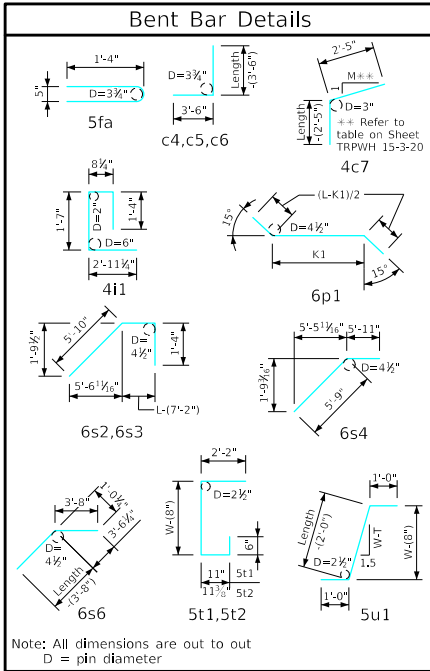


ENGLISHLRFDDESIGNEDTRIPLECULVERTS.DGN - TRPWH 15-7-20 S2 - THIS SHEET ISSUED 07-2020.



Bill of Reinforcing for One Headwall 15° 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	23'-0	48	5b1	2	19'-10	41	5b1	2	16'-9	35	
Wingwall, F.F.H.	5b2	10 Var.	2 Each 9'-2 to 21'-7	160	5b2	8 Var.	2 Each 9'-2 to 18'-5	115	5b2	6 Var.	2 Each 9'-2 to 15'-4	77	
Wingwall, B.F.H.	4b3	2	23'-1	31	4b3	2	19'-11	27	4b3	2	16'-10	22	
Wingwall, B.F.H.	4b4	8 Var.	2 Each 12'-4 to 21'-8	91	4b4	6 Var.	2 Each 12'-4 to 18'-6	62	4b4	4 Var.	2 Each 12'-4 to 15'-5	37	
Interior Wall, Both F.H.	5b5	18 Var.	2 Each 6'-11 to 22'-6	276	5b5	14 Var.	2 Each 7'-1 to 19'-4	193	5b5	10 Var.	2 Each 7'-4 to 16'-2	123	
Wingwall, F.F.V.	4c1	52 Var.	2 Each 2'-7 to 8'-8	195	4c1	34 Var.	2 Each 2'-7 to 7'-9	117	4c1	26 Var.	2 Each 2'-7 to 6'-5	78	
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	2	9'-0	12	4c3	2	8'-0	11	4c3	2	7'-0	9	
Wingwall, B.F.V.	5c4	40 Var.	2 Each 6'-3 to 12'-5	389	5c4	34 Var.	2 Each 6'-3 to 11'-5	313	5c4	26 Var.	2 Each 6'-3 to 10'-2	223	
Wingwall, B.F.V. (O)	5c5	1	12'-6	13	5c5	1	11'-6	12	5c5	1	10'-6	11	
Wingwall, B.F.V. (A)	5c5	2	12'-6	26	5c5	2	11'-6	24	5c5	2	10'-6	22	
Wingwall, B.F.V.	5c6	12	8'-6	106	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	74 Var.	2 Each 1'-6 to 6'-1	187	4c8	62 Var.	2 Each 1'-6 to 5'-2	138	4c8	50 Var.	2 Each 1'-5 to 4'-2	93	
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	22'-11	505	4d1	33	19'-10	437	4d1	33	16'-8	367	
Apron, Longit., Top	6f1	33	22'-11	1136	6f1	33	19'-10	983	6f1	33	16'-8	826	
Parapet, Vertical	4i1	63	6'-7	277	4i1	63	6'-7	277	4i1	63	6'-7	277	
Parapet, Horiz.	7j1	4	33'-9	276	7j1	4	33'-9	276	7j1	4	33'-9	276	
Apron, Trans., Top	5m1	22	33'-2	761	5m1	18	33'-2	623	5m1	13	33'-2	450	
Apron, Trans., Top	5m2	11 Var.	2'-4 to 30'-4	187	5m2	10 Var.	4'-9 to 29'-11	181	5m2	11 Var.	4'-4 to 32'-4	210	
Apron, Trans., Bott.	4m3	19	30'-1	382	4m3	16	30'-1	322	4m3	13	30'-1	261	
Curtain, Horiz.	6p1	5	34'-3	257	6p1	5	34'-3	257	6p1	5	34'-3	257	
Wing Slope, Both F.	6s1	4	17'-1	103	6s1	4	13'-10	83	6s1	4	10'-7	64	
Wing Slope, Both F. (O)	6s2	2	7'-10	24	6s2	2	7'-10	24	6s2	2	7'-10	24	
Wing Slope, Both F. (A)	6s3	2	8'-0	24	6s3	2	8'-0	24	6s3	2	8'-0	24	
Wing Slope, F.F.	6s4	2	11'-8	35	6s4	2	11'-8	35	6s4	2	11'-8	35	
Wing Slope, F.F.	6s5	2	14'-8	44	6s5	2	11'-4	34	6s5	2	8'-1	24	
Interior Wall, Both F.	6s6	4	23'-7	142	6s6	4	20'-4	122	6s6	4	17'-1	103	
Curtain, Vert.	5t1	33	6'-5	221	5t1	33	6'-5	221	5t1	33	6'-5	221	
Curtain, Vert. Ends	5t2	4	6'-5	27	5t2	4	6'-5	27	5t2	4	6'-5	27	
Bracket, Vert.	5u1	4	5'-4	22	5u1	4	5'-4	22	5u1	4	5'-4	22	
Estimated Quantities One Headwall	Reinf. Steel	6002 LB				5043 LB				4235 LB			
	Concrete	Parapet Δ	3.1		3.1		3.1		3.1		3.1		
		Wingwalls	8.4	45.1 CY	6.1	38.4 CY	4.1	31.9 CY	4.1	31.9 CY			
		Apron =	33.6		29.2		24.7		24.7				

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 15-1-20 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

Standard Design - Triple Reinforced Concrete Box Culverts

Parallel Wing Headwalls

July, 2020

Quantity Tabulation

10'-0" Span

15° Skew

TRPWH

15-7-20

Sheet 2 of 2

APPROVED BY BRIDGE ENGINEER