

BILL OF REINFORCING FOR ONE HEADWALL 0° SKEW CULVERT SPAN x CULVERT HEIGHT

LOCATION	SHAPE	12' x 12'				12' x 11'				12' x 10'				12' x 9'				12' x 8'				12' x 7'				12' x 6'				12' x 5'				12' x 4'			
		BAR NO.	LENGTH	WT.	BAR NO.	LENGTH	WT.	BAR NO.	LENGTH	WT.	BAR NO.	LENGTH	WT.	BAR NO.	LENGTH	WT.	BAR NO.	LENGTH	WT.	BAR NO.	LENGTH	WT.	BAR NO.	LENGTH	WT.	BAR NO.	LENGTH	WT.	BAR NO.	LENGTH	WT.						
FENCE ANCHOR (GALV.)	5fa	2	3'-1	6	5fa	2	3'-1	6	5fa	2	3'-1	6	5fa	2	3'-1	6	5fa	2	3'-1	6	5fa	2	3'-1	6	5fa	2	3'-1	6	5fa	2	3'-1	6					
WINGWALL, F.F.H.	5b1	2	39'-10	83	5b1	2	36'-10	77	5b1	2	33'-10	71	5b1	2	30'-10	64	5b1	2	27'-10	58	5b1	2	24'-10	52	5b1	2	21'-10	46	5b1	2	18'-10	39					
WINGWALL, F.F.H.	5b2	22 VAR	2 EACH 8'-10:38'-10	547	5b2	20 VAR	2 EACH 8'-10:35'-10	466	5b2	18 VAR	2 EACH 8'-10:32'-10	391	5b2	16 VAR	2 EACH 8'-10:29'-10	323	5b2	14 VAR	2 EACH 8'-10:26'-10	260	5b2	12 VAR	2 EACH 8'-10:23'-10	204	5b2	10 VAR	2 EACH 8'-10:20'-10	155	5b2	8 VAR	2 EACH 8'-10:17'-10	111					
WINGWALL, B.F.H.	4b3	2	39'-10	53	4b3	2	36'-10	49	4b3	2	33'-10	45	4b3	2	30'-10	41	4b3	2	27'-10	37	4b3	2	24'-10	33	4b3	2	21'-10	29	4b3	2	18'-10	25					
WINGWALL, B.F.H.	4b4	20 VAR	2 EACH 11'-10:38'-10	338	4b4	18 VAR	2 EACH 11'-10:35'-10	287	4b4	16 VAR	2 EACH 11'-10:32'-10	239	4b4	14 VAR	2 EACH 11'-10:29'-10	195	4b4	12 VAR	2 EACH 11'-10:26'-10	155	4b4	10 VAR	2 EACH 11'-10:23'-10	119	4b4	8 VAR	2 EACH 11'-10:20'-10	87	4b4	6 VAR	2 EACH 11'-10:17'-10	59					
WINGWALL, F.F.V.	5c1	148 VAR	2 EACH 2'-9:14'-11	1364	5c1	90 VAR	2 EACH 2'-9:13'-9	774	5c1	82 VAR	2 EACH 2'-9:12'-9	663	5c1	56 VAR	2 EACH 2'-9:11'-9	423	4c1	50 VAR	2 EACH 2'-9:10'-9	225	4c1	44 VAR	2 EACH 2'-9:9'-9	184	4c1	38 VAR	2 EACH 2'-9:8'-9	146	4c1	32 VAR	2 EACH 2'-9:7'-9	112					
WINGWALL, F.F.V. (L)	5c2	2	15'-0	31	5c2	2	14'-0	29	5c2	2	13'-0	27	5c2	2	12'-0	25	4c2	2	11'-0	15	4c2	2	10'-0	13	4c2	2	9'-0	12	4c2	2	8'-0	11					
WINGWALL, F.F.V. (R)	5c2	2	15'-0	31	5c2	2	14'-0	29	5c2	2	13'-0	27	5c2	2	12'-0	25	4c2	2	11'-0	15	4c2	2	10'-0	13	4c2	2	9'-0	12	4c2	2	8'-0	11					
WINGWALL, B.F.V.	6c3	74 VAR	2 EACH 6'-4:18'-4	1371	5c3	68 VAR	2 EACH 6'-4:17'-4	839	5c3	62 VAR	2 EACH 6'-4:16'-4	733	5c3	56 VAR	2 EACH 6'-4:15'-4	633	5c3	50 VAR	2 EACH 6'-4:14'-4	539	5c3	44 VAR	2 EACH 6'-4:13'-4	451	5c3	38 VAR	2 EACH 6'-4:12'-4	370	6c3	32 VAR	2 EACH 6'-4:11'-4	425					
WINGWALL, B.F.V. (L)	6c4	2	18'-6	56	5c4	2	17'-6	37	5c4	2	16'-6	34	5c4	2	15'-6	32	5c4	2	14'-6	30	5c4	2	13'-6	28	5c4	2	12'-6	26	6c4	2	11'-6	35					
WINGWALL, B.F.V. (R)	6c4	2	18'-6	56	5c4	2	17'-6	37	5c4	2	16'-6	34	5c4	2	15'-6	32	5c4	2	14'-6	30	5c4	2	13'-6	28	5c4	2	12'-6	26	6c4	2	11'-6	35					
WINGWALL, B.F.V.	6c5	48	8'-6	613	5c5	44	8'-6	390	5c5	42	8'-6	372	5c5	38	8'-6	337	5c5	34	8'-6	301	5c5	30	8'-6	266	5c5	26	8'-6	231	c5	—	—	c5	—				
APRON, LONGIT., BOT.	4d1	11	39'-10	293	4d1	11	36'-10	271	4d1	11	33'-10	249	4d1	11	30'-10	227	4d1	11	27'-10	205	4d1	11	24'-10	182	4d1	11	21'-10	160	4d1	11	18'-10	138					
APRON, LONGIT., TOP	6f1	13	39'-10	778	6f1	13	36'-10	719	6f1	13	33'-10	661	6f1	13	30'-10	602	6f1	13	27'-10	543	6f1	13	24'-10	485	6f1	13	21'-10	426	6f1	13	18'-10	368					
PARAPET, VERTICAL	4i1	25	6'-5	107	4i1	25	6'-5	107	4i1	25	6'-5	107	4i1	25	6'-5	107	4i1	25	6'-5	107	4i1	25	6'-5	107	4i1	25	6'-5	107	4i1	25	6'-5	107					
PARAPET, HORIZ.	7j1	4	13'-8	112	7j1	4	13'-8	112	7j1	4	13'-4	109	7j1	4	13'-4	109	7j1	4	13'-4	109	7j1	4	13'-2	108	7j1	4	13'-2	108	7j1	4	13'-2	108					
APRON, TRANS., TOP	6m1	51	14'-2	1085	6m1	47	14'-2	1000	6m1	43	13'-10	893	6m1	39	13'-10	810	6m1	35	13'-10	727	6m1	31	13'-8	636	6m1	27	13'-8	554	6m1	23	13'-8	472					
APRON, TRANS., BOT.	5m3	73	10'-11	831	6m3	34	11'-9	600	5m3	31	10'-7	342	5m3	28	10'-7	309	4m3	25	9'-9	163	4m3	22	9'-7	141	4m3	19	9'-7	122	4m3	16	9'-7	102					
CURTAIN, HORIZ.	6p1	6	14'-2	128	6p1	6	14'-2	128	6p1	6	13'-10	125	6p1	6	13'-10	125	6p1	5	13'-8	103	6p1	5	13'-8	103	6p1	5	13'-8	103	6p1	5	13'-8	103					
WING SLOPE, BOTH F.	6s1	4	35'-8	214	6s1	4	32'-6	195	6s1	4	29'-4	176	6s1	4	26'-2	157	6s1	4	23'-0	138	6s1	4	19'-10	119	6s1	4	16'-8	100	6s1	4	13'-7	82					
WING SLOPE, BOTH F. (L)	6s2	2	7'-9	23	6s2	2	7'-9	23	6s2	2	7'-9	23	6s2	2	7'-9	23	6s2	2	7'-9	23	6s2	2	7'-9	23	6s2	2	7'-9	23	6s2	2	7'-9	23					
WING SLOPE, BOTH F. (R)	6s3	2	7'-9	23	6s3	2	7'-9	23	6s3	2	7'-9	23	6s3	2	7'-9	23	6s3	2	7'-9	23	6s3	2	7'-9	23	6s3	2	7'-9	23	6s3	2	7'-9	23					
WING SLOPE, F. F.	6s4	2	11'-0	33	6s4	2	11'-0	33	6s4	2	11'-0	33	6s4	2	11'-0	33	6s4	2	11'-0	33	6s4	2	11'-0	33	6s4	2	11'-0	33	6s4	2	11'-0	33					
WING SLOPE, F. F.	6s5	2	33'-5	100	6s5	2	30'-3	91	6s5	2	27'-1	81	6s5	2	23'-11	72	6s5	2	20'-9	62	6s5	2	17'-7	53	6s5	2	14'-5	43	6s5	2	11'-3	34					
CURTAIN, VERT.	5t1	13	7'-11	107	5t1	13	7'-8	104	5t1	13	7'-5	101	5t1	13	7'-2	97	5t1	13	6'-11	94	5t1	13	6'-8	90	5t1	13	6'-5	87	5t1	13	6'-5	87					
CURTAIN, VERT., ENDS	5t2	4	7'-11	33	5t2	4	7'-8	32	5t2	4	7'-5	31	5t2	4	7'-2	30	5t2	4	6'-11	29	5t2	4	6'-8	28	5t2	4	6'-5	27	5t2	4	6'-5	27					
BRACKET, VERT.	5u1	4	6'-8	28	5u1	4	6'-5	27	5u1	4	6'-2	26	5u1	4	6'-0	25	5u1	4	5'-9	24	5u1	4	5'-7	23	5u1	4	5'-4	22	5u1	4	5'-4	22					

ESTIMATED QUANTITIES ONE HEADWALL	REINF. STEEL	8444 LBS.						6485 LBS.						5622 LBS.						4885 LBS.						4076 LBS.						3551 LBS.						3084 LBS.						2598 LBS.						2177 LBS.					
	CONCRETE	PARAPET Δ	1.7	WINGWALLS	21.8	APRON	28.2	PARAPET Δ	1.7	WINGWALLS	18.7	APRON	26.0	PARAPET Δ	1.5	WINGWALLS	13.2	APRON	23.2	PARAPET Δ	1.5	WINGWALLS	11.0	APRON	21.1	PARAPET Δ	1.5	WINGWALLS	9.0	APRON	18.9	PARAPET Δ	1.5	WINGWALLS	6.4	APRON	16.6	PARAPET Δ	1.5	WINGWALLS	5.0	APRON	14.5	PARAPET Δ	1.5	WINGWALLS	3.7	APRON	12.5	PARAPET Δ	1.5	WINGWALLS	2.5	APRON	10.6

Δ INCLUDES TOP OF WINGWALL QUANTITIES. (L) - INDICATES BAR LOCATED AT LEFT CORNER. (R) - INDICATES BAR LOCATED AT RIGHT CORNER. NOTE: WEIGHT OF BARS OVER 40'-0 LONG INCLUDE AN ALLOWANCE OF 2'-0 FOR LAP. REFER TO SHEET PWH 0-1-12 FOR LEFT AND RIGHT CORNER LOCATIONS.

HEADWALL NOTES:

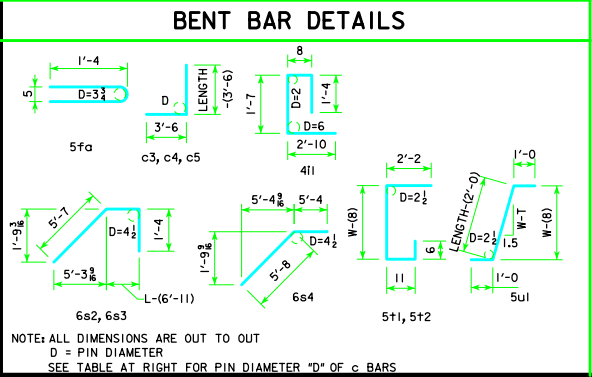
THIS HEADWALL IS BASED ON A 3:1 SLOPE NORMAL TO CENTERLINE OF ROADWAY.
 THE SIDES OF THE FOOTING ARE TO BE FORMED TO INSURE CORRECT LINE AND GRADE.
 ALL EXPOSED CORNERS OF 90° OR SHARPER ARE TO BE FILLETED WITH A 3/4" DRESSED AND BEVELED STRIP.
 ALL REINFORCING IS TO BE SECURELY WIRED IN PLACE BEFORE THE CONCRETE IS POURED. ALL SLAB AND FLOOR REINFORCING STEEL IS TO BE SUPPORTED BY BAR CHAIRS AT INTERVALS OF NOT MORE THAN 3'-0 IN EITHER DIRECTION AS OUTLINED IN THE STANDARD SPECIFICATIONS.

CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN. CLEARANCE TO THE BOTTOM ENDS OF VERTICAL BARS SHALL BE 3 INCHES.

CONCRETE QUANTITIES ARE ESTIMATED FROM BACK OF PARAPET.

HORIZONTAL TAILS OF BARS "b" & "s" ESTIMATED TO EXTEND 2'-0 BEYOND BACK OF PARAPET (INTO END OF BARREL). LONGITUDINAL BARS "4d1" AND "6f1" ESTIMATED TO PROJECT INTO END SECTION OF BARREL A MINIMUM OF 2'-0 BEYOND BACK OF PARAPET. THE "LENGTH" COLUMN REFLECTS TOTAL NUMBER OF FEET NECESSARY TO MEET THESE REQUIREMENTS.

c BAR PIN DIAMETER	
BAR SIZE	D
4	3/8"
5	3/4"
6	1/2"



NOTE: ALL DIMENSIONS ARE OUT TO OUT
 D = PIN DIAMETER
 SEE TABLE AT RIGHT FOR PIN DIAMETER "D" OF c BARS

LATEST REVISION DATE <i>Thomas E. M. Powell</i> APPROVED BY BRIDGE ENGINEER	
	STANDARD DESIGN - SINGLE REINFORCED CONCRETE BOX CULVERTS PARALLEL WING HEADWALLS
	APRIL, 2012
	QUANTITY TABULATION 12'-0 SPAN 0° SKEW
PWH 0-5-12	

ENGLISH \ REDS \ GINEDS \ IN \ CULVERTS \ .DGN - PWH 0-5-12 - THIS SHEET ISSUED 04-12-