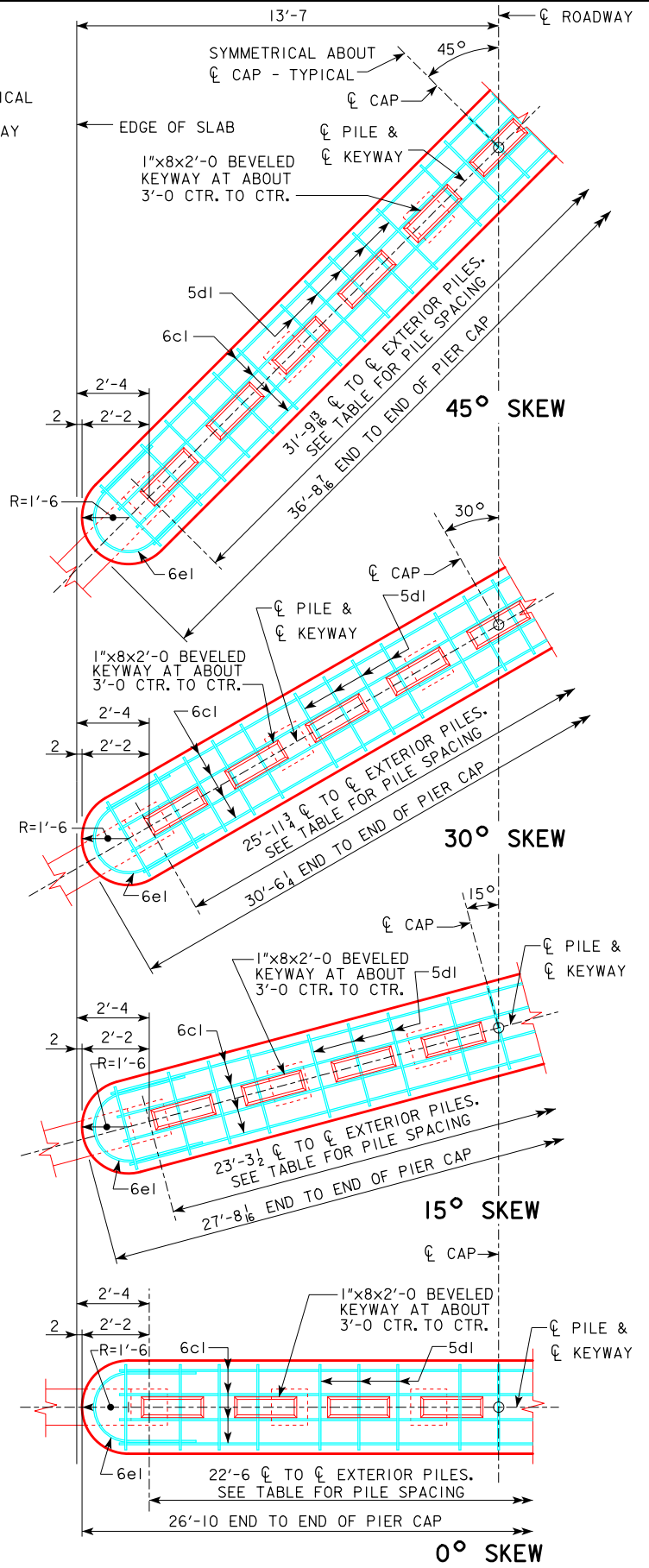
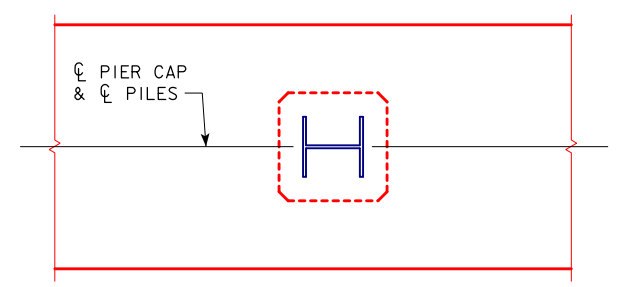
REVISED 12-08 - REVISED PILES REQUIRED FOR 110'-0 BRIDGE.
REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE.

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	

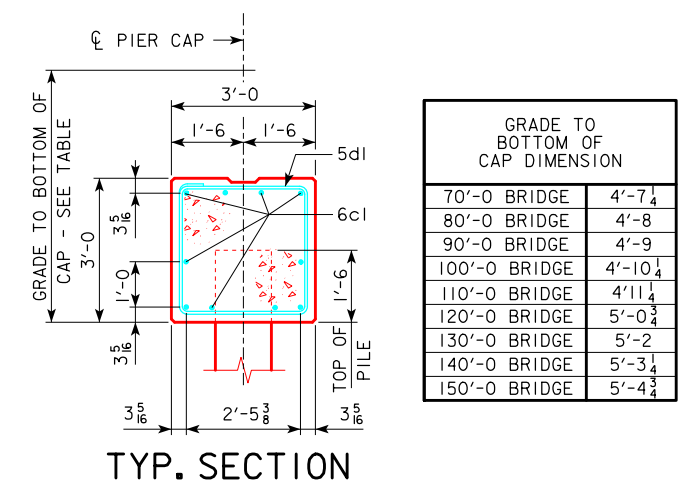
REVISED 12-08 - REVISED PILES REQUIRED 90'-0 AND 120'-0 BRIDGES. ADDED TYPE 3 PILE ORIENTATION DETAIL. EXTRA 5dl BAR ADDED AT PIER CAP END.
REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE.



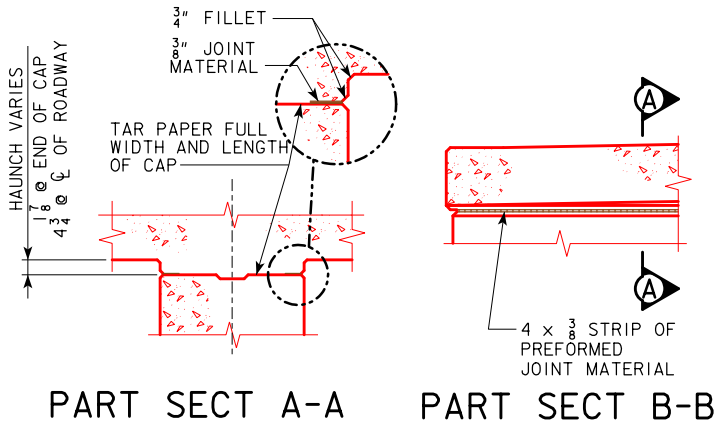
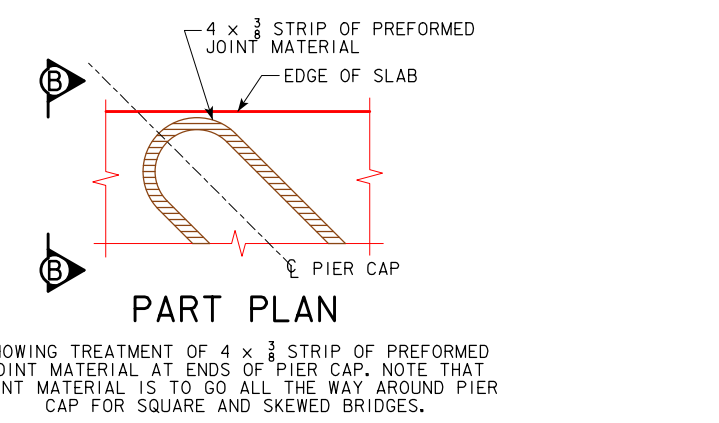
TYPICAL HALF ELEVATION PIER CAP
(LOOKING PARALLEL TO ϕ ROADWAY)



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



GRADE TO BOTTOM OF CAP DIMENSION	
70'-0 BRIDGE	4'-7 1/4
80'-0 BRIDGE	4'-8
90'-0 BRIDGE	4'-9
100'-0 BRIDGE	4'-10 1/4
120'-0 BRIDGE	5'-0 3/4
130'-0 BRIDGE	5'-2
140'-0 BRIDGE	5'-3 1/4
150'-0 BRIDGE	5'-4 3/4

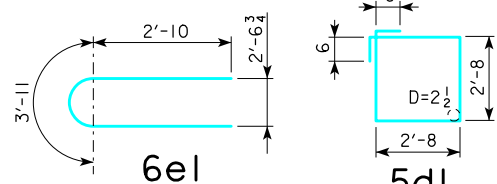


08-2022 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER 	 STANDARD DESIGN - 24 OR ROADWAY, 35 BRIDGE CONTINUOUS CONCRETE SLAB BRIDGES NOVEMBER, 2006
	NON-MONOLITHIC PIER CAP DETAILS ALL BRIDGES
	J24-25-06 SHEET 1 OF 2

BILL OF REINFORCING STEEL - ONE PIER

BRIDGE LENGTH		70'-0 BRIDGE			80'-0 BRIDGE			90'-0 BRIDGE			100'-0 BRIDGE			110'-0 BRIDGE			120'-0 BRIDGE			130'-0 BRIDGE			140'-0 BRIDGE			150'-0 BRIDGE		
MARK	SKEW	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		
6c1	0°	—	10	23'-10	358	10	23'-10	358	10	23'-10	358	10	23'-10	358	10	23'-10	358	10	23'-10	358	10	23'-10	358	10	23'-10	358		
	15°	—	10	24'-8	370	10	24'-8	370	10	24'-8	370	10	24'-8	370	10	24'-8	370	10	24'-8	370	10	24'-8	370	10	24'-8	370		
	30°	—	10	27'-6	413	10	27'-6	413	10	27'-6	413	10	27'-6	413	10	27'-6	413	10	27'-6	413	10	27'-6	413	10	27'-6	413		
	45°	—	10	33'-9	507	10	33'-9	507	10	33'-9	507	10	33'-9	507	10	33'-9	507	10	33'-9	507	10	33'-9	507	10	33'-9	507		
5d1	0°	—	17	11'-8	207	20	11'-8	244	16	11'-8	195	16	11'-8	195	18	11'-8	219	20	11'-8	244	20	11'-8	244	20	11'-8	244		
	15°	—	17	11'-8	207	20	11'-8	244	16	11'-8	195	16	11'-8	195	18	11'-8	219	20	11'-8	244	20	11'-8	244	20	11'-8	244		
	30°	—	22	11'-8	268	20	11'-8	244	23	11'-8	280	23	11'-8	280	18	11'-8	219	20	11'-8	244	20	11'-8	244	20	11'-8	244		
	45°	—	27	11'-8	329	26	11'-8	317	23	11'-8	280	23	11'-8	280	26	11'-8	317	29	11'-8	353	29	11'-8	353	29	11'-8	353		
6e1	ALL	—	6	9'-7	86	6	9'-7	86	6	9'-7	86	6	9'-7	86	6	9'-7	86	6	9'-7	86	6	9'-7	86	6	9'-7	86		

BENT BAR DETAILS



ESTIMATED QUANTITIES - ONE PIER

BRIDGE LENGTH	SKEW	70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
STRUCTURAL CONCRETE (CU. YDS.)	0°	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7
	15°	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
	30°	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	45°	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
REINFORCING STEEL (LBS.)	0°	651	688	639	639	663	688	688	688	688
	15°	663	700	651	651	675	700	700	700	700
	30°	767	743	779	779	718	743	743	743	743
	45°	922	910	873	873	910	946	946	946	946
④ PILING (NO.)	ALL	6	7	8	8	9	10	10	10	10

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

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	7	8	8	9	10	10	10	10
TYP. PILE SPACES @ 0°	5 SPA. @ 4'-6	6 SPA. @ 3'-9	② 7 SPA. @ ABOUT 3'-3	② 7 SPA. @ ABOUT 3'-3	③ 8 SPA. @ ABOUT 2'-10	③ 9 SPA. @ 2'-6	③ 9 SPA. @ 2'-6	③ 9 SPA. @ 2'-6	③ 9 SPA. @ 2'-6
TYP. PILE SPACES @ 15°	5 SPA. @ ABOUT 4'-8	6 SPA. @ ABOUT 3'-11	7 SPA. @ ABOUT 3'-4	7 SPA. @ ABOUT 3'-4	② 8 SPA. @ ABOUT 2'-11	③ 9 SPA. @ ABOUT 2'-7	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	6 SPA. @ ABOUT 4'-4	7 SPA. @ ABOUT 3'-9	7 SPA. @ ABOUT 3'-9	② 8 SPA. @ 3'-3	② 9 SPA. @ ABOUT 2'-11	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	6 SPA. @ ABOUT 5'-4	7 SPA. @ ABOUT 4'-7	7 SPA. @ ABOUT 4'-7	8 SPA. @ ABOUT 4'-0	9 SPA. @ ABOUT 3'-6	9 SPA. @ ABOUT 3'-6	9 SPA. @ ABOUT 3'-6	9 SPA. @ ABOUT 3'-6
④ PU, STRENGTH I DESIGN LOAD FOR PIER (KIPS)	623 KIPS	683 KIPS	750 KIPS	822 KIPS	891 KIPS	973 KIPS	1054 KIPS	1138 KIPS	1232 KIPS

- ① THIS TYPICAL NUMBER OF PILES MAY NEED TO BE MODIFIED DEPENDING ON SELECTED P10L 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 5d1 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 P10L PILE SIZE AT THIS SPACING IS 14 INCHES.
- ③ MAXIMUM P10L PILE SIZE AT THIS SPACING IS 12 INCHES.
- ④ STRENGTH I PIER DESIGN LOAD INCLUDES DYNAMIC LOAD ALLWANCE (IM), AND PIER CAP WEIGHT IS BASED ON 45° SKEW. USE THIS PU FOR DETERMINING NUMBER OF PILES AND PILE LENGTH.

PIER NOTES:

FOR SKEWED BRIDGES BOTTOM OF PIER CAP IS TO BE SLOPED TO COMPENSATE FOR GRADE. THEREFORE BOTTOM OF CAP ELEVATIONS WILL BE REQUIRED AT THE $\frac{1}{2}$ OF ROADWAY AND AT EACH EXTERIOR PILE.

THE MINIMUM CLEAR DISTANCE FROM THE FACE OF THE CONCRETE TO NEAR REINFORCING BAR IS TO BE 2 INCHES 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.

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.

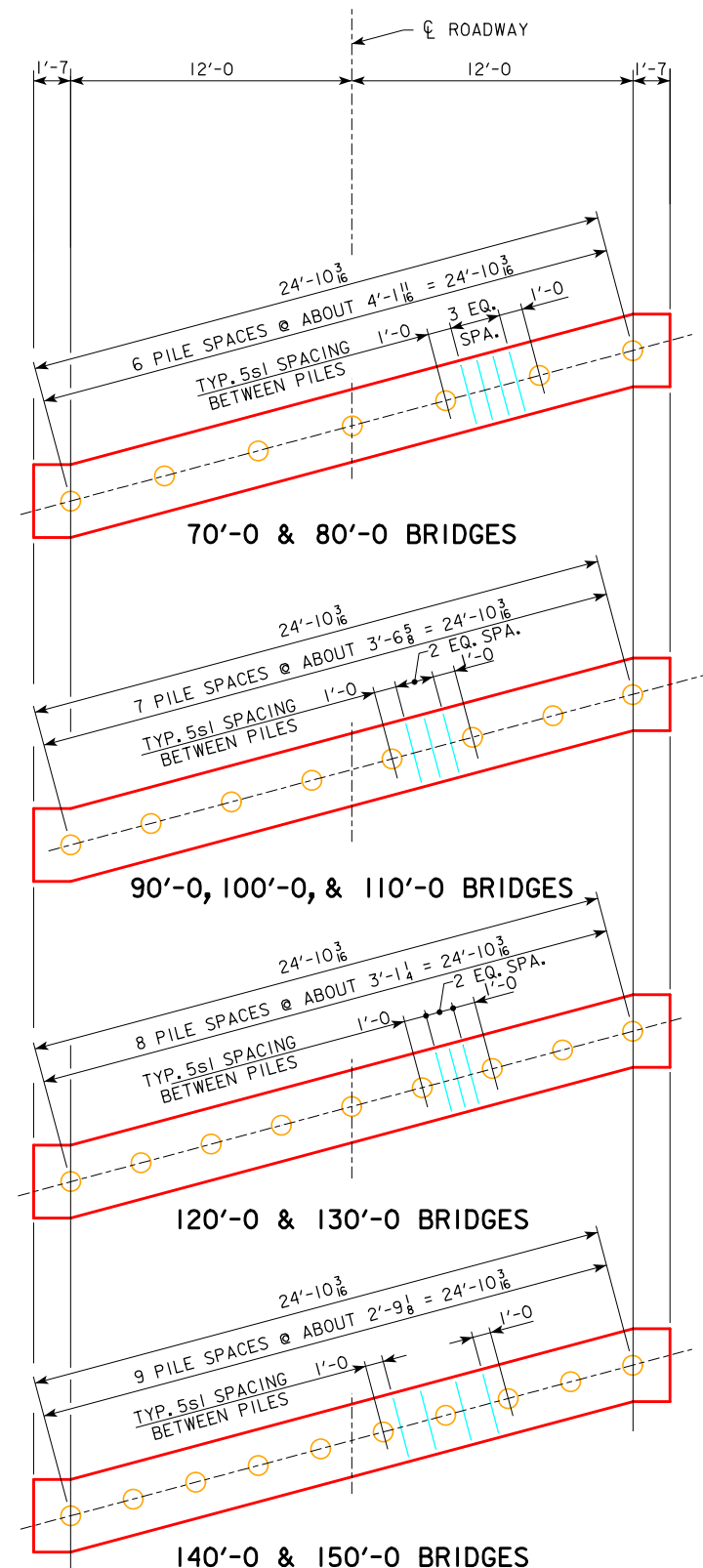
ALL REINFORCING STEEL IS TO BE GRADE 60.

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

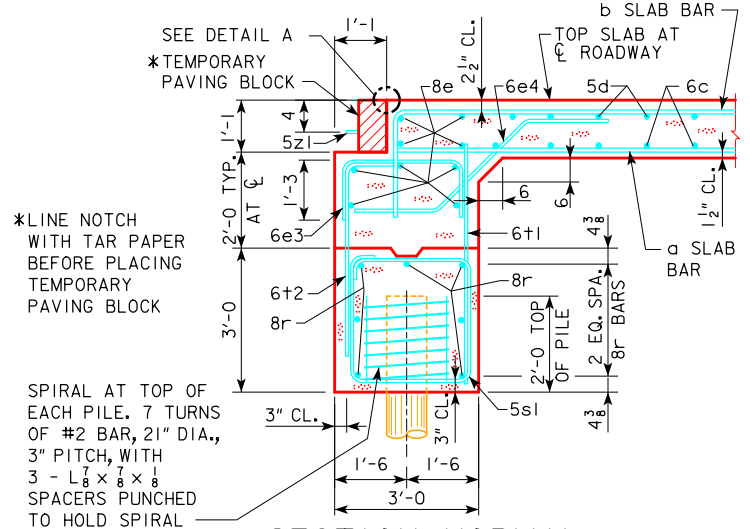
REVISED 06-13 - REVISION FOR LRFD PILE DESIGN.
REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE.

08-2022 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 24'-0 ROADWAY, 3 SPAN BRIDGES <h2 style="margin: 0;">CONTINUOUS CONCRETE SLAB BRIDGES</h2> NOVEMBER, 2006 NON-MONOLITHIC PIER CAP DETAILS ALL BRIDGES	J24-26-06
		SHEET 2 OF 2	

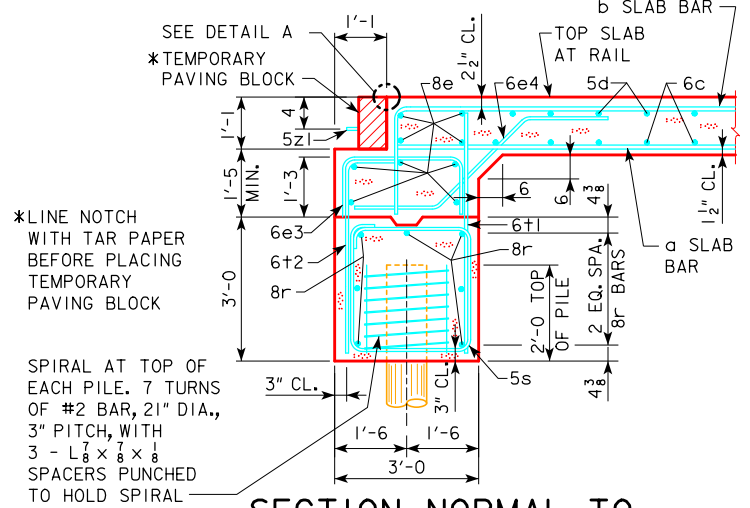
REVISED 06-13 - REVISION FOR LRF PILE DESIGN.
REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE. CHANGED PAVING BLOCK LIFTING HOOP BAR MARK, (WAS 5x1).



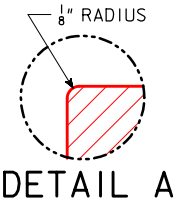
PILE PLAN - 15° SKEW WOOD PILING



SECTION NORMAL TO ABUTMENT AT CL

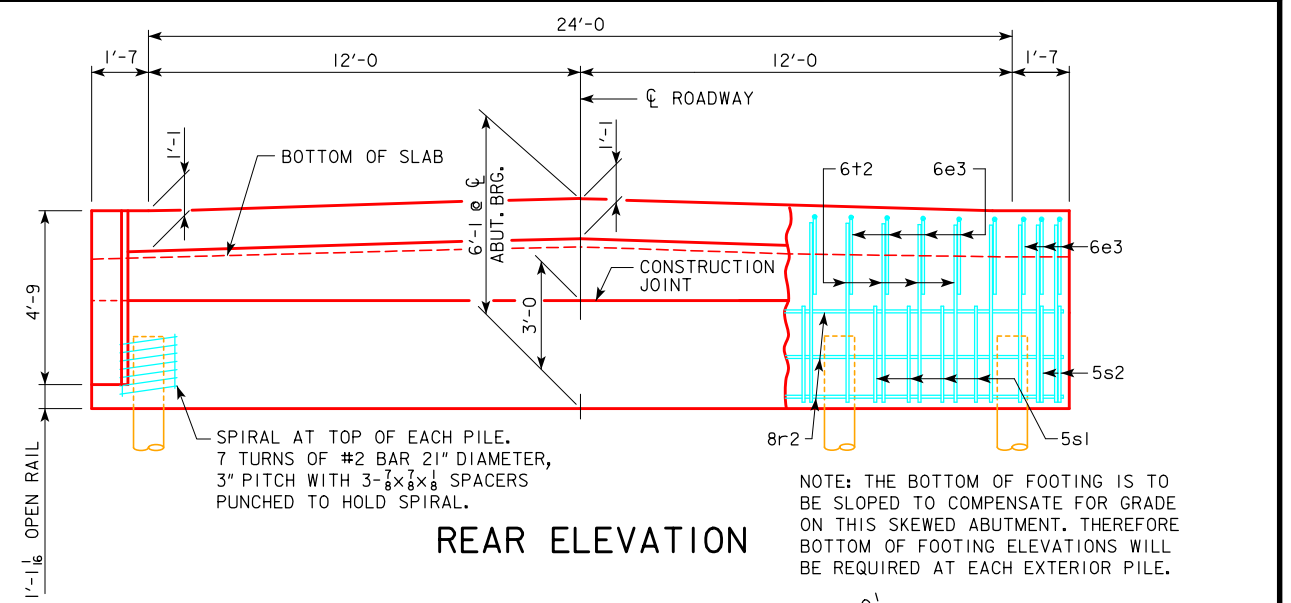


SECTION NORMAL TO ABUTMENT AT GUTTERLINE

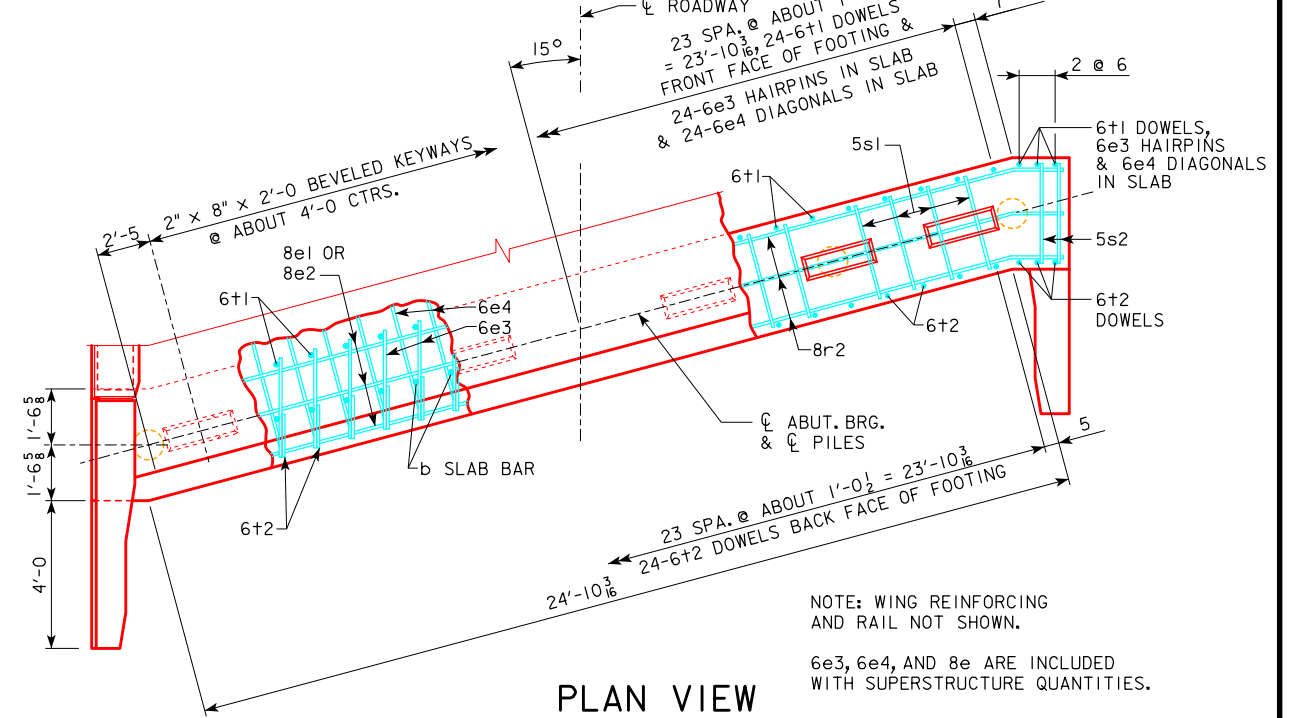


ABUTMENT NOTES:

- 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 TIMBER PILES.
- THE MINIMUM CLEAR DISTANCE FROM THE FACE OF THE CONCRETE TO NEAR REINFORCING BAR IS TO BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN.
- TIMBER PILES SHALL BE DRIVEN TO FULL PENETRATION IF PRACTICABLE BUT IN NO CASE TO A BEARING VALUE LESS THAN SHOWN IN DESIGN PLANS. TIMBER PILES SHALL NOT BE DRIVEN TO MORE THAN 160 TONS.
- 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



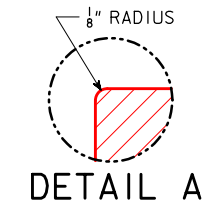
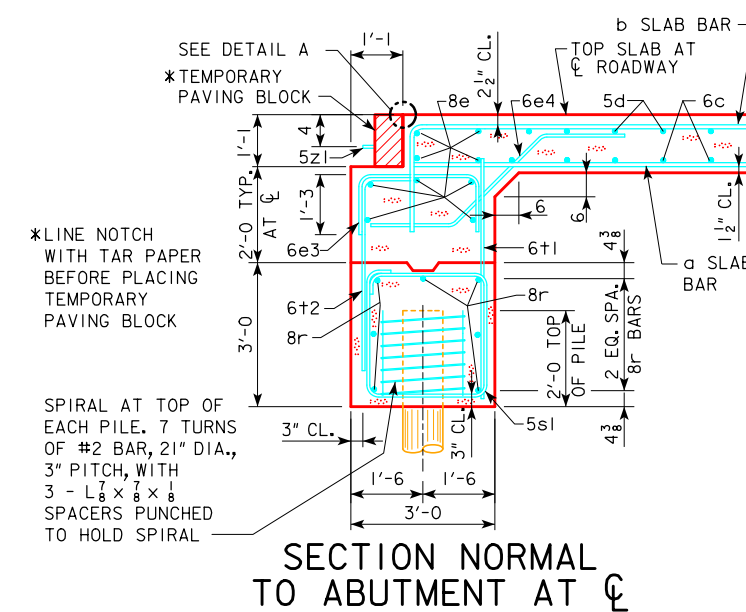
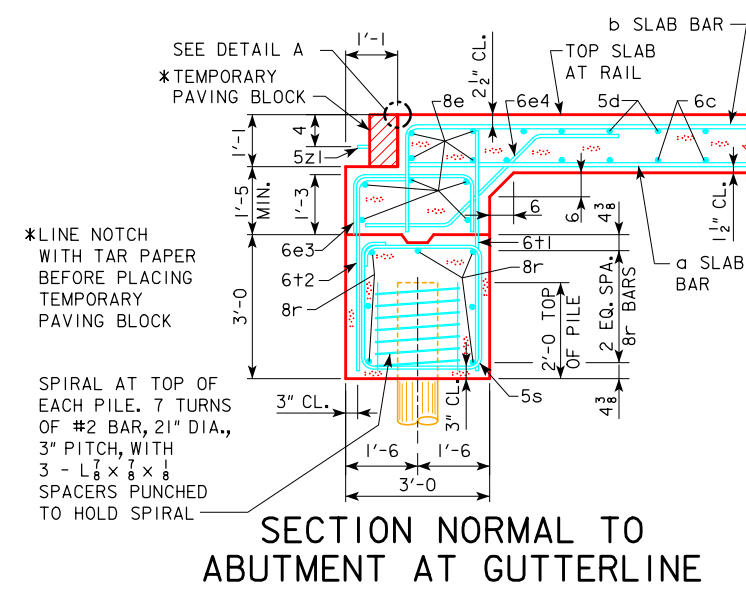
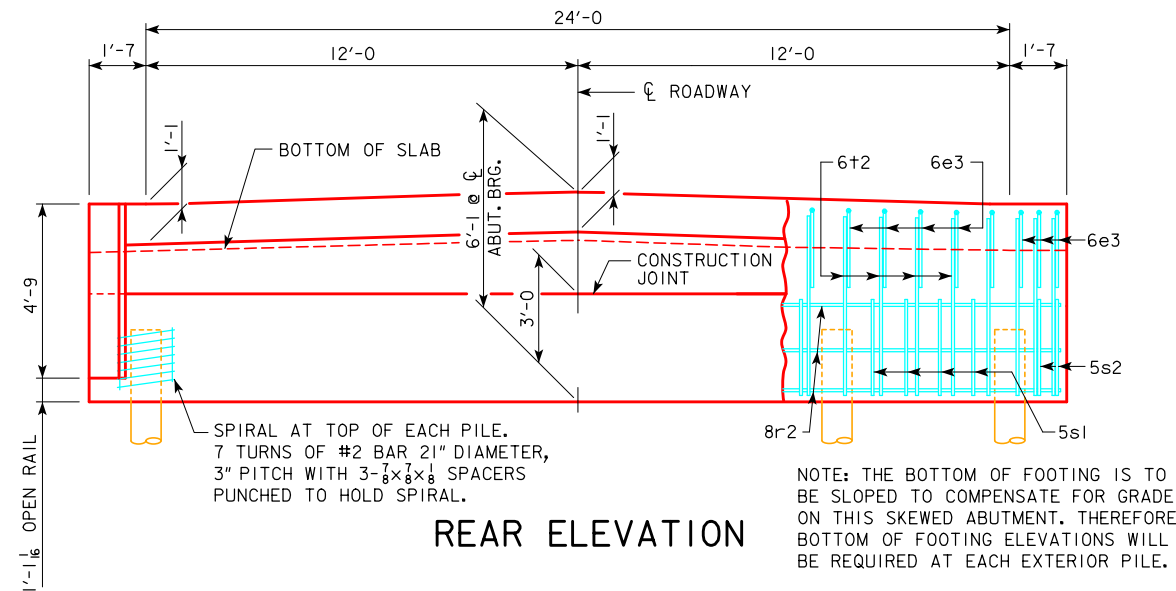
PLAN VIEW

NUMBER OF PILES AND ABUTMENT DESIGN LOADS									
BRIDGE LENGTH	70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
PILING - NUMBER	7	7	8	8	8	9	9	10	10
PU, STRENGTH I DESIGN LOAD - KIPS	348	369	390	417	442	471	499	Δ 590	Δ 622

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

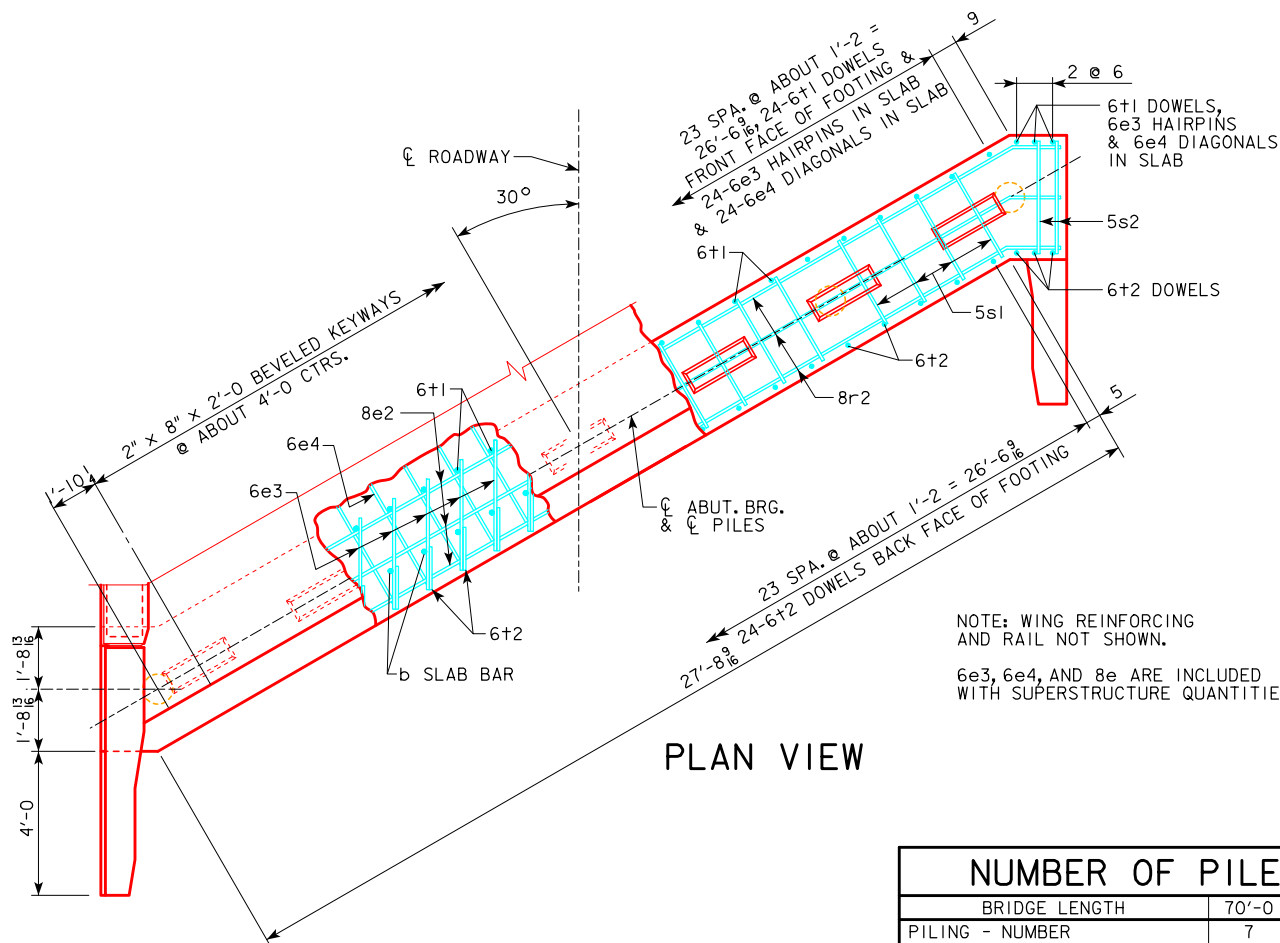
08-2022 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER 	 STANDARD DESIGN - 24'-0 ROADWAY, 3 SPAN BRIDGES CONTINUOUS CONCRETE SLAB BRIDGES NOVEMBER, 2006
	ABUTMENT DETAILS 15° SKEW - TIMBER PILING
	J24-28-06

REVISED 06-13 - REVISION FOR LRFD PILE DESIGN.
REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE. CHANGED PAVING BLOCK LIFTING HOOP BAR MARK, (WAS 5x1).



ABUTMENT NOTES:

- 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 TIMBER PILES.
- THE MINIMUM CLEAR DISTANCE FROM THE FACE OF THE CONCRETE TO NEAR REINFORCING BAR IS TO BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN.
- TIMBER PILES SHALL BE DRIVEN TO FULL PENETRATION IF PRACTICABLE BUT IN NO CASE TO A BEARING VALUE LESS THAN SHOWN IN DESIGN PLANS. TIMBER PILES SHALL NOT BE DRIVEN TO MORE THAN 160 TONS.
- 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.



NUMBER OF PILES AND ABUTMENT DESIGN LOADS									
BRIDGE LENGTH	70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
PILING - NUMBER	7	7	8	8	9	9	10	11	12
PU, STRENGTH I DESIGN LOAD - KIPS	358	379	400	427	452	481	510	Δ 601	Δ 632

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

08-2022
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

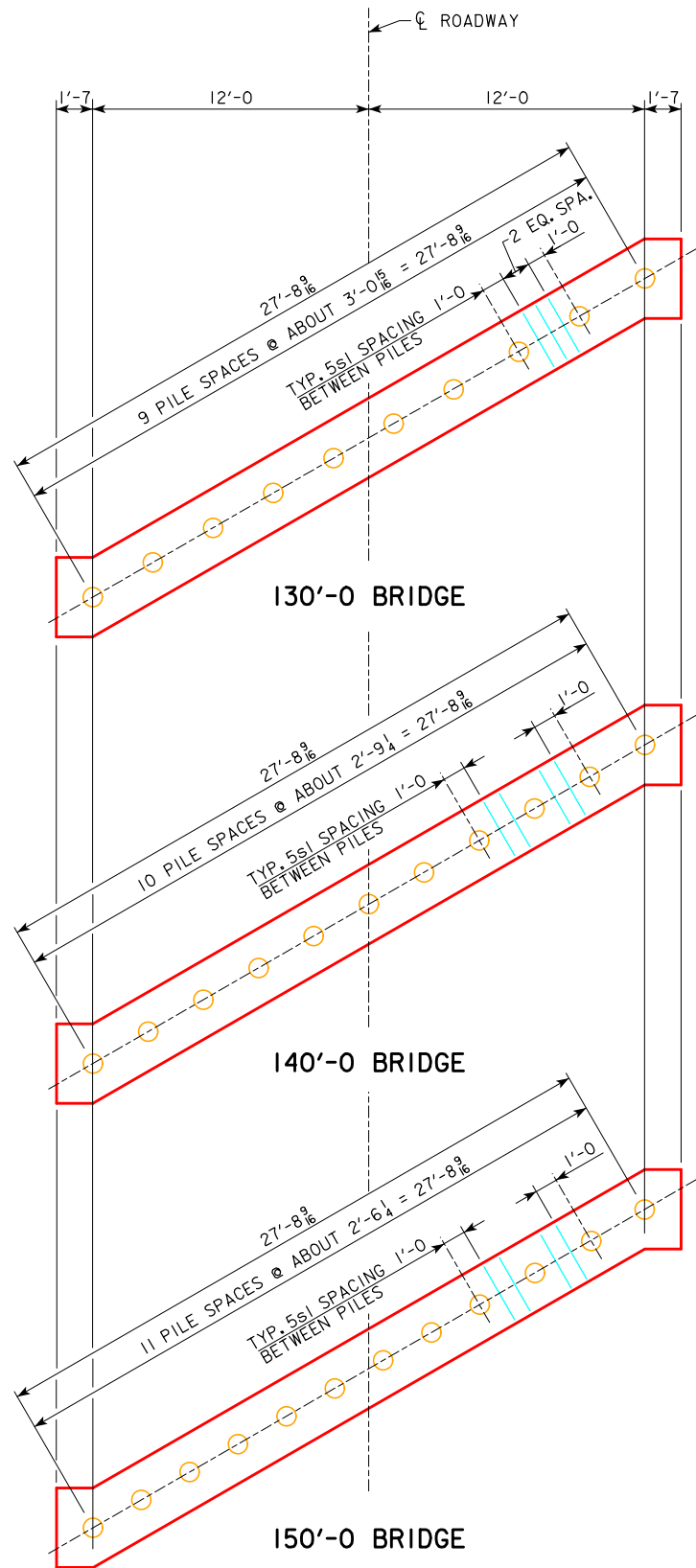
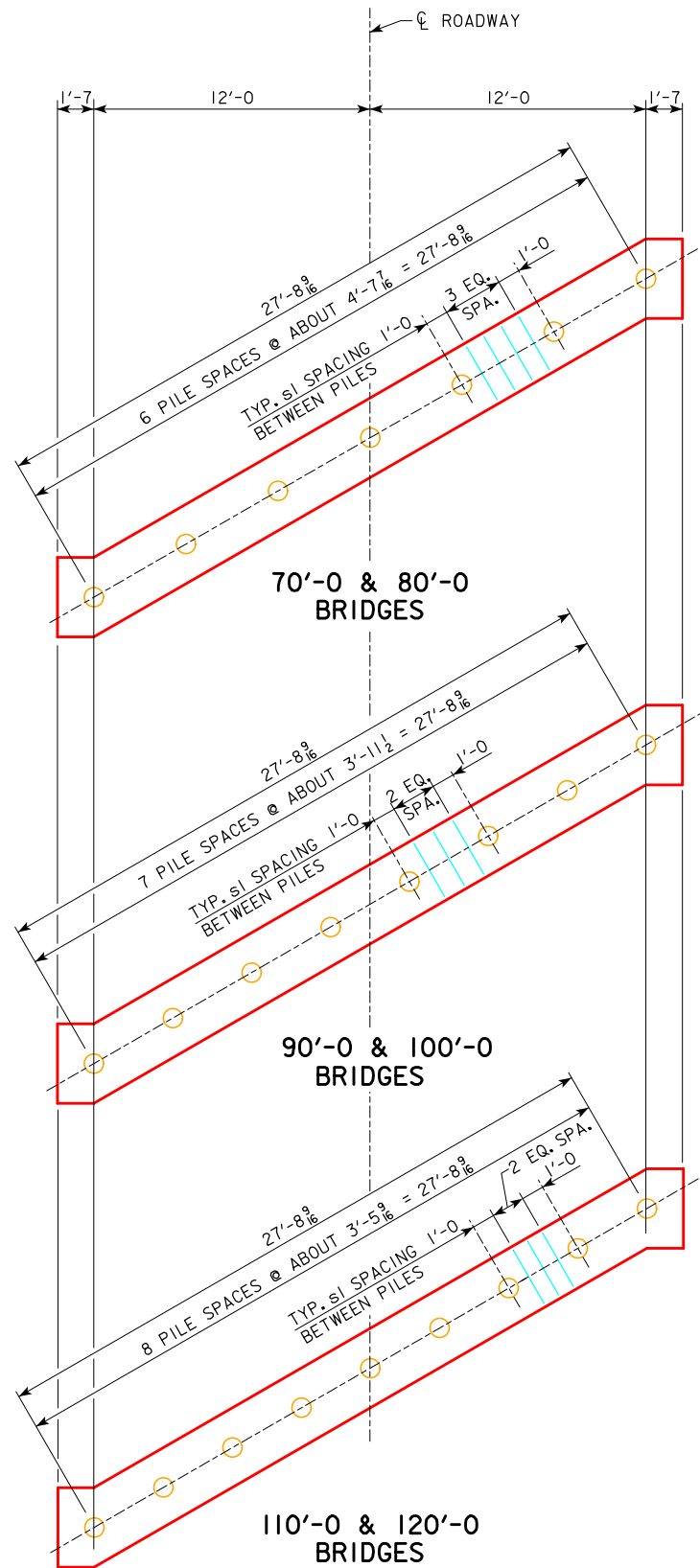
STANDARD DESIGN - 24'-0 ROADWAY, 3 SPAN BRIDGES

CONTINUOUS CONCRETE SLAB BRIDGES

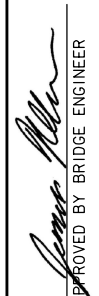

NOVEMBER, 2006

J24-29-06

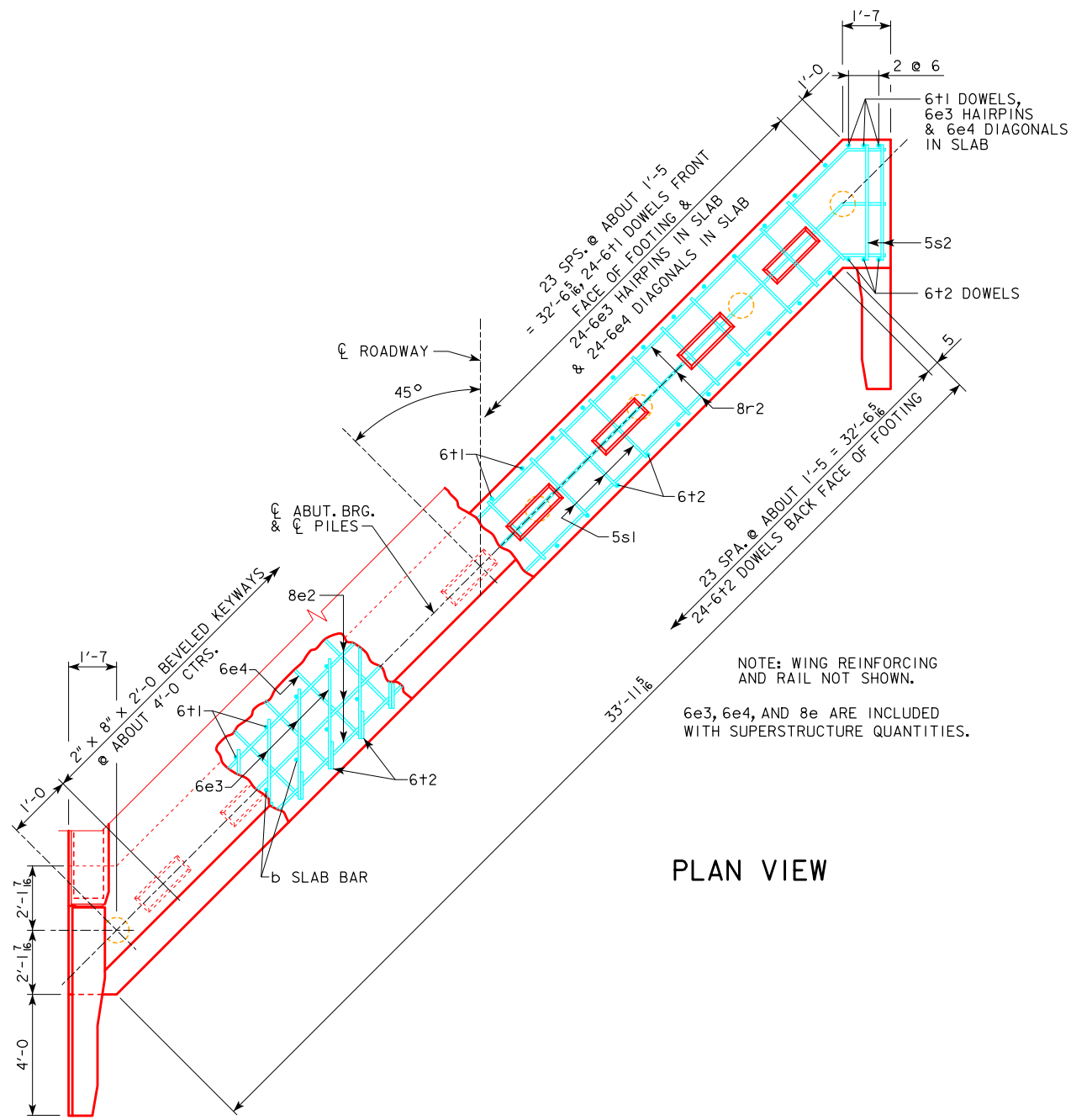
REVISED 12-08 - REVISED ENTIRE SHEET.
REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE.



PILE PLAN - 30° SKEW
WOOD PILING

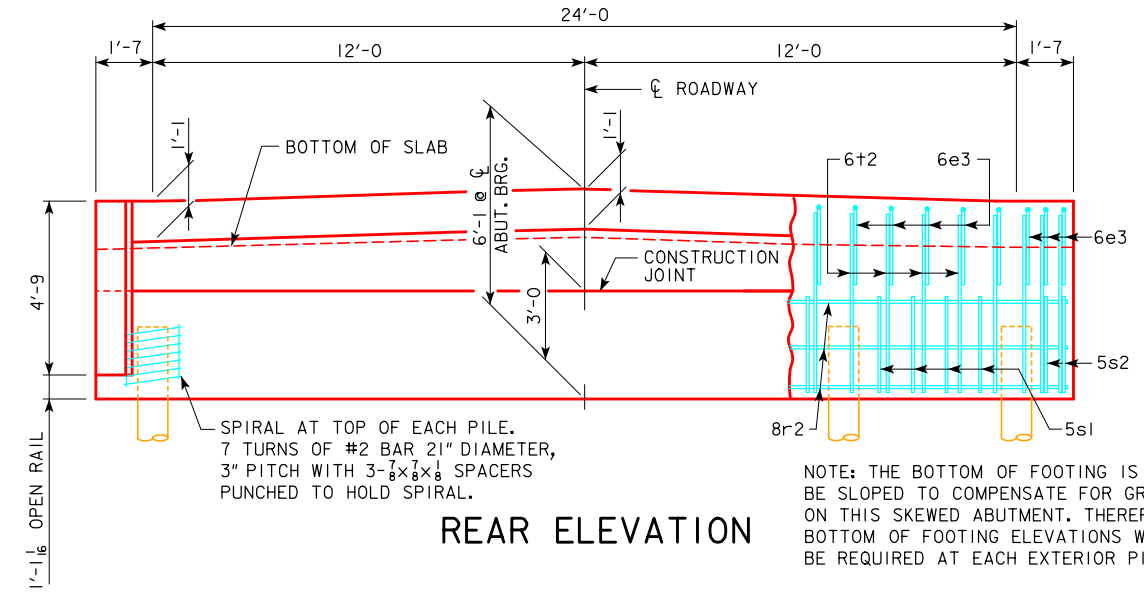
08-2022 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER		
		STANDARD DESIGN - 24'-0 ROADWAY, 3 SPAN BRIDGES	
		CONTINUOUS CONCRETE SLAB BRIDGES NOVEMBER, 2006	
30° ABUTMENT DETAILS SKEW - TIMBER PILING		J24-30-06	

REVISED 06-13 - REVISION FOR LRFD PILE DESIGN.
REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE. CHANGED PAVING BLOCK LIFTING HOOP BAR MARK, (WAS 5x1).



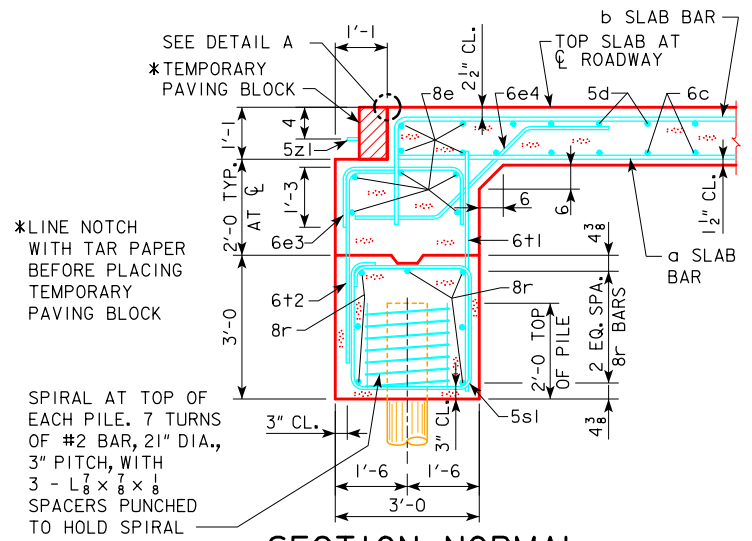
PLAN VIEW

NOTE: WING REINFORCING AND RAIL NOT SHOWN.
6e3, 6e4, AND 8e ARE INCLUDED WITH SUPERSTRUCTURE QUANTITIES.

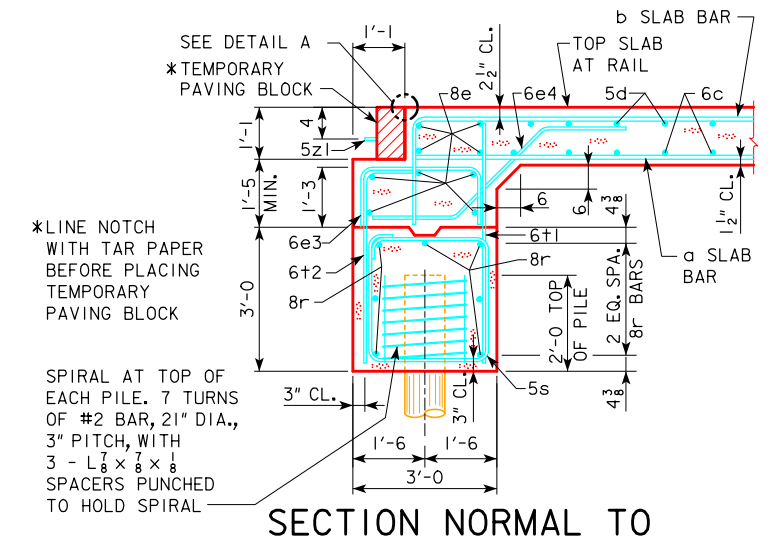


REAR ELEVATION

NOTE: THE BOTTOM OF FOOTING IS TO BE SLOPED TO COMPENSATE FOR GRADE ON THIS SKEWED ABUTMENT. THEREFORE BOTTOM OF FOOTING ELEVATIONS WILL BE REQUIRED AT EACH EXTERIOR PILE.



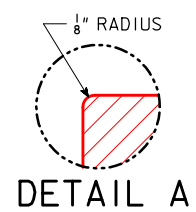
SECTION NORMAL TO ABUTMENT AT CL



SECTION NORMAL TO ABUTMENT AT GUTTERLINE

ABUTMENT NOTES:

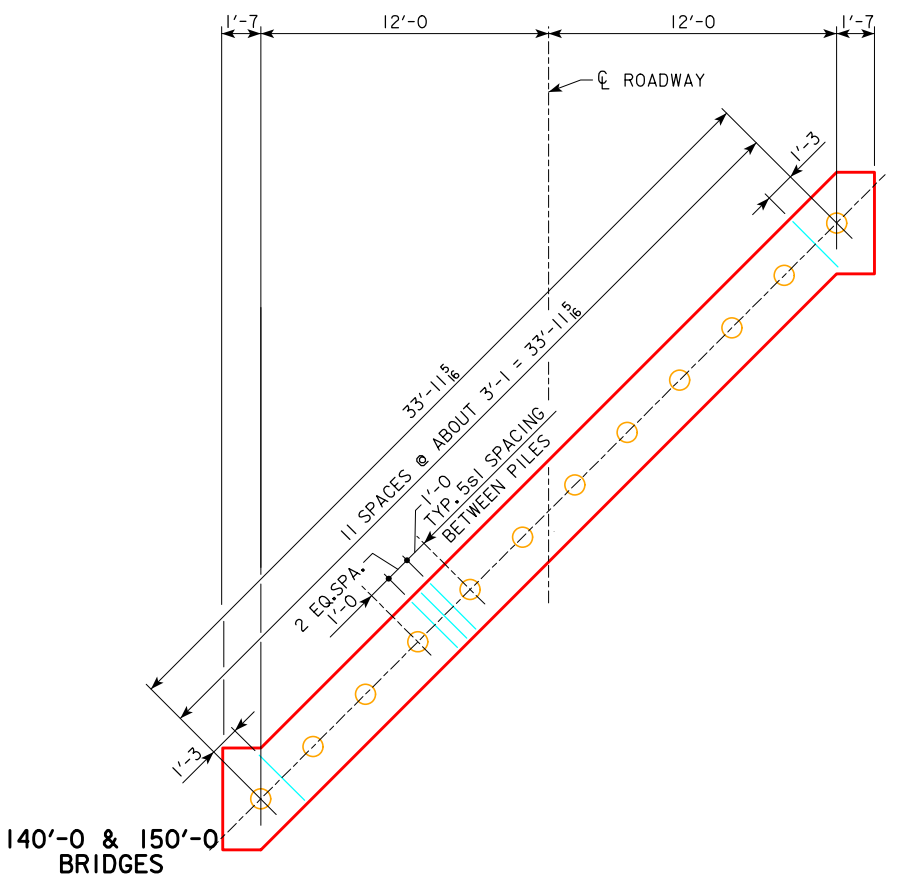
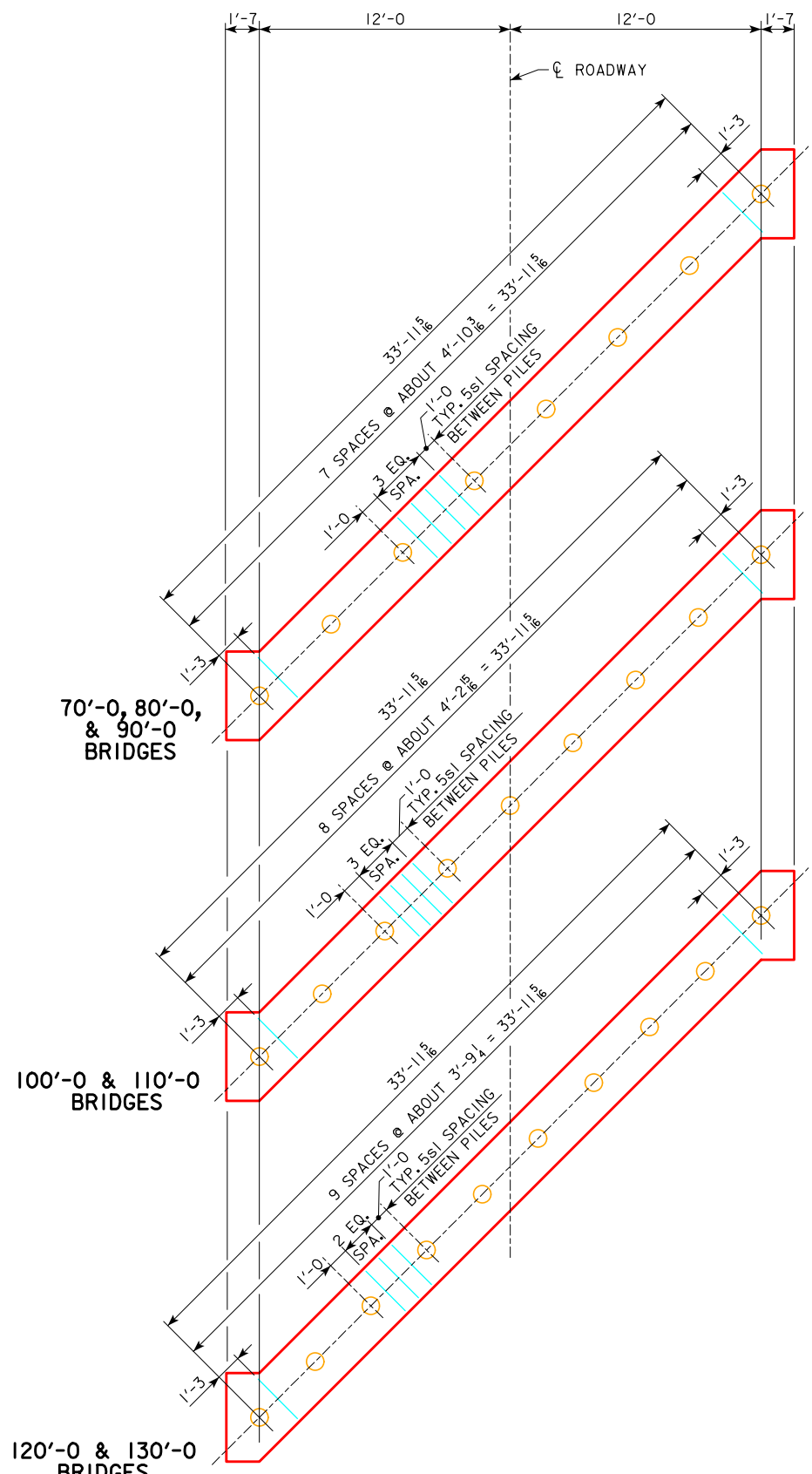
- THE CONCRETE AND REINFORCING STEEL FOR THE WINGS IS INCLUDED WITH THE SUPERSTRUCTURE.
- DETAILS ON THIS SHEET ARE TO BE USED ONLY WHEN ABUTMENTS ARE PLACED ON TIMBER PILES.
- THE MINIMUM CLEAR DISTANCE FROM THE FACE OF THE CONCRETE TO NEAR REINFORCING BAR IS TO BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN.
- TIMBER PILES SHALL BE DRIVEN TO FULL PENETRATION IF PRACTICABLE BUT IN NO CASE TO A BEARING VALUE LESS THAN SHOWN IN DESIGN PLANS. TIMBER PILES SHALL NOT BE DRIVEN TO MORE THAN 160 TONS.
- 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.



DETAIL A

<p>08-2022 LATEST REVISION DATE</p>	<p>APPROVED BY BRIDGE ENGINEER</p>	<p>IOWADOT</p> <p>STANDARD DESIGN - 24'-0 ROADWAY, 3 SPAN BRIDGES</p> <p>CONTINUOUS CONCRETE SLAB BRIDGES</p> <p>NOVEMBER, 2006</p>
<p>ABUTMENT DETAILS</p> <p>45° SKEW - TIMBER PILING</p>		<p>J24-31-06</p>

REVISED 06-13 - REVISION FOR LRFD PILE DESIGN.
 REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE.



PILE PLAN - 45° SKEW
 WOOD PILING

NUMBER OF PILES AND ABUTMENT DESIGN LOADS									
BRIDGE LENGTH	70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
PILING - NUMBER	8	8	8	9	9	10	10	12	12
PU, STRENGTH I DESIGN LOAD - KIPS	379	401	421	448	474	504	532	Δ 623	Δ 655

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

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 45° SKEW - TIMBER PILING	J24-32-06

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		
8r1	ABUTMENT FOOTING LONGITUDINAL		26'-10	7	502	7	502	7	502	7	502	7	502	7	502	7	502	7	502		
5s1	ABUTMENT FOOTING HOOPS		11'-0	22	252	22	252	22	252	25	287	25	287	20	229	20	229	22	252	22	252
6+1	FOOTING TO SLAB DOWELS		5'-0	30	225	30	225	30	225	30	225	30	225	30	225	30	225	30	225	30	225
6+2	FOOTING TO SLAB DOWELS		5'-7	30	252	30	252	30	252	30	252	30	252	30	252	30	252	30	252	30	252
#2	PILE SPIRAL		38'-6	7	45	7	45	7	45	8	51	8	51	9	58	9	58	10	64	10	64
	SPIRAL SPACERS, L _{1/8} x _{1/8} x _{1/8} x 0.70		1'-10	21	27	21	27	21	27	24	31	24	31	27	35	27	35	30	39	30	39
REINFORCING STEEL - TOTAL (LBS.)				1303	1303	1303	1303	1348	1348	1301	1301	1334	1334								

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	
8r2	ABUTMENT FOOTING LONGITUDINAL		27'-8	7	517	7	517	7	517	7	517	7	517	7	517	7	517	7	517	
5s1	ABUTMENT FOOTING HOOPS		11'-0	24	275	24	275	21	241	21	241	24	275	24	275	18	207	18	207	
5s2	ABUTMENT FOOTING HOOPS		11'-3	4	47	4	47	4	47	4	47	4	47	4	47	4	47	4	47	
6+1	FOOTING TO SLAB DOWELS		5'-0	30	225	30	225	30	225	30	225	30	225	30	225	30	225	30	225	
6+2	FOOTING TO SLAB DOWELS		5'-7	30	252	30	252	30	252	30	252	30	252	30	252	30	252	30	252	
#2	PILE SPIRAL		38'-6	7	45	7	45	8	51	8	51	9	58	9	58	10	64	10	64	
	SPIRAL SPACERS, L _{1/8} x _{1/8} x _{1/8} x 0.70		1'-10	21	27	21	27	24	31	24	31	27	35	27	35	30	39	30	39	
REINFORCING STEEL - TOTAL (LBS.)				1388	1388	1364	1364	1364	1364	1409	1409	1351	1351							

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
8r2	ABUTMENT FOOTING LONGITUDINAL		30'-7	7	572	7	572	7	572	7	572	7	572	7	572	7	572	7	572
5s1	ABUTMENT FOOTING HOOPS		11'-0	24	275	24	275	21	241	21	241	24	275	24	275	20	229	22	252
5s2	ABUTMENT FOOTING HOOPS		11'-11	4	50	4	50	4	50	4	50	4	50	4	50	4	50	4	50
6+1	FOOTING TO SLAB DOWELS		5'-0	30	225	30	225	30	225	30	225	30	225	30	225	30	225	30	225
6+2	FOOTING TO SLAB DOWELS		5'-7	30	252	30	252	30	252	30	252	30	252	30	252	30	252	30	252
#2	PILE SPIRAL		38'-6	7	45	7	45	8	51	8	51	9	58	9	58	10	64	11	77
	SPIRAL SPACERS, L _{1/8} x _{1/8} x _{1/8} x 0.70		1'-10	21	27	21	27	24	31	24	31	27	35	27	35	30	39	33	42
REINFORCING STEEL - TOTAL (LBS.)				1446	1446	1422	1422	1467	1467	1512	1441	1474							

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
8r2	ABUTMENT FOOTING LONGITUDINAL		36'-9	7	687	7	687	7	687	7	687	7	687	7	687	7	687	7	687
5s1	ABUTMENT FOOTING HOOPS		11'-0	28	321	28	321	28	321	32	367	32	367	27	310	27	310	33	379
5s2	ABUTMENT FOOTING HOOPS		13'-6	4	56	4	56	4	56	4	56	4	56	4	56	4	56	4	56
6+1	FOOTING TO SLAB DOWELS		5'-0	30	225	30	225	30	225	30	225	30	225	30	225	30	225	30	225
6+2	FOOTING TO SLAB DOWELS		5'-7	30	252	30	252	30	252	30	252	30	252	30	252	30	252	30	252
#2	PILE SPIRAL		38'-6	8	51	8	51	8	51	9	58	9	58	10	64	10	64	12	77
	SPIRAL SPACERS, L _{1/8} x _{1/8} x _{1/8} x 0.70		1'-10	24	31	24	31	24	31	27	35	27	35	30	39	30	39	36	46
REINFORCING STEEL - TOTAL (LBS.)				1623	1623	1623	1680	1680	1633	1633	1722	1722							

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.	8.6	8.6	8.6	8.6	8.6	8.5	8.5	8.4	8.4	
REINFORCING STEEL	LBS.	1303	1303	1303	1348	1348	1301	1301	1334	1334	
WOOD PILES (TREATED)	NO.	7	7	7	8	8	9	9	10	10	
PREBORE HOLES	FT.	-	-	-	-	-	-	-	100	100	

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.	8.9	8.9	8.9	8.9	8.9	8.8	8.8	8.7	8.7	
REINFORCING STEEL	LBS.	1388	1388	1364	1364	1364	1409	1409	1351	1351	
WOOD PILES (TREATED)	NO.	7	7	8	8	8	9	9	10	10	
PREBORE HOLES	FT.	-	-	-	-	-	-	-	100	100	

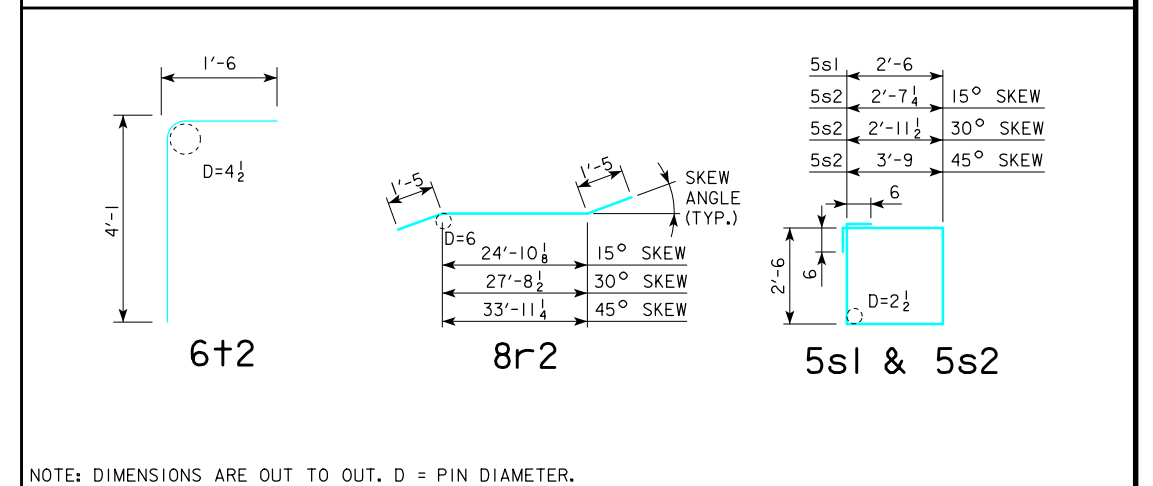
ESTIMATED QUANTITIES - ONE ABUT. - 30° SKEW

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.	10.0	10.0	10.0	10.0	9.9	9.9	9.8	9.8	9.7	
REINFORCING STEEL	LBS.	1446	1446	1422	1422	1467	1467	1512	1441	1474	
WOOD PILES (TREATED)	NO.	7	7	8	8	9	9	10	11	12	
PREBORE HOLES	FT.	-	-	-	-	-	-	-	110	120	

ESTIMATED QUANTITIES - ONE ABUT. - 45° 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.	12.3	12.3	12.3	12.3	12.3	12.2	12.2	12.1	12.1	
REINFORCING STEEL	LBS.	1623	1623	1623	1680	1680	1633	1633	1722	1722	
WOOD PILES (TREATED)	NO.	8	8	8	9	9	10	10	12	12	
PREBORE HOLES	FT.	-	-	-	-	-	-	-	120	120	

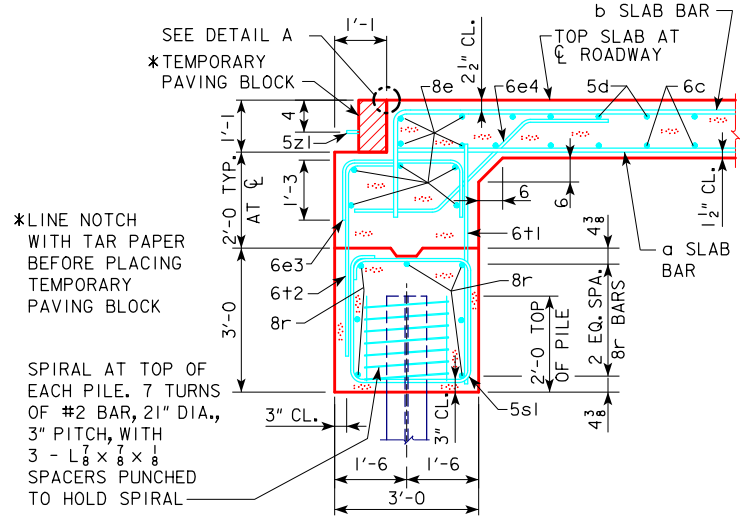
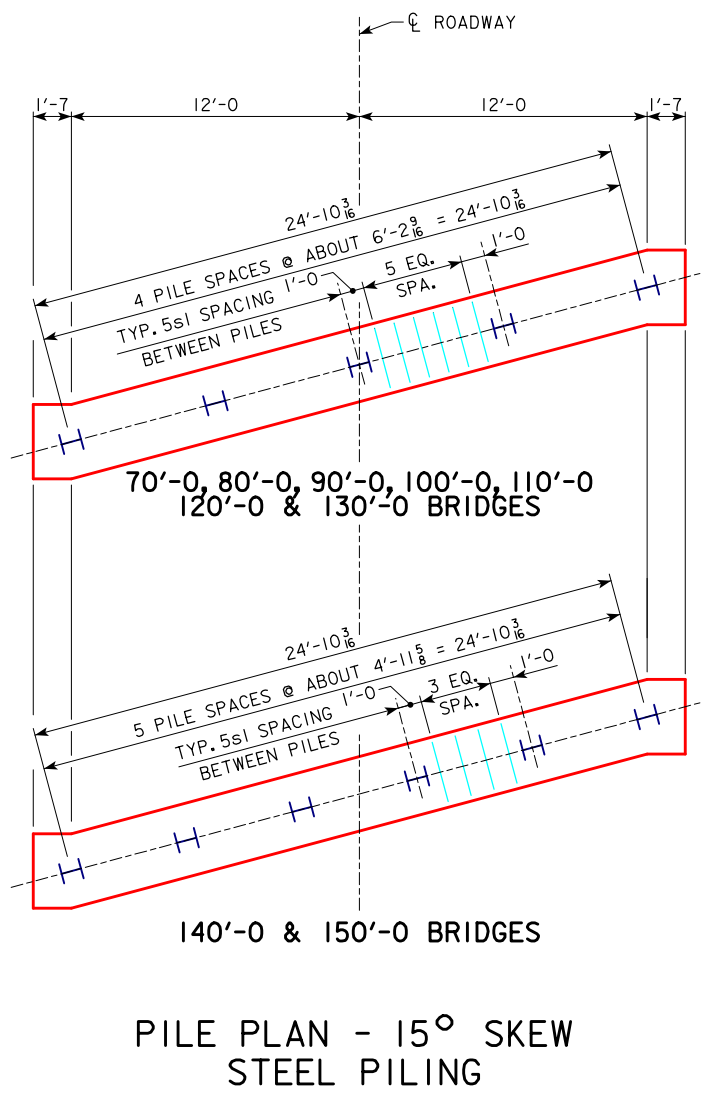
BENT BAR DETAILS



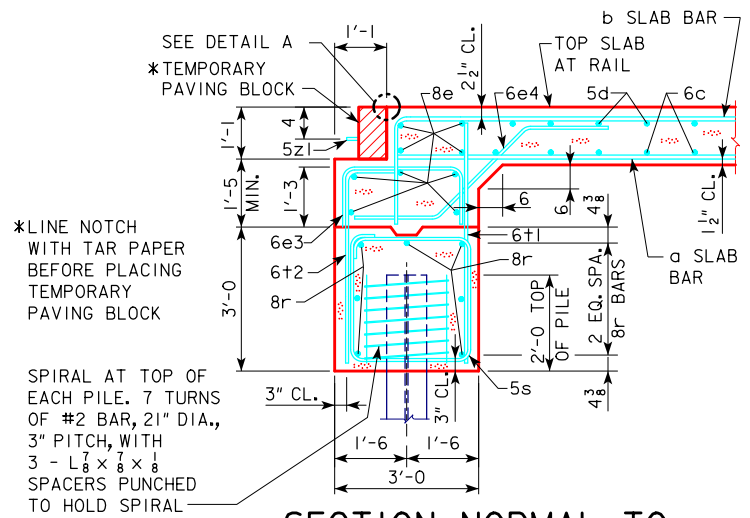
REVISED 07-09 - CONCRETE QUANTITIES CHANGED.
REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE.

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 TIMBER PILING
	J24-33-06

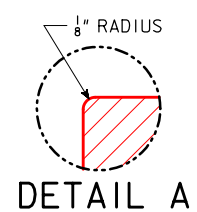
REVISED 06-13 - REVISION FOR LRFD PILE DESIGN. REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE. CHANGED PAVING BLOCK LIFTING HOOP BAR MARK, (WAS 5x1).



SECTION NORMAL TO ABUTMENT AT CL

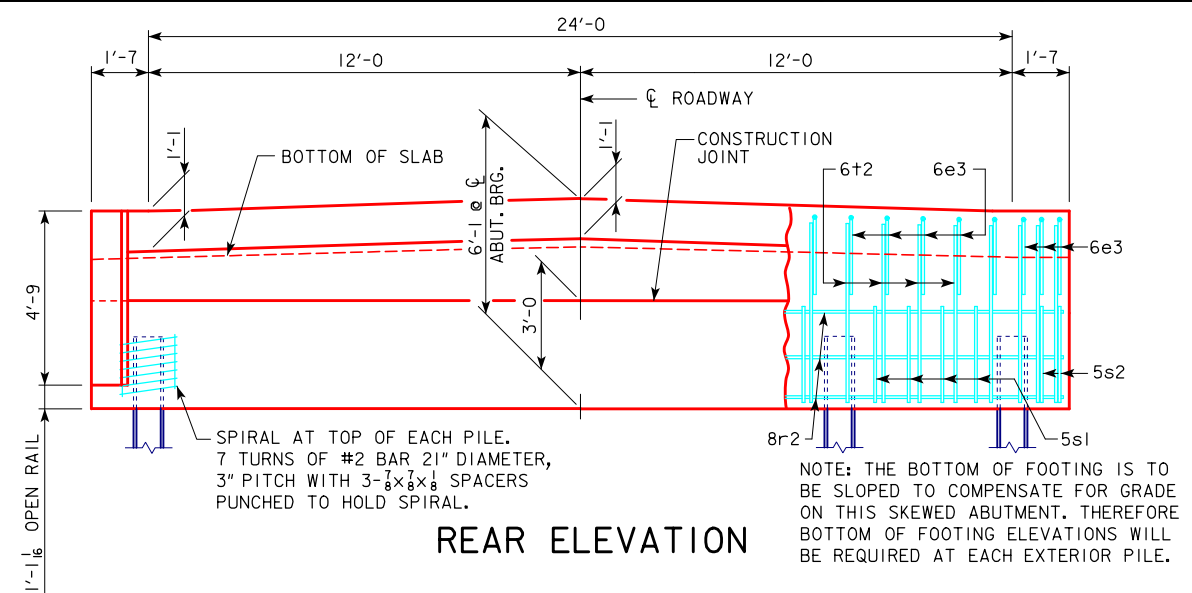


SECTION NORMAL TO ABUTMENT AT GUTTERLINE

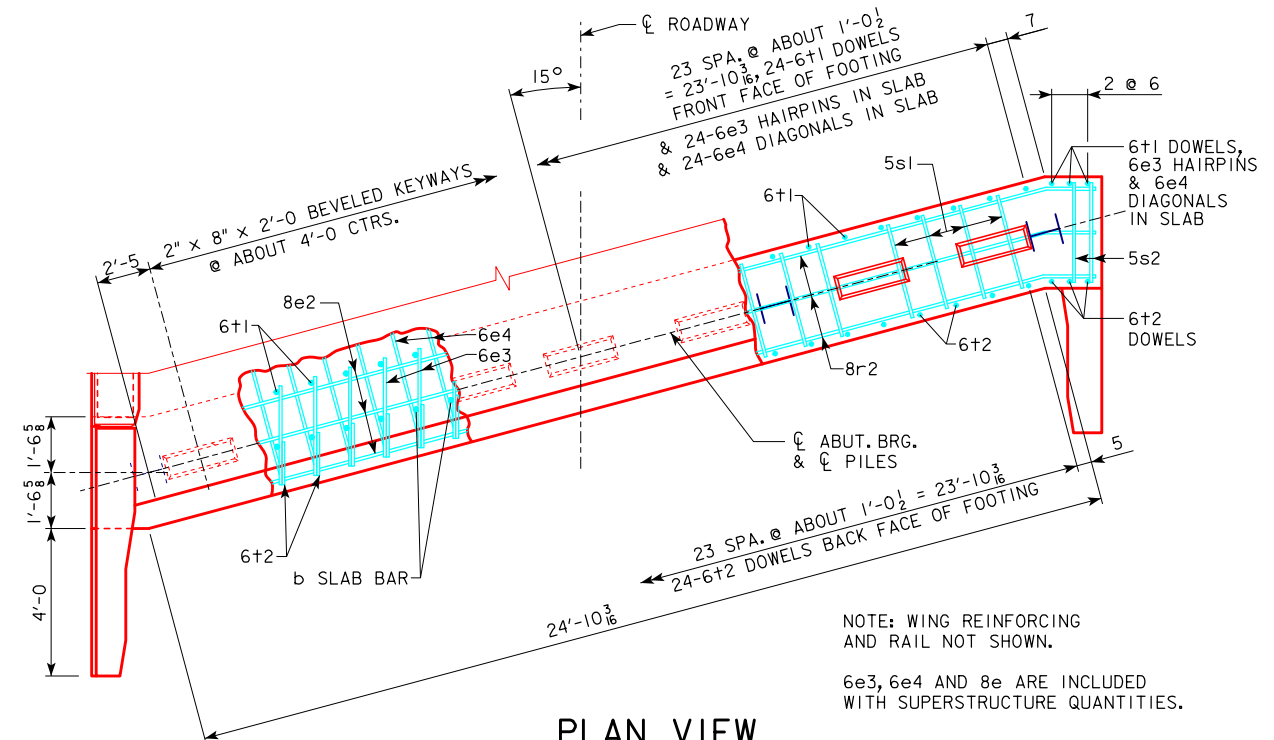


ABUTMENT NOTES:

- 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

NUMBER OF PILES AND ABUTMENT DESIGN LOADS									
BRIDGE LENGTH	70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
PILING - NUMBER	5	5	5	5	5	5	5	6	6
PU, STRENGTH I DESIGN LOAD - KIPS	348	369	390	417	442	471	499	Δ 590	Δ 622

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

08-2022
LATEST REVISION DATE

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

**CONTINUOUS CONCRETE
SLAB BRIDGES**

NOVEMBER, 2006

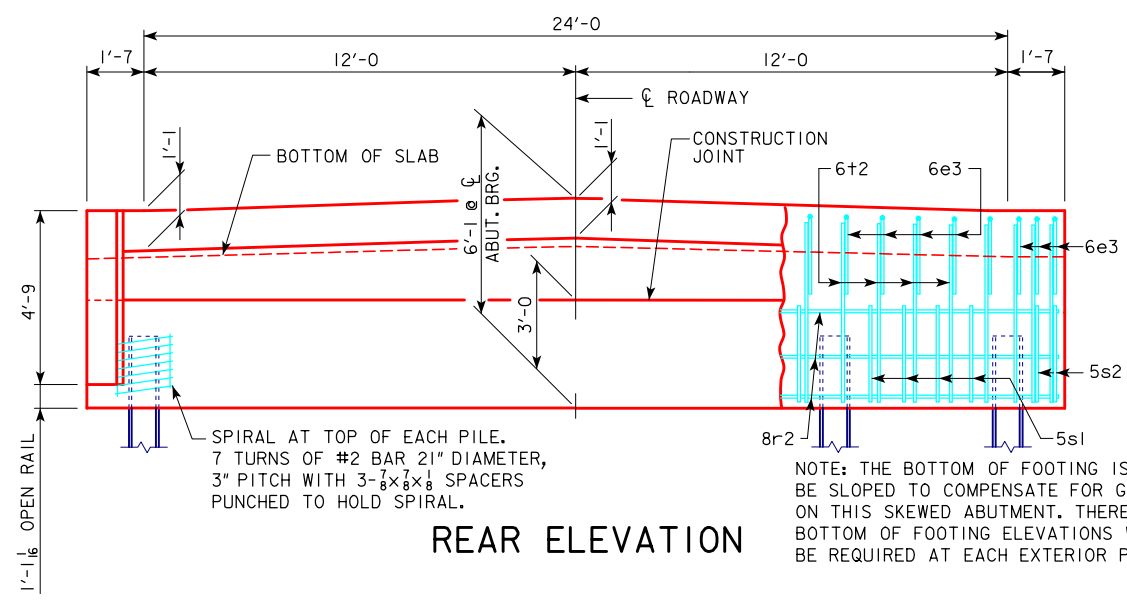
APPROVED BY BRIDGE ENGINEER

ABUTMENT DETAILS

15° SKEW - STEEL PILING

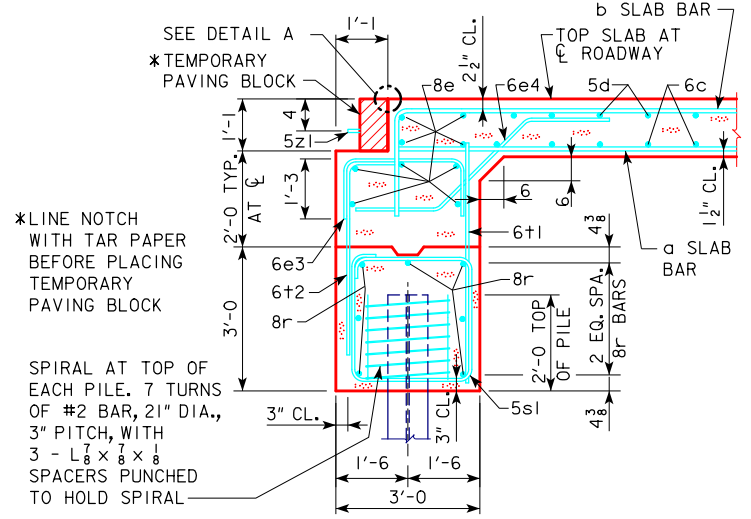
J24-35-06

REVISED 06-13 - REVISION FOR LRED PILE DESIGN.
REVISED 08-2022 - UPDATED BRIDGE ENGINEER SIGNATURE. CHANGED PAVING BLOCK LIFTING HOOP BAR MARK, (WAS 5x1).

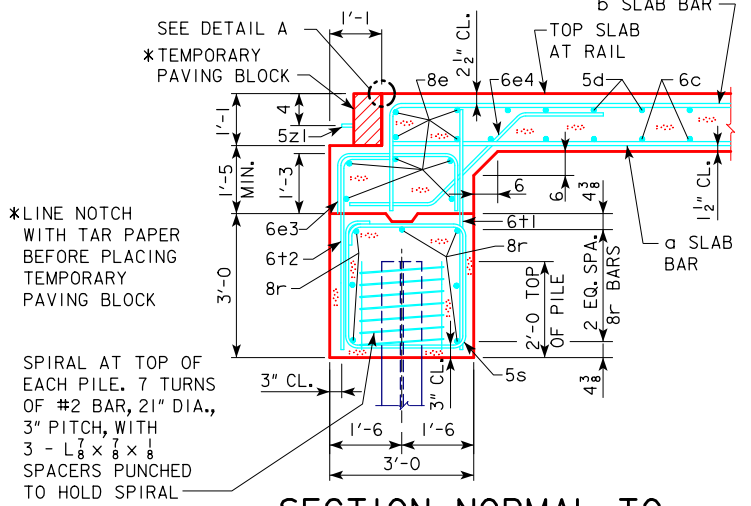


REAR ELEVATION

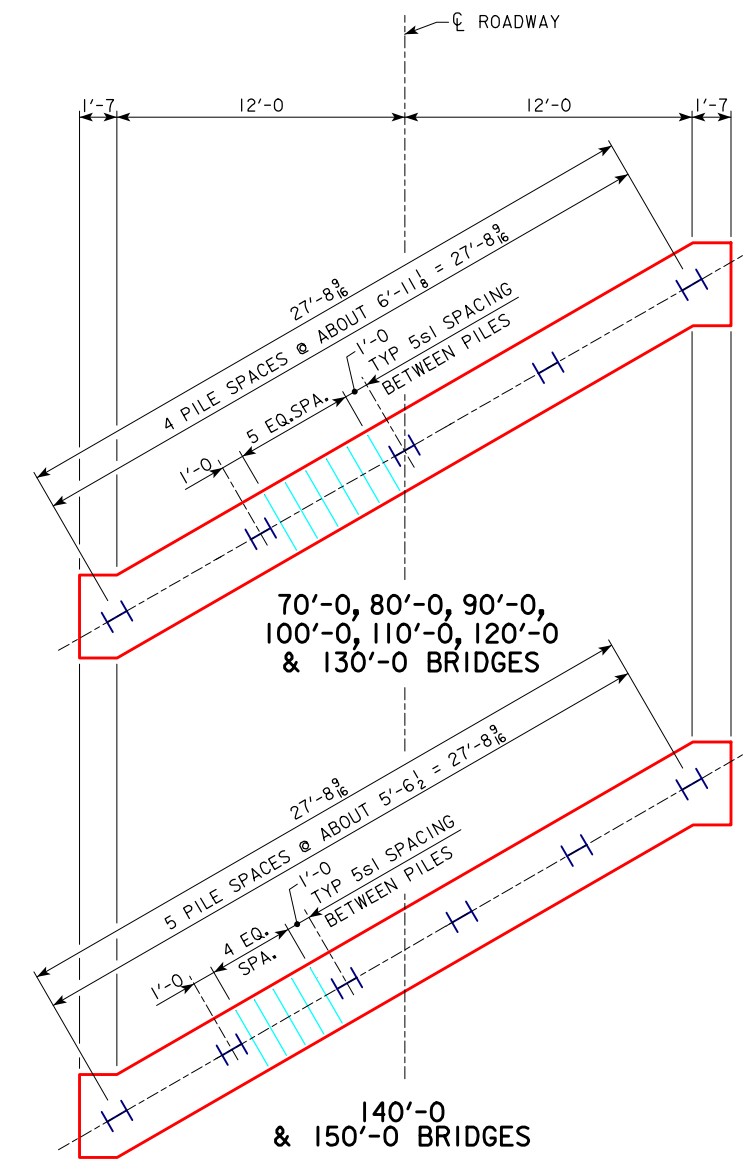
NOTE: THE BOTTOM OF FOOTING IS TO BE SLOPED TO COMPENSATE FOR GRADE ON THIS SKEWED ABUTMENT. THEREFORE BOTTOM OF FOOTING ELEVATIONS WILL BE REQUIRED AT EACH EXTERIOR PILE.



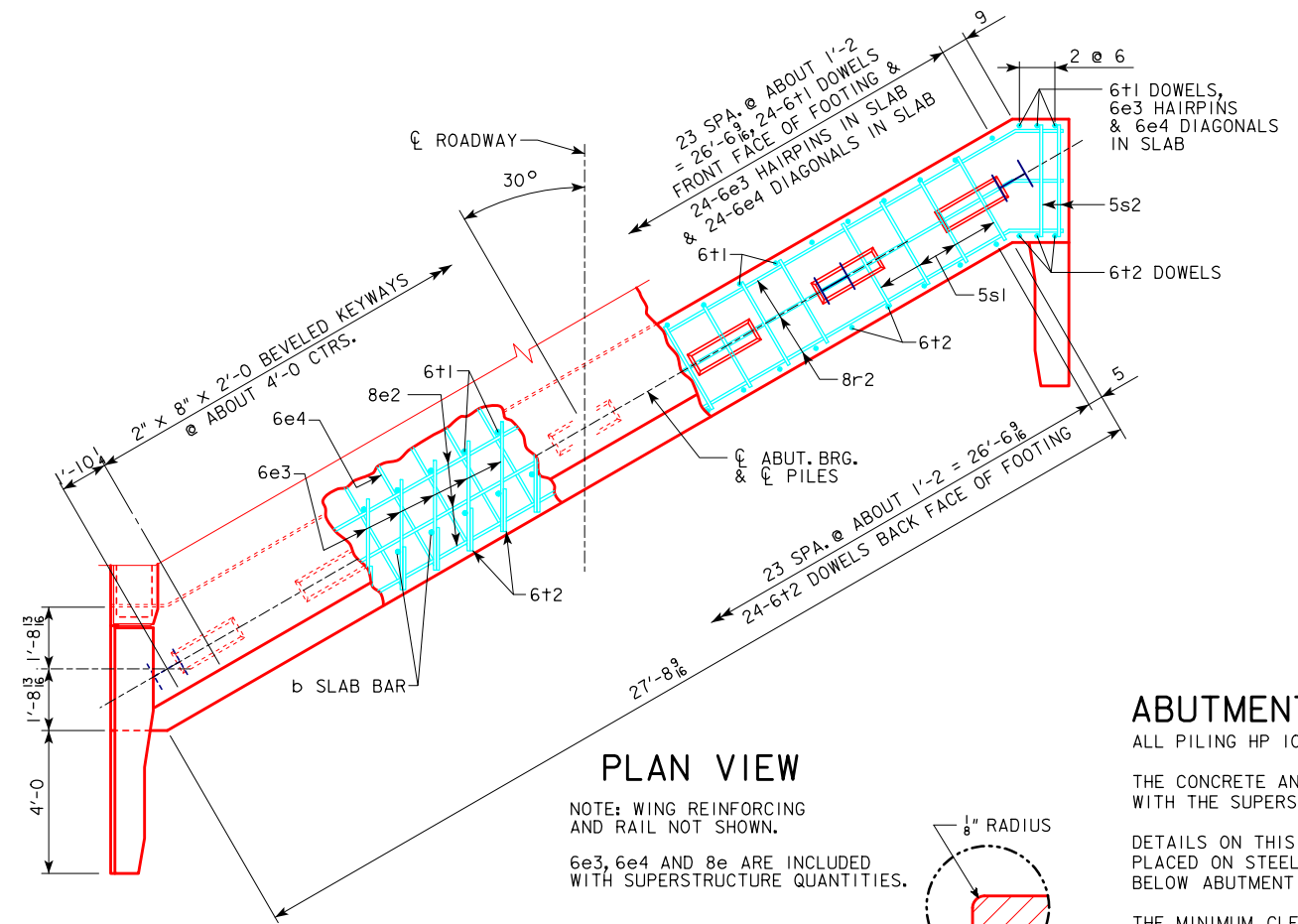
SECTION NORMAL TO ABUTMENT AT ROADWAY CL



SECTION NORMAL TO ABUTMENT AT GUTTERLINE

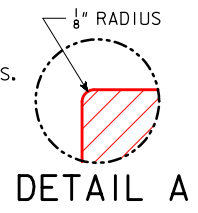


PILE PLAN - 30° SKEW STEEL PILING



PLAN VIEW

NOTE: WING REINFORCING AND RAIL NOT SHOWN.
6e3, 6e4 AND 8e ARE INCLUDED WITH SUPERSTRUCTURE QUANTITIES.



DETAIL A

ABUTMENT NOTES:

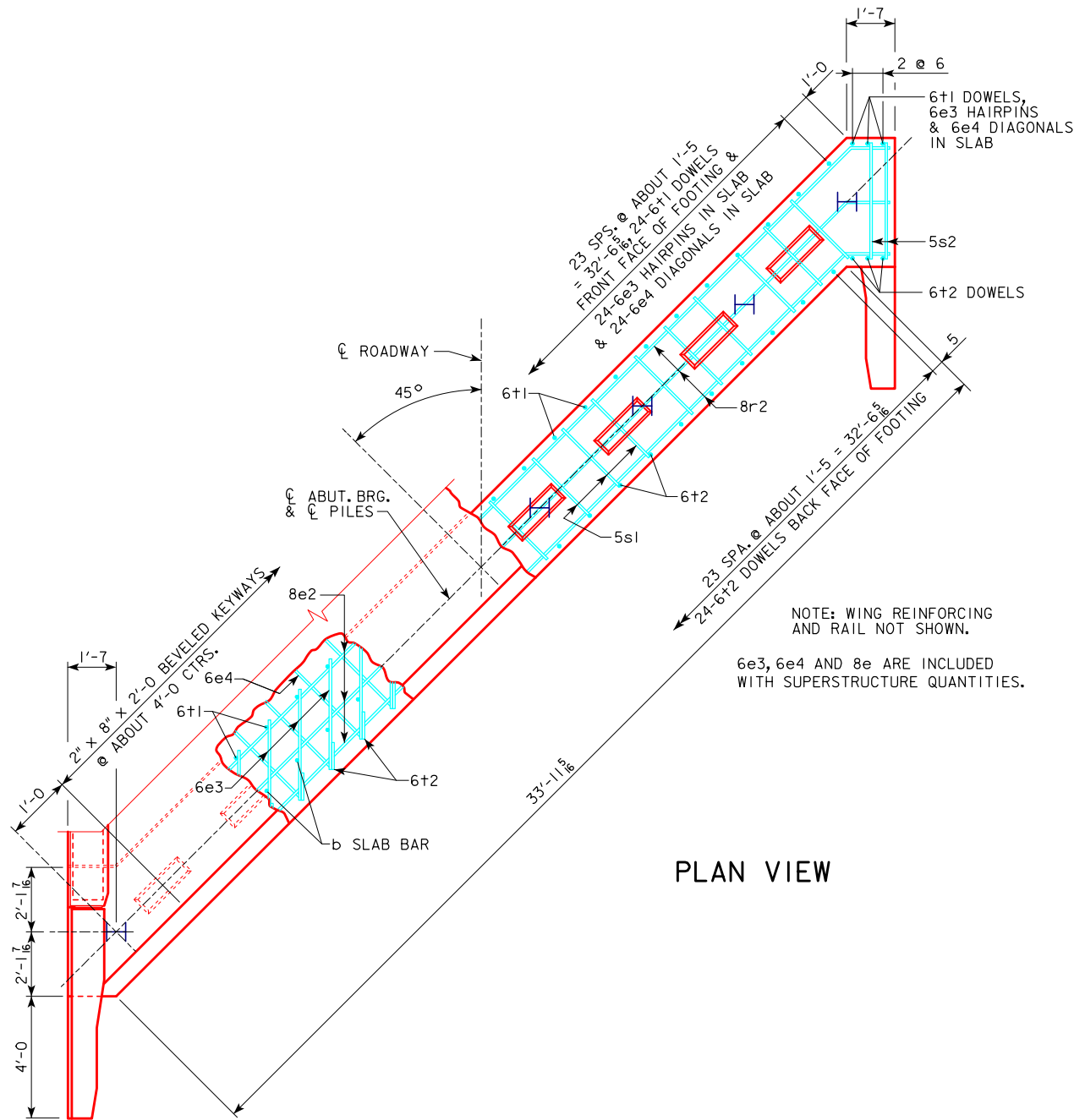
- ALL PILING HP 10x42.
- THE CONCRETE AND REINFORCING STEEL FOR THE WINGS IS INCLUDED WITH THE SUPERSTRUCTURE.
- DETAILS ON THIS SHEET ARE TO BE USED ONLY WHEN ABUTMENTS ARE PLACED ON STEEL PILES. IF ROCK IS ENCOUNTERED CLOSER THAN 12' BELOW ABUTMENT FOOTING, SPECIAL ANALYSIS MAY BE REQUIRED.
- THE MINIMUM 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.

NUMBER OF PILES AND ABUTMENT DESIGN LOADS									
BRIDGE LENGTH	70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
PILING - NUMBER	5	5	5	5	5	5	5	6	6
PU, STRENGTH I DESIGN LOAD - KIPS	358	379	400	427	452	481	510	Δ 601	Δ 632

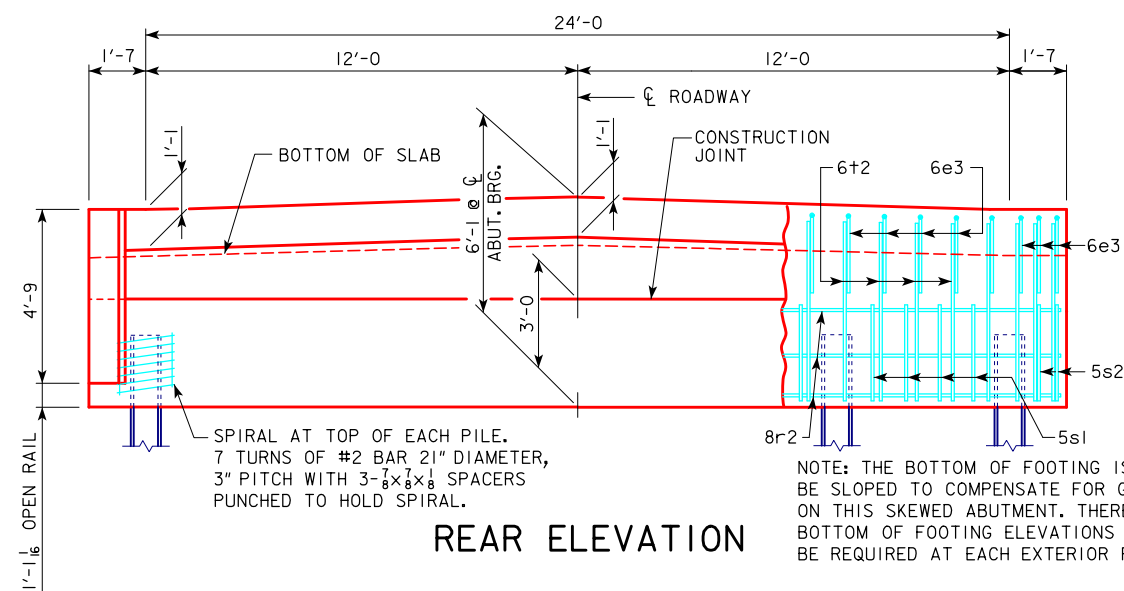
Δ INCLUDES DYNAMIC LOAD ALLOWANCE
NOTE: PU, STRENGTH I DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

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 30° SKEW - STEEL PILING
	J24-36-06

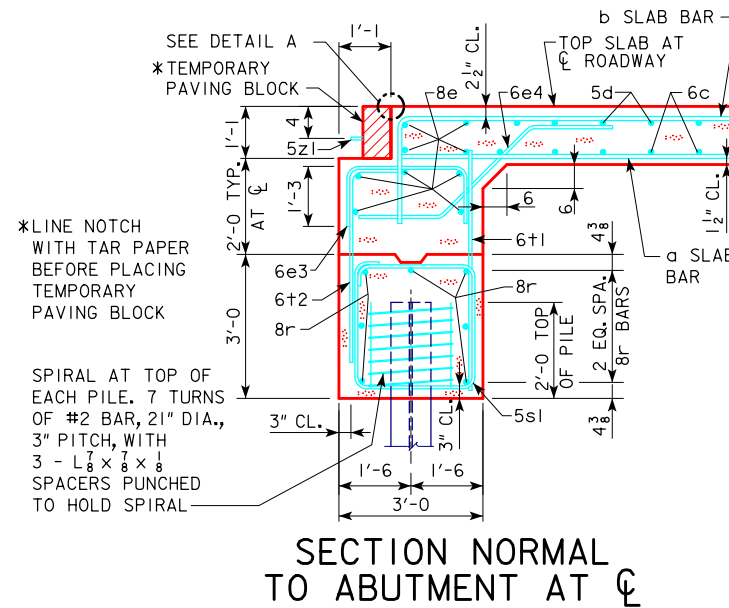
REVISED 06-13 - REVISION FOR LRFD PILE DESIGN.
REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE. CHANGED PAVING BLOCK LIFTING HOOP BAR MARK, (WAS 5x1).



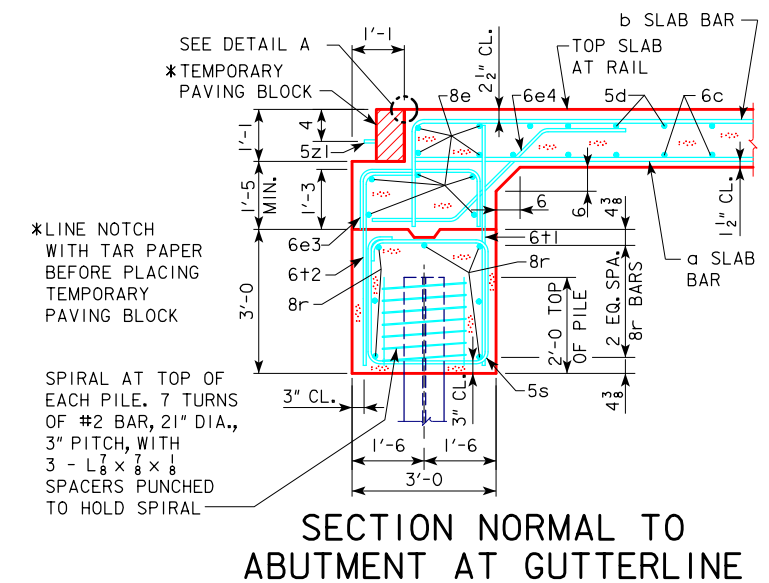
PLAN VIEW



REAR ELEVATION



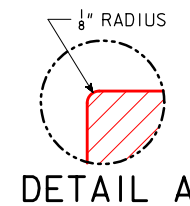
SECTION NORMAL TO ABUTMENT AT ϕ



SECTION NORMAL TO ABUTMENT AT GUTTERLINE

ABUTMENT NOTES:

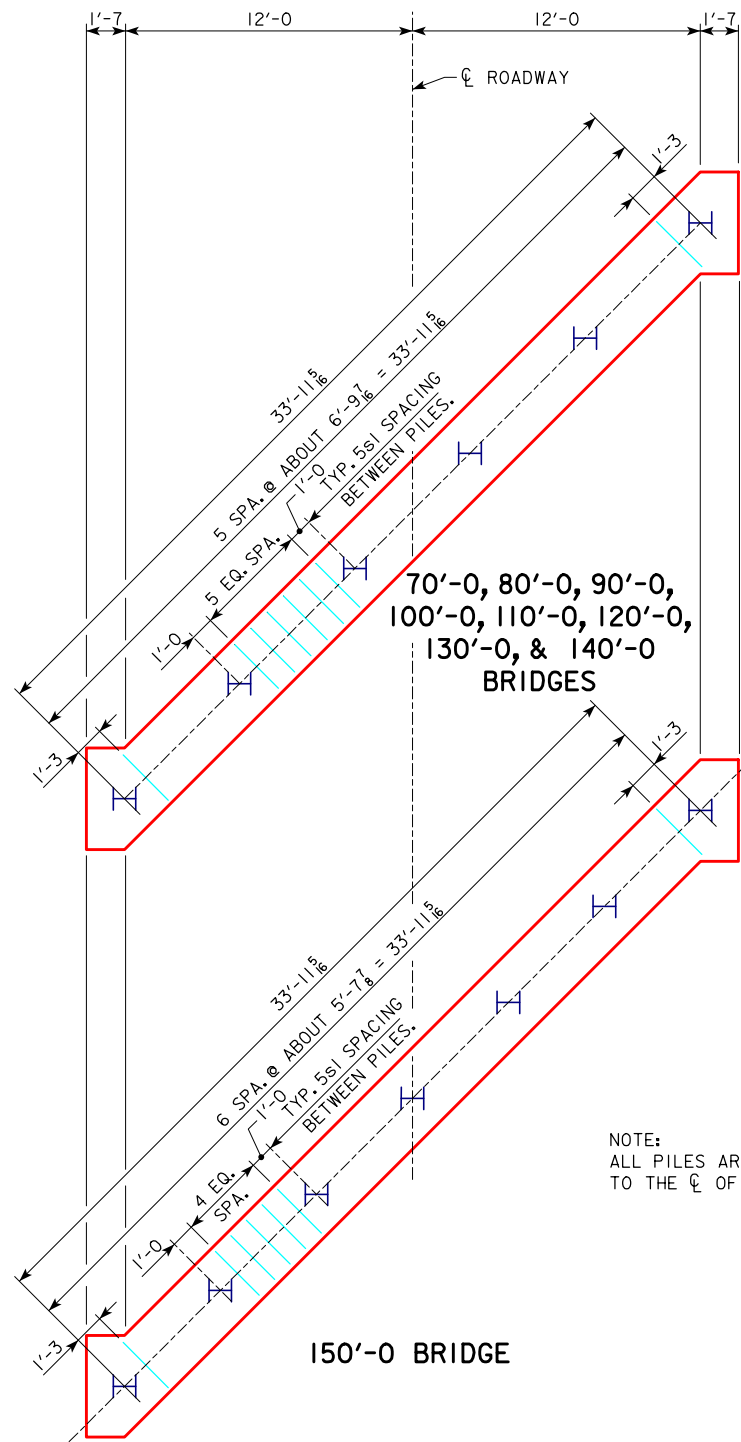
- ALL PILING HP 10x42.
- THE CONCRETE AND REINFORCING STEEL FOR THE WINGS IS INCLUDED WITH THE SUPERSTRUCTURE.
- DETAILS ON THIS SHEET ARE TO BE USED ONLY WHEN ABUTMENTS ARE PLACED ON STEEL PILES. IF ROCK IS ENCOUNTERED CLOSER THAN 12' BELOW ABUTMENT FOOTING, SPECIAL ANALYSIS MAY BE REQUIRED.
- THE MINIMUM 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.



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
ABUTMENT DETAILS 45° SKEW - STEEL PILING		J24-37-06

REVISED 06-13 - REVISION FOR LRFD PILE DESIGN.
 REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE.



**PILE PLAN - 45° SKEW
STEEL PILING**

NOTE: ALL PILING HP 10x42

NUMBER OF PILES AND ABUTMENT DESIGN LOADS									
BRIDGE LENGTH	70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
PILING - NUMBER	6	6	6	6	6	6	6	6	7
PU, STRENGTH DESIGN LOAD - KIPS	379	401	421	448	474	504	532	Δ 623	Δ 655

Δ INCLUDES DYNAMIC LOAD ALLOWANCE
 NOTE: PU, STRENGTH | DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

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 45° SKEW - STEEL PILING	J24-38-06

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
8r1	ABUTMENT FOOTING LONGITUDINAL		26'-10	7	502	7	502	7	502	7	502	7	502
5s1	ABUTMENT FOOTING HOOPS		11'-0	25	287	25	287	25	287	24	275	24	275
6+1	FOOTING TO SLAB DOWELS		5'-0	30	225	30	225	30	225	30	225	30	225
6+2	FOOTING TO SLAB DOWELS		5'-7	30	252	30	252	30	252	30	252	30	252
#2	PILE SPIRAL		38'-6	4	26	4	26	4	26	5	32	5	32
	SPIRAL SPACERS, L $\frac{1}{8}$ x $\frac{1}{8}$ x $\frac{1}{8}$ x 0.70		1'-10	12	15	12	15	12	15	15	19	15	19
REINFORCING STEEL - TOTAL (LBS.)					1307	1307	1307	1305	1305	1305	1305	1316	1316

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
8r2	ABUTMENT FOOTING LONGITUDINAL		27'-8	7	517	7	517	7	517	7	517	7	517
5s1	ABUTMENT FOOTING HOOPS		11'-0	24	275	24	275	24	275	24	275	20	229
5s2	ABUTMENT FOOTING HOOPS		11'-3	4	47	4	47	4	47	4	47	4	47
6+1	FOOTING TO SLAB DOWELS		5'-0	30	225	30	225	30	225	30	225	30	225
6+2	FOOTING TO SLAB DOWELS		5'-7	30	252	30	252	30	252	30	252	30	252
#2	PILE SPIRAL		38'-6	5	32	5	32	5	32	5	32	6	39
	SPIRAL SPACERS, L $\frac{1}{8}$ x $\frac{1}{8}$ x $\frac{1}{8}$ x 0.70		1'-10	15	19	15	19	15	19	15	19	18	23
REINFORCING STEEL - TOTAL (LBS.)					1367	1367	1367	1367	1367	1367	1332	1332	

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
8r2	ABUTMENT FOOTING LONGITUDINAL		30'-7	7	572	7	572	7	572	7	572	7	572
5s1	ABUTMENT FOOTING HOOPS		11'-0	24	275	24	275	24	275	24	275	25	287
5s2	ABUTMENT FOOTING HOOPS		11'-11	4	50	4	50	4	50	4	50	4	50
6+1	FOOTING TO SLAB DOWELS		5'-0	30	225	30	225	30	225	30	225	30	225
6+2	FOOTING TO SLAB DOWELS		5'-7	30	252	30	252	30	252	30	252	30	252
#2	PILE SPIRAL		38'-6	5	32	5	32	5	32	5	32	6	39
	SPIRAL SPACERS, L $\frac{1}{8}$ x $\frac{1}{8}$ x $\frac{1}{8}$ x 0.70		1'-10	15	19	15	19	15	19	15	19	18	23
REINFORCING STEEL - TOTAL (LBS.)					1425	1425	1425	1425	1425	1425	1448	1448	

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
8r2	ABUTMENT FOOTING LONGITUDINAL		36'-9	7	687	7	687	7	687	7	687	7	687
5s1	ABUTMENT FOOTING HOOPS		11'-0	30	344	30	344	30	344	30	344	30	344
5s2	ABUTMENT FOOTING HOOPS		13'-6	4	56	4	56	4	56	4	56	4	56
6+1	FOOTING TO SLAB DOWELS		5'-0	30	225	30	225	30	225	30	225	30	225
6+2	FOOTING TO SLAB DOWELS		5'-7	30	252	30	252	30	252	30	252	30	252
#2	PILE SPIRAL		38'-6	6	39	6	39	6	39	6	39	7	45
	SPIRAL SPACERS, L $\frac{1}{8}$ x $\frac{1}{8}$ x $\frac{1}{8}$ x 0.70		1'-10	18	23	18	23	18	23	18	23	21	27
REINFORCING STEEL - TOTAL (LBS.)					1626	1626	1626	1626	1626	1626	1626	1636	

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.	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	
REINFORCING STEEL	LBS.	1307	1307	1307	1305	1305	1305	1305	1316	1316	
STEEL PILING HP 10x42	NO.	4	4	4	5	5	5	5	6	6	
PREBORE HOLES	FT.	-	-	-	-	-	-	-	60	60	

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.	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	
REINFORCING STEEL	LBS.	1367	1367	1367	1367	1367	1367	1367	1332	1332	
STEEL PILING HP 10x42	NO.	5	5	5	5	5	5	5	6	6	
PREBORE HOLES	FT.	-	-	-	-	-	-	-	60	60	

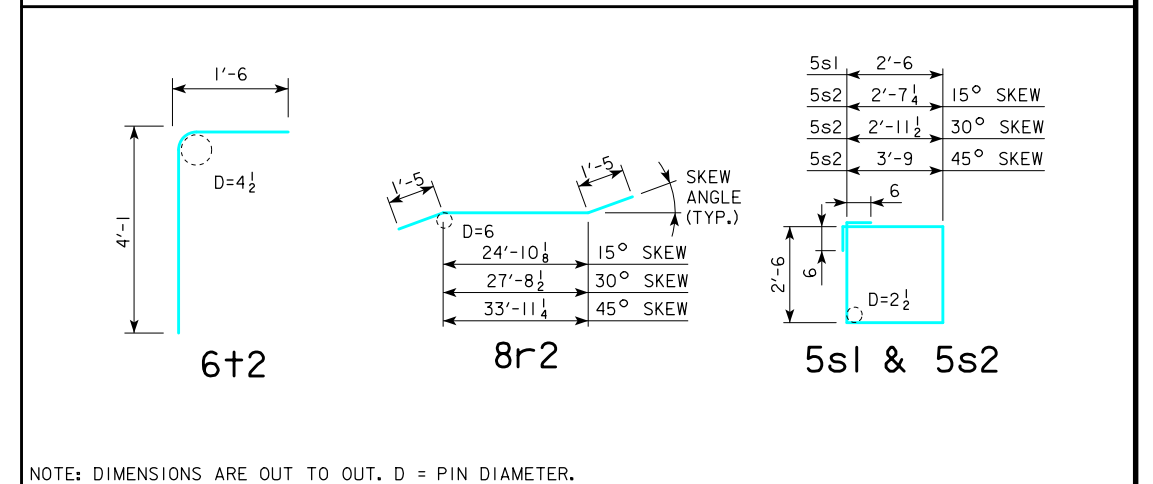
ESTIMATED QUANTITIES - ONE ABUT. - 30° SKEW

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.	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	
REINFORCING STEEL	LBS.	1425	1425	1425	1425	1425	1425	1425	1448	1448	
STEEL PILING HP 10x42	NO.	5	5	5	5	5	5	5	6	6	
PREBORE HOLES	FT.	-	-	-	-	-	-	-	60	60	

ESTIMATED QUANTITIES - ONE ABUT. - 45° 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.	1626	1626	1626	1626	1626	1626	1626	1626	1636	
STEEL PILING HP 10x42	NO.	6	6	6	6	6	6	6	6	7	
PREBORE HOLES	FT.	-	-	-	-	-	-	-	60	70	

BENT BAR DETAILS



REVISED 07-09 - CONCRETE QUANTITIES CHANGED.
REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE.

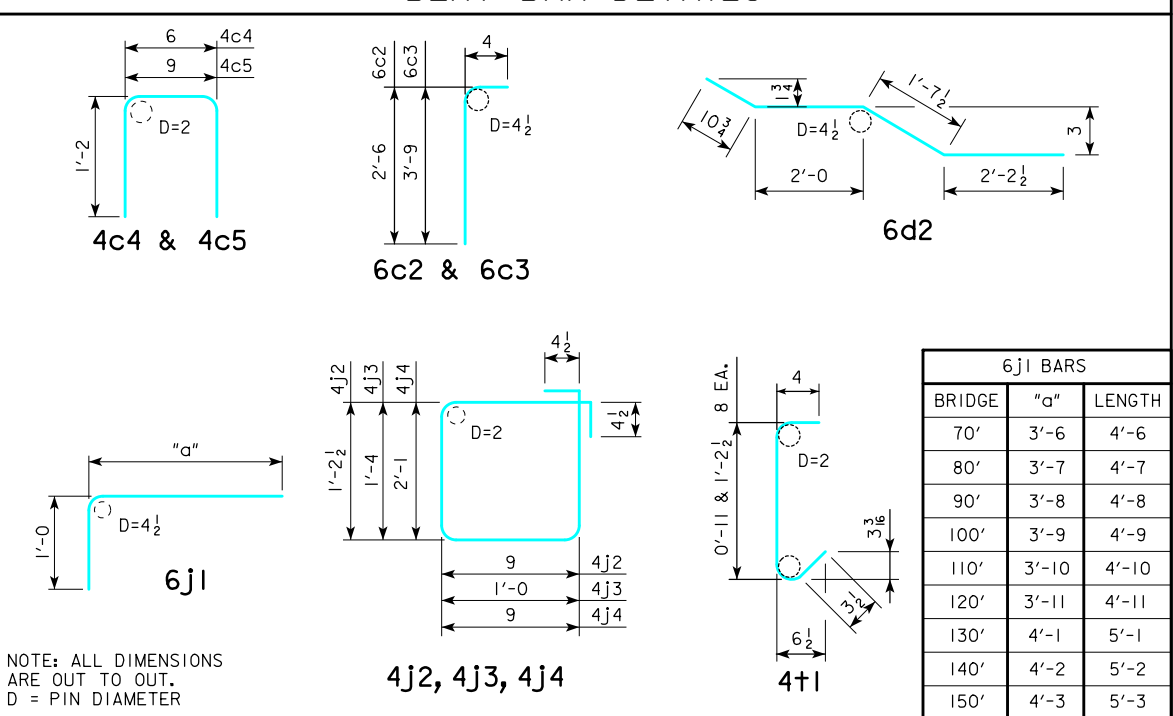
08-2022 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 24'-0 ROADWAY, 3 SPAN BRIDGES
		CONTINUOUS CONCRETE SLAB BRIDGES NOVEMBER, 2006
		ABUTMENT DETAILS STEEL PILING
		J24-39-06

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						
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						
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						
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						
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						
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						
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						
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						
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



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 \bar{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.

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

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

CONTINUOUS CONCRETE SLAB BRIDGES

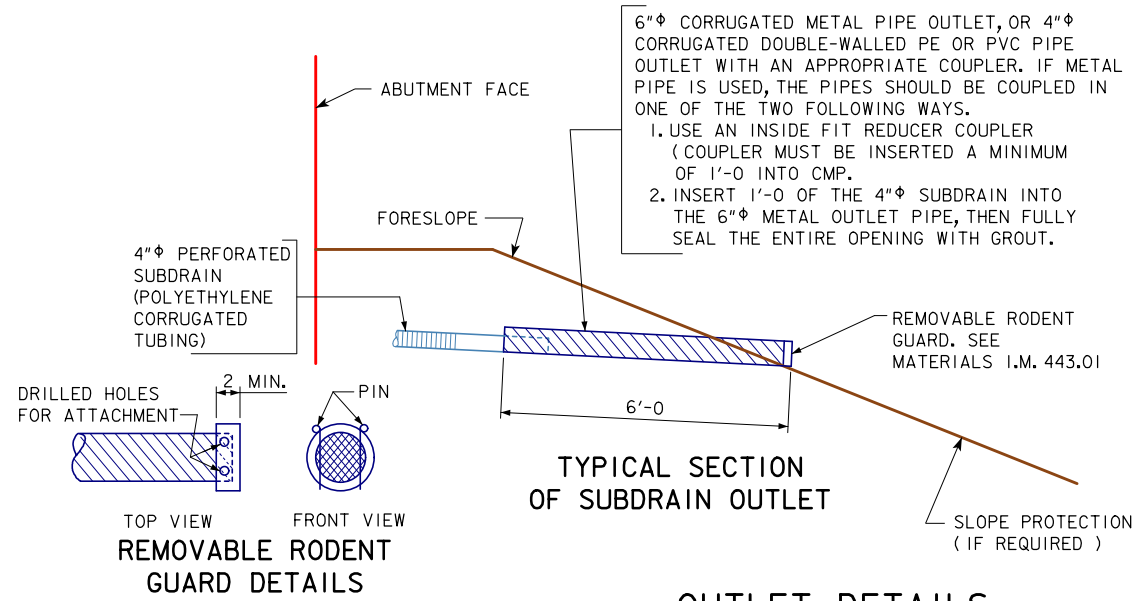
NOVEMBER, 2006

APPROVED BY BRIDGE ENGINEER

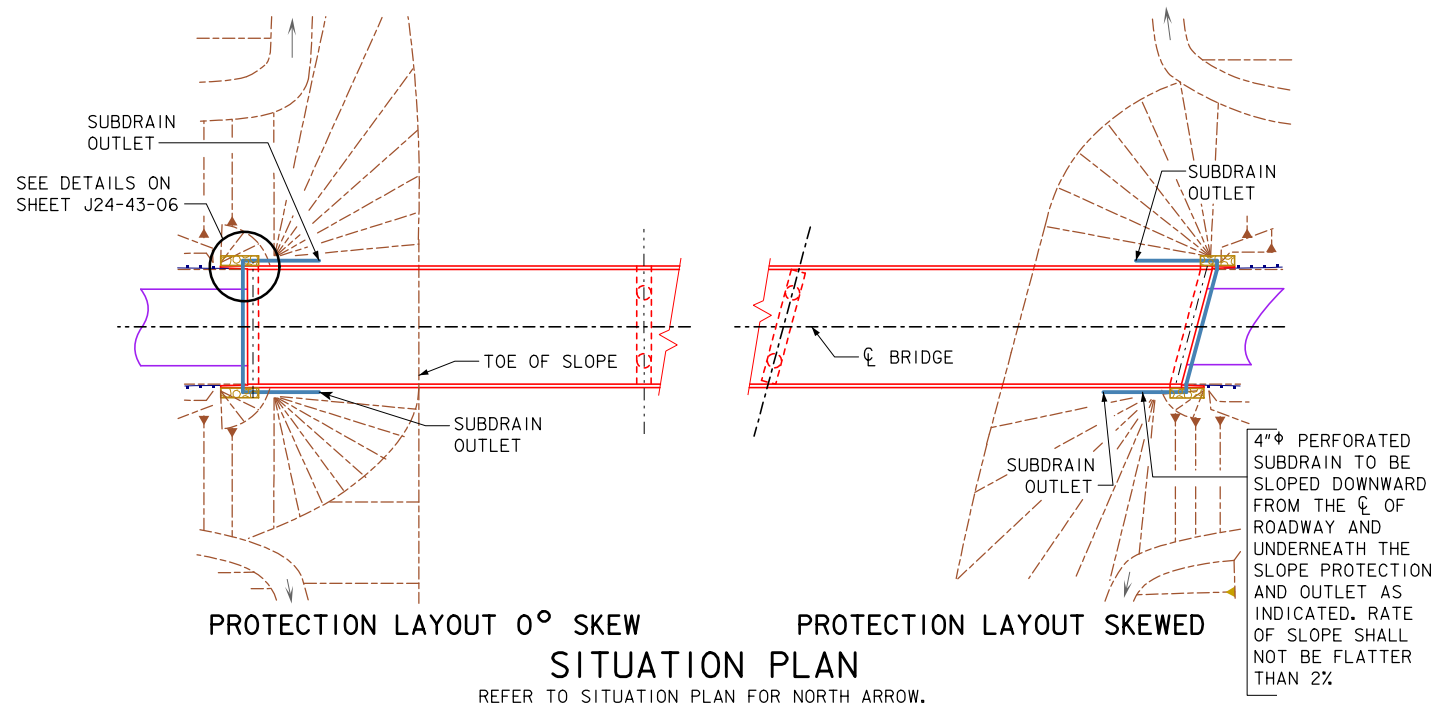
**OPEN RAIL DETAILS
(TL-4)**

J24-41-06

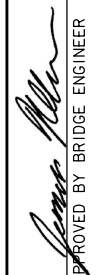

REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE. REMOVED NOTE STATING "ALL OPEN RAIL REINFORCING STEEL IS TO BE INCLUDED WITH THE SUPERSTRUCTURE REINFORCING STEEL." CORRECTED NUMBER OF 6j1 BARS FOR 130'-0, CHANGED NUMBER OF 6h1 BARS FROM 32 TO 36 FOR BRIDGE LENGTHS OF 80'-0, 90'-0, 100'-0, AND 110'-0.



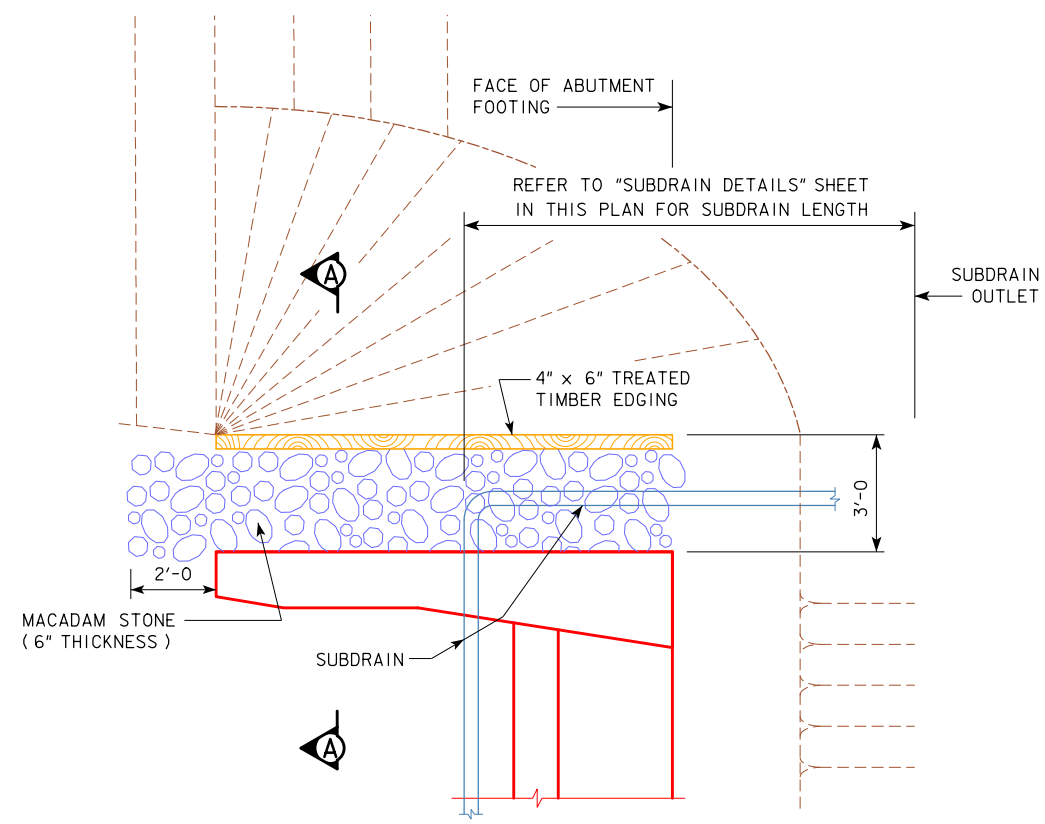
OUTLET DETAILS



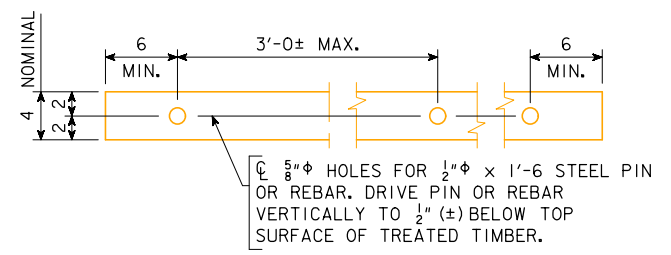
REVISED 12-08 - REMOVED GRANULAR BACKFILL DETAILS.
 REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE.

08-2022 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 24'-0" ROADWAY, 3 SPAN BRIDGES CONTINUOUS CONCRETE SLAB BRIDGES NOVEMBER, 2006	
		SUBDRAIN DETAILS	J24-42-06

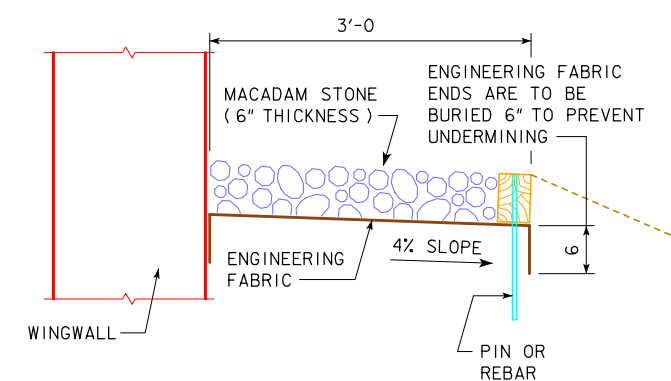
REVISED 09-14 - THE AREA OF MACADAM STONE WAS EXTENDED 2'-0" IN FRONT OF THE BRIDGE WING.
REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE.



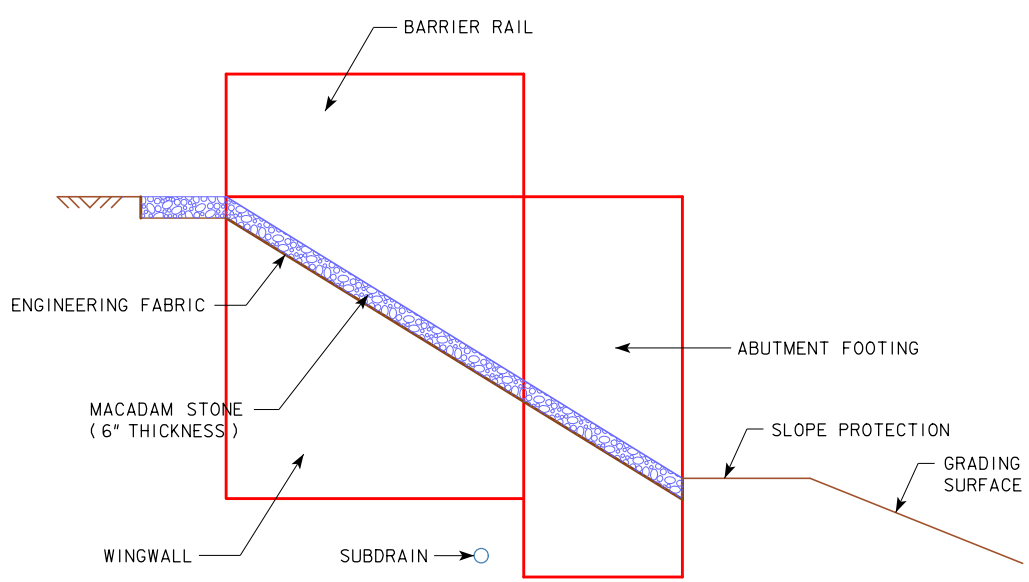
TOP VIEW OF WING ARMORING



4" x 6" TREATED TIMBER EDGING DETAILS



SECTION A-A



PROFILE VIEW OF WING ARMORING

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).

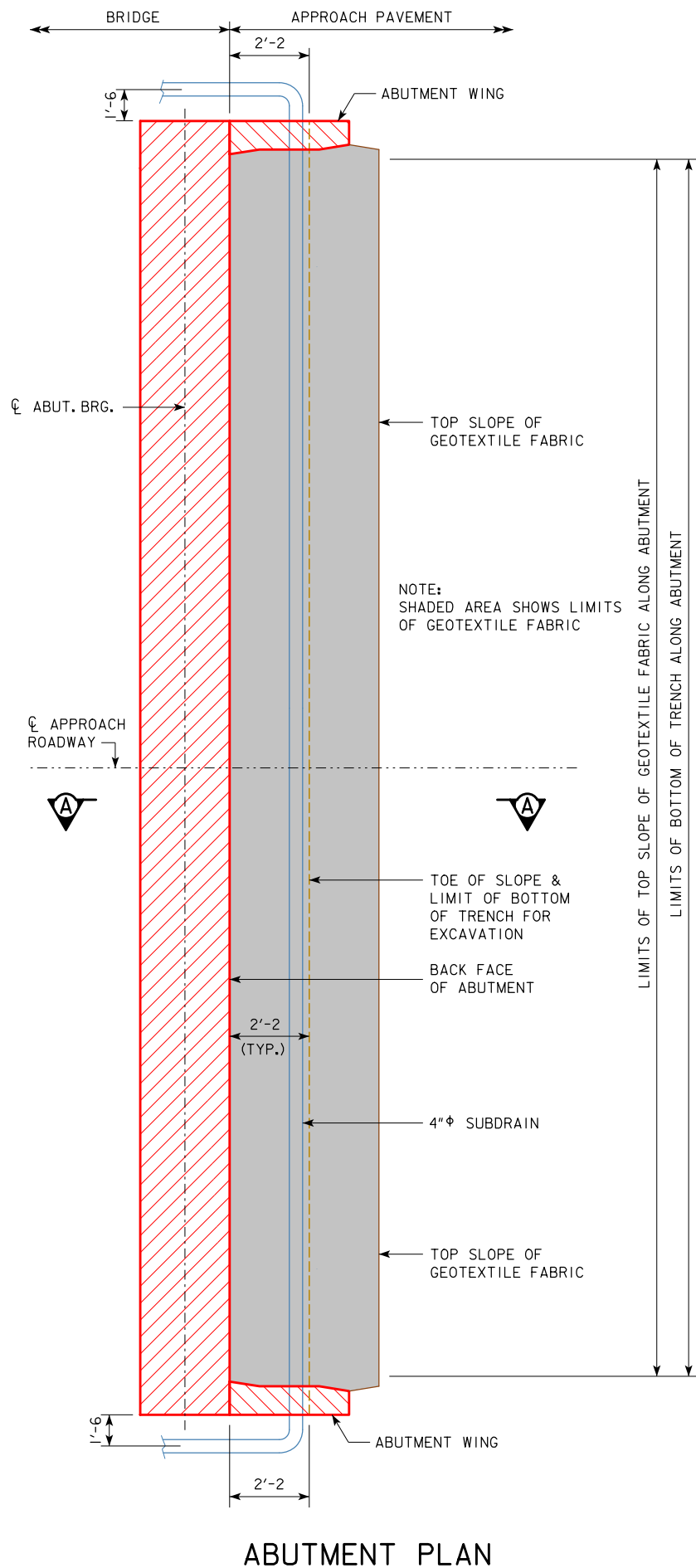
WOOD PRESERVATIVE TREATMENT FOR THE TIMBER EDGING SHALL MEET THE REQUIREMENTS FOR GUARDRAIL POSTS, SAWED FOUR SIDES, IN ACCORDANCE WITH SECTION 4161 OF THE STANDARD SPECIFICATIONS.

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

REVISED 09-2016 - CHANGED THE BRIDGE APPROACH PAVEMENT STANDARD TO "BR" (WAS "RK-20").
REVISED 08-2022: 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.

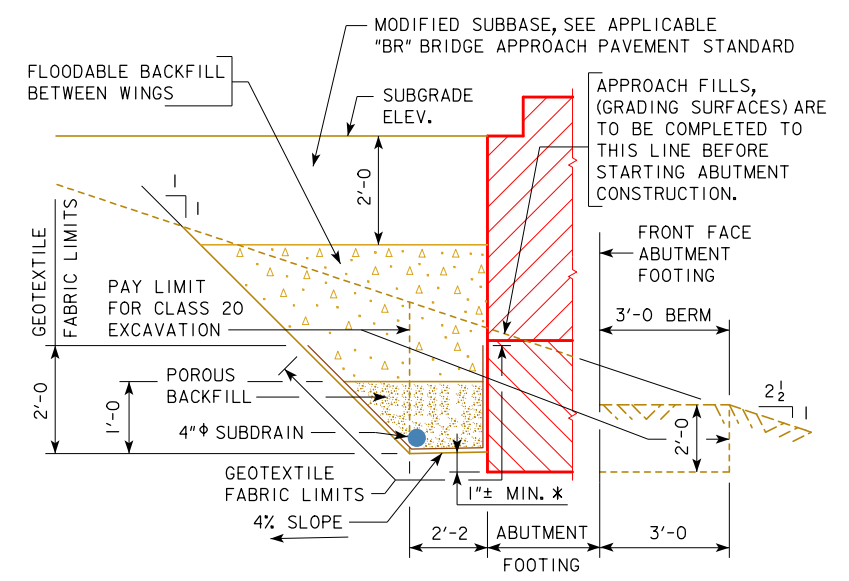
NOTE:
SEE SUBDRAIN DETAILS SHEET FOR DETAILS NOT SHOWN ON THIS SHEET WHICH ARE PERTINENT TO THIS STRUCTURE.

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.

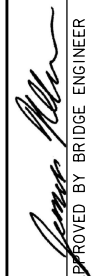

THE GEOTEXTILE FABRIC SHALL BE IN ACCORDANCE WITH ARTICLE 4196.01, B, 6 OF THE STANDARD SPECIFICATIONS. IF THE ENGINEERING FABRIC IS LAPPED THE LAPS SHALL BE A MINIMUM OF ONE FOOT IN LENGTH, SHINGLE FASHION WITH UP SLOPE LAP PIECE ON TOP AND STAPLED FOR CONTINUITY.



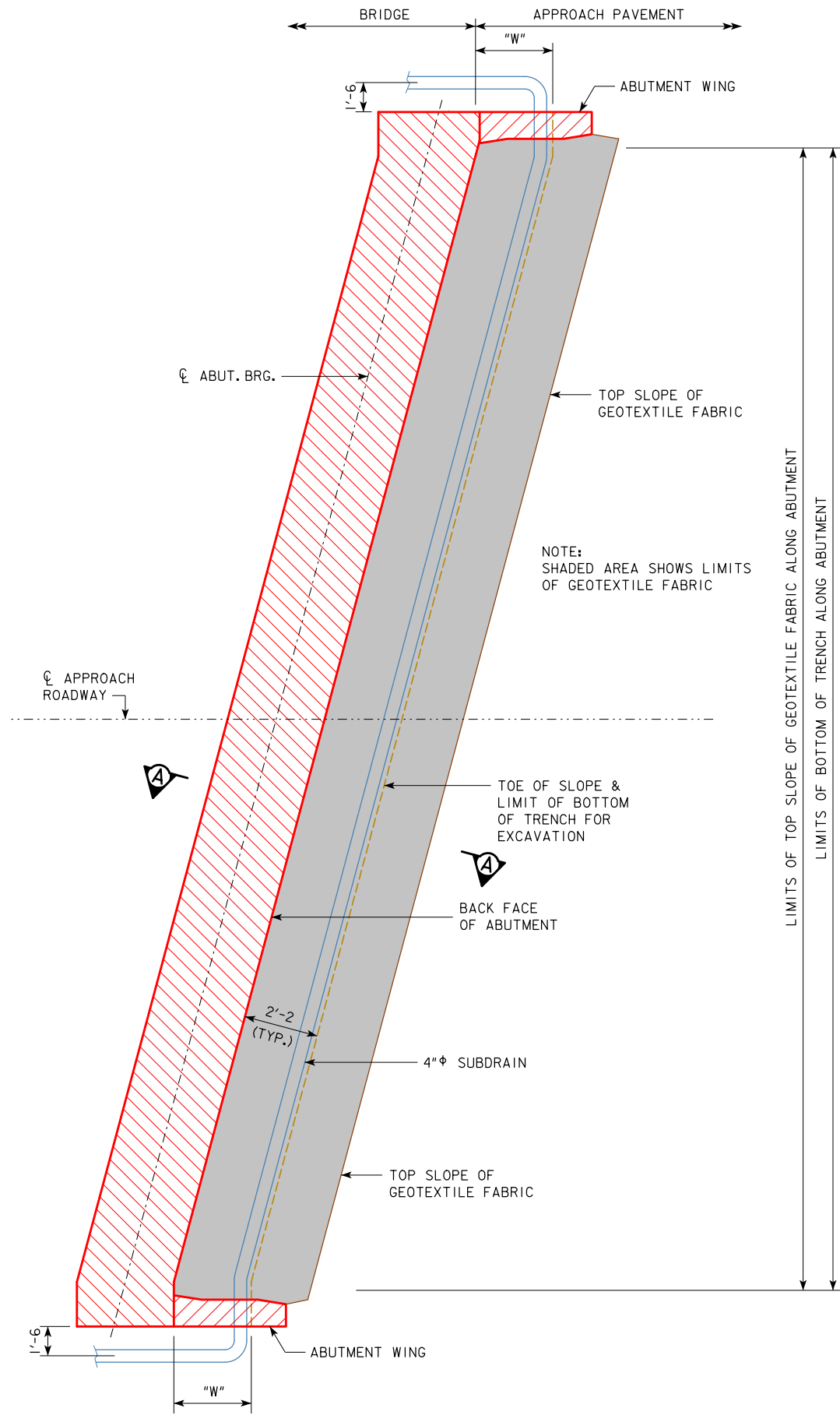
**SECTION A-A
BACKFILL DETAILS**

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

* DIMENSION VARIES DUE TO 2% SUBDRAIN SLOPE.

08-2022 LATEST REVISION DATE  APPROVED BY BRIDGE ENGINEER	 STANDARD DESIGN - 24'-0 ROADWAY, 3 SPAN BRIDGES CONTINUOUS CONCRETE SLAB BRIDGES DECEMBER, 2008	
	ABUTMENT BACKFILL DETAILS FOR 0° SKEWS	J24-44-06

REVISED 03-2021 - REVISION FOR
REVISED 08-2022: UPDATED BRIDGE ENGINEER SIGNATURE.



ABUTMENT PLAN WITHOUT WING EXTENSIONS

"W" DIMENSION	
SKEW	DIMENSION
15°	2'-2 ⁷ / ₈
30°	2'-6
45°	3'-0 ³ / ₄

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.

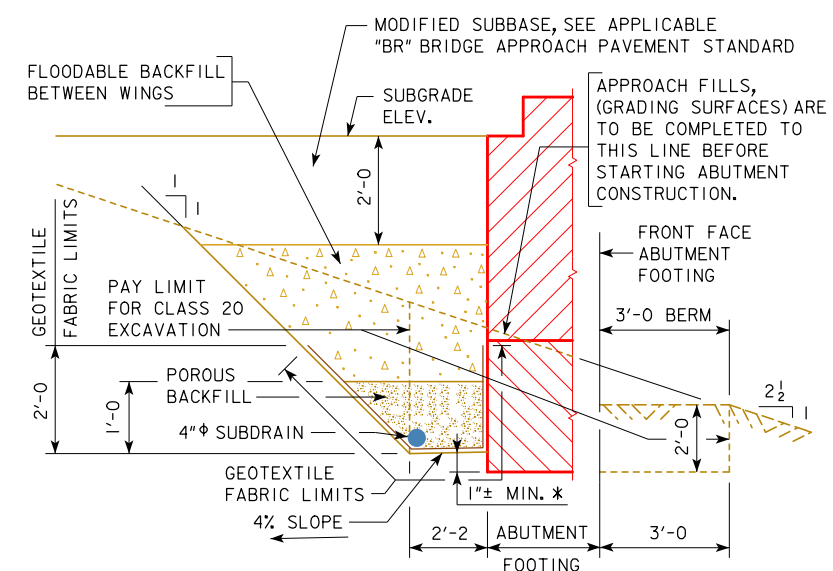
NOTE:
SEE SUBDRAIN DETAILS SHEET FOR DETAILS NOT SHOWN ON THIS SHEET WHICH ARE PERTINENT TO THIS STRUCTURE.

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.

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	ABUTMENT BACKFILL DETAILS FOR 15°, 30°, & 45° SKEWS
	J24-45-06