

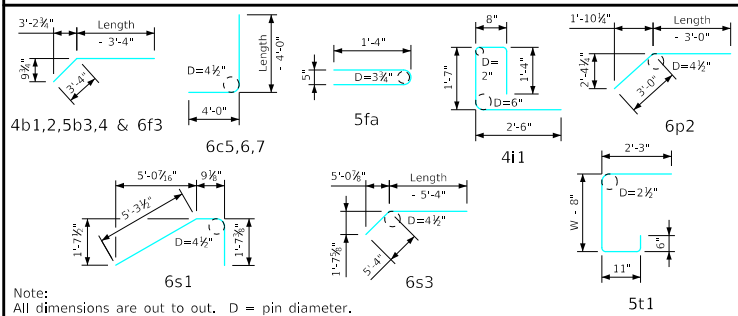
Bill of Reinforcing for One Headwall 0° Skew Span x Culvert Height

Bar	Location	Shape	10' x 6'			10' x 5'			10' x 4'			Bar		
			No.	Length	Wt.	No.	Length	Wt.	No.	Length	Wt.			
5fa	Fence Anchor (Galv.)		2	2'-10"	6	2	2'-10"	6	2	2'-10"	6	5fa		
4b1	Wingwall, B.F.H.		2	22'-8"	30	2	19'-7"	26	2	16'-6"	22	4b1		
4b2	Wingwall, B.F.H.		8 Var.	2 Each 11'-11" to 21'-3"	89	6 Var.	2 Each 11'-11" to 18'-2"	60	4 Var.	2 Each 11'-11" to 15'-1"	36	4b2		
5b3	Wingwall, F.F.H.		2	22'-8"	47	2	19'-7"	41	2	16'-6"	34	5b3		
5b4	Wingwall, F.F.H.		10 Var.	2 Each 8'-11" to 21'-3"	157	8 Var.	2 Each 8'-11" to 18'-2"	113	6 Var.	2 Each 8'-11" to 15'-1"	75	5b4		
4c1	Wingwall, F.F.V.		40 Var.	2 Each 2'-9" to 8'-11"	156	32 Var.	2 Each 2'-9" to 7'-8"	111	26 Var.	2 Each 2'-9" to 6'-8"	82	4c1		
4c2	Wingwall, F.F.V.		--	--	--	--	--	--	--	--	--	4c2		
4c3	Wingwall, F.F.V.		2	7'-8"	10	4	6'-8"	18	4	5'-8"	15	4c3		
5c4	Wingwall, B.F.V.		12 Var.	2 Each 2'-9" to 4'-5"	45	12 Var.	2 Each 2'-9" to 4'-5"	45	12 Var.	2 Each 2'-9" to 4'-5"	45	5c4		
6c5	Wingwall, B.F.V.		28 Var.	2 Each 8'-9" to 12'-11"	456	20 Var.	2 Each 8'-9" to 11'-8"	307	14 Var.	2 Each 8'-9" to 10'-8"	204	6c5		
6c6	Wingwall, B.F.V.		--	--	--	--	--	--	--	--	--	6c6		
6c7	Wingwall, B.F.V.		2	11'-8"	35	4	10'-8"	64	4	9'-8"	58	6c7		
4d1	Apron, Longit., Bott.		7	15'-11"	74	7	13'-11"	65	7	11'-11"	56	4d1		
4d2	Apron, Longit., Bott.		6	17'-8"	71	6	14'-7"	58	6	11'-6"	46	4d2		
6f1	Apron, Longit., Top		9	15'-11"	215	9	13'-11"	188	9	11'-11"	161	6f1		
6f2	Apron, Longit., Top		8 Var.	2 Each 4'-7" to 12'-10"	105	6 Var.	2 Each 5'-4" to 10'-10"	73	4 Var.	2 Each 6'-1" to 8'-10"	45	6f2		
6f3	Apron, Longit., Top		2	22'-8"	68	2	19'-7"	59	2	16'-6"	50	6f3		
4i1	Parapet, Vertical		21	6'-1"	85	21	6'-1"	85	21	6'-1"	85	4i1		
7j1	Parapet, Horizontal		4	11'-2"	91	4	11'-2"	91	4	11'-2"	91	7j1		
6m1	Apron, Trans., Top		18 Var.	11'-4" to 17'-9"	393	15 Var.	11'-4" to 16'-7"	314	13 Var.	11'-4" to 15'-10"	265	6m1		
6m2	Apron, Trans., Bott.		12 Var.	5'-9" to 11'-3"	153	10 Var.	5'-9" to 10'-3"	120	8 Var.	5'-9" to 9'-3"	90	6m2		
6p1	Curtain, Horizontal		4	10'-3"	62	4	10'-3"	62	4	10'-3"	62	6p1		
6p2	Curtain, Horizontal		8	11'-1"	133	8	9'-10"	118	8	8'-7"	103	6p2		
6s1	Wing Slope, Both F.		4	7'-8"	46	4	7'-8"	46	4	7'-8"	46	6s1		
6s2	Wing Slope, Both F.		4	17'-7"	106	4	14'-4"	86	4	11'-1"	67	6s2		
6s3	Wing Slope, F.F.		2	23'-8"	71	2	20'-5"	61	2	17'-2"	52	6s3		
5t1	Curtain, Vertical		17	6'-6"	115	15	6'-6"	102	13	6'-6"	88	5t1		
Estimated Quantities One Headwall			Reinf. Steel			2819 LB			2319 LB			1884 LB		
			Concrete	Parapet Δ	1.4	20.5 CY	1.4	16.9 CY	1.4	13.4 CY				
Wingwalls	5.0	3.7	2.5											
Apron *	14.1	11.8	9.5											

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.

Note: Weight of bars over 40'-0" long include an allowance of 2'-5" for lap. Lengths shown for bars over 40'-0" long do not include lap.

Bent Bar Details



Headwall Notes:

- See Sheet FWH G2-21 for General Notes, Specifications, and Design Stresses.
- 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 "d", "6f1" and "6f3" 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	
		Flared Wing Headwalls	
		February, 2021	
Quantity Tabulation		10'-0" Span	FWH 0-8-21
0° Skew		Sheet 2 of 2	