

ENGLISH REDESIGNED TRIPLE CULVERTS.DGN - TRH 30-7-12 - THIS SHEET ISSUED 04-12.

### BILL OF REINFORCING FOR ONE HEADWALL 30° SKEW CULVERT SPAN x CULVERT HEIGHT

BAR	LOCATION	SHAPE	12' x 12'		12' x 11'		12' x 10'		12' x 9'		12' x 8'		12' x 7'		12' x 6'		BAR								
			NO.	LENGTH	WT.	NO.	LENGTH	WT.	NO.	LENGTH	WT.	NO.	LENGTH	WT.	NO.	LENGTH		WT.	NO.	LENGTH	WT.				
5fa	FENCE ANCHOR (GALV.)		2	2'-10"	6	2	2'-10"	6	2	2'-10"	6	2	2'-10"	6	2	2'-10"	6	5fa							
4b1	WINGWALL, B.F.H. LONG		1	54'-2	38	1	50'-0	35	1	45'-10	32	1	41'-8	29	1	37'-6	25	1	33'-4	22	1	29'-2	19	4b1	
4b2	WINGWALL, B.F.H. SHORT		1	41'-2	29	1	38'-1	25	1	35'-0	23	1	31'-10	21	1	28'-9	19	1	25'-7	17	1	22'-6	15	4b2	
4b3	WINGWALL, B.F.H. LONG		10	14'-8 TO 52'-3	228	9	14'-8 TO 48'-1	192	8	14'-8 TO 43'-11	158	7	14'-8 TO 39'-9	127	6	14'-8 TO 35'-7	101	5	14'-8 TO 31'-5	77	4	14'-8 TO 27'-3	56	4b3	
4b4	WINGWALL, B.F.H. SHORT		10	11'-11 TO 39'-9	173	9	11'-11 TO 36'-8	146	8	11'-11 TO 33'-7	122	7	11'-11 TO 30'-5	99	6	11'-11 TO 27'-4	78	5	11'-11 TO 24'-3	60	4	11'-11 TO 21'-1	44	4b4	
5b5	WINGWALL, F.F.H. LONG		1	54'-3	59	1	50'-1	55	1	45'-11	50	1	41'-9	46	1	37'-7	39	1	33'-5	35	1	29'-2	30	5b5	
5b6	WINGWALL, F.F.H. SHORT		1	41'-3	45	1	38'-2	40	1	35'-0	37	1	31'-11	33	1	28'-9	30	1	25'-8	27	1	22'-6	23	5b6	
5b7	WINGWALL, F.F.H. LONG		11	10'-7 TO 52'-4	368	10	10'-7 TO 48'-2	311	9	10'-7 TO 43'-11	258	8	10'-7 TO 39'-9	210	7	10'-7 TO 35'-7	169	6	10'-7 TO 31'-5	131	5	10'-7 TO 27'-3	99	5b7	
5b8	WINGWALL, F.F.H. SHORT		11	8'-10 TO 39'-10	279	10	8'-10 TO 36'-9	238	9	8'-10 TO 33'-7	199	8	8'-10 TO 30'-6	164	7	8'-10 TO 27'-4	132	6	8'-10 TO 24'-3	103	5	8'-10 TO 21'-1	78	5b8	
5b9	INTERIOR WALLS, BOTH F.H.		42	2 EA. 5'-7 TO 30'-11	799	38	2 EA. 5'-7 TO 28'-8	679	34	2 EA. 5'-7 TO 26'-5	566	30	2 EA. 5'-7 TO 24'-0	463	26	2 EA. 5'-8 TO 21'-9	372	22	2 EA. 5'-8 TO 19'-5	288	18	2 EA. 5'-9 TO 17'-1	214	5b9	
4c1	WINGWALL, F.F.V. LONG		51	2'-10 TO 14'-10	301	47	2'-10 TO 13'-10	262	43	2'-10 TO 12'-11	226	39	2'-10 TO 11'-11	192	35	2'-10 TO 10'-0	162	31	2'-10 TO 8'-10	133	26	2'-10 TO 6'-10	101	4c1	
4c2	WINGWALL, F.F.V. SHORT		38	2'-10 TO 14'-9	223	35	2'-10 TO 13'-9	194	32	2'-10 TO 12'-10	167	29	2'-10 TO 11'-10	142	26	2'-10 TO 10'-10	119	23	2'-10 TO 9'-11	98	20	2'-10 TO 8'-11	78	4c2	
4c3	WINGWALL, F.F.V. LONG		23	8'-5 TO 13'-9	170	19	8'-5 TO 12'-9	134	15	8'-5 TO 11'-10	101	11	8'-5 TO 10'-10	71	---	---	---	---	---	---	---	---	---	---	4c3
4c4	WINGWALL, F.F.V. SHORT		18	9'-5 TO 14'-11	146	15	9'-5 TO 13'-11	117	12	9'-5 TO 12'-11	90	9	9'-5 TO 12'-0	64	---	---	---	---	---	---	---	---	---	---	4c4
4c5	WINGWALL, F.F.V. LONG		2	13'-9	18	2	12'-9	17	2	11'-9	16	1	10'-9	7	1	9'-9	7	1	8'-9	6	2	7'-9	10	4c5	
4c5	WINGWALL, F.F.V. SHORT		2	13'-9	18	2	12'-9	17	2	11'-9	16	2	10'-9	14	2	9'-9	13	1	8'-9	6	1	7'-9	5	4c5	
4c6	INTERIOR WALLS, BOTH F.V.		4	11'-9	5	4	11'-9	5	4	11'-9	5	4	11'-9	5	4	11'-9	5	4	11'-9	5	4	11'-8	4	4c6	
4c7	INTERIOR WALLS, BOTH F.V.		108	2 EA. 11'-11 TO 10'-4	514	100	2 EA. 11'-11 TO 11'-6	448	90	2 EA. 11'-11 TO 10'-5	371	82	2 EA. 11'-11 TO 9'-6	313	72	2 EA. 11'-11 TO 8'-5	248	64	2 EA. 11'-11 TO 7'-6	201	54	2 EA. 11'-11 TO 6'-6	152	4c7	
4c8	INTERIOR WALLS, BOTH F.V.		4	12'-7	34	4	11'-7	31	4	10'-7	28	4	9'-7	26	4	8'-7	23	4	7'-7	20	4	6'-7	18	4c8	
5c9	WINGWALL, B.F.V. LONG		11	2'-10 TO 5'-3	46	11	2'-10 TO 5'-3	46	11	2'-10 TO 5'-3	46	11	2'-10 TO 5'-3	46	11	2'-10 TO 5'-3	46	11	2'-10 TO 5'-3	46	11	2'-10 TO 5'-3	46	5c9	
5c10	WINGWALL, B.F.V. SHORT		5	2'-10 TO 4'-2	18	5	2'-10 TO 4'-2	18	5	2'-10 TO 4'-2	18	5	2'-10 TO 4'-2	18	5	2'-10 TO 4'-2	18	5	2'-10 TO 4'-2	18	5	2'-10 TO 4'-2	18	5c10	
5c11	WINGWALL, B.F.V. LONG		40	9'-6 TO 18'-10	591	36	9'-6 TO 17'-10	513	32	9'-6 TO 16'-11	441	28	9'-6 TO 15'-11	371	24	9'-6 TO 14'-10	307	20	9'-6 TO 13'-11	245	15	9'-6 TO 12'-10	175	5c11	
5c12	WINGWALL, B.F.V. SHORT		33	8'-6 TO 18'-9	469	30	8'-6 TO 17'-9	411	27	8'-6 TO 16'-10	357	24	8'-6 TO 15'-10	305	21	8'-6 TO 14'-10	256	18	8'-6 TO 13'-11	210	15	8'-6 TO 12'-11	168	5c12	
6c13	WINGWALL, B.F.V. LONG		33	10'-6	520	29	10'-6	457	25	10'-6	394	21	10'-6	331	17	10'-6	268	13	10'-6	205	8	10'-6	126	6c13	
6c13	WINGWALL, B.F.V. SHORT		25	10'-6	394	22	10'-6	347	19	10'-6	300	16	10'-6	252	13	10'-6	205	10	10'-6	158	7	10'-6	110	6c13	
5c14	WINGWALL, B.F.V. LONG		2	17'-9	37	2	16'-9	35	2	15'-9	33	1	14'-9	15	1	13'-9	14	1	12'-9	13	2	11'-9	25	5c14	
5c14	WINGWALL, B.F.V. SHORT		2	17'-9	37	2	16'-9	35	2	15'-9	33	2	14'-9	31	2	13'-9	29	1	12'-9	13	1	11'-9	12	5c14	
4d1	APRON, LONGIT., BOTT.		25	31'-6	526	25	29'-2	487	25	26'-10	448	25	24'-7	411	25	23'-9	372	25	19'-11	333	25	17'-8	295	4d1	
4d2	APRON, LONGIT., BOTT. LONG		3	48'-4	101	3	44'-2	93	3	40'-1	85	3	35'-11	72	3	31'-9	64	3	27'-8	55	3	23'-7	47	4d2	
4d3	APRON, LONGIT., BOTT. SHORT		3	36'-10	74	3	33'-9	68	3	30'-8	61	3	27'-7	55	3	24'-6	49	3	21'-5	43	3	18'-4	37	4d3	
6f1	APRON, LONGIT., TOP		37	31'-6	1751	37	29'-2	1621	37	26'-10	1491	37	24'-7	1366	37	22'-3	1237	37	19'-11	1107	37	17'-8	982	6f1	
6f2	APRON, LONGIT., TOP LONG		11	5'-4 TO 28'-6	279	10	5'-4 TO 26'-2	237	9	5'-4 TO 23'-10	197	8	5'-4 TO 21'-7	162	7	5'-4 TO 19'-3	129	6	5'-3 TO 16'-11	100	5	5'-3 TO 14'-7	74	6f2	
6f3	APRON, LONGIT., TOP SHORT		8	7'-0 TO 28'-8	214	7	7'-9 TO 26'-5	180	7	5'-5 TO 24'-1	155	6	6'-2 TO 21'-9	126	5	6'-11 TO 19'-6	99	4	7'-9 TO 17'-2	75	4	5'-5 TO 14'-10	61	6f3	
6f4	APRON, LONGIT., TOP LONG		1	54'-3	85	1	50'-1	79	1	45'-11	72	1	41'-9	66	1	37'-7	56	1	33'-5	50	1	29'-2	44	6f4	
6f5	APRON, LONGIT., TOP SHORT		1	41'-3	65	1	38'-2	57	1	35'-0	53	1	31'-11	48	1	28'-9	43	1	25'-8	39	1	22'-6	34	6f5	
4f1	PARAPET, VERTICAL		77	6'-4	326	75	6'-4	317	75	6'-4	317	75	6'-4	317	75	6'-4	317	75	6'-4	317	75	6'-4	317	4f1	
7j1	PARAPET, HORIZONTAL		4	45'-9	392	4	45'-5	390	4	45'-0	386	4	45'-0	386	4	45'-0	386	4	44'-7	383	4	44'-7	383	7j1	
6m1	APRON, TRANS., TOP		16	42'-8 TO 45'-6	1113	16	42'-4 TO 45'-2	1105	16	42'-0 TO 44'-10	1097	15	42'-0 TO 44'-7	1026	13	42'-0 TO 44'-3	886	10	41'-8 TO 43'-4	672	7	41'-8 TO 42'-9	467	6m1	
6m2	APRON, TRANS., TOP		9	45'-9 TO 48'-9	669	6	45'-5 TO 47'-4	438	3	45'-10 TO 45'-10	215	1	44'-9 TO 44'-9	71	3	34'-8 TO 37'-3	162	6	30'-6 TO 37'-0	304	9	26'-6 TO 36'-10	428	6m2	
6m3	APRON, TRANS., TOP		29	8'-9 TO 39'-9	1054	29	7'-10 TO 38'-11	1018	29	7'-0 TO 38'-1	982	29	6'-4 TO 37'-5	953	25	6'-9 TO 33'-5	754	22	5'-11 TO 29'-4	582	19	5'-3 TO 25'-4	436	6m3	
6m4	APRON, TRANS., BOTT.		24	38'-10 TO 54'-6	1757	22	38'-8 TO 53'-0	1582	20	38'-6 TO 51'-5	1408	18	38'-6 TO 50'-1	1248	16	38'-6 TO 48'-8	1091	14	38'-3 TO 47'-2	935	12	38'-3 TO 45'-9	787	6m4	
6p1	CURTAIN, HORIZONTAL		4	44'-1	278	4	43'-10	277	4	43'-8	276	4	43'-8	276	4	43'-8	276	4	43'-5	274	4	43'-5	274	6p1	
6p2	CURTAIN, HORIZONTAL LONG		4	28'-0	168	4	26'-0	156	4	24'-0	144	4	22'-0	132	4	20'-0	120	4	18'-0	108	4	16'-0	96	6p1	
6p3	CURTAIN, HORIZONTAL SHORT		4	15'-11	96	4	14'-11	90	4	13'-10	83	4	12'-10	77	4	11'-9	71	4	10'-9	65	4	9'-8	58	6p1	
6s1	WING SLOPE, BOTH F. LONG		2	8'-0	24	2	8'-0	24	2	8'-0	24	2	8'-0	24	2	8'-0	24	2	8'-0	24	2	8'-0	24	6s1	
6s2	WING SLOPE, BOTH F. SHORT		2	6'-11	21	2	6'-11	21	2	6'-11	21	2	6'-11	21	2	6'-11	21	2	6'-11	21	2	6'-11	21	6s2	
6s3	WING SLOPE, BOTH F. LONG		2	49'-4	155	2	45'-0	142	2	40'-9	129	2	36'-5	109	2	32'-2	97	2	27'-10	84	2	23'-7	71	6s3	
6s4	WING SLOPE, BOTH F. SHORT		2	38'-6	116	2	35'-2	106	2	31'-11	96	2</													