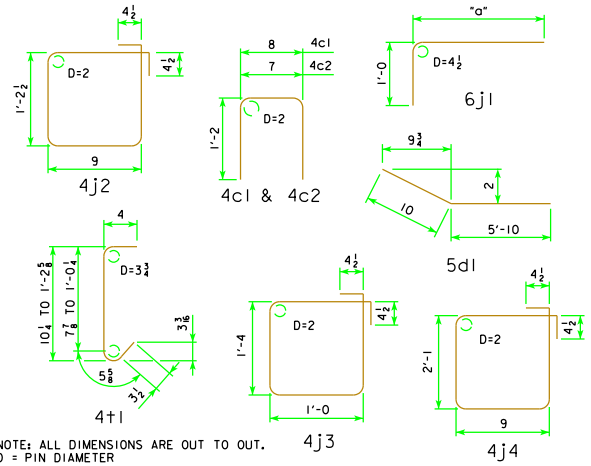
REINFORCING STEEL-TWO OPEN RAILS

℄-℄ ABUTMENT BEARING			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
4c1	VERTICAL HOOP END SECTION		48	3'-0	96	48	3'-0	96	48	3'-0	96	48	3'-0	96	48	3'-0	96	48	3'-0	96	48	3'-0	96	48	3'-0	96	48	3'-0	96
4c2	VERTICAL HOOP AT END OF END SECTION		4	2'-11	8	4	2'-11	8	4	2'-11	8	4	2'-11	8	4	2'-11	8	4	2'-11	8	4	2'-11	8	4	2'-11	8	4	2'-11	8
5c3	VERTICAL END SECTION		104	4'-2	452	104	4'-2	452	104	4'-2	452	104	4'-2	452	104	4'-2	452	104	4'-2	452	104	4'-2	452	104	4'-2	452	104	4'-2	452
5d1	LONGITUDINAL END SECTION FRONT FACE		28	6'-8	195	28	6'-8	195	28	6'-8	195	28	6'-8	195	28	6'-8	195	28	6'-8	195	28	6'-8	195	28	6'-8	195	28	6'-8	195
5d2	LONGITUDINAL END SECTION BACK FACE		28	6'-8	195	28	6'-8	195	28	6'-8	195	28	6'-8	195	28	6'-8	195	28	6'-8	195	28	6'-8	195	28	6'-8	195	28	6'-8	195
5d3	LONGITUDINAL WING FOOTING BOTH FACE		16	6'-8	111	16	6'-8	111	16	6'-8	111	16	6'-8	111	16	6'-8	111	16	6'-8	111	16	6'-8	111	16	6'-8	111	16	6'-8	111
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		40	VARIES	51	40	VARIES	51	40	VARIES	51	40	VARIES	51	40	VARIES	51	40	VARIES	51	40	VARIES	51	40	VARIES	51	40	VARIES	51
(INCLUDE WITH SUPERSTRUCTURE REINFORCING)		TOTAL (LBS.)	4677		5376			5907			6371			6838			7638			8150			8634			9182		

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

BENT BAR DETAILS



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

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

OPEN RAIL NOTES:

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

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

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

ALL OPEN RAIL REINFORCING STEEL IS TO BE INCLUDED WITH THE SUPERSTRUCTURE REINFORCING STEEL.

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.

CONCRETE PLACEMENT QUANTITIES

NOTE: THESE VALUES TO BE USED FOR ALL SKEWS.

℄-℄ ABUTMENT BEARING	70'-0	80'-0	90'-0	100'-0	110'-0	120'-0	130'-0	140'-0	150'-0
*STANDARD SECTION CU. YD.	11.6	13.4	15.0	16.7	18.3	20.1	21.7	23.3	24.9
END SECTION 4 @ 0.755 CU. YDS.	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
TOTAL CU.YDS.	14.6	16.4	18.0	19.7	21.3	23.1	24.7	26.3	27.9

* 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

12-07
LATEST REVISION DATE

APPROVED BY BRIDGE ENGINEER

Iowa Department of Transportation
Highway Division

STANDARD DESIGN - 30' ROADWAY, 3 SPAN BRIDGES

CONTINUOUS CONCRETE SLAB BRIDGES

NOVEMBER, 2006

OPEN RAIL DETAILS
(TL-4)

J30-44-06

REVISED 12-07 - 6j1 BAR CHANGED TO VARIABLE LENGTH. REINFORCED QUANTITY CHANGED