



J30-06 CONTINUOUS CONCRETE SLAB BRIDGE STANDARDS

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

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

GENERAL NOTES:

THE J30-06 BRIDGE STANDARDS, IF PROPERLY USED, PROVIDE THE STRUCTURAL PLANS NECESSARY TO CONSTRUCT THREE SPAN 30' ROADWAY CONTINUOUS CONCRETE SLAB BRIDGES WITH LENGTHS OF 70'-0, 80'-0, 90'-0, 100'-0, 110'-0, 120'-0, 130'-0, 140'-0 AND 150'-0.

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

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

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

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

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

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

THE FLOOR SLAB AS SHOWN INCLUDES 1/2" INTEGRAL WEARING SURFACE.

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

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

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

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

THE INTEGRAL ABUTMENTS AND PILE BENTS FOR THESE J30 STANDARDS HAVE BEEN DESIGNED FOR THE USE OF VARIOUS TYPES OF PILE FOOTINGS AS FOLLOWS.

- INTEGRAL ABUTMENTS: TIMBER PILES OR HP 10x42 PILES AT BRIDGE DESIGN MANUAL (BDM) ARTICLE 6.2.6.I STRUCTURAL RESISTANCE LEVEL-I (SRL-I)
- PILE BENTS: STANDARD CONCRETE-FILLED STEEL PIPE PILES (PIOL), STANDARD PRESTRESSED CONCRETE PILES (PIOL), OR STANDARD H-PILES (PIOL AND SRL-I)

BECAUSE THESE BRIDGE STANDARDS HAVE BEEN REVISED FOR LRFD BASED ON 2012-COMPLETED IOWA STATE UNIVERSITY RESEARCH, FOR PILE FOUNDATIONS THE DESIGNER WILL NEED TO DETERMINE THE CONSTRUCTION CONTROL METHOD, CONTRACT LENGTH, AND DRIVING TARGET AND GIVE THAT INFORMATION ON THE FRONT SHEET OF THE PLANS. BRIDGE DESIGN MANUAL CADD NOTES E177, E718, E719, E818, AND E819 ARE APPROPRIATE FOR THAT PURPOSE. THE NOTES, AS WELL AS THE BRIDGE DESIGN MANUAL AND DESIGN EXAMPLES, ARE AVAILABLE ON THE OFFICE OF BRIDGES AND STRUCTURES WEB SITE: [HTTP://WWW.IOWADOT.GOV/BRIDGE/INDEX.HTM](http://www.iowadot.gov/bridge/index.htm).

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

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

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

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

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

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

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

THESE BRIDGE PLANS LABEL ALL REINFORCING STEEL WITH ENGLISH NOTATION (501 IS 1/2 INCH DIAMETER BAR). ENGLISH REINFORCING STEEL RECEIVED IN THE FIELD MAY DISPLAY THE FOLLOWING "BAR DESIGNATION". THE "BAR DESIGNATION" IS THE STAMPED IMPRESSION ON THE REINFORCING BARS, AND IS EQUIVALENT TO THE BAR DIAMETER IN MILLIMETERS.

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

SPECIFICATIONS:

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

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

DESIGN STRESSES:

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

SIX FOOT OF APPROACH SLAB DEAD & LIVE LOAD INCLUDED IN ABUTMENT LOADS. CONTROL OF CRACKING BY DISTRIBUTION OF REINFORCEMENT FOR SLAB DESIGN BASED ON PRE 2005 LRFD INTERMS.

09-2020
LATEST REVISION DATE

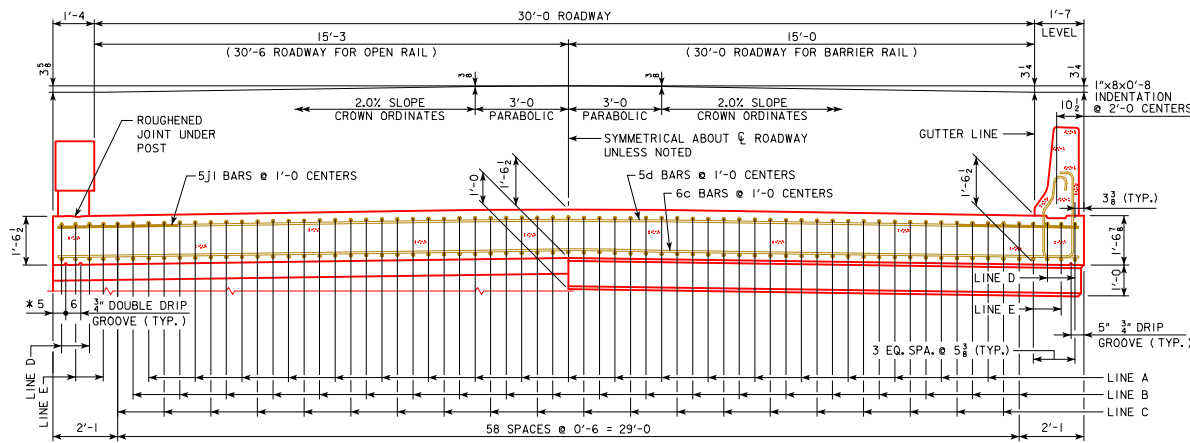

APPROVED BY BRIDGE ENGINEER


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

GENERAL NOTES

J30-01A-06

REVISED 07-2016: DATE ON SHEET CHANGED TO CORRECT CLERICAL ERROR.
REVISED 09-2020: UPDATED BRIDGE ENGINEER SIGNATURE.



HALF SECTION NEAR ABUTMENT

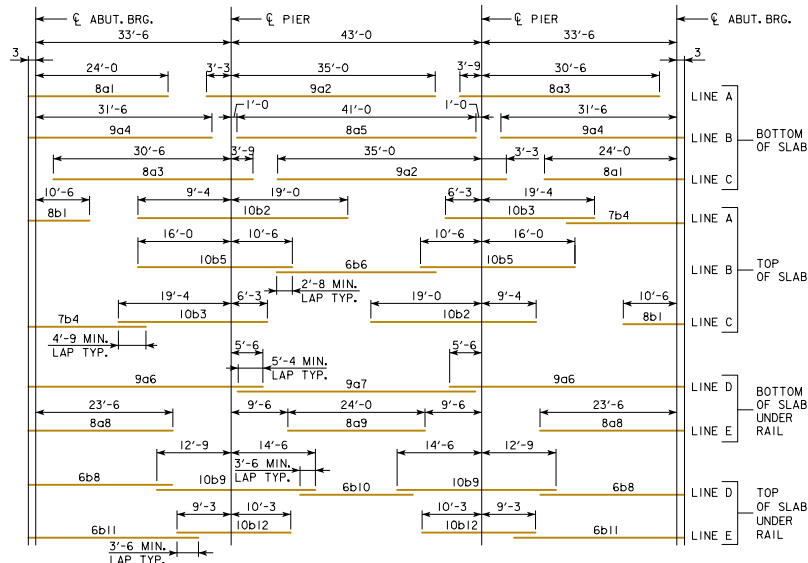
HALF SECTION NEAR PIER

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

SLAB CROSS-SECTIONAL AREA FOR OPEN RAIL = 51.14 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 POURED. I.M. 451.01 REQUIREMENTS SHALL APPLY FOR BAR CHAIRS.

SLAB CROSS-SECTIONAL AREA FOR BARRIER RAIL = 51.19 SQ. FT.



REVISED 07-2009: OPEN RAIL REINF. QTY'S CHANGED WHICH CHANGED TOTAL REINF. QTY'S.
REVISED 09-2020: UPDATED BRIDGE ENGINEER SIGNATURE. CHANGED PAVING BLOCK LIFTING HOOP BAR MARKS, WAS 5x11.

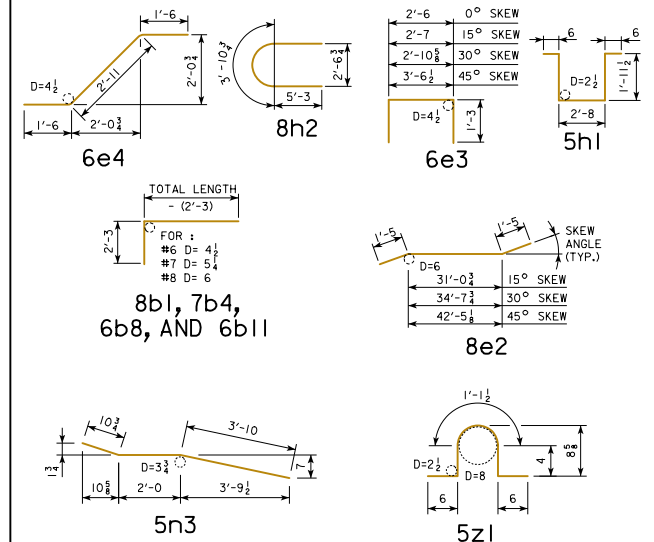
BILL OF REINFORCING STEEL FOR SUPERSTRUCTURE - 110' BRIDGE													
LOCATION		SKEW		0°		15°		30°		45°			
		SHAPE		BAR	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT
SLAB LONGITUDINAL BOTTOM				8a1	39	24'-3	2526	39	24'-3	2526	39	24'-3	2526
SLAB LONGITUDINAL BOTTOM				9a2	39	38'-3	5072	39	38'-3	5072	39	38'-3	5072
SLAB LONGITUDINAL BOTTOM				8a3	39	34'-3	3567	39	34'-3	3567	39	34'-3	3567
SLAB LONGITUDINAL BOTTOM				9a4	40	31'-9	4318	40	31'-9	4318	40	31'-9	4318
SLAB LONGITUDINAL BOTTOM				8a5	20	41'-0	2190	20	41'-0	2190	20	41'-0	2190
SLAB LONGITUDINAL BOTTOM, AT RAIL				9a6	8	39'-3	1068	8	39'-3	1068	8	39'-3	1068
SLAB LONGITUDINAL BOTTOM, AT RAIL				9a7	4	42'-8	581	4	42'-8	581	4	42'-8	581
SLAB LONGITUDINAL BOTTOM, AT RAIL				8a8	8	23'-9	508	8	23'-9	508	8	23'-9	508
SLAB LONGITUDINAL BOTTOM, AT RAIL				8a9	4	24'-0	257	4	24'-0	257	4	24'-0	257
SLAB LONGITUDINAL TOP				8b1	39	13'-0	1354	39	13'-0	1354	39	13'-0	1354
SLAB LONGITUDINAL TOP				10b2	39	28'-4	4755	39	28'-4	4755	39	28'-4	4755
SLAB LONGITUDINAL TOP				10b3	39	25'-7	4294	39	25'-7	4294	39	25'-7	4294
SLAB LONGITUDINAL TOP				7b4	39	21'-5	1708	39	21'-5	1708	39	21'-5	1708
SLAB LONGITUDINAL TOP				10b5	40	26'-6	4562	40	26'-6	4562	40	26'-6	4562
SLAB LONGITUDINAL TOP				6b6	20	27'-4	822	20	27'-4	822	20	27'-4	822
SLAB LONGITUDINAL TOP, AT RAIL				6b8	8	26'-9	322	8	26'-9	322	8	26'-9	322
SLAB LONGITUDINAL TOP, AT RAIL				10b9	8	27'-3	939	8	27'-3	939	8	27'-3	939
SLAB LONGITUDINAL TOP, AT RAIL				6b10	4	21'-0	127	4	21'-0	127	4	21'-0	127
SLAB LONGITUDINAL TOP, AT RAIL				6b11	8	30'-3	364	8	30'-3	364	8	30'-3	364
SLAB LONGITUDINAL TOP, AT RAIL				10b12	8	19'-6	672	8	19'-6	672	8	19'-6	672
SLAB TRANSVERSE, BOTTOM				6c1	107	32'-10	5277	107	34'-0	5465	94	32'-10	4636
SLAB TRANSVERSE, BOTTOM				6c2	-	-	-	-	-	-	30	VARIES	797
SLAB TRANSVERSE, TOP				5d1	107	32'-10	3665	107	34'-0	3795	94	32'-10	3220
SLAB TRANSVERSE, TOP				5d2	-	-	-	-	-	-	80	32'-10	2740
SLAB TRANSVERSE, TOP				8e1	18	32'-10	1578	-	-	-	30	VARIES	553
SLAB TRANSVERSE, AT ABUTMENT				8e2	-	-	-	18	33'-11	1631	18	37'-6	1803
SLAB, HAIRPINS, AT ABUTMENT				6e3	72	5'-0	541	72	5'-1	550	72	5'-5	586
SLAB, HAIRPINS, AT ABUTMENT				6e4	72	5'-11	640	72	5'-11	640	72	5'-11	640
PIER CAP HOOPS				5h1	54	7'-7	428	54	7'-7	428	54	7'-7	428
PIER CAP ENDS				8h2	4	14'-5	154	4	14'-5	154	4	14'-5	154
PIER CAP, BOTTOM LONGITUDINAL				8h3	8	29'-10	638	8	30'-11	661	8	34'-5	736
PIER CAP, TOP LONGITUDINAL				8h4	4	32'-10	351	4	34'-0	364	4	37'-11	405
TOP OF SLAB, TRANSVERSE, AT RAIL				5j1	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
WING, HORIZONTAL BACK FACE				5n1	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
** PAVING BLOCK LIFTING HOOPS				5z1	10	2'-10	30	10	2'-10	30	10	2'-10	30
SUB TOTAL - LBS.							55,709			56,125			56,395
BARRIER RAIL - SEE LIST ON RAIL SHEET J30-41-06							6962			6962			6962
OPEN RAIL - SEE LIST ON RAIL SHEET J30-44-06							7261			7261			7261
TOTAL - LBS.							62,671			63,087			63,357
				WITH MONOLITHIC PIER CAP			62,970			63,386			63,656
TOTAL - LBS.							61,100			61,480			61,634
				WITH NON-MONOLITHIC PIER CAP			61,399			61,779			61,933
SAME AS ABOVE EXCEPT ALL "h" BARS DELETED							61,399			61,779			61,933

** BARS MAY BE NON-COATED AT CONTRACTOR'S OPTION.

ESTIMATED QUANTITIES FOR SUPERSTRUCTURE - 110' BRIDGE													
ITEM		SKEW		0°		15°		30°		45°			
				WITH MONOLITHIC PIER CAP		WITH MONOLITHIC PIER CAP		WITH MONOLITHIC PIER CAP		WITH NON-MONOLITHIC PIER CAP		WITH NON-MONOLITHIC PIER CAP	
WITH BARRIER RAIL				234.5	235.2	238.0	243.7	229.9	230.5	232.7	237.3		
CONCRETE BARRIER OR OPEN RAIL				62,671	63,087	63,357	64,184	61,100	61,480	61,634	62,062		
WITH OPEN RAIL				242.0	242.2	242.9	244.5	242.0	242.2	242.9	244.5		
WITH OPEN RAIL				234.3	235.0	237.8	243.5	229.7	230.3	232.5	237.1		
OPEN RAIL				62,970	63,386	63,656	64,483	61,399	61,779	61,933	62,361		

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

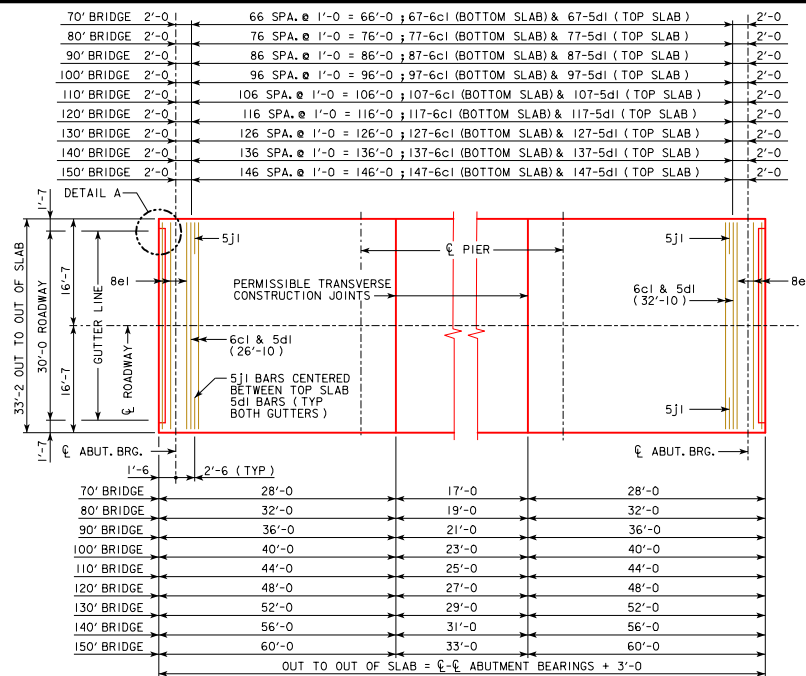
BENT BAR DETAILS



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

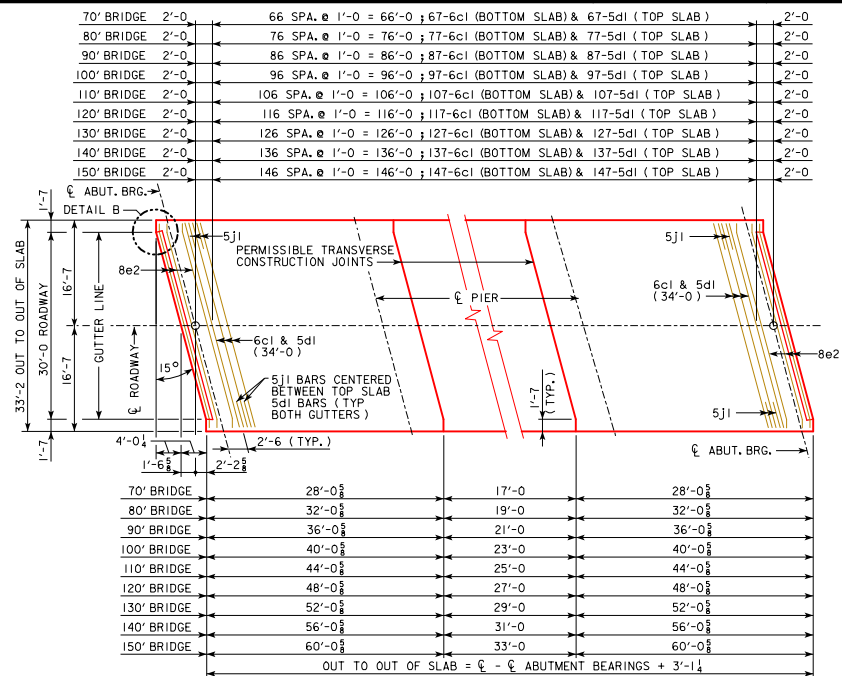
09-2020 LATEST REVISION DATE		APPROVED BY BRIDGE ENGINEER	Highway Division
			STANDARD DESIGN - 30' ROADWAY, 3 SPAN BRIDGES
			CONTINUOUS CONCRETE SLAB BRIDGES NOVEMBER, 2006
SUPERSTRUCTURE DETAILS 110'-0 BRIDGE		J30-11E-06	
EPOXY COATED REINFORCING			

REVISED 07-2009; CHANGED THE DRAIN ANGLES DETAILS ON SECTION A-A.
REVISED 09-2020; UPDATED BRIDGE ENGINEER SIGNATURE. CHANGED PAVING BLOCK LIFTING HOOP BAR MARK, WAS 5x11.

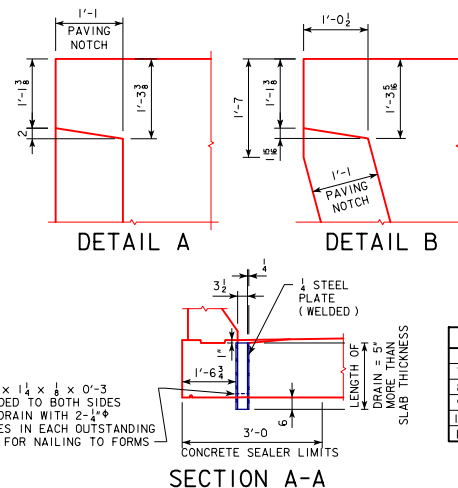
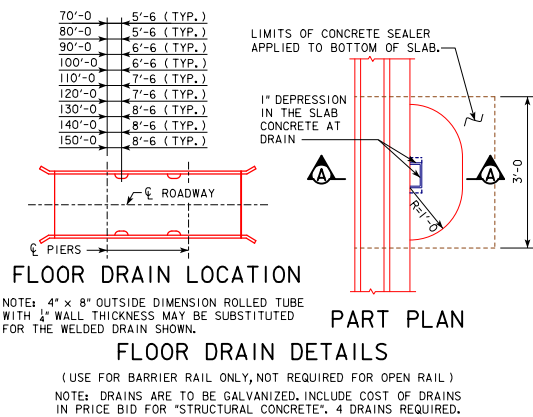


0° SKEW

TRANSVERSE REINFORCING STEEL LAYOUT

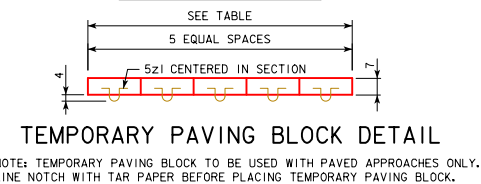


15° SKEW

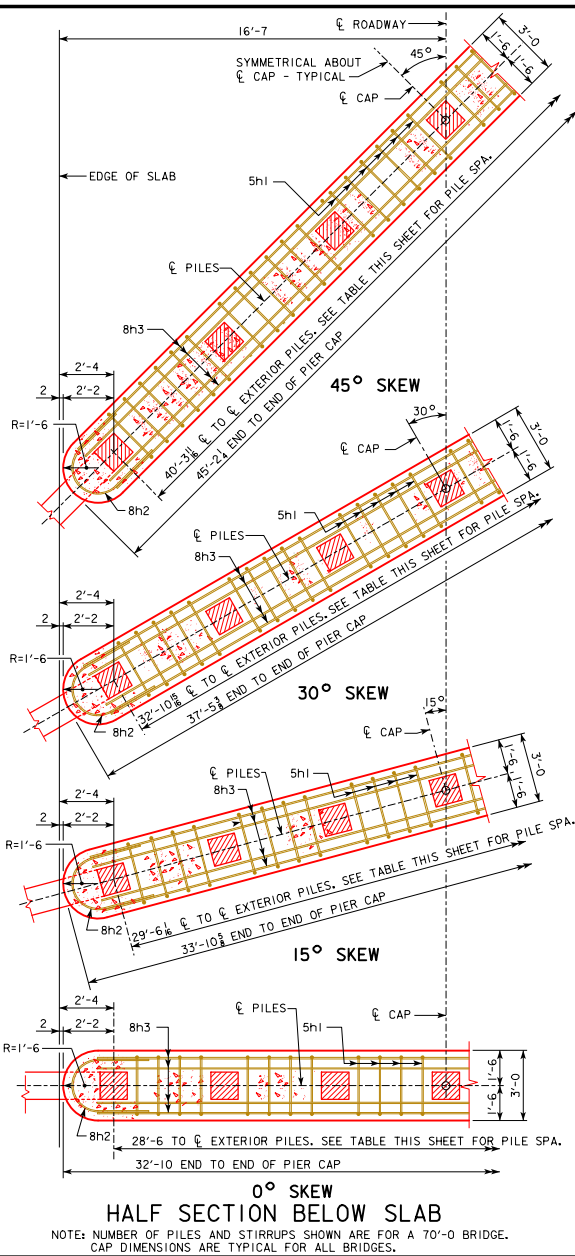


WEIGHT OF ONE FLOOR DRAIN			
SPAN	WEIGHT, LBS.	SPAN	WEIGHT, LBS.
70'-0"	32	120'-0"	41
80'-0"	33	130'-0"	43
90'-0"	35	140'-0"	45
100'-0"	37	150'-0"	48
110'-0"	39		

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



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



TYPICAL NUMBERS OF PILES AND SPACINGS AND FACTORED PIER LOADS

BRIDGE LENGTH	70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
① TYP. NO. OF PILES	7	7	8	9	10	11	12	12	12
TYP. PILE SPACES @ 0°	6 SPA. @ 4'-9	6 SPA. @ 4'-9	7 SPA. @ ABOUT 4'-11(-)	8 SPA. @ ABOUT 3'-7(-)	9 SPA. @ 3'-2	10 SPA. @ ABOUT 2'-10(+)	11 SPA. @ ABOUT 2'-7(+)	11 SPA. @ ABOUT 2'-7(+)	11 SPA. @ ABOUT 2'-7(+)
TYP. PILE SPACES @ 15°	6 SPA. @ ABOUT 4'-11(+)	6 SPA. @ ABOUT 4'-11(+)	7 SPA. @ ABOUT 4'-3(-)	8 SPA. @ ABOUT 3'-8(+)	9 SPA. @ ABOUT 3'-3(+)	10 SPA. @ ABOUT 2'-11(+)	11 SPA. @ ABOUT 2'-8(+)	11 SPA. @ ABOUT 2'-8(+)	11 SPA. @ ABOUT 2'-8(+)
TYP. PILE SPACES @ 30°	6 SPA. @ ABOUT 5'-6(-)	6 SPA. @ ABOUT 5'-6(-)	7 SPA. @ ABOUT 4'-8(+)	8 SPA. @ ABOUT 4'-1(+)	9 SPA. @ ABOUT 3'-8(-)	10 SPA. @ ABOUT 3'-3(+)	11 SPA. @ ABOUT 3'-0(-)	11 SPA. @ ABOUT 3'-0(-)	11 SPA. @ ABOUT 3'-0(-)
TYP. PILE SPACES @ 45°	6 SPA. @ ABOUT 6'-9(-)	6 SPA. @ ABOUT 6'-9(-)	7 SPA. @ ABOUT 5'-9(+)	8 SPA. @ ABOUT 5'-0(+)	9 SPA. @ ABOUT 4'-6(-)	10 SPA. @ ABOUT 4'-0(+)	11 SPA. @ ABOUT 3'-8(-)	11 SPA. @ ABOUT 3'-8(-)	11 SPA. @ ABOUT 3'-8(-)
④ PU. STRENGTH I DESIGN LOAD FOR PIER (KIPS)	631 KIPS	699 KIPS	776 KIPS	860 KIPS	942 KIPS	1039 KIPS	1134 KIPS	1234 KIPS	1346 KIPS

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

PIER NOTES:

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

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

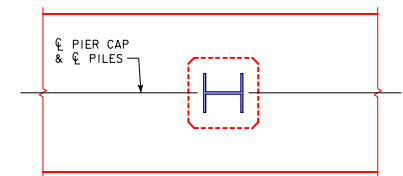
THE PIER PILES ARE TO BE DRIVEN TO FULL PENETRATION, IF PRACTICABLE, BUT IN NO CASE TO A BEARING VALUE LESS THAN THE PILE BEARING REQUIRED FOR EACH BRIDGE LENGTH AS SHOWN ON THIS SHEET. ADDITIONAL DRIVING CAPACITY MAY BE REQUIRED THROUGH SCOURABLE LAYERS. REFER TO GENERAL PLAN NOTES FOR ADDITIONAL INFORMATION.

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

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

ALL REINFORCING STEEL IS TO BE GRADE 60.

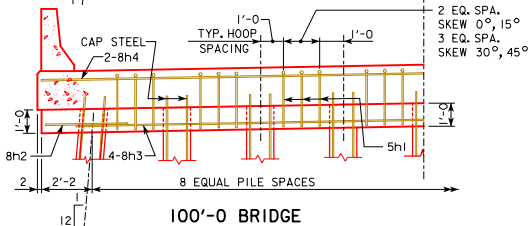
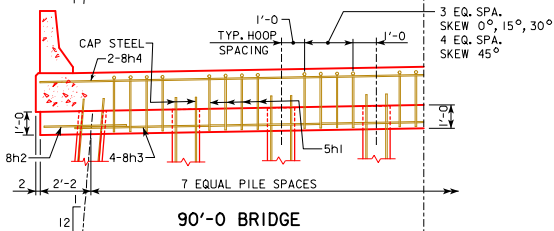
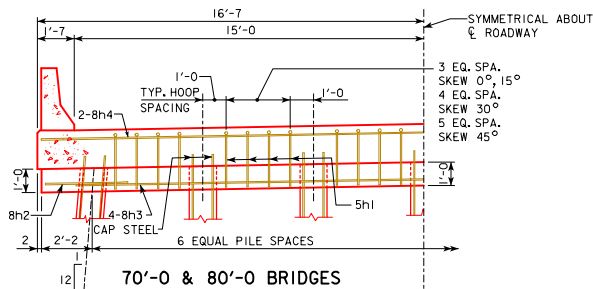
PIER PILING WAS DESIGNED FOR HL-93 LOADING WITH AN ALLOWANCE FOR 20 LBS. PER SQ. FT. FUTURE WEARING SURFACE.



PILE ORIENTATION DETAIL FOR TYPE 3 TRESTLE BENT PILES

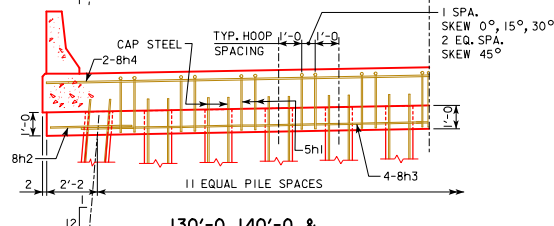
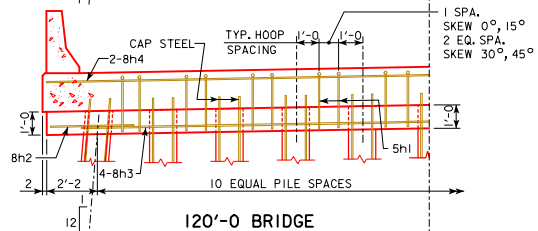
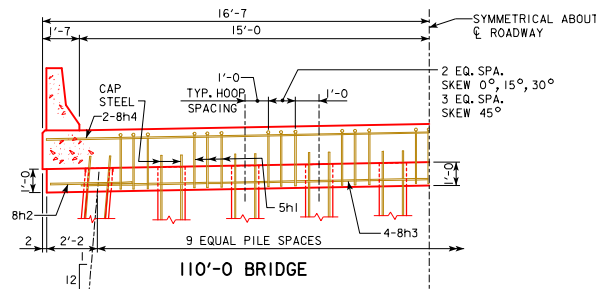
09-2020 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER 		
	STANDARD DESIGN - 30' ROADWAY, 3 SPAN BRIDGES CONTINUOUS CONCRETE SLAB BRIDGES NOVEMBER, 2006	
	MONOLITHIC PIER CAP DETAILS ALL BRIDGES	J30-23-06
	SHEET 1 OF 2	

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



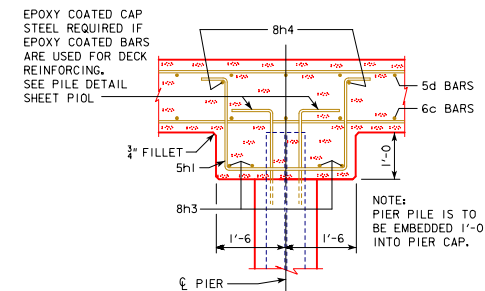
HALF SECTION NEAR PIER

SHOWING STIRRUP SPACING AND NUMBER OF PILING
NOTE: BOTTOM OF CAP ELEVATIONS WILL BE REQUIRED AT THE
CL OF ROADWAY AND AT EACH EXTERIOR PILE.



HALF SECTION NEAR PIER

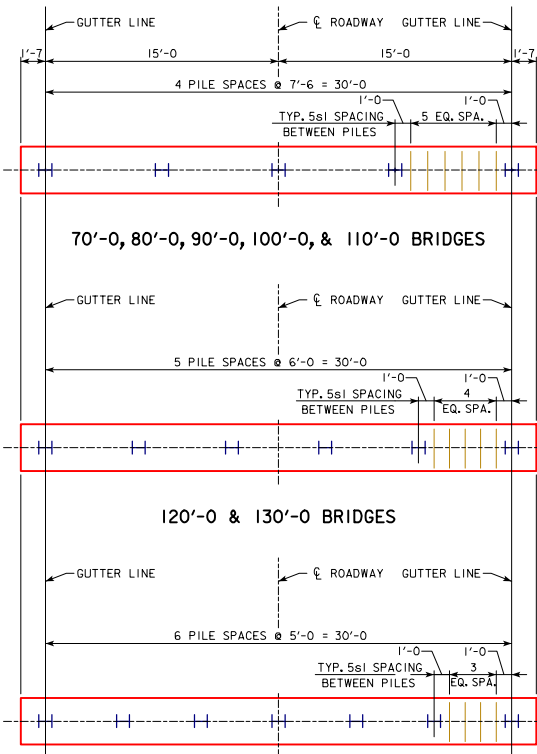
SHOWING STIRRUP SPACING AND NUMBER OF PILING
NOTE: BOTTOM OF CAP ELEVATIONS WILL BE REQUIRED AT THE
CL OF ROADWAY AND AT EACH EXTERIOR PILE.



TYPICAL CAP SECTION

09-2020 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	 Highway Division
STANDARD DESIGN - 30' ROADWAY, 3 SPAN BRIDGES CONTINUOUS CONCRETE SLAB BRIDGES NOVEMBER, 2006		
MONOLITHIC PIER CAP DETAILS ALL BRIDGES		J30-24-06
SHEET 2 OF 2		

REVISED 06-2013; REVISION FOR LRFD PILE DESIGN.
REVISED 09-2020; UPDATED BRIDGE ENGINEER SIGNATURE. CHANGED PAVING BLOCK LIFTING HOOF BAR MARK, WAS 5x10.



PILE PLAN - 0° SKEW STEEL PILING

ABUTMENT NOTES:

ALL PILING HP 10x42.

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

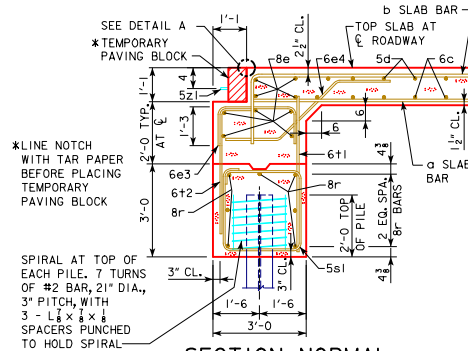
DETAILS ON THIS SHEET ARE TO BE USED ONLY WHEN ABUTMENTS ARE PLACED ON STEEL PILES. IF ROCK IS ENCOUNTERED CLOSER THAN 12'-0 BELOW ABUTMENT FOOTING, SPECIAL ANALYSIS MAY BE REQUIRED.

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

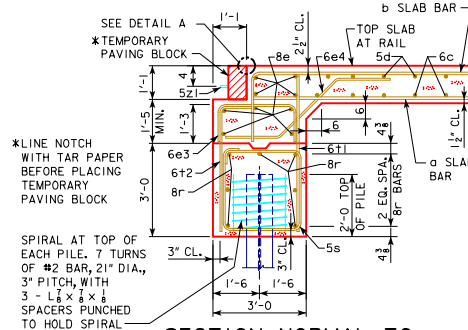
STEEL ABUTMENT PILES SHALL BE DRIVEN TO FULL PENETRATION IF PRACTICABLE BUT IN NO CASE TO A BEARING VALUE LESS THAN SHOWN IN DESIGN PLANS.

ALL REINFORCING STEEL IS TO BE GRADE 60.

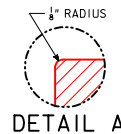
ABUTMENT PILING WAS DESIGNED FOR HL-93 LOADING WITH AN ALLOWANCE FOR 20 LBS. PER SQ. FT. FUTURE WEARING SURFACE.



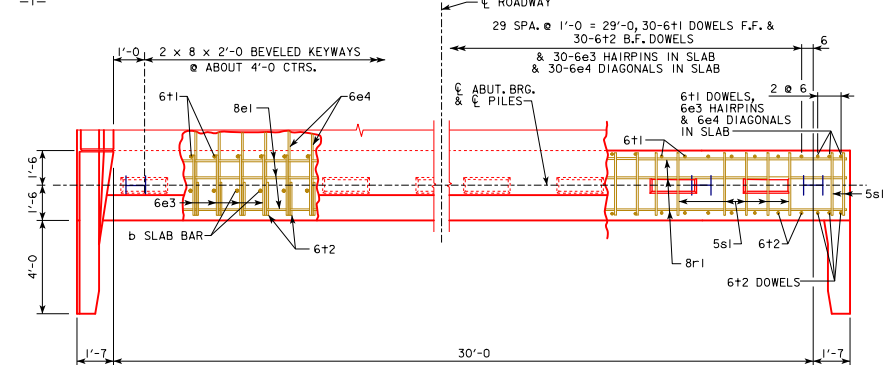
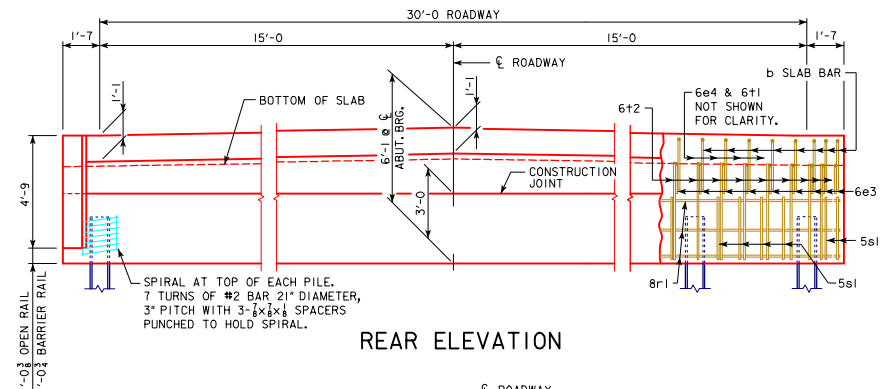
SECTION NORMAL
TO ABUTMENT AT CL



SECTION NORMAL TO
ABUTMENT AT GUTTERLINE



DETAIL A



PLAN VIEW

NOTE: WING REINFORCING
AND RAIL NOT SHOWN.

6e3, 6e4, AND 8e1 ARE INCLUDED
WITH SUPERSTRUCTURE QUANTITIES.

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	6	6	7	7	
PU, STRENGTH I DESIGN LOAD - KIPS	377	402	426	456	485	519	561	Δ 646	Δ 684	

Δ INCLUDES DYNAMIC LOAD ALLOWANCE

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

09-2020 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER 		
	STANDARD DESIGN - 30' ROADWAY, 3 SPAN BRIDGES CONTINUOUS CONCRETE SLAB BRIDGES NOVEMBER, 2006	
	ABUTMENT DETAILS 0° SKEW - STEEL PILING	J30-34-06

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	NO.	WEIGHT
8r1	ABUTMENT FOOTING LONGITUDINAL		32'-10	7	614	7	614	7	614	7	614	7	614	7	614	7	614	7	614	7	614
5s1	ABUTMENT FOOTING HOOPS		11'-0	28	321	28	321	28	321	28	321	28	321	29	333	29	333	28	321	28	321
6+1	FOOTING TO SLAB DOWELS		5'-0	36	270	36	270	36	270	36	270	36	270	36	270	36	270	36	270	36	270
6+2	FOOTING TO SLAB DOWELS		5'-7	36	302	36	302	36	302	36	302	36	302	36	302	36	302	36	302	36	302
#2	PILE SPIRAL		38'-6	5	32	5	32	5	32	5	32	5	32	6	39	6	39	7	45	7	45
	SPIRAL SPACERS - L $\frac{7}{8}$ X $\frac{7}{8}$ X $\frac{1}{2}$ X 0.70		1'-10	15	19	15	19	15	19	15	19	15	19	18	23	18	23	21	27	21	27
																	</				

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

BILL OF REINFORCING STEEL - ONE ABUTMENT - 30° SKEW																					
BRIDGE LENGTH			70'-0		80'-0		90'-0		100'-0		110'-0		120'-0		130'-0		140'-0		150'-0		
MARK	LOCATION	SHAPE	LENGTH	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT
8r2	ABUTMENT FOOTING LONGITUDINAL		37'-6	7	701	7	701	7	701	7	701	7	701	7	701	7	701	7	701	7	701
5s1	ABUTMENT FOOTING HOOPS		11'-0	30	344	30	344	30	344	30	344	30	344	30	344	30	344	30	344	30	344
5s2	ABUTMENT FOOTING HOOPS		11'-11	4	50	4	50	4	50	4	50	4	50	4	50	4	50	4	50	4	50
6f1	FOOTING TO SLAB DOWELS		5'-0	36	270	36	270	36	270	36	270	36	270	36	270	36	270	36	270	36	270
6f2	FOOTING TO SLAB DOWELS		5'-7	36	302	36	302	36	302	36	302	36	302	36	302	36	302	36	302	36	302
#2	PILE SPIRAL		38'-6	6	39	6	39	6	39	6	39	6	39	6	39	6	39	7	45	7	45
	SPIRAL SPACERS - L $\frac{7}{8}$ X $\frac{7}{8}$ X $\frac{1}{2}$ X 0.70		1'-10	18	23	18	23	18	23	18	23	18	23	18	23	18	23	21	27	21	27
							</														

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

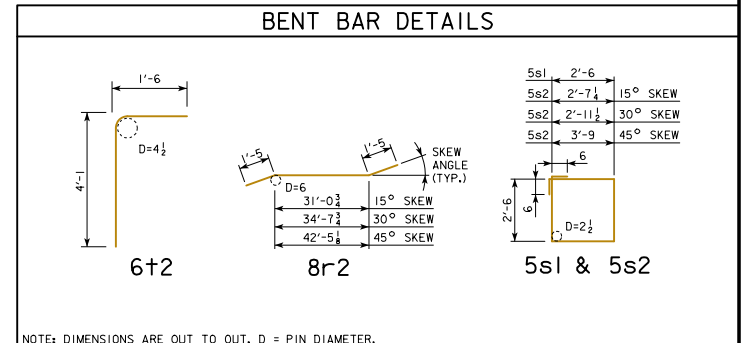
NOTE: THE PILE SPIRALS AND SPIRAL SPACERS ARE TO BE NON-COATED REINFORCING BUT MAY BE EPOXY COATED AT THE CONTRACTORS OPTION AND EXPENSE.

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

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

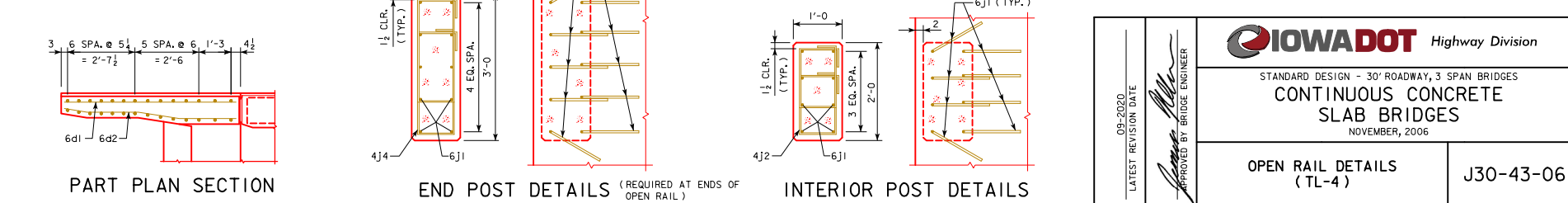
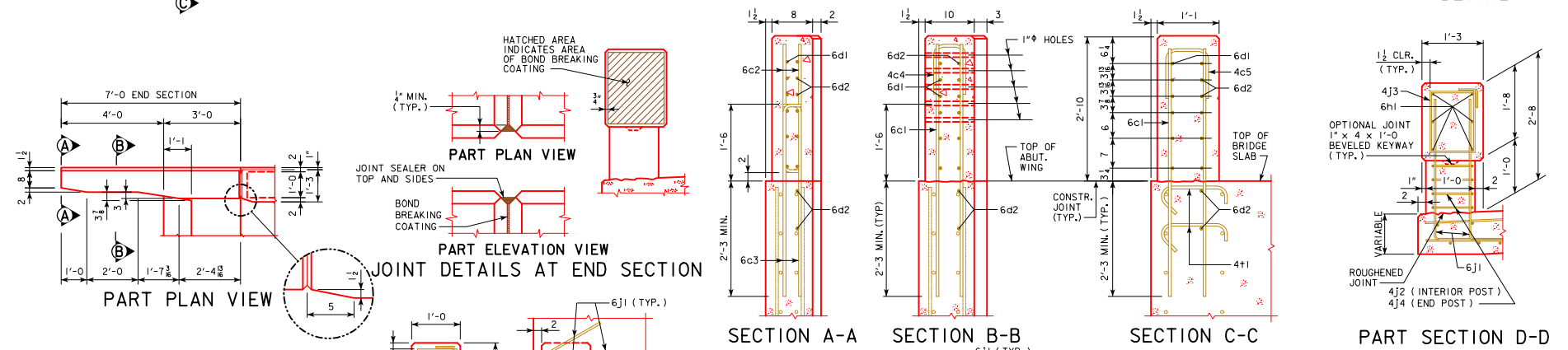
ESTIMATED QUANTITIES - ONE ABUT. - 30° SKEW										
LOCATION	UNIT	QUANTITY								
BRIDGE LENGTH		70'-0"	80'-0"	90'-0"	100'-0"	110'-0"	120'-0"	130'-0"	140'-0"	150'-0"
STRUCTURAL CONCRETE (BRIDGE)	C.Y.	12.8	12.8	12.8	12.8	12.8	12.8	12.8	12.8	12.8
REINFORCING STEEL	LBS.	1729	1729	1729	1729	1729	1729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

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.	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7
REINFORCING STEEL	LBS.	2028	2028	2028	2028	2028	2028	2028	2038	2038
STEEL PILING HP 10x42	NO.	7	7	7	7	7	7	7	8	8
PREFORE HOLES	FT.	-	-	-	-	-	-	-	70	80



09-2020 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER	
	STANDARD DESIGN - 30' ROADWAY, 3 SPAN BRIDGES CONTINUOUS CONCRETE SLAB BRIDGES NOVEMBER, 2006
	ABUTMENT DETAILS STEEL PILING
J30-39-06	

E-E ABUT. BRG		70'-0				80'-0				90'-0				100'-0				110'-0				120'-0				130'-0				140'-0				150'-0			
SKEW		0°	15°	30°	45°	0°	15°	30°	45°	0°	15°	30°	45°	0°	15°	30°	45°	0°	15°	30°	45°	0°	15°	30°	45°	0°	15°	30°	45°	0°	15°	30°	45°				
DIMENSION OF NUMBER	A (FT.-IN.)	81'-0	81'-1 1/4	81'-5 1/2	82'-3	91'-0	91'-1 1/4	91'-5 1/2	92'-3	101'-0	101'-1 1/4	101'-5 1/2	102'-3	111'-0	111'-1 1/4	111'-5 1/2	112'-3	121'-0	121'-1 1/4	121'-5 1/2	122'-3	131'-0	131'-1 1/4	131'-5 1/2	132'-3	141'-0	141'-1 1/4	141'-5 1/2	142'-3	151'-0	151'-1 1/4	151'-5 1/2	152'-3				
	B (FT.-IN.)	67'-0	67'-1 1/4	67'-5 1/2	68'-3	77'-0	77'-1 1/4	77'-5 1/2	78'-3	87'-0	87'-1 1/4	87'-5 1/2	88'-3	97'-0	97'-1 1/4	97'-5 1/2	98'-3	107'-0	107'-1 1/4	107'-5 1/2	108'-3	117'-0	117'-1 1/4	117'-5 1/2	118'-3	127'-0	127'-1 1/4	127'-5 1/2	128'-3	137'-0	137'-1 1/4	137'-5 1/2	138'-3				
	C	8	8	8	8	10	10	10	10	11	11	11	11	12	12	12	12	13	13	13	13	15	15	15	15	16	16	16	16	17	17	17	17				
	D (FT.-IN.)	7'-8	7'-10 1/2	7'-11 1/2	7'-11 1/2	7'-10	7'-13	7'-14	7'-14	7'-6 1/2	7'-7 1/2	7'-8 1/2	7'-9 1/2	7'-9	7'-9 1/2	7'-10 1/2	7'-10 1/2	7'-11 1/2	7'-11 1/2	7'-11 1/2	7'-11 1/2	7'-6 1/2	7'-6 1/2	7'-6 1/2	7'-7 1/2	7'-8 1/2	7'-8 1/2	7'-8 1/2	7'-8 1/2	7'-9 1/2	7'-9 1/2	7'-10 1/2	7'-10 1/2				

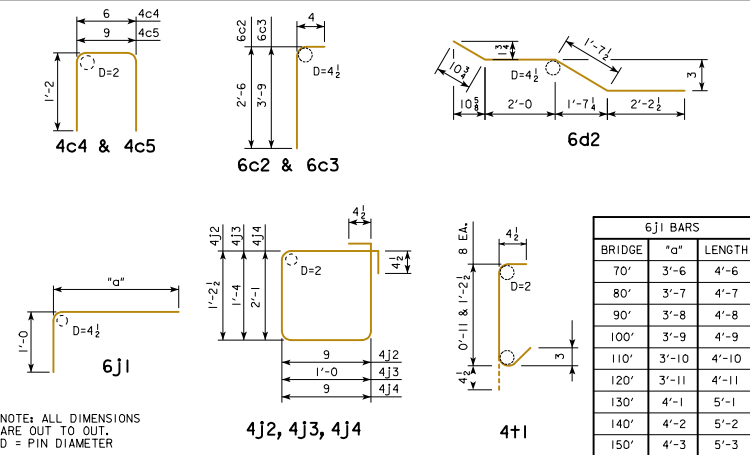


REVISED 07-2004: NUMBER OF 6d1 & 6d2 BARS CHANGED AND IS REFLECTED IN THE WEIGHT CHANGE.
REVISED 07-2016: REMOVED OPEN RAIL NOTE STATING "ALL OPEN RAIL REINFORCING STEEL IS TO BE INCLUDED WITH THE SUPERSTRUCTURE REINFORCING STEEL."
REVISED 09-2020: UPDATED BRIDGE ENGINEER SIGNATURE.

EPOXY REINFORCING STEEL-TWO OPEN RAILS																														
BRIDGE LENGTH				70'-0			80'-0			90'-0			100'-0			110'-0			120'-0			130'-0			140'-0			150'-0		
BAR	LOCATION		SHAPE	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT	NO.	LENGTH	WEIGHT
6c1	VERTICAL			96	4'-11	709	96	4'-11	709	96	4'-11	709	96	4'-11	709	96	4'-11	709	96	4'-11	709	96	4'-11	709	96	4'-11	709	96	4'-11	709
6c2	VERTICAL			16	2'-10	68	16	2'-10	68	16	2'-10	68	16	2'-10	68	16	2'-10	68	16	2'-10	68	16	2'-10	68	16	2'-10	68	16	2'-10	68
6c3	VERTICAL			16	4'-1	98	16	4'-1	98	16	4'-1	98	16	4'-1	98	16	4'-1	98	16	4'-1	98	16	4'-1	98	16	4'-1	98	16	4'-1	98
4c4	VERTICAL HOOPS			20	2'-10	38	20	2'-10	38	20	2'-10	38	20	2'-10	38	20	2'-10	38	20	2'-10	38	20	2'-10	38	20	2'-10	38	20	2'-10	38
4c5	VERTICAL HOOPS			16	3'-1	33	16	3'-1	33	16	3'-1	33	16	3'-1	33	16	3'-1	33	16	3'-1	33	16	3'-1	33	16	3'-1	33	16	3'-1	33
6d1	HORIZONTAL			24	6'-8	240	24	6'-8	240	24	6'-8	240	24	6'-8	240	24	6'-8	240	24	6'-8	240	24	6'-8	240	24	6'-8	240	24	6'-8	240
6d2	HORIZONTAL			32	6'-9	324	32	6'-9	324	32	6'-9	324	32	6'-9	324	32	6'-9	324	32	6'-9	324	32	6'-9	324	32	6'-9	324	32	6'-9	324
6h1	LONGITUDINAL OPEN RAIL			24	35'-9	1289	36	28'-4	1532	36	31'-8	1712	36	35'-0	1893	36	38'-4	2073	48	32'-2	2319	48	34'-8	2499	48	37'-2	2680	60	32'-5	2921
6j1	VERTICAL DOWELS OPEN RAIL			152	4'-6	1027	184	4'-7	1267	200	4'-8	1402	216	4'-9	1541	232	4'-10	1684	264	4'-11	1950	280	5'-1	2138	296	5'-2	2297	312	5'-3	2460
4j2	HOOPS INTERIOR POSTS			112	4'-8	349	144	4'-8	449	160	4'-8	499	176	4'-8	549	192	4'-8	599	224	4'-8	698	240	4'-8	798	256	4'-8	898	272	4'-8	948
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	VARIES	21	16	VARIES	21	16	VARIES	21	16	VARIES	21	16	VARIES	21	16	VARIES	21	16	VARIES	21	16	VARIES	21	16	VARIES	21
(INCLUDE WITH SUPERSTRUCTURE REINFORCING)				TOTAL (LBS.)		5100			5799			6330			6794			7261			8061			8573			9057			9605

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

BENT BAR DETAILS



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

CONCRETE PLACEMENT QUANTITIES

NOTE: THESE VALUES TO BE USED FOR ALL SKEWS.

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

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

CONCRETE OPEN RAIL QUANTITIES

BRIDGE LENGTH		UNIT	70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
CONCRETE OPEN RAILING, TL-4	0° SKEW	L.F.	162.0	182.0	202.0	222.0	242.0	262.0	282.0	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

OPEN RAIL NOTES:

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

COST OF THE JOINT SEALER AND BOND BREAKER SHALL BE CONSIDERED INCIDENTAL TO OTHER CONSTRUCTION.

THE CONCRETE OPEN RAIL IS TO BE BID ON A LINEAL FOOT BASIS MEASURED FROM END TO END OF RAIL. THE NUMBER OF LINEAL FEET OF OPEN RAIL INSTALLED WILL BE PAID FOR AT THE CONTRACT PRICE PER LINEAL FOOT. PRICE BID FOR "CONCRETE OPEN RAILING, TL-4" SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, EXCLUDING REINFORCING STEEL, AND ALL OF THE EQUIPMENT AND LABOR REQUIRED TO CONSTRUCT THE RAIL IN ACCORDANCE WITH THESE PLANS AND CURRENT SPECIFICATIONS.

ALL OPEN RAIL CONCRETE IS TO BE CLASS C.

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

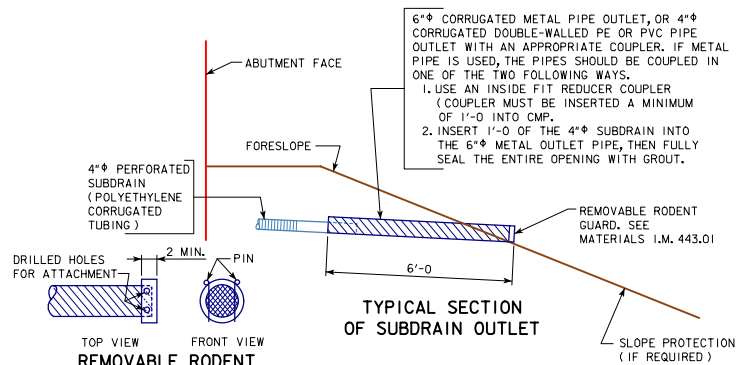
THE JOINT SEALER SHALL BE LIGHT GRAY NONSAG LATEX CAULKING SEALER MARKETED FOR OUTDOOR USE. NO TESTING OR CERTIFICATION IS REQUIRED.

TOP OF THE OPEN RAIL IS TO BE PARALLEL TO THEORETICAL & GRADE.

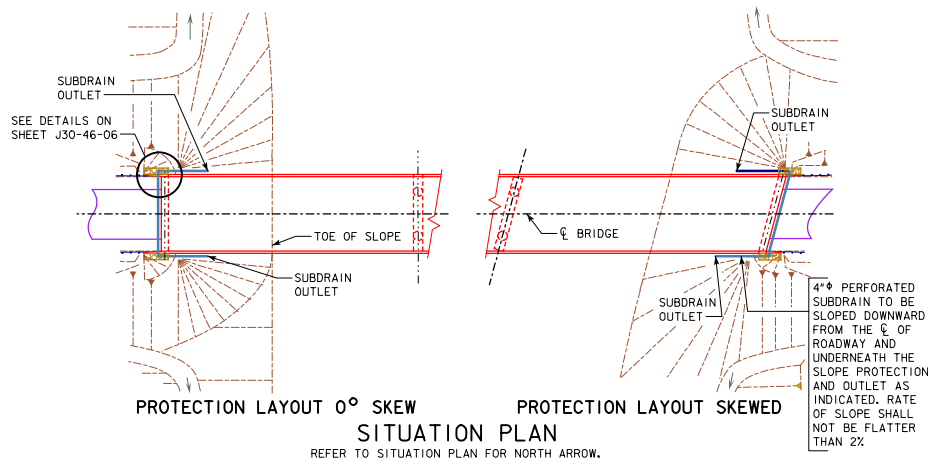
IF CONDUIT IS REQUIRED IN THIS PLAN THE RIGID STEEL CONDUIT, JUNCTION BOXES AND FITTINGS INCLUDING LABOR AND ANY ADDITIONAL WORK TO DO THE INSTALLATION IS CONSIDERED INCIDENTAL TO THE COST OF THE RAILING.

09-2020 LATEST REVISION DATE		APPROVED BY BRIDGE ENGINEER	Highway Division
			STANDARD DESIGN - 30' ROADWAY, 3 SPAN BRIDGES
			CONTINUOUS CONCRETE SLAB BRIDGES NOVEMBER, 2006
OPEN RAIL DETAILS (TL-4)		J30-44-06	

REVISED 12-2008: REMOVED GRANULAR BACKFILL DETAILS.
REVISED 09-2020: UPDATED BRIDGE ENGINEER SIGNATURE.

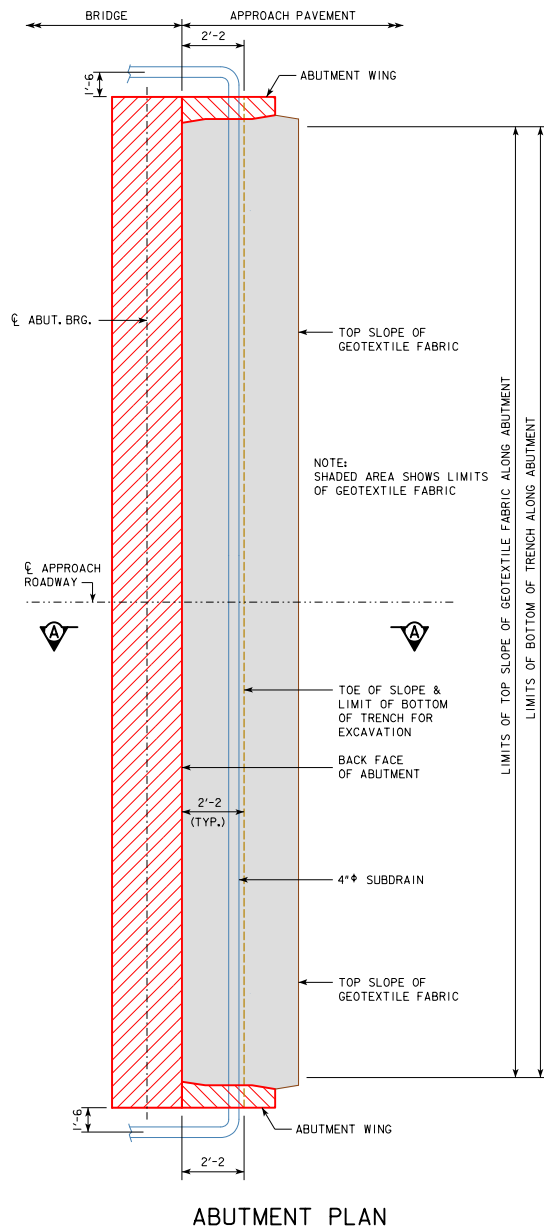


OUTLET DETAILS



09-2020 LATEST REVISION DATE	 APPROVED BY BRIDGE ENGINEER	 IOWA DOT Highway Division
		STANDARD DESIGN - 30' ROADWAY, 3 SPAN BRIDGES CONTINUOUS CONCRETE SLAB BRIDGES NOVEMBER, 2006
		SUBDRAIN DETAILS

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



ABUTMENT 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.

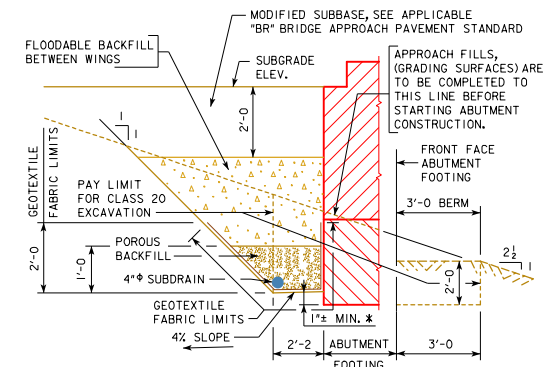
NOTE:
SEE SUBDRAIN DETAILS SHEET FOR DETAILS NOT SHOWN ON THIS SHEET WHICH ARE PERTINENT TO THIS STRUCTURE.

NOTE:

SUBDRAIN SHALL SLOPE DOWNWARD 2% FROM $\bar{C}$ APPROACH ROADWAY WHEN OUTLETTING BOTH SIDES OF THE ABUTMENT.

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

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



SECTION A-A BACKFILL DETAILS

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

* DIMENSION VARIES DUE TO 2% SUBDRAIN SLOPE.

09-2020 LATEST REVISION DATE APPROVED BY BRIDGE ENGINEER J30-47-06	IOWA DOT Highway Division
	STANDARD DESIGN - 30' ROADWAY, 3 SPAN BRIDGES CONTINUOUS CONCRETE SLAB BRIDGES DECEMBER, 2008
	ABUTMENT BACKFILL DETAILS FOR 0° SKEWS