



c Bar Pin Diameter	
Bar Size	D
5	3 3/4"
6	4 1/2"

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

Bill of Reinforcing for One Headwall 45° Skew Span x Culvert Height

Location	Shape	10' x 6'				10' x 5'				10' x 4'								
		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						
Wingwall, F.F.H.	5b1	2	30'-9	64	5b1	2	26'-6	55	5b1	2	22'-3	46						
Wingwall, F.F.H.	5b2	10 Var.	2 Each 11'-9 to 28'-9	211	5b2	8 Var.	2 Each 11'-9 to 24'-6	151	5b2	6 Var.	2 Each 11'-9 to 20'-3	100						
Wingwall, B.F.H.	4b3	2	31'-0	41	4b3	2	26'-9	36	4b3	2	22'-6	30						
Wingwall, B.F.H.	4b4	8 Var.	2 Each 16'-4 to 29'-1	121	4b4	6 Var.	2 Each 16'-4 to 24'-10	82	4b4	4 Var.	2 Each 16'-4 to 20'-7	49						
Interior Wall, Both F.H.	5b5	18 Var.	2 Each 9'-0 to 29'-10	365	5b5	14 Var.	2 Each 9'-2 to 25'-7	254	5b5	10 Var.	2 Each 9'-6 to 21'-3	160						
Wingwall, F.F.V.	4c1	72 Var.	2 Each 2'-7 to 8'-9	273	4c1	46 Var.	2 Each 2'-7 to 7'-9	159	4c1	36 Var.	2 Each 2'-7 to 6'-7	110						
Wingwall, F.F.V.	c2	--	--	--	c2	--	--	--	c2	--	--	--						
Wingwall, F.F.V. (O)	4c3	2	9'-0	12	4c3	2	8'-0	11	4c3	2	7'-0	9						
Wingwall, F.F.V. (A)	4c3	3	9'-0	18	4c3	3	8'-0	16	4c3	3	7'-0	14						
Wingwall, B.F.V.	5c4	54 Var.	2 Each 6'-9 to 12'-10	551	6c4	60 Var.	2 Each 6'-9 to 11'-10	837	6c4	48 Var.	2 Each 6'-9 to 10'-10	634						
Wingwall, B.F.V. (O)	5c5	1	13'-0	14	6c5	1	12'-0	18	6c5	1	11'-0	17						
Wingwall, B.F.V. (A)	5c5	4	13'-0	54	6c5	4	12'-0	72	6c5	4	11'-0	66						
Wingwall, B.F.V.	5c6	16	9'-0	150	c6	--	--	--	c6	--	--	--						
Interior Wall, Both F.V	4c7	4	3'-9	10	4c7	4	3'-9	10	4c7	4	3'-9	10						
Interior Wall, Both F.V	4c8	102 Var.	2 Each 1'-5 to 6'-2	258	4c8	84 Var.	2 Each 1'-5 to 5'-2	185	4c8	68 Var.	2 Each 1'-5 to 4'-2	127						
Interior Wall, Both F.V	4c9	4	6'-6	17	4c9	4	5'-6	15	4c9	4	4'-6	12						
Apron, Longit., Bott.	4d1	33	30'-6	672	4d1	33	26'-3	579	4d1	33	22'-0	485						
Apron, Longit., Top	6f1	33	30'-6	1512	6f1	33	26'-3	1301	6f1	33	22'-0	1090						
Parapet, Vertical	4i1	63	7'-10	330	4i1	63	7'-10	330	4i1	63	7'-10	330						
Parapet, Horiz.	7j1	4	46'-2	397	7j1	4	46'-2	397	7j1	4	46'-2	397						
Apron, Trans., Top	5m1	24	33'-2	830	5m1	16	33'-2	553	5m1	7	33'-2	242						
Apron, Trans., Top	5m2	61 Var.	2'-3 to 32'-3	1097	5m2	61 Var.	2'-0 to 32'-0	1082	5m2	61 Var.	2'-3 to 32'-3	1097						
Apron, Trans., Bott.	5m3	19	42'-2	884	5m3	16	42'-2	744	5m3	13	42'-2	605						
Curtain, Horiz.	6p1	5	46'-2	365	6p1	5	46'-2	365	6p1	5	46'-2	365						
Wing Slope, Both F.	6s1	4	22'-2	133	6s1	4	17'-9	107	6s1	4	13'-5	81						
Wing Slope, Both F. (O)	6s2	2	9'-8	29	6s2	2	9'-8	29	6s2	2	9'-8	29						
Wing Slope, Both F. (A)	6s3	2	10'-5	31	6s3	2	10'-5	31	6s3	2	10'-5	31						
Wing Slope, F.F.	6s4	2	14'-1	42	6s4	2	14'-1	42	6s4	2	14'-1	42						
Wing Slope, F.F.	6s5	2	19'-8	59	6s5	2	15'-4	46	6s5	2	11'-0	33						
Interior Wall, Both F.	6s6	4	31'-1	187	6s6	4	26'-8	160	6s6	4	22'-4	134						
Curtain, Vert.	5t1	45	6'-5	301	5t1	45	6'-5	301	5t1	45	6'-5	301						
Curtain, Vert. Ends	5t2	4	6'-10	29	5t2	4	6'-10	29	5t2	4	6'-10	29						
Bracket, Vert.	5u1	4	5'-4	22	5u1	4	5'-4	22	5u1	4	5'-4	22						
Estimated Quantities One Headwall	Reinf. Steel	9085 LB				8025 LB				6703 LB								
	Concrete	Parapet Δ	4.3	61.7 CY	Parapet Δ	4.3	52.4 CY	Parapet Δ	4.3	43.7 CY	Wingwalls	11.5	33.8	Wingwalls	5.6	33.8	Apron =	45.9

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 TRPWH 45-1-20 for acute and obtuse corner locations.

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 - Triple Reinforced Concrete Box Culverts Parallel Wing Headwalls July, 2020 Quantity Tabulation 10'-0" Span 45° Skew	TRPWH 45-7-20 Sheet 2 of 2
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