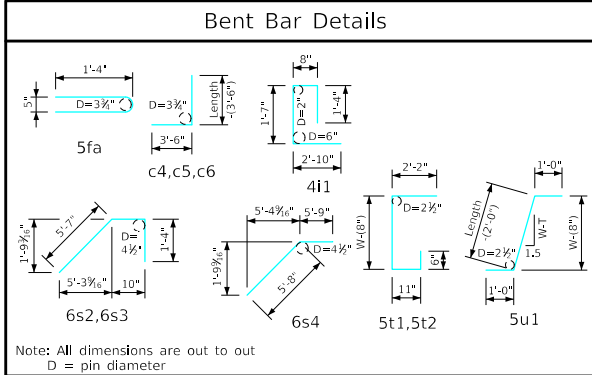


Bill of Reinforcing for One Headwall 0° Skew Span x Culvert Height

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	34'-3"	71	5b1	2	31'-3"	65	5b1	2	28'-3"	59	5b1	2	25'-3"	53	5b1	2	22'-3"	46	5b1	2	19'-3"	40	5b1	2	16'-3"	34
Wingwall, F.F.H.		5b2	18 Var.	2 Each 8'-10 to 32'-10	391	5b2	16 Var.	2 Each 8'-10 to 29'-10	323	5b2	14 Var.	2 Each 8'-10 to 26'-10	260	5b2	12 Var.	2 Each 8'-10 to 23'-10	204	5b2	10 Var.	2 Each 8'-10 to 20'-10	155	5b2	8 Var.	2 Each 8'-10 to 17'-10	111	5b2	6 Var.	2 Each 8'-10 to 14'-10	74
Wingwall, B.F.H.		4b3	2	34'-3"	46	4b3	2	31'-3"	42	4b3	2	28'-3"	38	4b3	2	25'-3"	34	4b3	2	22'-3"	30	4b3	2	19'-3"	26	4b3	2	16'-3"	22
Wingwall, B.F.H.		4b4	16 Var.	2 Each 11'-10 to 32'-10	239	4b4	14 Var.	2 Each 11'-10 to 29'-10	195	4b4	12 Var.	2 Each 11'-10 to 26'-10	155	4b4	10 Var.	2 Each 11'-10 to 23'-10	119	4b4	8 Var.	2 Each 11'-10 to 20'-10	87	4b4	6 Var.	2 Each 11'-10 to 17'-10	59	4b4	4 Var.	2 Each 11'-10 to 14'-10	36
Wingwall, F.F.V.		4c1	62 Var.	2 Each 2'-5 to 12'-5	307	4c1	56 Var.	2 Each 2'-5 to 11'-5	259	4c1	66 Var.	2 Each 2'-5 to 10'-5	283	4c1	58 Var.	2 Each 2'-5 to 9'-5	229	4c1	50 Var.	2 Each 2'-5 to 8'-5	181	4c1	32 Var.	2 Each 2'-5 to 7'-5	105	4c1	26 Var.	2 Each 2'-5 to 6'-5	77
Wingwall, F.F.V.		4c2	24 Var.	2 Each 8'-11 to 12'-7	172	4c2	18 Var.	2 Each 8'-11 to 11'-7	123	c2	--	--	--	c2	--	--	--	c2	--	--	--	c2	--	--	--	c2	--	--	--
Wingwall, F.F.V. (L)		4c3	2	12'-10"	17	4c3	2	11'-10"	16	4c3	2	10'-10"	14	4c3	2	9'-10"	13	4c3	2	8'-10"	12	4c3	2	7'-10"	10	4c3	2	6'-10"	9
Wingwall, F.F.V. (R)		4c3	2	12'-10"	17	4c3	2	11'-10"	16	4c3	2	10'-10"	14	4c3	2	9'-10"	13	4c3	2	8'-10"	12	4c3	2	7'-10"	10	4c3	2	6'-10"	9
Wingwall, B.F.V.		5c4	62 Var.	2 Each 6'-1 to 16'-1	717	5c4	56 Var.	2 Each 6'-1 to 15'-1	618	5c4	50 Var.	2 Each 6'-1 to 14'-1	526	5c4	44 Var.	2 Each 6'-1 to 13'-1	440	5c4	38 Var.	2 Each 6'-1 to 12'-1	360	5c4	32 Var.	2 Each 6'-1 to 11'-1	286	5c4	26 Var.	2 Each 6'-1 to 10'-1	219
Wingwall, B.F.V. (L)		5c5	2	16'-4"	34	5c5	2	15'-4"	32	5c5	2	14'-4"	30	5c5	2	13'-4"	28	5c5	2	12'-4"	26	5c5	2	11'-4"	24	5c5	2	10'-4"	22
Wingwall, B.F.V. (R)		5c5	2	16'-4"	34	5c5	2	15'-4"	32	5c5	2	14'-4"	30	5c5	2	13'-4"	28	5c5	2	12'-4"	26	5c5	2	11'-4"	24	5c5	2	10'-4"	22
Wingwall, B.F.V.		5c6	38	8'-6"	337	5c6	32	8'-6"	284	5c6	26	8'-6"	231	5c6	20	8'-6"	177	5c6	14	8'-6"	124	c6	--	--	--	--	--	--	
Apron, Longit., Bott.		4d1	9	34'-3"	206	4d1	9	31'-3"	188	4d1	9	28'-3"	170	4d1	9	25'-3"	152	4d1	9	22'-3"	134	4d1	9	19'-3"	116	4d1	9	16'-3"	98
Apron, Longit., Top		6f1	9	34'-3"	463	6f1	9	31'-3"	422	6f1	9	28'-3"	382	6f1	9	25'-3"	341	6f1	9	22'-3"	301	6f1	9	19'-3"	260	6f1	9	16'-3"	220
Parapet, Vertical		4i1	17	6'-5"	73	4i1	17	6'-5"	73	4i1	17	6'-5"	73	4i1	17	6'-5"	73	4i1	17	6'-5"	73	4i1	17	6'-5"	73	4i1	17	6'-5"	73
Parapet, Horiz.		7j1	4	9'-4"	76	7j1	4	9'-4"	76	7j1	4	9'-4"	76	7j1	4	9'-2"	75	7j1	4	9'-2"	75	7j1	4	9'-2"	75	7j1	4	9'-2"	75
Apron, Trans., Top		5m1	32	9'-10"	328	5m1	29	9'-10"	297	5m1	26	9'-10"	267	5m1	23	9'-8"	232	5m1	20	9'-8"	202	5m1	17	9'-8"	171	5m1	14	9'-8"	141
Apron, Trans., Bott.		m2	--	--	--	m2	--	--	--	m2	--	--	--	m2	--	--	--	m2	--	--	--	m2	--	--	--	m2	--	--	--
Curtain, Horiz.		5m3	61	6'-3"	398	5m3	55	6'-3"	359	5m3	33	6'-3"	215	5m3	22	6'-1"	140	4m3	19	5'-4"	68	4m3	16	5'-4"	57	4m3	13	5'-4"	46
Wing Slope, Both F.		6p1	6	9'-10"	89	6p1	6	9'-10"	89	6p1	6	9'-10"	89	6p1	5	9'-8"	73	6p1	5	9'-8"	73	6p1	5	9'-8"	73	6p1	5	9'-8"	73
Wing Slope, Both F. (L)		6s1	4	29'-5"	177	6s1	4	26'-3"	158	6s1	4	23'-1"	139	6s1	4	19'-11"	120	6s1	4	16'-9"	101	6s1	4	13'-7"	82	6s1	4	10'-5"	63
Wing Slope, Both F. (R)		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, F.F.		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'-5"	34	6s4	2	11'-5"	34	6s4	2	11'-5"	34	6s4	2	11'-5"	34	6s4	2	11'-5"	34	6s4	2	11'-5"	34	6s4	2	11'-5"	34
Curtain, Vert.		6s5	2	26'-10"	81	6s5	2	23'-8"	71	6s5	2	20'-6"	62	6s5	2	17'-4"	52	6s5	2	14'-2"	43	6s5	2	11'-0"	33	6s5	2	7'-10"	24
Curtain, Vert., Ends		5t1	9	7'-5"	70	5t1	9	7'-2"	67	5t1	9	6'-8"	65	5t1	9	6'-5"	60	5t1	9	6'-5"	60	5t1	9	6'-5"	60	5t1	9	6'-5"	60
Bracket, Vert.		5u1	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	5t2	4	6'-5"	27
Bracket, Vert.		5u1	4	6'-1"	25	5u1	4	5'-11"	25	5u1	4	5'-8"	24	5u1	4	5'-5"	23	5u1	4	5'-3"	22	5u1	4	5'-3"	22	5u1	4	5'-3"	22
Estimated Quantities One Headwall	Reinf. Steel	4485 LB				3946 LB				3317 LB				2796 LB				2324 LB				1830 LB				1532 LB			
	Concrete	28.6 CY				25.1 CY				21.8 CY				17.7 CY				14.9 CY				12.5 CY				10.2 CY			
	Parapet Δ	1.3				1.3				1.3				1.2				1.2				1.2				1.2			
	Wingwalls	13.0				10.8				8.8				6.3				4.8				3.5				2.4			
	Apron *	14.3				13.0				11.7				10.2				8.9				7.8				6.6			

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.
 (L) - Indicates bar located at left corner.
 (R) - Indicates bar located at right corner.
 Refer to Sheet PWH 0-1-20 for left and right 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	 APPROVED BY BRIDGE ENGINEER	 Standard Design - Single Reinforced Concrete Box Culverts
		Parallel Wing Headwalls July, 2020
		Quantity Tabulation 8'-0" Span 0° Skew PWH 0-9-20