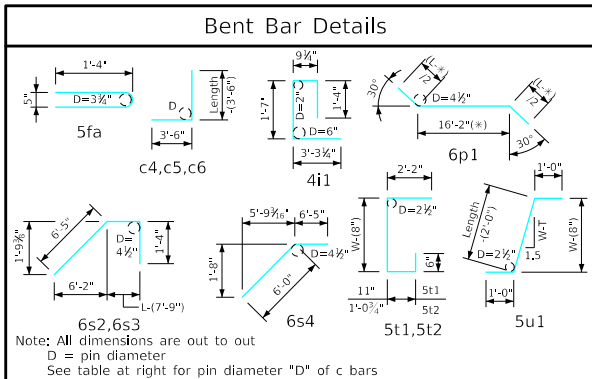


Bill of Reinforcing for One Headwall 30° Skew Span x Culvert Height

Location	Shape	14' x 14'				14' x 13'				14' x 12'				14' x 11'				14' x 10'				14' x 9'				14' x 8'				14' x 7'			
		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	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	5fa	2	2'-10"	6
Wingwall, F.F.H.		5b1	2	53'-2"	116	5b1	2	49'-8"	109	5b1	2	46'-2"	101	5b1	2	42'-9"	94	5b1	2	39'-3"	82	5b1	2	35'-10"	75	5b1	2	32'-4"	67	5b1	2	28'-11"	60
Wingwall, F.F.H.		5b2	24 Var.	2 Each 10'-0 to 51'-7"	855	5b2	24 Var.	2 Each 10'-0 to 48'-1"	742	5b2	22 Var.	2 Each 10'-0 to 44'-7"	636	5b2	20 Var.	2 Each 10'-0 to 41'-2"	539	5b2	18 Var.	2 Each 10'-0 to 37'-8"	447	5b2	16 Var.	2 Each 10'-0 to 34'-3"	369	5b2	14 Var.	2 Each 10'-0 to 30'-9"	298	5b2	12 Var.	2 Each 10'-0 to 27'-4"	234
Wingwall, B.F.H.		4b3	2	53'-6"	75	4b3	2	50'-1"	70	4b3	2	46'-6"	65	4b3	2	43'-1"	61	4b3	2	39'-6"	53	4b3	2	36'-1"	48	4b3	2	32'-7"	44	4b3	2	29'-1"	39
Wingwall, B.F.H.		4b4	24 Var.	2 Each 13'-10 to 51'-11"	540	4b4	22 Var.	2 Each 13'-10 to 48'-5"	467	4b4	20 Var.	2 Each 13'-9 to 44'-11"	398	4b4	18 Var.	2 Each 13'-9 to 41'-6"	335	4b4	16 Var.	2 Each 13'-8 to 37'-11"	276	4b4	14 Var.	2 Each 13'-8 to 34'-5"	225	4b4	12 Var.	2 Each 13'-7 to 31'-0"	179	4b4	10 Var.	2 Each 13'-7 to 27'-6"	137
Wingwall, F.F.V.		5c1	100 Var.	2 Each 2'-9 to 16'-11"	1026	5c1	92 Var.	2 Each 2'-9 to 15'-9"	888	5c1	86 Var.	2 Each 2'-9 to 14'-10"	789	5c1	78 Var.	2 Each 2'-9 to 13'-9"	671	4c1	72 Var.	2 Each 2'-9 to 12'-10"	375	4c1	64 Var.	2 Each 2'-9 to 11'-8"	308	4c1	76 Var.	2 Each 2'-9 to 10'-9"	343	4c1	68 Var.	2 Each 2'-9 to 9'-11"	288
Wingwall, F.F.V.		5c2	54 Var.	2 Each 9'-3 to 16'-9"	732	5c2	48 Var.	2 Each 9'-3 to 15'-11"	630	5c2	40 Var.	2 Each 9'-3 to 14'-9"	501	5c2	34 Var.	2 Each 9'-3 to 13'-10"	409	4c2	26 Var.	2 Each 9'-3 to 12'-8"	190	4c2	20 Var.	2 Each 9'-3 to 11'-10"	141	c2	--	--	--	c2	--	--	--
Wingwall, F.F.V. (O)		5c3	2	17'-2"	36	5c3	2	16'-2"	34	5c3	2	15'-2"	32	5c3	2	14'-2"	30	4c3	2	13'-2"	18	4c3	2	12'-2"	16	4c3	2	11'-2"	15	4c3	2	10'-2"	14
Wingwall, F.F.V. (A)		5c3	2	17'-2"	36	5c3	2	16'-2"	34	5c3	2	15'-2"	32	5c3	2	14'-2"	30	4c3	2	13'-2"	18	4c3	2	12'-2"	16	4c3	2	11'-2"	15	4c3	2	10'-2"	14
Wingwall, B.F.V.		6c4	100 Var.	2 Each 6'-5 to 20'-7"	2028	6c4	92 Var.	2 Each 6'-5 to 19'-5"	1785	6c4	86 Var.	2 Each 6'-5 to 18'-7"	1615	5c4	78 Var.	2 Each 6'-5 to 17'-5"	969	4c4	72 Var.	2 Each 6'-5 to 16'-6"	860	5c4	64 Var.	2 Each 6'-5 to 15'-5"	729	5c4	58 Var.	2 Each 6'-5 to 14'-6"	633	5c4	50 Var.	2 Each 6'-5 to 13'-4"	515
Wingwall, B.F.V. (O)		6c5	1	20'-8"	31	6c5	1	19'-8"	30	6c5	1	18'-8"	28	5c5	1	17'-8"	18	5c5	1	16'-8"	17	5c5	1	15'-8"	16	5c5	1	14'-8"	15	5c5	1	13'-8"	14
Wingwall, B.F.V. (A)		6c5	3	20'-8"	93	6c5	3	19'-8"	89	6c5	3	18'-8"	84	5c5	3	17'-8"	55	5c5	3	16'-8"	52	5c5	3	15'-8"	49	5c5	3	14'-8"	46	5c5	3	13'-8"	43
Wingwall, B.F.V.		7c6	70	9'-6"	1359	6c6	64	8'-6"	817	6c6	56	8'-6"	715	5c6	50	8'-6"	643	5c6	42	8'-6"	372	5c6	36	8'-6"	319	5c6	28	8'-6"	248	5c6	22	8'-6"	195
Apron, Longit., Bott.		4d1	15	53'-0"	555	4d1	15	49'-7"	521	4d1	15	46'-1"	486	4d1	15	42'-7"	451	4d1	15	39'-2"	392	4d1	15	35'-8"	357	4d1	15	32'-3"	323	4d1	15	28'-9"	288
Apron, Longit., Top		6f1	15	53'-0"	1249	6f1	15	49'-7"	1172	6f1	15	46'-1"	1093	6f1	15	42'-7"	1014	6f1	15	39'-2"	882	6f1	15	35'-8"	804	6f1	15	32'-3"	727	6f1	15	28'-9"	648
Parapet, Vertical		4i1	29	7'-0"	136	4i1	29	7'-0"	136	4i1	29	7'-0"	136	4i1	29	7'-0"	136	4i1	29	7'-0"	136	4i1	29	7'-0"	136	4i1	29	7'-0"	136	4i1	29	7'-0"	136
Parapet, Horiz.		9j1	4	18'-3"	248	9j1	4	18'-3"	248	9j1	4	18'-1"	246	9j1	4	18'-1"	246	9j1	4	17'-8"	240	9j1	4	17'-8"	240	9j1	4	17'-8"	240	9j1	4	17'-6"	238
Apron, Trans., Top		5m1	93	16'-4"	1584	5m1	86	16'-4"	1465	5m1	79	16'-2"	1332	5m1	72	16'-2"	1214	5m1	65	15'-10"	1073	5m1	58	15'-10"	958	5m1	51	15'-10"	842	5m1	44	15'-8"	719
Apron, Trans., Bott.		5m2	15 Var.	2'-7 to 14'-8"	135	5m2	15 Var.	2'-7 to 14'-9"	136	5m2	15 Var.	2'-7 to 14'-8"	135	5m2	15 Var.	2'-8 to 14'-9"	136	5m2	15 Var.	2'-8 to 14'-8"	134	5m2	15 Var.	2'-7 to 14'-9"	136	5m2	15 Var.	2'-8 to 14'-10"	137	5m2	15 Var.	2'-8 to 14'-9"	136
Apron, Trans., Bott.		6m3	85	16'-0"	2043	6m3	79	16'-0"	1899	5m3	73	15'-0"	1142	6m3	45	15'-10"	1070	6m3	31	15'-5"	718	5m3	28	14'-8"	428	5m3	25	14'-8"	382	5m3	22	14'-5"	331
Curtain, Horiz.		6p1	7	18'-6"	195	6p1	7	18'-6"	195	6p1	6	18'-4"	165	6p1	6	18'-4"	165	6p1	6	18'-0"	162	6p1	6	18'-0"	162	6p1	6	18'-0"	162	6p1	5	17'-10"	134
Wing Slope, Both F.		6s1	4	47'-7"	300	6s1	4	43'-11"	278	6s1	4	40'-4"	257	6s1	4	36'-9"	221	6s1	4	33'-2"	199	6s1	4	29'-6"	177	6s1	4	25'-11"	156	6s1	4	22'-4"	134
Wing Slope, Both F. (O)		6s2	2	8'-2"	25	6s2	2	8'-2"	25	6s2	2	8'-3"	25	6s2	2	8'-3"	25	6s2	2	8'-4"	25	6s2	2	8'-4"	25	6s2	2	8'-4"	25	6s2	2	8'-4"	25
Wing Slope, Both F. (A)		6s3	2	8'-9"	26	6s3	2	8'-9"	26	6s3	2	8'-9"	26	6s3	2	8'-9"	26	6s3	2	8'-9"	26	6s3	2	8'-9"	26	6s3	2	8'-9"	26	6s3	2	8'-9"	26
Wing Slope, F.F.		6s4	2	12'-5"	37	6s4	2	12'-5"	37	6s4	2	12'-5"	37	6s4	2	12'-5"	37	6s4	2	12'-5"	37	6s4	2	12'-5"	37	6s4	2	12'-5"	37	6s4	2	12'-5"	37
Wing Slope, F.F.		6s5	2	45'-1"	143	6s5	2	41'-6"	132	6s5	2	37'-11"	114	6s5	2	34'-3"	103	6s5	2	30'-8"	92	6s5	2	27'-1"	81	6s5	2	23'-5"	70	6s5	2	19'-10"	60
Curtain, Vert.		5t1	17	8'-5"	149	5t1	17	8'-2"	145	5t1	17	7'-11"	140	5t1	17	7'-8"	136	5t1	17	7'-5"	132	5t1	17	7'-2"	127	5t1	17	6'-11"	123	5t1	17	6'-8"	118
Curtain, Vert. Ends		5t2	4	8'-7"	36	5t2	4	8'-4"	35	5t2	4	8'-1"	34	5t2	4	7'-10"	33	5t2	4	7'-7"	32	5t2	4	7'-4"	31	5t2	4	7'-1"	30	5t2	4	6'-10"	29
Bracket, Vert.		5u1	4	7'-1"	30	5u1	4	6'-4"	29	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
Estimated Quantities One Headwall	Reinf. Steel	13,824 LB				12,180 LB				10,398 LB				8700 LB				7072 LB				6067 LB				5349 LB				4641 LB			
	Concrete	83.4 CY				75.9 CY				66.1 CY				59.5 CY				49.2 CY				43.7 CY				38.4 CY				32.2 CY			

Δ Includes top of wingwall quantities.
 * Assumes apron and floor are equal thickness, adjust concrete quantities for transition where apron and floor thickness are not equal.
 (A) - Indicates bar located at acute corner.
 (O) - Indicates bar located at obtuse corner.
 Refer to Sheet PWH 30-1-20 for acute and obtuse corner locations.

Note: Weight of bars over 40'-0" long include an allowance of 2'-5" for lap.



Headwall Notes:

- This headwall is based on a 3:1 slope normal to centerline of roadway.
- The sides of the apron are to be formed to ensure correct line and grade.
- All apron 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'-5" 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'-5" beyond back of parapet. The "length" column reflects total number of feet necessary to meet these requirements.
- Dimensions are in feet and inches unless otherwise noted.

LATEST REVISION DATE	
	Standard Design - Single Reinforced Concrete Box Culverts
	Parallel Wing Headwalls
	July, 2020
Quantity Tabulation	PWH 30-6-20 SHEET 1 OF 2
14'-0" Span	
30° Skew	