VARIABLE DIMENSIONS AND QUANTITIES FOR BARREL SECTIONS

BAR LIST

	a1			a2			b1			b2			e1			e2		
FILL	SIZE	SP	LENGTH	SIZE	SP	LENGTH	SIZE	SP	NO.	SIZE	SP	NO.	SIZE	SP	NO.	SIZE	SP	NO.
0	4	9	11'-9	6	7.5	11'-9	4	9	28	4	9	15	5	12	22	4	17	20
1	4	9	11'-10	6	7.5	11'-10	4	9	28	4	9	15	5	12	22	4	17	20
2	4	6	11'-6	5	4.5	11'-6	4	9	28	4	9	15	5	12	22	4	17	20
3	4	9	11'-5	5	6	11'-5	4	9	28	4	9	15	5	12	22	4	17	20
4	4	9	11'-5	5	6	11'-5	4	9	28	4	9	15	5	12	22	4	17	20
5-7	4	9	11'-6	5	6	11'-6	4	9	28	4	9	15	5	12	22	4	17	20
8-10	4	6	11'-9	5	6	11'-9	4	9	28	4	9	15	5	12	22	4	17	20
11-13	4	6	12'-0	5	6	12'-0	4	9	28	4	9	15	5	12	22	4	17	20
14-16	4	6	12'-3	5	6	12'-3	4	9	28	4	9	15	5	12	22	4	17	20
17-19	4	9	12'-6	5	6	12'-6	4	9	28	4	9	15	5	12	22	4	17	20
20-22	4	6	12'-9	5	6	12'-9	4	9	28	4	9	15	5	12	22	4	17	20
23-25	4	6	13'-0	5	6	13'-0	4	9	28	4	9	15	5	12	22	4	17	20

	f1			f2			k1			k2			k4				
FILL	SIZE	SP	NO.	SIZE	SP	NO.	SIZE	SP	LENGTH	SIZE	SP	LENGTH	SIZE	SP	LENGTH	h	v
0	4	12	26	4	17	20	4	9	26'-2	5	9	10'-9	5	12	5'-2	1'-9	3'-5
1	4	12	26	4	17	20	4	9	26'-2	5	9	10'-5	5	12	5'-6	2'-0	3'-6
2	4	12	26	4	17	20	5	9	26'-2	6	9	9'-4	5	12	5'-6	2'-4	3'-2
3	4	12	26	4	17	20	5	12	26'-2	6	12	8'-9	5	12	5'-8	2'-6	3'-2
4	4	12	26	4	17	20	4	9	26'-2	5	9	8'-3	5	12	5'-7	2'-5	3'-2
5-7	4	12	26	4	17	20	4	9	26'-2	5	9	8'-1	5	12	5'-5	2'-3	3'-2
8-10	4	12	26	4	17	20	6	15	26'-2	6	15	7'-10	5	12	5'-2	1'-11	3'-3
11-13	4	12	26	4	17	20	5	12	26'-2	6	12	8'-5	5	12	5'-2	1'-9	3'-5
14-16	4	12	26	4	17	20	5	12	26'-2	6	12	8'-7	5	12	5'-5	1'-11	3'-6
17-19	4	12	26	4	17	20	7	18	26'-2	7	18	8'-3	5	9	5'-9	2'-0	3'-9
20-22	4	12	26	4	17	20	7	18	26'-2	7	18	8'-5	5	9	6'-4	2'-6	3'-10
23-25	4	12	26	4	17	20	7	18	26'-2	7	18	8'-8	5	9	6'-8	2'-8	4'-0

	k5					k6			k7			k9			m1		
FILL	SIZE	SP	LENGTH	h	v	SIZE	SP	LENGTH	SIZE	SP	LENGTH	SIZE	SP *	LENGTH	SIZE	SP	LENGTH
0	5	12	5'-2	1'-9	3'-5	5	12	26'-2	5	12	5'-3	5	4.5	26'-2	5	12	26'-8
1	5	12	5'-2	1'-8	3'-6	5	15	21'-3	6	15	6'-5	5	7.5	26'-2	5	12	26'-8
2	6	12	5'-2	2'-0	3'-2	5	9	19'-5	6	9	6'-2	5	4.5	26'-2	5	9	26'-8
3	6	12	5'-2	2'-0	3'-2	5	9	17'-11	6	9	5'-8	5	4.5	26'-2	4	9	26'-8
4	6	12	5'-2	2'-0	3'-2	5	9	17'-7	6	9	5'-6	5	4.5	26'-2	4	9	26'-8
5-7	6	12	5'-2	2'-0	3'-2	6	12	17'-5	7	12	5'-9	6	4.5	26'-2	5	12	26'-8
8-10	6	12	5'-2	1'-11	3'-3	7	15	17'-6	8	15	5'-11	7	7.5	26'-2	5	9	26'-8
11-13	6	12	5'-4	1'-11	3'-5	6	9	17'-3	6	9	4'-11	6	4.5	26'-2	7	18	26'-8
14-16	6	12	5'-4	1'-10	3'-6	8	18	17'-8	9	18	6'-3	8	4.5	26'-2	7	18	26'-8
17-19	5	9	5'-8	1'-11	3'-9	8	15	17'-6	8	15	5'-7	8	7.5	26'-2	7	18	26'-8
20-22	5	9	6'-3	2'-5	3'-10	8	15	17'-6	8	15	6'-10	8	7.5	26'-2	7	18	26'-8
23-25	5	9	6'-5	2'-5	4'-0	8	15	17'-6	8	15	6'-10	8	7.5	26'-2	7	18	26'-8

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

	m6			m7			m9			
FILL	SIZE	SP	LENGTH	SIZE	SP	LENGTH	SIZE	SP *	LENGTH	FILL
0	5	15	26'-8	6	15	5'-5	5	7.5	26'-8	0
1	4	9	18'-11	5	9	5'-1	4	4.5	26'-8	1
2	6	12	18'-5	7	12	5'-6	6	4.5	26'-8	2
3	5	9	17'-8	6	9	5'-1	5	4.5	26'-8	3
4	5	9	17'-7	6	9	5'-1	5	4.5	26'-8	4
5-7	6	9	17'-5	6	9	4'-8	6	4.5	26'-8	5-7
8-10	6	9	17'-5	6	9	4'-10	6	4.5	26'-8	8-10
11-13	6	9	17'-5	6	9	4'-10	6	4.5	26'-8	11-13
14-16	6	9	17'-6	6	9	5'-0	6	4.5	26'-8	14-16
17-19	8	18	17'-11	9	18	6'-4	8	4.5	26'-8	17-19
20-22	8	15	17'-9	8	15	5'-7	8	7.5	26'-8	20-22
23-25	8	15	17'-10	8	15	5'-9	8	7.5	26'-8	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	12	10	10.5	11.5	10	9	4.5	9	12	18	1'-7	13'-1	2'-7	3'-7	13'-4	2'-8	.920	1.018	.889	2.827	386.97
1	12	10	11.5	12	10	9	4.5	9	18	12	1'-10	8'-2	3'-2	3'-5	5'-7	2'-7	1.002	1.060	.889	2.951	375.84
2	12	10	9	10.5	10	6	4.5	9	12	12	2'-3	6'-4	3'-1	3'-4	5'-1	2'-9	.798	.935	.889	2.622	459.16
3	12	10	8	10	10	9	4.5	9	12	12	2'-7	4'-10	2'-10	2'-11	4'-4	2'-6	.716	.893	.889	2.498	401.00
4	12	10	8	10	10	9	4.5	9	12	12	2'-10	4'-6	2'-9	3'-0	4'-3	2'-7	.716	.893	.889	2.498	391.50
5-7	12	10	8.5	10.5	10	9	4.5	9	12	12	3'-0	4'-4	2'-10	2'-11	4'-1	2'-4	.757	.935	.889	2.581	413.32
8-10	12	10	10	12	10	6	7.5	9	18	12	3'-5	4'-5	3'-0	3'-7	4'-1	2'-5	.880	1.060	.889	2.829	438.68
11-13	12	10	11.5	14	10	6	4.5	9	12	12	3'-2	4'-2	2'-6	3'-4	4'-1	2'-5	1.002	1.227	.889	3.118	449.63
14-16	12	10	13	15.5	10	6	4.5	9	12	12	3'-2	4'-7	3'-2	3'-5	4'-2	2'-6	1.125	1.352	.889	3.366	458.42
17-19	12	10	14.5	17	10	9	4.5	4.5	18	12	3'-5	4'-5	2'-9	3'-5	4'-7	3'-2	1.248	1.477	.889	3.614	477.71
20-22	12	10	16	18.5	10	6	4.5	4.5	18	18	3'-5	4'-5	3'-5	3'-4	4'-5	2'-9	1.370	1.602	.889	3.861	499.47
23-25	12	10	17.5	20	10	6	4.5	4.5	18	18	3'-4	4'-5	3'-5	3'-3	4'-6	2'-10	1.493	1.727	.889	4.109	505.00

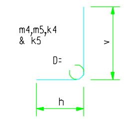
* THESE DIMENSIONS ARE CORRECT FOR 38' LONG STANDARD SECTIONS ONLY. DIMENSIONS MUST BE RECALCULATED FOR ALL OTHER SECTION LENGTHS.

NOTES:

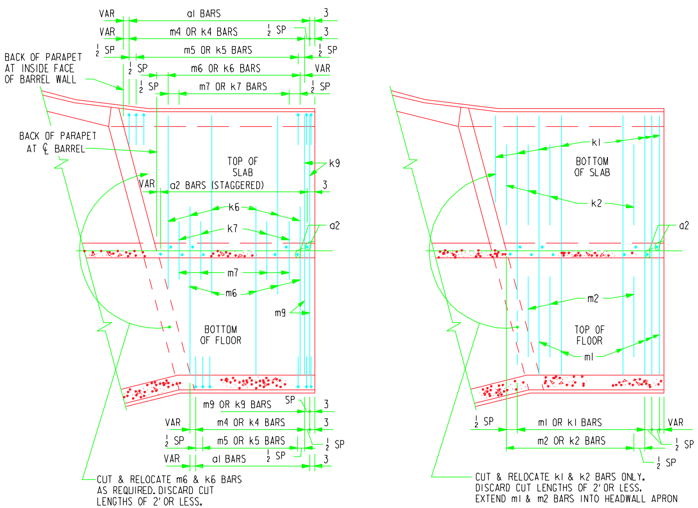
1. SEE DRAWING TWRCB-GI-87 FOR GENERAL INFORMATION, SPECIFICATIONS, AND DESIGN STRESSES.

BENT BAR DETAIL

BARS	D
4	3
5	3¾
6	4½
7	5¼



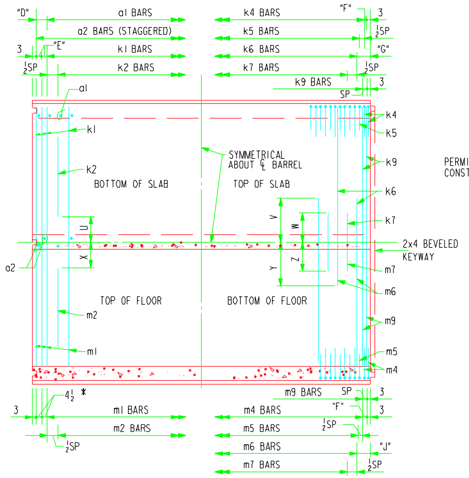
NOTE:
ALL DIMENSIONS ARE OUT TO OUT.
D = PIN DIAMETER.



END SECTION - PLAN VIEW (KEYWAY NOT SHOWN)

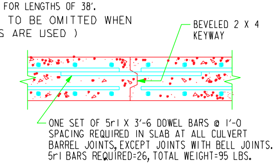
NOTE: END SECTION DETAILS SHOWN ARE FOR A 15° SKEW BARREL. USE FOR SKEWS OF 30° & 45° BY INCREASING THE NUMBER OF TRANSVERSE REINFORCING BARS REQUIRED TO BE CUT & RELOCATED.

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

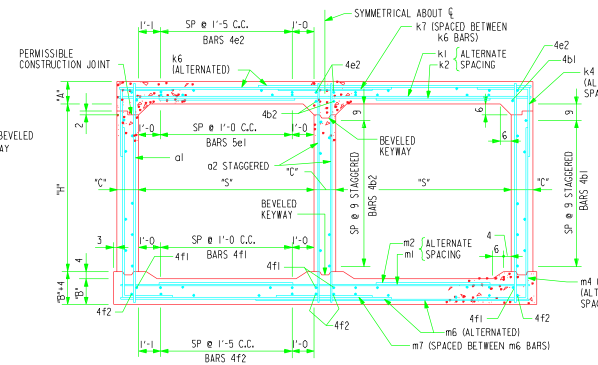


STANDARD SECTION PLAN VIEW

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

JULY, 1987

TWRCB 12-10-87

LATEST REVISION DATE: 12-5-96

APPROVED BY:

REVISED: 8/89; KEYWAY NOTE & DETAIL ADDED. LONGITUDINAL BARREL STEEL NOTE ADDED.
REVISED: 12/96 ; KEYWAY NOTATION CHANGED, DOWEL BAR LENGTH CHANGED.
TWB1210.S01

XXXXXXXXXXSYSTEMTIME XXXXXXXUSERNAME XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXDGNSPEC