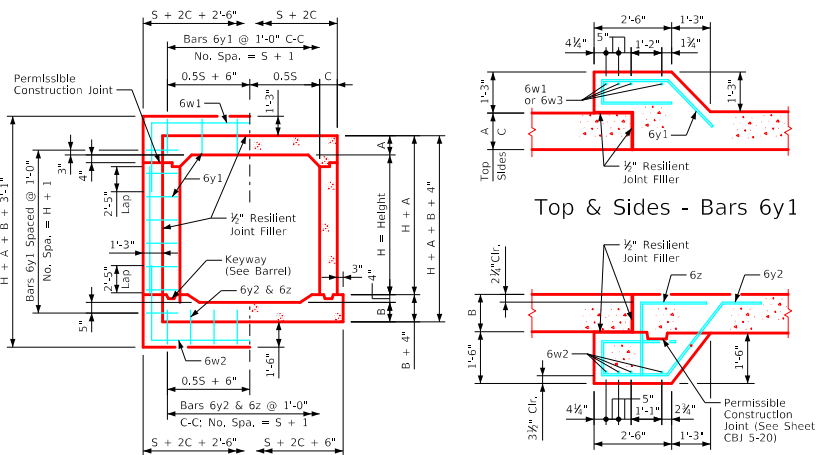


Estimate of Quantities - One Joint - 14' Spans

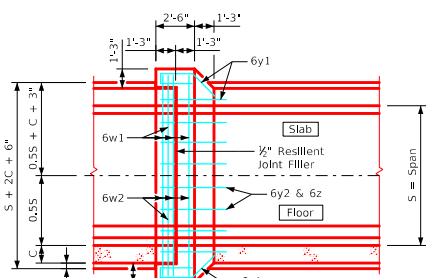
Bill of Reinforcing Steel		14' x 4'		14' x 5'		14' x 6'		14' x 7'		14' x 8'		14' x 9'		14' x 10'		14' x 11'		14' x 12'		14' x 13'		14' x 14'				
Bar	Location	Shape	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight			
6w1	Slab & Walls		4	27'-4"	164	4	27'-4"	164	4	27'-6"	165	4	27'-6"	165	4	27'-8"	166	4	27'-10"	167	4	28'-0"	168	4	28'-4"	170
6w2	Floor & Walls		4	29'-8"	178	4	31'-8"	190	4	27'-10"	167	4	27'-10"	167	4	28'-0"	168	4	28'-2"	169	4	28'-4"	170	4	28'-6"	171
6w3	Walls		--	--	--	--	--	--	8	5'-6"	66	8	6'-6"	78	8	7'-6"	90	8	8'-6"	102	8	9'-6"	114	8	10'-6"	126
6y1	Top & Sides		28	8'-0"	336	30	8'-0"	360	32	8'-0"	384	34	8'-0"	408	36	8'-0"	432	38	8'-0"	456	40	8'-0"	480	42	8'-0"	504
6y2	Bottom		16	9'-4"	224	16	9'-4"	224	16	9'-4"	224	16	9'-4"	224	16	9'-4"	224	16	9'-4"	224	16	9'-4"	224	16	9'-4"	224
6z	Bottom & Floor		16	3'-9"	90	16	3'-9"	90	16	3'-9"	90	16	3'-9"	90	16	3'-9"	90	16	3'-9"	90	16	3'-9"	90	16	3'-9"	90
Total Weight (LB)			992		1028		1097		1133		1169		1205		1243		1281		1319		1357		1395			
Total Concrete (CY)			7.4		7.7		8.0		8.2		8.5		8.8		9.2		9.5		9.8		10.2		10.5			

Estimate of Quantities - One Joint - 16' Spans

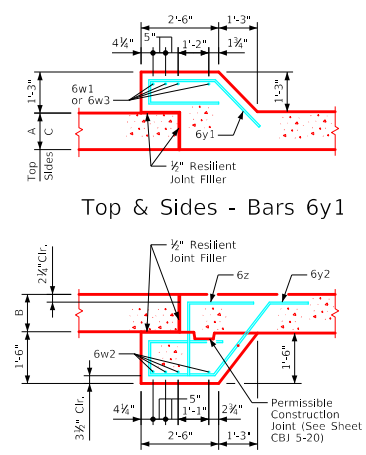
Bill of Reinforcing Steel		16' x 4'		16' x 5'		16' x 6'		16' x 7'		16' x 8'		16' x 9'		16' x 10'		16' x 11'		16' x 12'		16' x 13'		16' x 14'				
Bar	Location	Shape	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight	No.	Length	Weight			
6w1	Slab & Walls		4	29'-5"	177	4	29'-5"	177	4	29'-6"	177	4	29'-6"	177	4	29'-8"	178	4	29'-10"	179	4	30'-0"	180	4	30'-2"	181
6w2	Floor & Walls		4	31'-9"	191	4	33'-9"	203	4	29'-11"	180	4	29'-10"	179	4	29'-10"	179	4	30'-0"	180	4	30'-2"	181	4	30'-4"	182
6w3	Walls		--	--	--	--	--	--	8	5'-6"	66	8	6'-6"	78	8	7'-6"	90	8	8'-6"	102	8	9'-6"	114	8	10'-6"	126
6y1	Top & Sides		30	8'-0"	360	32	8'-0"	384	34	8'-0"	408	36	8'-0"	432	38	8'-0"	456	40	8'-0"	480	42	8'-0"	504	44	8'-0"	528
6y2	Bottom		18	9'-4"	252	18	9'-4"	252	18	9'-5"	255	18	9'-6"	257	18	9'-6"	257	18	9'-6"	257	18	9'-6"	257	18	9'-5"	255
6z	Bottom & Floor		18	3'-9"	101	18	3'-9"	101	18	3'-9"	101	18	3'-9"	101	18	3'-9"	101	18	3'-9"	101	18	3'-9"	101	18	3'-9"	101
Total Weight (LB)			1081		1118		1189		1225		1261		1297		1335		1373		1411		1447		1485			
Total Concrete (CY)			8.1		8.4		8.7		9.0		9.3		9.5		9.9		10.2		10.5		10.8		11.2			



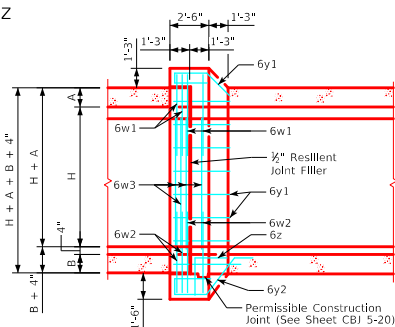
Joint Detail Section thru Barrel



Plan View



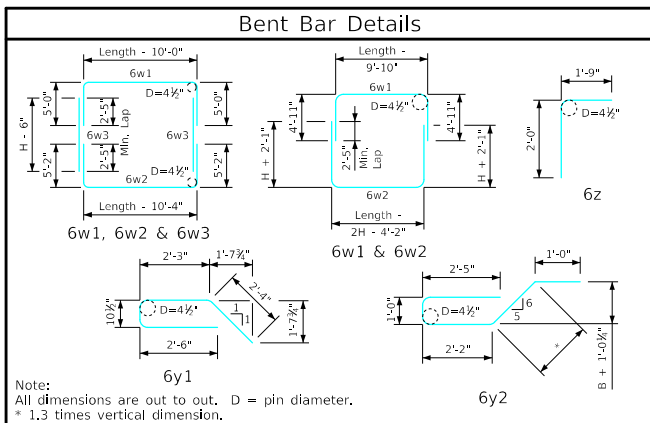
Bottom - Bars 6y2 & 6z



Longitudinal Section

Barrel Size	Barrel Dimension			Bell Joint Quantities (CY)		
	A	B	C	Footings	Walls	Slab
14' x 4'	10	12.5	9	3.459	1.047	2.883
14' x 5'	10	12.5	9	3.459	1.332	2.883
14' x 6'	10	12.5	9	3.459	1.618	2.883
14' x 7'	10	12.5	9	3.459	1.903	2.883
14' x 8'	10	12.5	9	3.459	2.189	2.883
14' x 9'	10	12.5	9	3.459	2.474	2.883
14' x 10'	10	12.5	10	3.487	2.760	2.907
14' x 11'	10	12.5	11	3.516	3.045	2.931
14' x 12'	10	12.5	12	3.544	3.331	2.954
14' x 13'	10	12.5	13	3.573	3.616	2.978
14' x 14'	10	12.5	14	3.602	3.902	3.002
16' x 4'	11	13	9.5	3.828	1.047	3.204
16' x 5'	11	13	9.5	3.828	1.332	3.204
16' x 6'	11	13.5	9.5	3.840	1.618	3.204
16' x 7'	12	14.5	9	3.849	1.903	3.216
16' x 8'	12	14.5	9	3.849	2.189	3.216
16' x 9'	12	14.5	9	3.849	2.474	3.216
16' x 10'	11.5	14.5	10	3.878	2.760	3.228
16' x 11'	11	14.5	11	3.907	3.045	3.240
16' x 12'	11	14	12	3.923	3.331	3.264
16' x 13'	11	13.5	13	3.940	3.616	3.288
16' x 14'	11	13.5	14	3.969	3.902	3.311

Concrete Placement



Notes:

- Dimensions and quantities shown are based on slab, floor, and wall thicknesses (A, B, and C, respectively). Values for these dimensions, under varying fill conditions, can be found on the RCB culvert barrel detail sheets.
- Change lengths of bars 6w1, 6w2, 6z, and adjust reinforcing steel and concrete quantities accordingly for slab, wall, and floor thicknesses other than shown.
- All bar lengths are estimated with a 2" clearance from concrete edge to outside of bar, except as noted.
- Material and construction to be in accordance with the current Standard Specifications of I.D.O.T.
- See Sheet RCB G2-20 for General Notes, Specifications, and Design Stresses.
- Barrel floor bars m1 & m9 are to be shortened 6" in length at bell joints.
- Dimensions "A", "B" and "C" are in inches. "Length" dimensions in bar lists are in feet and inches.

LATEST REVISION DATE 	IOWA DOT Highway Division	
	Standard Design Single Reinforced Concrete Box Culverts July, 2020	
	Culvert Bell Joints	CBJ 4-20

14' & 16' Spans