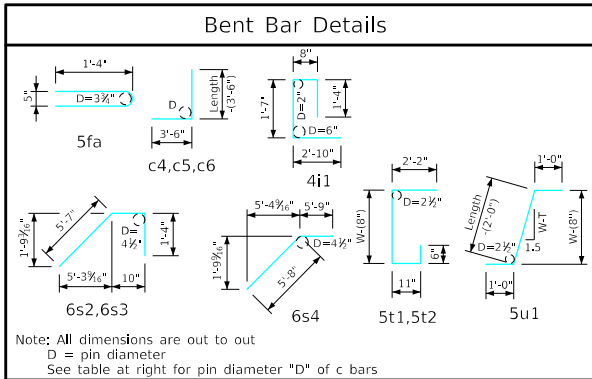


### Bill of Reinforcing for One Headwall 0° Skew Span x Culvert Height

Location	Shape	16' x 14'				16' x 13'				16' x 12'				16' x 11'				16' x 10'				16' x 9'				16' x 8'				16' 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	46'-3"	102	5b1	2	43'-3"	95	5b1	2	40'-3"	89	5b1	2	37'-3"	78	5b1	2	34'-3"	71	5b1	2	31'-3"	65	5b1	2	28'-3"	59	5b1	2	25'-3"	53
Wingwall, F.F.H.		5b2	24 Var.	2 Each 8'-10 To 44'-10	738	5b2	24 Var.	2 Each 8'-10 to 41'-3	639	5b2	22 Var.	2 Each 8'-10 to 38'-10	547	5b2	20 Var.	2 Each 8'-10 to 35'-10	466	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
Wingwall, B.F.H.		4b3	2	46'-3"	65	4b3	2	43'-3"	61	4b3	2	40'-3"	57	4b3	2	37'-3"	50	4b3	2	34'-3"	46	4b3	2	31'-3"	42	4b3	2	28'-3"	38	4b3	2	25'-3"	34
Wingwall, B.F.H.		4b4	24 Var.	2 Each 11'-10 To 44'-10	461	4b4	22 Var.	2 Each 11'-10 to 41'-10	398	4b4	20 Var.	2 Each 11'-10 to 38'-10	338	4b4	18 Var.	2 Each 11'-10 to 35'-10	287	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
Wingwall, F.F.V.		5c1	86 Var.	2 Each 2'-10 To 16'-10	882	5c1	80 Var.	2 Each 2'-10 to 15'-10	779	5c1	74 Var.	2 Each 2'-10 to 14'-10	682	5c1	68 Var.	2 Each 2'-10 to 13'-10	591	4c1	62 Var.	2 Each 2'-10 to 12'-10	324	4c1	56 Var.	2 Each 2'-10 to 11'-10	274	4c1	66 Var.	2 Each 2'-10 to 10'-10	301	4c1	58 Var.	2 Each 2'-10 to 9'-10	245
Wingwall, F.F.V.		5c2	48 Var.	2 Each 9'-4 To 17'-0	659	5c2	42 Var.	2 Each 9'-4 to 16'-0	555	5c2	36 Var.	2 Each 9'-4 to 15'-0	457	5c2	30 Var.	2 Each 9'-4 to 14'-0	365	4c2	24 Var.	2 Each 9'-4 to 13'-0	179	4c2	18 Var.	2 Each 9'-4 to 12'-0	128	c2	--	--	--	c2	--	--	
Wingwall, F.F.V. (L)		5c3	2	17'-3"	36	5c3	2	16'-3"	34	5c3	2	15'-3"	32	5c3	2	14'-3"	30	4c3	2	13'-3"	18	4c3	2	12'-3"	16	4c3	2	11'-3"	15	4c3	2	10'-3"	14
Wingwall, F.F.V. (R)		5c3	2	17'-3"	36	5c3	2	16'-3"	34	5c3	2	15'-3"	32	5c3	2	14'-3"	30	4c3	2	13'-3"	18	4c3	2	12'-3"	16	4c3	2	11'-3"	15	4c3	2	10'-3"	14
Wingwall, B.F.V.		6c4	86 Var.	2 Each 6'-6 To 20'-6	1744	6c4	80 Var.	2 Each 6'-6 to 19'-6	1562	6c4	74 Var.	2 Each 6'-6 to 18'-6	1389	5c4	68 Var.	2 Each 6'-6 to 17'-6	851	5c4	62 Var.	2 Each 6'-6 to 16'-6	744	5c4	56 Var.	2 Each 6'-6 to 15'-6	642	5c4	50 Var.	2 Each 6'-6 to 14'-6	548	5c4	44 Var.	2 Each 6'-6 to 13'-6	459
Wingwall, B.F.V. (L)		6c5	2	20'-9"	62	6c5	2	19'-9"	59	6c5	2	18'-9"	56	5c5	2	17'-9"	37	5c5	2	16'-9"	35	5c5	2	15'-9"	33	5c5	2	14'-9"	31	5c5	2	13'-9"	29
Wingwall, B.F.V. (R)		6c5	2	20'-9"	62	6c5	2	19'-9"	59	6c5	2	18'-9"	56	5c5	2	17'-9"	37	5c5	2	16'-9"	35	5c5	2	15'-9"	33	5c5	2	14'-9"	31	5c5	2	13'-9"	29
Wingwall, B.F.V.		7c6	62	9'-3"	1172	6c6	56	8'-6"	715	6c6	50	8'-6"	638	5c6	44	8'-6"	390	5c6	38	8'-6"	337	5c6	32	8'-6"	284	5c6	26	8'-6"	231	5c6	20	8'-6"	177
Apron, Longit., Bott.		4d1	17	46'-3"	553	4d1	17	43'-3"	519	4d1	17	40'-3"	485	4d1	17	37'-3"	423	4d1	17	34'-3"	389	4d1	17	31'-3"	355	4d1	17	28'-3"	321	4d1	17	25'-3"	287
Apron, Longit., Top		6f1	17	46'-3"	1243	6f1	17	43'-3"	1166	6f1	17	40'-3"	1089	6f1	17	37'-3"	951	6f1	17	34'-3"	875	6f1	17	31'-3"	798	6f1	17	28'-3"	721	6f1	17	25'-3"	645
Parapet, Vertical		4i1	33	6'-5"	141	4i1	33	6'-5"	141	4i1	33	6'-5"	141	4i1	33	6'-5"	141	4i1	33	6'-5"	141	4i1	33	6'-5"	141	4i1	33	6'-5"	141	4i1	33	6'-5"	141
Parapet, Horiz.		9j1	4	17'-10"	243	9j1	4	17'-10"	243	9j1	4	17'-8"	240	9j1	4	17'-4"	236	9j1	4	17'-4"	236	9j1	4	17'-4"	236	9j1	4	17'-4"	236	9j1	4	17'-4"	236
Apron, Trans., Top		5m1	88	18'-4"	1683	5m1	82	18'-4"	1568	5m1	76	18'-2"	1440	5m1	70	18'-2"	1326	5m1	64	17'-10"	1190	5m1	58	17'-10"	1079	5m1	52	17'-10"	967	5m1	46	17'-8"	848
Apron, Trans., Bott.		m2	--	--	--	m2	--	--	--	m2	--	--	--	m2	--	--	--	m2	--	--	--	m2	--	--	--	m2	--	--	--	m2	--	--	
Apron, Trans., Bott.		6m3	85	15'-7"	1990	5m3	79	14'-9"	1215	5m3	73	14'-7"	1110	6m3	34	15'-5"	787	6m3	31	15'-1"	702	5m3	28	14'-3"	416	5m3	25	14'-3"	372	5m3	22	14'-1"	323
Curtain, Horiz.		6p1	7	18'-4"	193	6p1	7	18'-4"	193	6p1	6	18'-2"	164	6p1	6	18'-2"	164	6p1	6	17'-10"	161	6p1	6	17'-10"	161	6p1	6	17'-10"	161	6p1	5	17'-8"	133
Wing Slope, Both F.		6s1	4	42'-0"	267	6s1	4	38'-10"	233	6s1	4	35'-8"	214	6s1	4	32'-7"	196	6s1	4	29'-5"	177	6s1	4	26'-3"	158	6s1	4	23'-1"	139	6s1	4	19'-11"	120
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'-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	6s4	2	11'-5"	34
Wing Slope, F.F.		6s5	2	39'-5"	118	6s5	2	36'-4"	109	6s5	2	33'-2"	100	6s5	2	30'-0"	90	6s5	2	26'-10"	81	6s5	2	23'-8"	71	6s5	2	20'-6"	62	6s5	2	17'-4"	52
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'-5"	35	5t2	4	8'-2"	34	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
Bracket, Vert.		5u1	4	7'-1"	30	5u1	4	6'-10"	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	12,750 LB				10,671 LB				9643 LB				7811 LB				6664 LB				5734 LB				5066 LB				4414 LB			
	Concrete	79.4 CY				72.6 CY				63.3 CY				57.1 CY				47.8 CY				42.5 CY				37.5 CY				31.6 CY			
	Parapet Δ	2.1				2.1				2.0				2.0				1.9				1.9				1.8							
	Wingwalls	30.7				26.9				21.5				18.4				13.0				10.8				8.8							
	Apron *	46.6				43.6				39.8				36.7				32.9				29.8				26.8							

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 16'-0" Span 0° Skew
		PWH 0-5-20 SHEET 1 OF 2