

ENGLISH.DESIGNED.TWIN.CULVERTS.DGN - TWH 30-8-12 - THIS SHEET ISSUED 04-1-21

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

BAR	LOCATION	SHAPE	10' x 7'			10' x 6'			10' x 5'			10' x 4'			8' x 10'			8' x 9'			8' x 8'			BAR			
			NO.	LENGTH	WT.	NO.	LENGTH	WT.	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	2	2'-10"	6	2	2'-10"	6	2	2'-10"	6	5fa
4b1	WINGWALL, B.F.H. LONG		1	33'-4"	22	1	29'-2"	19	1	25'-0"	17	1	20'-10"	14	1	45'-10"	32	1	41'-8"	29	1	37'-6"	25	1	4b1	4b1	
4b2	WINGWALL, B.F.H. SHORT		1	25'-7"	17	1	22'-6"	15	1	19'-5"	13	1	16'-3"	11	1	35'-0"	23	1	31'-10"	21	1	28'-9"	19	1	4b2	4b2	
4b3	WINGWALL, B.F.H. LONG		5	14'-8 TO 31'-5"	77	4	14'-8 TO 27'-3"	56	3	14'-8 TO 23'-1"	38	2	14'-8 TO 18'-10"	22	8	14'-8 TO 43'-11"	158	7	14'-8 TO 39'-9"	127	6	14'-8 TO 35'-7"	101	4	4b3	4b3	
4b4	WINGWALL, B.F.H. SHORT		5	11'-10 TO 24'-3"	60	4	11'-10 TO 21'-1"	44	3	11'-9 TO 18'-0"	30	2	11'-9 TO 14'-10"	18	8	11'-11 TO 33'-7"	122	7	11'-10 TO 30'-5"	99	6	11'-10 TO 27'-4"	78	4	4b4	4b4	
5b5	WINGWALL, F.F.H. LONG		1	33'-5"	35	1	29'-2"	30	1	25'-0"	26	1	20'-10"	22	1	45'-11"	50	1	41'-9"	46	1	37'-7"	39	5b5	5b5		
5b6	WINGWALL, F.F.H. SHORT		1	25'-8"	27	1	22'-6"	23	1	19'-5"	20	1	16'-4"	17	1	35'-0"	37	1	31'-11"	33	1	28'-9"	30	5b6	5b6		
5b7	WINGWALL, F.F.H. LONG		6	10'-7 TO 31'-5"	131	5	10'-7 TO 27'-3"	99	4	10'-7 TO 23'-1"	70	3	10'-7 TO 18'-11"	46	9	10'-7 TO 43'-11"	258	8	10'-7 TO 39'-9"	210	7	10'-7 TO 35'-7"	169	5b7	5b7		
5b8	WINGWALL, F.F.H. SHORT		6	8'-9 TO 24'-3"	103	5	8'-9 TO 21'-1"	78	4	8'-9 TO 18'-0"	56	3	8'-9 TO 14'-11"	37	9	8'-10 TO 33'-7"	199	8	8'-10 TO 30'-6"	164	7	8'-9 TO 27'-4"	132	5b8	5b8		
5b9	INTERIOR WALL, BOTH F.H.		11	5'-8 TO 19'-5"	144	9	5'-9 TO 17'-1"	107	7	5'-10 TO 14'-9"	75	5	5'-9 TO 12'-5"	48	17	5'-7 TO 26'-4"	283	15	5'-7 TO 24'-0"	231	13	5'-8 TO 21'-9"	186	5b9	5b9		
4c1	WINGWALL, F.F.V. LONG		31	2'-9 TO 9'-11"	131	26	2'-9 TO 8'-9"	100	22	2'-9 TO 7'-9"	77	18	2'-9 TO 6'-10"	58	43	2'-8 TO 12'-9"	221	39	2'-8 TO 11'-9"	188	35	2'-8 TO 10'-10"	158	4c1	4c1		
4c2	WINGWALL, F.F.V. SHORT		23	2'-9 TO 9'-10"	97	20	2'-9 TO 8'-10"	77	17	2'-9 TO 7'-11"	61	14	2'-9 TO 6'-11"	45	32	2'-8 TO 12'-8"	164	29	2'-8 TO 11'-8"	139	26	2'-8 TO 10'-8"	116	4c2	4c2		
4c3	WINGWALL, F.F.V. LONG		---	---	---	---	---	---	---	---	---	---	---	---	20	8'-3 TO 12'-10"	141	16	8'-3 TO 12'-9"	108	---	---	---	---	4c3	4c3	
4c4	WINGWALL, F.F.V. SHORT		---	---	---	---	---	---	---	---	---	---	---	---	12	9'-3 TO 12'-9"	88	9	9'-3 TO 11'-10"	63	---	---	---	---	4c4	4c4	
4c5	WINGWALL, F.F.V. LONG		1	8'-8"	6	2	7'-8"	10	2	6'-8"	9	2	5'-8"	8	2	11'-7"	15	1	10'-7"	7	1	9'-7"	6	4c5	4c5		
4c6	INTERIOR WALL, BOTH F.V.		2	1'-8"	2	2	1'-7"	2	2	1'-7"	2	2	1'-7"	2	2	1'-7"	2	2	1'-7"	2	2	1'-7"	2	4c6	4c6		
4c7	INTERIOR WALL, BOTH F.V.		32	1'-10 TO 7'-5"	99	27	1'-10 TO 6'-5"	74	22	1'-9 TO 5'-4"	52	18	1'-9 TO 4'-5"	37	45	1'-9 TO 10'-3"	180	41	1'-9 TO 9'-4"	152	36	1'-9 TO 8'-3"	120	4c7	4c7		
4c8	INTERIOR WALL, BOTH F.V.		2	7'-6"	10	2	6'-6"	9	2	5'-6"	7	2	4'-6"	6	2	10'-5"	14	2	9'-5"	13	2	8'-5"	11	4c8	4c8		
5c9	WINGWALL, B.F.V. LONG		11	2'-9 TO 5'-2"	45	11	2'-9 TO 5'-2"	45	11	2'-9 TO 5'-2"	45	11	2'-9 TO 5'-2"	45	11	2'-9 TO 5'-1"	44	11	2'-8 TO 5'-1"	44	11	2'-8 TO 5'-1"	44	5c9	5c9		
5c10	WINGWALL, B.F.V. SHORT		5	2'-9 TO 4'-1"	18	5	2'-9 TO 4'-1"	18	5	2'-9 TO 4'-1"	18	5	2'-9 TO 4'-1"	18	5	2'-8 TO 4'-0"	17	5	2'-8 TO 4'-0"	17	5	2'-8 TO 4'-0"	17	5c10	5c10		
5c11	WINGWALL, B.F.V. LONG		20	9'-5 TO 13'-11"	243	15	9'-5 TO 12'-9"	173	11	9'-5 TO 11'-11"	127	9	8'-5 TO 10'-11"	74	32	9'-4 TO 16'-9"	435	28	9'-4 TO 15'-9"	366	24	9'-4 TO 14'-10"	302	5c11	5c11		
5c12	WINGWALL, B.F.V. SHORT		18	8'-5 TO 13'-10"	209	15	8'-5 TO 12'-10"	166	12	8'-5 TO 11'-11"	127	9	8'-5 TO 10'-11"	74	27	8'-4 TO 16'-8"	352	24	8'-4 TO 15'-8"	300	21	8'-4 TO 14'-8"	252	5c12	5c12		
6c13	WINGWALL, B.F.V. LONG		13	10'-6"	205	8	10'-6"	126	---	---	---	---	---	---	25	10'-6"	394	21	10'-6"	331	17	10'-6"	268	6c13	6c13		
6c14	WINGWALL, B.F.V. SHORT		10	10'-6"	158	7	10'-6"	110	---	---	---	---	---	---	19	10'-6"	300	16	10'-6"	252	13	10'-6"	205	6c14	6c14		
5c14	WINGWALL, B.F.V. LONG		1	12'-8"	13	2	11'-8"	24	2	10'-8"	22	2	9'-8"	20	2	15'-7"	33	1	14'-7"	15	1	13'-7"	14	5c14	5c14		
5c14	WINGWALL, B.F.V. SHORT		1	12'-8"	13	1	11'-8"	12	1	10'-8"	11	2	9'-8"	20	2	15'-7"	33	2	14'-7"	30	2	13'-7"	28	5c14	5c14		
4d1	APRON, LONGIT., BOTT.		13	19'-11"	173	13	17'-8"	153	13	15'-4"	133	13	13'-0"	113	11	26'-10"	197	11	24'-7"	181	11	22'-3"	163	4d1	4d1		
4d2	APRON, LONGIT., BOTT. LONG		3	27'-8"	55	3	23'-7"	47	3	19'-6"	39	3	15'-5"	31	3	40'-1"	85	3	35'-11"	72	3	31'-9"	64	4d2	4d2		
4d3	APRON, LONGIT., BOTT. SHORT		3	21'-5"	43	3	18'-4"	37	3	15'-3"	31	3	12'-3"	25	3	30'-8"	61	3	27'-7"	55	3	24'-6"	49	4d3	4d3		
6f1	APRON, LONGIT., TOP		20	19'-11"	598	20	17'-8"	531	20	15'-4"	461	20	13'-0"	391	16	26'-10"	645	16	24'-7"	591	16	22'-3"	535	6f1	6f1		
6f2	APRON, LONGIT., TOP LONG		6	5'-3 TO 16'-11"	100	5	5'-3 TO 14'-7"	74	4	5'-3 TO 12'-4"	53	3	5'-3 TO 10'-0"	34	9	5'-4 TO 23'-10"	197	8	5'-4 TO 21'-7"	162	7	5'-3 TO 19'-3"	129	6f2	6f2		
6f3	APRON, LONGIT., TOP SHORT		4	7'-9 TO 17'-2"	75	4	5'-5 TO 14'-10"	61	3	6'-2 TO 12'-6"	42	2	7'-0 TO 10'-3"	26	7	5'-5 TO 24'-1"	155	6	6'-2 TO 21'-9"	126	5	6'-11 TO 19'-6"	99	6f3	6f3		
6f4	APRON, LONGIT., TOP LONG		1	33'-5"	50	1	29'-2"	44	1	25'-0"	38	1	20'-10"	31	1	45'-11"	72	1	41'-9"	66	1	37'-7"	56	6f4	6f4		
6f5	APRON, LONGIT., TOP SHORT		1	25'-8"	39	1	22'-6"	34	1	19'-5"	29	1	16'-4"	25	1	35'-0"	53	1	31'-11"	48	1	28'-9"	43	6f5	6f5		
4i1	PARAPET, VERTICAL		41	6'-4"	173	41	6'-4"	173	41	6'-4"	173	41	6'-4"	173	33	6'-4"	140	33	6'-4"	140	33	6'-4"	140	4i1	4i1		
7j1	PARAPET, HORIZONTAL		4	25'-3"	206	4	25'-3"	206	4	25'-3"	206	4	25'-3"	206	4	20'-11"	171	4	20'-11"	171	4	20'-11"	171	7j1	7j1		
6m1	APRON, TRANS., TOP		10	23'-8 TO 25'-5"	369	10	23'-8 TO 25'-5"	369	9	23'-8 TO 25'-2"	330	7	23'-8 TO 24'-10"	255	8	19'-8 TO 21'-0"	244	8	19'-8 TO 21'-0"	244	8	19'-8 TO 21'-0"	244	6m1	6m1		
6m2	APRON, TRANS., TOP		6	25'-9 TO 27'-8"	241	3	25'-9 TO 26'-6"	118	1	25'-5 TO 25'-5"	38	3	17'-11 TO 20'-6"	87	19	21'-3 TO 28'-0"	703	16	21'-3 TO 26'-11"	579	13	21'-3 TO 25'-9"	459	6m2	6m2		
6m3	APRON, TRANS., TOP		16	5'-5 TO 22'-7"	331	16	4'-9 TO 21'-5"	315	16	4'-1 TO 20'-10"	299	13	3'-5 TO 16'-10"	198	13	7'-0 TO 20'-4"	267	13	6'-4 TO 19'-8"	254	12	6'-9 TO 19'-0"	232	6m3	6m3		
6m4	APRON, TRANS., BOTT.		14	18'-11 TO 27'-10"	492	12	18'-11 TO 26'-5"	409	10	18'-11 TO 25'-1"	330	8	18'-11 TO 23'-9"	256	20	14'-5 TO 27'-4"	627	18	14'-5 TO 26'-0"	546	16	14'-5 TO 24'-8"	470	6m4	6m4		
6p1	CURTAIN, HORIZONTAL		4	24'-1"	145	4	24'-1"	145	4	24'-1"	145	4	24'-1"	145	4	19'-7"	118	4	19'-7"	118	4	19'-7"	118	6p1	6p1		
6p2	CURTAIN, HORIZONTAL LONG		4	18'-0"	108	4	16'-0"	96	4	13'-11"	84	4	11'-11"	72	4	24'-0"	144	4	22'-0"	132	4	20'-0"	120	6p2	6p2		
6p3	CURTAIN, HORIZONTAL SHORT		4	10'-9"	65	4	9'-8"	58	4	8'-8"	52	4	7'-7"	46	4	13'-10"	83	4	12'-10"	77	4	11'-9"	71	6p3	6p3		
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	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	6s2		
6s3	WING SLOPE, BOTH F. LONG		2	27'-10"	84	2	23'-7"	71	2	19'-3"	58	2	15'-0"	45	2	40'-9"	129	2	36'-5"	109	2	32'-2"	97	6s3	6s3		
6s4	WING SLOPE, BOTH F. SHORT		2	22'-1"	66	2	18'-10"																				