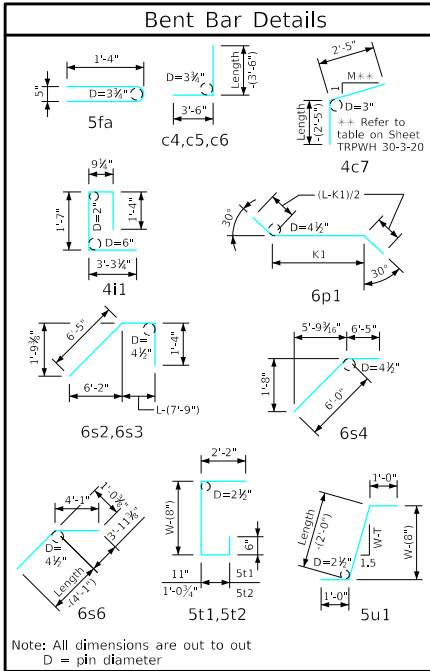


ENGLISHLRFDDESIGNEDTRIPLECULVERTS.DGN - TRPWH 30-5-20 S2 - THIS SHEET ISSUED 07-2020.



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

Location	Shape	12' x 6'				12' x 5'				12' 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	25'-5	53	5b1	2	22'-0	46	5b1	2	18'-6	39	
Wingwall, F.F.H.	5b2	10 Var.	2 Each 10'-0 to 23'-10	176	5b2	8 Var.	2 Each 10'-0 to 20'-5	127	5b2	6 Var.	2 Each 10'-0 to 16'-11	84	
Wingwall, B.F.H.	4b3	2	25'-7	34	4b3	2	22'-2	30	4b3	2	18'-8	25	
Wingwall, B.F.H.	4b4	8 Var.	2 Each 13'-7 to 24'-0	100	4b4	6 Var.	2 Each 13'-7 to 20'-7	68	4b4	4 Var.	2 Each 13'-7 to 17'-1	41	
Interior Wall, Both F.H.	5b5	18 Var.	2 Each 7'-7 to 24'-10	304	5b5	14 Var.	2 Each 7'-9 to 21'-4	212	5b5	10 Var.	2 Each 8'-1 to 17'-10	135	
Wingwall, F.F.V.	4c1	58 Var.	2 Each 2'-8 to 8'-9	221	4c1	36 Var.	2 Each 2'-8 to 7'-7	123	4c1	30 Var.	2 Each 2'-8 to 6'-8	94	
Wingwall, F.F.V.	c2	--	--	--	c2	--	--	--	c2	--	--	--	
Wingwall, F.F.V. (O)	4c3	2	9'-1	12	4c3	2	8'-1	11	4c3	2	7'-1	9	
Wingwall, F.F.V. (A)	4c3	2	9'-1	12	4c3	2	8'-1	11	4c3	2	7'-1	9	
Wingwall, B.F.V.	5c4	44 Var.	2 Each 6'-4 to 12'-5	430	5c4	48 Var.	2 Each 6'-4 to 11'-4	442	5c4	40 Var.	2 Each 6'-4 to 10'-6	351	
Wingwall, B.F.V. (O)	5c5	1	12'-7	13	5c5	1	11'-7	12	5c5	1	10'-7	11	
Wingwall, B.F.V. (A)	5c5	3	12'-7	39	5c5	3	11'-7	36	5c5	3	10'-7	33	
Wingwall, B.F.V.	5c6	14	8'-6	124	c6	--	--	--	c6	--	--	--	
Interior Wall, Both F.V	4c7	4	3'-10	10	4c7	4	3'-10	10	4c7	4	3'-10	10	
Interior Wall, Both F.V	4c8	84 Var.	2 Each 1'-6 to 6'-4	220	4c8	70 Var.	2 Each 1'-6 to 5'-4	160	4c8	56 Var.	2 Each 1'-6 to 4'-3	108	
Interior Wall, Both F.V	4c9	4	6'-7	18	4c9	4	5'-7	15	4c9	4	4'-7	12	
Apron, Longit., Bott.	4d1	39	25'-4	660	4d1	39	21'-10	569	4d1	39	18'-4	478	
Apron, Longit., Top	6f1	39	25'-4	1484	6f1	39	21'-10	1279	6f1	39	18'-4	1074	
Parapet, Vertical	4i1	75	7'-0	351	4i1	75	7'-0	351	4i1	75	7'-0	351	
Parapet, Horiz.	7j1	4	44'-7	384	7j1	4	44'-7	384	7j1	4	44'-7	384	
Apron, Trans., Top	5m1	24	39'-2	980	5m1	17	39'-2	694	5m1	10	39'-2	409	
Apron, Trans., Top	5m2	42 Var.	2'-4 to 37'-10	880	5m2	42 Var.	2'-5 to 37'-11	883	5m2	42 Var.	2'-6 to 38'-0	887	
Apron, Trans., Bott.	4m3	19	40'-10	549	4m3	21	40'-10	607	4m3	13	40'-10	376	
Curtain, Horiz.	6p1	5	44'-11	355	6p1	5	44'-11	355	6p1	5	44'-11	355	
Wing Slope, Both F.	6s1	4	18'-8	112	6s1	4	15'-1	91	6s1	4	11'-6	69	
Wing Slope, Both F. (O)	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	
Wing Slope, F.F.	6s4	2	12'-5	37	6s4	2	12'-5	37	6s4	2	12'-5	37	
Wing Slope, F.F.	6s5	2	16'-3	49	6s5	2	12'-8	38	6s5	2	9'-0	27	
Interior Wall, Both F.	6s6	4	25'-11	156	6s6	4	22'-4	134	6s6	4	18'-9	113	
Curtain, Vert.	5t1	44	6'-5	294	5t1	44	6'-5	294	5t1	44	6'-5	294	
Curtain, Vert. Ends	5t2	4	6'-7	27	5t2	4	6'-7	27	5t2	4	6'-7	27	
Bracket, Vert.	5u1	4	5'-4	22	5u1	4	5'-4	22	5u1	4	5'-4	22	
Estimated Quantities One Headwall	Reinf. Steel	8163 LB				7125 LB				5921 LB			
	Concrete	Parapet Δ	4.0		4.0		4.0		4.0		4.0		
		Wingwalls	9.4		6.8		51.1		4.6		42.6		
		Apron =	46.5		40.3				34.0				

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

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 30-1-20 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 <h2 style="margin: 0;">Parallel Wing Headwalls</h2> July, 2020 Quantity Tabulation 12'-0" Span 30° Skew	TRPWH 30-6-20 Sheet 2 of 2
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