

ENGLISH REDIGNEEDTWINCULVERTS.DGN - TWH 45-8-12 - THIS SHEET ISSUED 04-12.

BILL OF REINFORCING FOR ONE HEADWALL 45° SKEW CULVERT SPAN x CULVERT HEIGHT

BAR	LOCATION	SHAPE	12' x 5'		12' x 4'		10' x 12'		10' x 11'		10' x 10'		10' x 9'		10' x 8'		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	2	2'-10"	6	5fA			
4b1	WINGWALL, B.F.H. LONG		1	33'-10"	23	1	28'-0"	19	1	74'-8"	51	1	68'-10"	47	1	63'-0"	44	1	57'-2"	40	1	51'-4"	36	4b1
4b2	WINGWALL, B.F.H. SHORT		1	21'-5"	14	1	17'-11"	12	1	45'-10"	32	1	42'-4"	30	1	38'-10"	26	1	35'-5"	24	1	31'-11"	21	4b2
4b3	WINGWALL, B.F.H. LONG		3	19'-5 TO 31'-1"	51	2	19'-5 TO 25'-3"	30	10	19'-6 TO 71'-10"	314	9	19'-6 TO 66'-1"	265	8	19'-6 TO 60'-3"	219	7	19'-6 TO 54'-5"	177	6	19'-6 TO 48'-7"	139	4b3
4b4	WINGWALL, B.F.H. SHORT		3	12'-10 TO 19'-9"	33	2	12'-10 TO 16'-3"	19	10	12'-10 TO 44'-3"	194	9	12'-10 TO 40'-9"	163	8	12'-10 TO 37'-0"	134	7	12'-10 TO 33'-9"	109	6	12'-10 TO 30'-3"	86	4b4
5b5	WINGWALL, F.F.H. LONG		1	33'-11"	35	1	28'-1"	29	1	74'-8"	80	1	68'-10"	74	1	63'-0"	68	1	57'-2"	62	1	51'-4"	56	5b5
5b6	WINGWALL, F.F.H. SHORT		1	21'-5"	22	1	17'-11"	19	1	45'-10"	50	1	42'-5"	47	1	38'-10"	41	1	35'-5"	37	1	31'-11"	33	5b6
5b7	WINGWALL, F.F.H. LONG		4	13'-8 TO 31'-1"	93	3	13'-8 TO 25'-3"	61	11	13'-9 TO 71'-11"	506	10	13'-9 TO 66'-1"	428	9	13'-9 TO 60'-3"	357	8	13'-9 TO 54'-5"	291	7	13'-8 TO 48'-7"	232	5b7
5b8	WINGWALL, F.F.H. SHORT		4	9'-4 TO 19'-10"	61	3	9'-4 TO 16'-4"	40	11	9'-5 TO 44'-4"	313	10	9'-5 TO 40'-10"	264	9	9'-5 TO 37'-4"	219	8	9'-5 TO 33'-10"	180	7	9'-5 TO 30'-4"	145	5b8
5b9	INTERIOR WALL, BOTH F.H.		7	6'-10 TO 17'-7"	89	5	7'-0 TO 14'-8"	56	21	6'-6 TO 37'-4"	480	19	6'-6 TO 34'-6"	406	17	6'-6 TO 31'-9"	339	15	6'-6 TO 28'-11"	277	13	6'-7 TO 26'-1"	221	5b9
4c1	WINGWALL, F.F.V. LONG		31	2'-9 TO 7'-11"	110	25	2'-9 TO 6'-11"	81	72	2'-8 TO 14'-11"	423	66	2'-8 TO 13'-10"	364	60	2'-8 TO 12'-10"	311	54	2'-8 TO 11'-10"	262	49	2'-8 TO 10'-11"	222	4c1
4c2	WINGWALL, F.F.V. SHORT		19	2'-10 TO 8'-0"	69	15	2'-10 TO 6'-10"	48	43	2'-9 TO 14'-9"	251	40	2'-9 TO 13'-11"	223	36	2'-9 TO 12'-9"	186	33	2'-9 TO 11'-11"	162	29	2'-9 TO 10'-9"	131	4c2
4c3	WINGWALL, F.F.V. LONG		---	---	---	---	---	---	49	6'-9 TO 15'-0"	356	43	6'-9 TO 13'-11"	297	37	6'-9 TO 12'-11"	243	31	6'-9 TO 11'-11"	193	---	---	---	4c3
4c4	WINGWALL, F.F.V. SHORT		---	---	---	---	---	---	23	8'-7 TO 14'-11"	181	20	8'-7 TO 14'-0"	151	16	8'-7 TO 12'-11"	115	13	8'-7 TO 12'-0"	89	---	---	---	4c4
4c5	WINGWALL, F.F.V. LONG		2	6'-9"	9	2	5'-9"	8	1	13'-8"	9	2	12'-8"	17	2	11'-8"	16	2	10'-8"	14	1	9'-8"	6	4c5
4c6	INTERIOR WALL, BOTH F.V.		2	1'-8"	2	2	1'-8"	2	2	1'-7"	2	2	1'-7"	2	2	1'-7"	2	2	1'-7"	2	2	1'-7"	2	4c6
4c7	INTERIOR WALL, BOTH F.V.		27	1'-10 TO 5'-5"	65	22	1'-10 TO 4'-6"	47	66	1'-9 TO 12'-4"	310	61	1'-9 TO 11'-5"	268	55	1'-9 TO 10'-4"	222	50	1'-9 TO 9'-5"	186	44	1'-9 TO 8'-5"	149	4c7
4c8	INTERIOR WALL, BOTH F.V.		3	5'-7"	11	3	4'-7"	9	3	12'-6"	25	3	11'-6"	23	3	10'-6"	21	3	9'-6"	19	3	8'-6"	17	4c8
5c9	WINGWALL, B.F.V. LONG		15	2'-9 TO 5'-2"	62	15	2'-9 TO 5'-2"	62	15	2'-8 TO 5'-1"	61	15	2'-8 TO 5'-1"	61	15	2'-8 TO 5'-1"	61	15	2'-8 TO 5'-1"	61	15	2'-8 TO 5'-1"	61	5c9
5c10	WINGWALL, B.F.V. SHORT		4	2'-10 TO 3'-8"	14	4	2'-10 TO 3'-8"	14	4	2'-9 TO 3'-7"	13	4	2'-9 TO 3'-7"	13	4	2'-9 TO 3'-7"	13	4	2'-9 TO 3'-7"	13	4	2'-9 TO 3'-7"	13	5c10
5c11	WINGWALL, B.F.V. LONG		16	9'-4 TO 11'-11"	177	10	9'-4 TO 10'-11"	106	57	9'-3 TO 18'-11"	837	51	9'-3 TO 17'-10"	720	45	9'-3 TO 16'-9"	612	39	9'-3 TO 15'-10"	510	34	9'-3 TO 14'-11"	428	5c11
5c12	WINGWALL, B.F.V. SHORT		15	8'-0 TO 12'-0"	156	11	8'-0 TO 10'-10"	108	39	7'-11 TO 18'-9"	542	36	7'-11 TO 17'-11"	485	32	7'-11 TO 16'-9"	412	29	7'-11 TO 15'-11"	360	25	7'-11 TO 14'-9"	296	5c12
6c13	WINGWALL, B.F.V. LONG		---	---	---	---	---	---	47	10'-6"	741	41	10'-6"	647	35	10'-6"	552	29	10'-6"	457	24	10'-6"	379	6c13
6c13	WINGWALL, B.F.V. SHORT		---	---	---	---	---	---	28	10'-6"	442	25	10'-6"	394	21	10'-6"	331	18	10'-6"	284	14	10'-6"	221	6c13
5c14	WINGWALL, B.F.V. LONG		2	10'-9"	22	2	9'-9"	20	1	17'-8"	18	2	16'-8"	35	2	15'-8"	33	2	14'-8"	31	1	13'-8"	14	5c14
5c14	WINGWALL, B.F.V. SHORT		1	10'-9"	11	2	9'-9"	20	2	17'-8"	37	1	16'-8"	17	2	15'-8"	33	1	14'-8"	25	2	13'-8"	29	5c14
4d1	APRON, LONGIT., BOTT.		17	18'-4"	208	17	15'-6"	176	15	13'-1"	382	13	35'-3"	306	13	32'-5"	282	13	29'-7"	257	13	26'-9"	232	4d1
4d2	APRON, LONGIT., BOTT. LONG		3	27'-8"	55	3	22'-0"	44	3	68'-5"	142	3	62'-7"	130	3	56'-8"	118	3	50'-10"	106	3	45'-0"	95	4d2
4d3	APRON, LONGIT., BOTT. SHORT		3	17'-10"	36	3	14'-5"	29	3	42'-2"	89	3	38'-8"	77	3	35'-1"	70	3	31'-7"	63	3	28'-2"	56	4d3
6f1	APRON, LONGIT., TOP		24	18'-4"	661	24	15'-6"	559	20	38'-1"	1144	20	35'-3"	1059	20	32'-5"	974	20	29'-7"	889	20	26'-9"	804	6f1
6f2	APRON, LONGIT., TOP LONG		5	6'-10 TO 15'-0"	82	4	6'-0 TO 12'-2"	55	15	6'-6 TO 34'-10"	466	14	5'-8 TO 32'-0"	396	12	6'-11 TO 29'-2"	325	11	6'-1 TO 26'-4"	269	9	7'-3 TO 23'-6"	208	6f2
6f3	APRON, LONGIT., TOP SHORT		3	8'-6 TO 15'-4"	54	2	9'-1 TO 12'-6"	32	9	8'-1 TO 35'-2"	292	8	8'-8 TO 32'-4"	246	8	5'-9 TO 29'-6"	212	7	6'-4 TO 26'-8"	173	6	6'-10 TO 23'-10"	138	6f3
6f4	APRON, LONGIT., TOP LONG		1	33'-11"	51	1	28'-1"	42	1	74'-8"	116	1	68'-10"	107	1	63'-0"	98	1	57'-2"	89	1	51'-4"	80	6f4
6f5	APRON, LONGIT., TOP SHORT		1	21'-5"	32	1	17'-11"	27	1	45'-11"	72	1	42'-5"	67	1	38'-11"	58	1	35'-5"	53	1	31'-11"	48	6f5
4f1	PARAPET, VERTICAL		49	6'-8"	218	49	6'-8"	218	43	6'-8"	191	41	6'-8"	183	41	6'-8"	183	41	6'-8"	183	41	6'-8"	183	4f1
7J1	PARAPET, HORIZONTAL		4	36'-7"	299	4	36'-7"	299	4	32'-0"	262	4	31'-8"	259	4	31'-4"	256	4	31'-4"	256	4	31'-4"	256	7J1
6m1	APRON, TRANS., TOP		6	29'-3"	268	2	29'-3"	88	16	25'-6"	647	16	25'-3 TO 28'-4"	641	16	25'-0 TO 27'-10"	635	16	25'-0 TO 27'-10"	635	16	25'-0 TO 27'-10"	635	6m1
6m2	APRON, TRANS., TOP		12	16'-4 TO 24'-7"	369	16	13'-6 TO 24'-9"	460	19	28'-8 TO 35'-5"	914	15	28'-5 TO 33'-8"	699	11	28'-2 TO 31'-11"	496	7	28'-2 TO 30'-5"	308	4	28'-2 TO 29'-3"	172	6m2
6m3	APRON, TRANS., TOP		20	4'-11 TO 38'-2"	309	16	4'-4 TO 36'-0"	206	27	10'-1 TO 47'-10"	706	27	9'-5 TO 44'-0"	678	27	8'-8 TO 43'-4"	649	28	7'-7 TO 42'-9"	638	27	7'-0 TO 41'-7"	580	6m3
6m4	APRON, TRANS., BOTT.		10	28'-7 TO 38'-2"	501	8	28'-7 TO 36'-0"	388	24	23'-3 TO 47'-10"	308	22	23'-2 TO 45'-6"	1155	20	23'-0 TO 43'-4"	1010	18	23'-0 TO 41'-2"	874	16	23'-0 TO 39'-0"	745	6m4
6p1	CURTAIN, HORIZONTAL		4	34'-11"	210	4	34'-11"	210	4	29'-8"	178	4	29'-6"	177	4	29'-5"	177	4	29'-5"	177	4	29'-5"	177	6p1
6p2	CURTAIN, HORIZONTAL LONG		4	20'-2"	121	4	17'-0"	102	4	42'-4"	268	4	39'-2"	235	4	36'-0"	216	4	32'-10"	197	4	29'-8"	178	6p2
6p3	CURTAIN, HORIZONTAL SHORT		4	8'-6"	51	4	7'-6"	45	4	15'-8"	94	4	14'-7"	88	4	13'-7"	82	4	12'-7"	76	4	11'-7"	63	6p3
6s1	WING SLOPE, BOTH F. LONG		2	8'-4"	25	2	8'-4"	25	2	8'-4"	25	2	8'-4"	25	2	8'-4"	25	2	8'-4"	25	2	8'-4"	25	6s1
6s2	WING SLOPE, BOTH F. SHORT		2	7'-11"	24	2	7'-11"	24	2	7'-11"	24	2	7'-11"	24	2	7'-11"	24	2	7'-11"	24	2	7'-11"	24	6s2
6s3	WING SLOPE, BOTH F. LONG		2	27'-7"	83	2	21'-8"	65	2	69'-0"	214	2	63'-1"	196	2	57'-2"	178	2	51'-3"	161	2	45'-4"	143	6s3
6s4	WING SLOPE, BOTH F. SHORT		2	16'-8"	50	2	13'-0"	39	2	42'-1"	133	2	38'-6"	116	2	34'-10"	105	2	31'-2"	94	2	27'-7"	83	6s4
6s5	WING SLOPE, F.F. LONG		1	32'-10"	49	1	26'-11"	40	1	74'-3"	115	1	68'-4"	106	1	62'-5"	97	1	56'-6"	88	1	50'-7"	79	6s5
6s6	WING SLOPE, F.F. SHORT	<																						