VARIABLE DIMENSIONS AND QUANTITIES FOR BARREL SECTIONS

BAR LIST

	a1			a2			b1			b2			e1			e2			f1			f2		
FILL	SIZE	SP	LENGTH	SIZE	SP	LENGTH	SIZE	SP	NO.	SIZE	SP	NO.	SIZE	SP	NO.	SIZE	SP	NO.	SIZE	SP	NO.	SIZE	SP	NO.
0	4	6	13'-8	7	9	13'-8	4	9	32	4	9	17	5	12	18	4	18	16	4	12	22	4	18	16
1	4	6	13'-9	7	9	13'-9	4	9	32	4	9	17	5	12	18	4	18	16	4	12	22	4	18	16
2	4	9	13'-6	7	9	13'-6	4	9	32	4	9	17	5	12	18	4	18	16	4	12	22	4	18	16
3	5	12	13'-5	7	9	13'-5	4	9	32	4	9	17	5	12	18	4	18	16	4	12	22	4	18	16
4	5	12	13'-5	7	9	13'-5	4	9	32	4	9	17	5	12	18	4	18	16	4	12	22	4	18	16
5-7	5	12	13'-5	7	9	13'-5	4	9	32	4	9	17	5	12	18	4	18	16	4	12	22	4	18	16
8-10	6	9	13'-6	7	9	13'-6	4	9	32	4	9	17	5	12	18	4	18	16	4	12	22	4	18	16
11-13	4	9	13'-8	7	9	13'-8	4	9	32	4	9	17	5	12	18	4	18	16	4	12	22	4	18	16
14-16	5	12	13'-11	7	9	13'-11	4	9	32	4	9	17	5	12	18	4	18	16	4	12	22	4	18	16
17-19	5	12	14'-1	7	9	14'-1	4	9	32	4	9	17	5	12	18	4	18	16	4	12	22	4	18	16
20-22	5	12	14'-3	7	9	14'-3	4	9	32	4	9	17	5	12	18	4	18	16	4	12	22	4	18	16
23-25	6	12	14'-6	7	9	14'-6	4	9	32	4	9	17	5	12	18	4	18	16	4	12	22	4	18	16

	k1			k2			k4					k5					k6			k7			k9		
FILL	SIZE	SP	LENGTH	SIZE	SP	LENGTH	SIZE	SP	LENGTH	h	v	SIZE	SP	LENGTH	h	v	SIZE	SP	LENGTH	SIZE	SP	LENGTH	SIZE	* SP	LENGTH
0	5	12	22'-8	5	12	8'-0	4	12	5'-1	1'-11	3'-2	5	12	5'-1	1'-11	3'-2	4	12	22'-8	4	12	4'-10	4	4.5	22'-8
1	5	12	22'-8	5	12	7'-11	4	12	5'-3	1'-11	3'-4	5	12	5'-3	1'-11	3'-4	4	12	22'-8	5	12	5'-3	4	4.5	22'-8
2	5	12	22'-8	6	12	8'-1	6	15	6'-11	3'-0	3'-11	6	15	6'-1	2'-2	3'-11	4	9	17'-2	5	9	5'-5	4	4.5	22'-8
3	4	9	22'-8	4	9	6'-6	5	12	5'-9	2'-10	2'-11	5	12	4'-11	2'-0	2'-11	5	12	15'-6	5	12	4'-7	5	4.5	22'-8
4	4	12	22'-8	5	12	7'-0	6	18	5'-11	2'-10	3'-1	6	18	5'-3	2'-2	3'-1	5	12	15'-2	5	12	4'-5	5	4.5	22'-8
5-7	4	12	22'-8	5	12	6'-11	5	12	5'-8	2'-9	2'-11	5	12	4'-11	2'-0	2'-11	4	9	14'-10	5	9	4'-11	4	4.5	22'-8
8-10	5	12	22'-8	5	12	6'-2	6	18	5'-10	2'-8	3'-2	6	18	5'-4	2'-2	3'-2	5	9	14'-9	5	9	4'-4	5	4.5	22'-8
11-13	5	12	22'-8	5	12	6'-5	7	18	6'-9	2'-9	4'-0	7	18	6'-7	2'-7	4'-0	6	12	14'-11	6	12	4'-8	6	4.5	22'-8
14-16	5	12	22'-8	5	12	6'-6	6	12	6'-6	2'-5	4'-1	6	12	6'-2	2'-1	4'-1	6	12	14'-11	6	12	4'-9	6	4.5	22'-8
17-19	5	12	22'-8	5	12	6'-9	6	12	5'-9	2'-4	3'-5	6	12	5'-5	2'-0	3'-5	7	15	15'-1	7	15	5'-0	7	7.5	22'-8
20-22	4	9	22'-8	5	9	7'-4	6	12	5'-10	2'-4	3'-6	6	12	5'-6	2'-0	3'-6	5	9	14'-11	6	9	5'-0	5	4.5	22'-8
23-25	4	9	22'-8	5	9	7'-8	6	12	6'-0	2'-4	3'-8	6	12	5'-8	2'-0	3'-8	5	9	15'-0	6	9	5'-2	5	4.5	22'-8

m1			m2			m4					m5					m6			m7			m9			
SIZE	SP	LENGTH	SIZE	SP	LENGTH	SIZE	SP	LENGTH	h	v	SIZE	SP	LENGTH	h	v	SIZE	SP	LENGTH	SIZE	SP	LENGTH	SIZE	* SP	LENGTH	FILL
4	12	23'-2	5	12	6'-9	5	12	14'-2	2'-0	12'-2	5	12	14'-0	1'-10	12'-2	4	9	23'-2	4	9	3'-11	4	4.5	23'-2	0
4	12	23'-2	5	12	6'-11	5	12	14'-0	1'-11	12'-1	5	12	13'-11	1'-10	12'-1	5	12	15'-11	5	12	4'-0	5	4.5	23'-2	1
4	9	23'-2	5	9	6'-10	6	15	14'-2	2'-8	11'-6	6	15	13'-6	2'-0	11'-6	5	9	15'-6	5	9	4'-2	5	4.5	23'-2	2
4	12	23'-2	5	12	7'-0	5	12	14'-11	2'-10	12'-1	5	12	13'-11	1'-10	12'-1	4	9	15'-3	5	9	4'-8	4	4.5	23'-2	3
4	12	23'-2	5	12	6'-11	6	18	15'-2	2'-11	12'-3	6	18	14'-3	2'-0	12'-3	4	9	15'-1	5	9	4'-8	4	4.5	23'-2	4
5	12	23'-2	5	12	6'-2	5	12	14'-7	2'-6	12'-1	5	12	13'-11	1'-10	12'-1	5	9	15'-0	5	9	4'-2	5	4.5	23'-2	5-7
5	12	23'-2	5	12	6'-5	6	18	14'-11	2'-7	12'-4	6	18	14'-4	2'-0	12'-4	6	12	15'-2	6	12	4'-6	6	4.5	23'-2	8-10
4	9	23'-2	5	9	7'-1	7	18	15'-1	2'-8	12'-5	7	18	14'-10	2'-5	12'-5	5	9	15'-2	6	9	4'-10	5	4.5	23'-2	11-13
4	9	23'-2	5	9	7'-1	6	12	14'-2	2'-4	11'-10	6	12	13'-10	2'-0	11'-10	7	15	15'-4	7	15	4'-10	7	7.5	23'-2	14-16
4	9	23'-2	5	9	7'-4	6	12	15'-0	2'-4	12'-8	6	12	14'-8	2'-0	12'-8	7	15	15'-4	7	15	5'-0	7	7.5	23'-2	17-19
4	9	23'-2	5	9	7'-6	6	12	15'-0	2'-3	12'-9	6	12	14'-9	2'-0	12'-9	7	15	15'-4	7	15	5'-0	7	7.5	23'-2	20-22
4	9	23'-2	5	9	7'-10	6	12	15'-2	2'-4	12'-10	6	12	14'-10	2'-0	12'-10	7	15	15'-4	7	15	5'-1	7	7.5	23'-2	23-25

	DIMENSIONS															QUANTITIES				
																CONCRETE YD ³/FT				STEEL
FILL	S	H	A	B	C	D*	E*	F*	G*	J*	U	V	W	X	Y	Z	SLAB	FLOOR	WALLS	TOTAL	LBS/FT
0	10	12	10.5	11	12	6	4.5	9	12	12	1'-10	11'-4	2'-5	2'-6	11'-7	2'-0	.817	.859	1.291	2.967	351.16
1	10	12	11	11.5	12	6	4.5	9	12	12	1'-11	11'-4	2'-7	2'-5	4'-4	2'-0	.852	.896	1.291	3.039	351.79
2	10	12	9	10	12	9	4.5	7.5	12	12	1'-9	5'-10	2'-8	2'-5	3'-11	2'-1	.710	.787	1.291	2.788	386.50
3	10	12	8	10	12	9	4.5	9	12	12	2'-6	4'-2	2'-3	2'-4	3'-8	2'-4	.639	.787	1.291	2.717	339.82
4	10	12	8	10	12	9	4.5	9	12	12	2'-3	3'-10	2'-2	2'-4	3'-6	2'-4	.639	.787	1.291	2.717	337.58
5-7	10	12	8	10	12	9	4.5	9	12	12	2'-4	3'-6	2'-5	2'-10	3'-5	2'-1	.639	.787	1.291	2.717	349.97
8-10	10	12	8.5	11	12	9	4.5	9	12	12	2'-10	3'-5	2'-2	2'-9	3'-7	2'-3	.675	.859	1.291	2.825	396.32
11-13	10	12	9.5	12	12	9	4.5	9	12	12	2'-10	3'-7	2'-4	2'-6	3'-7	2'-5	.746	.932	1.291	2.969	409.84
14-16	10	12	11	13.5	12	9	4.5	9	12	18	2'-11	3'-7	2'-4	2'-8	3'-9	2'-5	.852	1.041	1.291	3.184	422.05
17-19	10	12	12	14.5	12	9	4.5	9	18	18	2'-10	3'-9	2'-6	2'-6	3'-9	2'-6	.923	1.113	1.291	3.327	428.61
20-22	10	12	13	15.5	12	9	4.5	9	12	18	2'-7	3'-7	2'-6	2'-7	3'-9	2'-6	.994	1.186	1.291	3.471	428.26
23-25	10	12	14.5	17	12	9	4.5	9	12	18	2'-6	3'-8	2'-7	2'-5	3'-9	2'-6	1.101	1.295	1.291	3.687	447.13

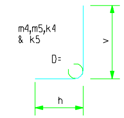
* THESE DIMENSIONS ARE CORRECT FOR 38' LONG STANDARD SECTIONS ONLY. DIMENSIONS MUST BE RECALCULATED FOR ALL OTHER SECTION LENGTHS.

NOTES:

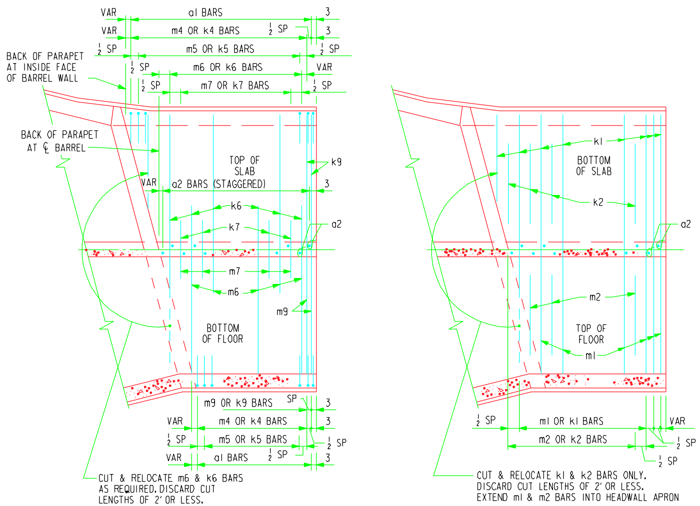
1. SEE DRAWING TWRCB-GI-87 FOR GENERAL INFORMATION, SPECIFICATIONS, AND DESIGN STRESSES.

BENT BAR DETAIL

BARS	D
4	3
5	3¾
6	4½
7	5¼



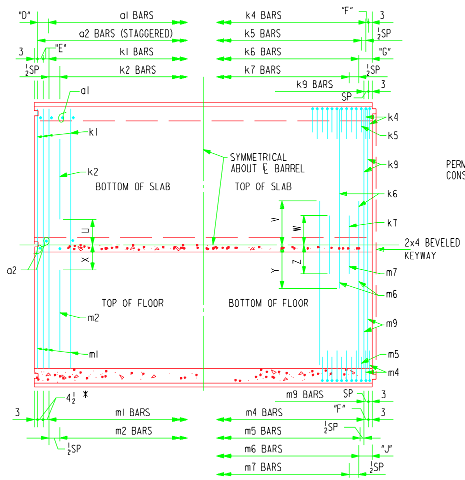
NOTE:
ALL DIMENSIONS ARE OUT TO OUT.
D = PIN DIAMETER.



END SECTION - PLAN VIEW (KEYWAY NOT SHOWN)

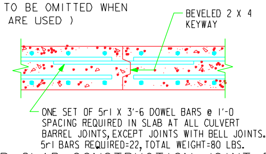
NOTE: END SECTION DETAILS SHOWN ARE FOR A 15° SKEW BARREL. USE FOR SKEWS OF 30° & 45° BY INCREASING THE NUMBER OF TRANSVERSE REINFORCING BARS REQUIRED TO BE CUT & RELOCATED.

NOTE: ALL LONGITUDINAL BARREL STEEL SHALL EXTEND AT LEAST TO THE BACKFACE OF PARAPET.

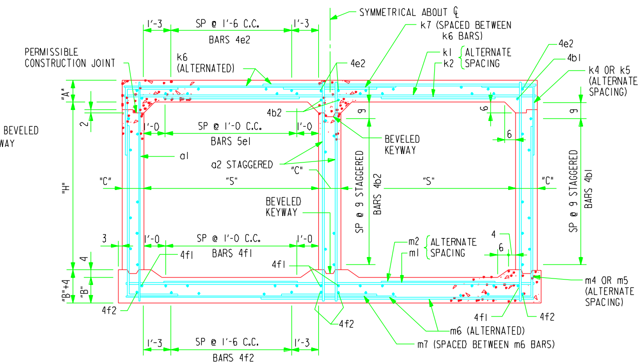


STANDARD SECTION PLAN VIEW

NOTE: TYPICAL FOR LENGTHS OF 38'.
(KEYWAY IS TO BE OMITTED WHEN BELL JOINTS ARE USED)



TOP SLAB CONSTRUCTION JOINT DETAIL



BARREL SECTION

STANDARD DESIGN

CULVERT BARREL DETAILS

FOR TWIN REINFORCED CONCRETE BOX CULVERTS

HIGHWAY DIVISION
IOWA DEPARTMENT OF TRANSPORTATION

LATEST REVISION DATE: 12-5-96

APPROVED BY: [signature]

JULY, 1987

TWRCB 10-12-87

REVISED: 8/89; KEYWAY NOTE & DETAIL ADDED, LONGITUDINAL BARREL STEEL NOTE ADDED.
REVISED: 12/96 ; KEYWAY NOTATION CHANGED, DOWEL BAR LENGTH CHANGED.
TWB1012.S01

XXXXXXXXXXSYSTEMTIME XXXXXXXUSERNAME XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXDGNSPEC