

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

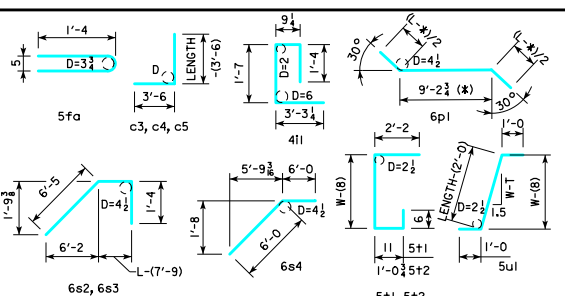
LOCATION	SHAPE	8' x 10'				8' x 9'				8' x 8'				8' x 7'				8' x 6'				8' x 5'				8' x 4'			
		BAR NO.	LENGTH	WT.		BAR NO.	LENGTH	WT.		BAR NO.	LENGTH	WT.		BAR NO.	LENGTH	WT.		BAR NO.	LENGTH	WT.		BAR NO.	LENGTH	WT.		BAR NO.	LENGTH	WT.	
FENCE ANCHOR (GALV.)		5fa	2	2'-10	6	5fa	2	2'-10	6	5fa	2	2'-10	6	5fa	2	2'-10	6	5fa	2	2'-10	6	5fa	2	2'-10	6	5fa	2	2'-10	6
WINGWALL, F.F.H.		5b1	2	38'-11	81	5b1	2	35'-5	74	5b1	2	32'-0	67	5b1	2	28'-6	59	5b1	2	25'-1	52	5b1	2	21'-7	45	5b1	2	18'-1	38
WINGWALL, F.F.H.		5b2	18 VAR	2 EACH 10'-1137'-9	449	5b2	16 VAR	2 EACH 10'-1134'-4	371	5b2	14 VAR	2 EACH 10'-1130'-10	299	5b2	12 VAR	2 EACH 10'-1127'-4	234	5b2	10 VAR	2 EACH 10'-0123'-11	177	5b2	8 VAR	2 EACH 10'-0120'-7	127	5b2	6 VAR	2 EACH 10'-0117'-0	84
WINGWALL, B.F.H.		4b3	2	39'-2	52	4b3	2	35'-8	48	4b3	2	32'-3	43	4b3	2	28'-8	38	4b3	2	25'-3	34	4b3	2	21'-9	29	4b3	2	18'-4	24
WINGWALL, B.F.H.		4b4	16 VAR	2 EACH 13'-9138'-0	277	4b4	14 VAR	2 EACH 13'-9134'-6	226	4b4	12 VAR	2 EACH 13'-9127'-1	180	4b4	10 VAR	2 EACH 13'-9124'-7	138	4b4	8 VAR	2 EACH 13'-9124'-1	101	4b4	6 VAR	2 EACH 13'-9120'-7	69	4b4	4 VAR	2 EACH 13'-9117'-2	41
WINGWALL, F.F.V.		5c1	142 VAR	2 EACH 2'-61127'-7	1117	6c1	64 VAR	2 EACH 2'-6111'-5	669	5c1	58 VAR	2 EACH 2'-6110'-7	396	5c1	50 VAR	2 EACH 2'-610'-5	311	4c1	44 VAR	2 EACH 2'-610'-6	162	4c1	36 VAR	2 EACH 2'-610'-5	119	4c1	30 VAR	2 EACH 2'-610'-6	90
WINGWALL, F.F.V. (O)		5c2	2	12'-9	27	6c2	2	11'-9	35	5c2	2	10'-9	22	5c2	2	9'-9	20	4c2	2	8'-9	12	4c2	2	7'-9	10	4c2	2	6'-9	9
WINGWALL, F.F.V. (A)		5c2	2	12'-9	27	6c2	2	11'-9	35	5c2	2	10'-9	22	5c2	2	9'-9	20	4c2	2	8'-9	12	4c2	2	7'-9	10	4c2	2	6'-9	9
WINGWALL, B.F.V.		6c3	72 VAR	2 EACH 6'-11116'-2	1203	5c3	64 VAR	2 EACH 6'-1111'-0	704	5c3	58 VAR	2 EACH 6'-1114'-2	613	5c3	50 VAR	2 EACH 6'-1113'-0	498	6c3	44 VAR	2 EACH 6'-1112'-1	600	6c3	36 VAR	2 EACH 6'-1111'-0	462	5c3	30 VAR	2 EACH 6'-1110'-1	253
WINGWALL, B.F.V. (O)		6c4	1	16'-3	24	5c4	1	15'-3	16	5c4	1	14'-3	15	5c4	1	13'-3	14	6c4	1	12'-3	18	6c4	1	11'-3	17	5c4	1	10'-3	11
WINGWALL, B.F.V. (A)		6c4	3	16'-3	73	5c4	3	15'-3	48	5c4	3	14'-3	45	5c4	3	13'-3	41	6c4	3	12'-3	55	6c4	3	11'-3	51	5c4	3	10'-3	32
WINGWALL, B.F.V.		6c5	46	8'-6	587	5c5	42	8'-6	48	5c5	36	8'-6	319	5c5	34	8'-6	301	6c5	—	—	—	—	—	—	—	—	—	—	—
APRON, LONGIT., BOT.		4d1	7	38'-9	181	4d1	7	35'-4	165	4d1	7	31'-10	149	4d1	7	28'-5	133	4d1	7	24'-11	117	4d1	7	21'-6	101	4d1	7	18'-0	84
APRON, LONGIT., TOP		6f1	9	38'-9	524	6f1	9	35'-4	478	6f1	9	31'-10	430	6f1	9	28'-5	384	6f1	9	24'-11	337	6f1	9	21'-6	291	6f1	9	18'-0	243
PARAPET, VERTICAL		4i1	19	7'-0	89	4i1	19	7'-0	89	4i1	19	7'-0	89	4i1	19	7'-0	89	4i1	19	7'-0	89	4i1	19	7'-0	89	4i1	19	7'-0	89
PARAPET, HORIZ.		7j1	4	10'-9	88	7j1	4	10'-9	88	7j1	4	10'-9	88	7j1	4	10'-7	87	7j1	4	10'-7	87	7j1	4	10'-7	87	7j1	4	10'-7	87
APRON, TRANS., TOP		6m1	35	9'-10	517	6m1	31	9'-10	458	6m1	28	9'-10	414	6m1	24	9'-8	348	6m1	21	9'-8	305	6m1	17	9'-8	247	6m1	14	9'-8	203
APRON, TRANS., BOT.		5m3	61	8'-1	509	6m3	28	8'-11	375	6m3	25	8'-11	335	5m3	22	7'-10	180	4m3	19	7'-0	89	4m3	16	7'-0	75	4m3	13	7'-0	61
CURTAIN, HORIZ.		6p1	6	11'-1	100	6p1	6	11'-1	100	6p1	6	11'-1	100	6p1	5	10'-11	82	6p1	5	10'-11	82	6p1	5	10'-11	82	6p1	5	10'-11	82
WING SLOPE, BOTH F.		6s1	4	33'-1	199	6s1	4	29'-5	177	6s1	4	25'-10	155	6s1	4	22'-3	134	6s1	4	18'-8	112	6s1	4	15'-0	90	6s1	4	11'-5	69
WING SLOPE, BOTH F. (O)		6s2	2	8'-5	25	6s2	2	8'-5	25	6s2	2	8'-5	25	6s2	2	8'-5	25	6s2	2	8'-4	25	6s2	2	8'-4	25	6s2	2	8'-4	25
WING SLOPE, BOTH F. (A)		6s3	2	8'-10	27	6s3	2	8'-10	27	6s3	2	8'-10	27	6s3	2	8'-10	27	6s3	2	8'-9	26	6s3	2	8'-9	26	6s3	2	8'-9	26
WING SLOPE, F. F.		6s4	2	12'-0	36	6s4	2	12'-0	36	6s4	2	12'-0	36	6s4	2	12'-0	36	6s4	2	12'-0	36	6s4	2	12'-0	36	6s4	2	12'-0	36
WING SLOPE, F. F. (O)		6s5	2	30'-10	93	6s5	2	27'-3	82	6s5	2	23'-8	71	6s5	2	20'-0	60	6s5	2	16'-5	49	6s5	2	12'-10	39	6s5	2	9'-3	28
CURTAIN, VERT.		5t1	10	7'-5	77	5t1	10	7'-2	75	5t1	10	6'-11	72	5t1	10	6'-8	70	5t1	10	6'-5	67	5t1	10	6'-5	67	5t1	10	6'-5	67
CURTAIN, VERT., ENDS		5t2	4	7'-7	32	5t2	4	7'-4	31	5t2	4	7'-1	30	5t2	4	6'-10	29	5t2	4	6'-7	27	5t2	4	6'-7	27	5t2	4	6'-7	27
BRACKET, VERT.		5u1	4	6'-2	26	5u1	4	5'-11	25	5u1	4	5'-8	24	5u1	4	5'-6	23	5u1	4	5'-3	22	5u1	4	5'-3	22	5u1	4	5'-3	22
ESTIMATED QUANTITIES ONE HEADWALL	REINF. STEEL	6476 LBS.				4870 LBS.				4103 LBS.				3423 LBS.				2730 LBS.				2285 LBS.				1778 LBS.			
	CONCRETE	32.9 CU.YD.				29.0 CU.YD.				25.2 CU.YD.				20.4 CU.YD.				17.2 CU.YD.				14.4 CU.YD.				11.8 CU.YD.			
		PARAPET Δ	1.4			PARAPET Δ	1.4			PARAPET Δ	1.4			PARAPET Δ	1.3			PARAPET Δ	1.3			PARAPET Δ	1.3			PARAPET Δ	1.3		
		WINGWALLS	15.2			WINGWALLS	12.7			WINGWALLS	10.4			WINGWALLS	7.4			WINGWALLS	5.7			WINGWALLS	4.2			WINGWALLS	2.9		
		APRON	16.3			APRON	14.9			APRON	13.4			APRON	11.7			APRON	10.2			APRON	8.9			APRON	7.6		

Δ INCLUDES TOP OF WINGWALL QUANTITIES.

(A) - INDICATES BAR LOCATED AT ACUTE CORNER.
(O) - INDICATES BAR LOCATED AT OBTUSE CORNER.
REFER TO SHEET PWH 30-1-12 FOR ACUTE AND OBTUSE CORNER LOCATIONS.

NOTE: WEIGHT OF BARS OVER 40'-0" LONG INCLUDE AN ALLOWANCE OF 2'-0" FOR LAP.

BENT BAR DETAILS



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

BAR SIZE	D
4	3
5	3 1/4
6	4 1/2

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.

07-2016 LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER <i>Thomas E. Mc Donnell</i>	
		STANDARD DESIGN - SINGLE REINFORCED CONCRETE BOX CULVERTS PARALLEL WING HEADWALLS
		APRIL, 2012
QUANTITY TABULATION		8'-0" SPAN 30° SKEW
PWH 30-7-12		