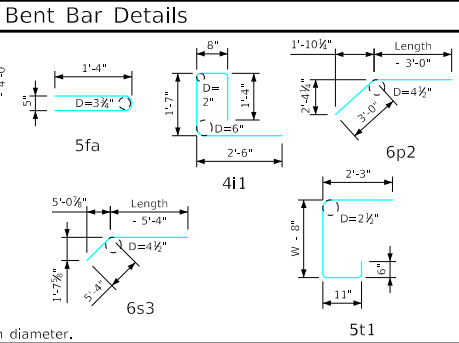


Bill of Reinforcing for One Headwall 0° Skew Span x Culvert Height

Bar	Location	Shape	6' x 8'			6' x 7'			6' x 6'			6' x 5'			6' x 4'			6' x 3'			Bar		
			No.	Length	Wt.	No.	Length	Wt.	No.	Length	Wt.	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	2	2'-10"	6	2	2'-10"	6	2	2'-10"	6	5fa		
4b1	Wingwall, B.F.H.		2	28'-10"	39	2	25'-9"	34	2	22'-8"	30	2	19'-7"	26	2	16'-6"	22	2	13'-5"	18	4b1		
4b2	Wingwall, B.F.H.		12 Var.	2 Each 11'-11 to 27'-5"	158	10 Var.	2 Each 11'-11 to 24'-4"	121	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	2	12'-0"	16	4b2		
5b3	Wingwall, F.F.H.		2	28'-11"	60	2	25'-9"	54	2	22'-8"	47	2	19'-7"	41	2	16'-6"	34	2	13'-5"	28	5b3		
5b4	Wingwall, F.F.H.		14 Var.	2 Each 8'-11 to 27'-6"	266	12 Var.	2 Each 8'-11 to 24'-4"	208	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	4 Var.	2 Each 8'-11 to 12'-0"	44	5b4		
4c1	Wingwall, F.F.V.		52 Var.	2 Each 2'-8 to 10'-9"	233	46 Var.	2 Each 2'-8 to 9'-10"	192	40 Var.	2 Each 2'-8 to 8'-10"	154	32 Var.	2 Each 2'-8 to 7'-7"	110	26 Var.	2 Each 2'-8 to 6'-7"	80	20 Var.	2 Each 2'-8 to 5'-7"	55	4c1		
4c2	Wingwall, F.F.V.		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4c2		
4c3	Wingwall, F.F.V.		2	9'-7"	13	2	8'-7"	11	2	7'-7"	10	4	6'-7"	18	4	5'-7"	15	4	4'-7"	12	4c3		
5c4	Wingwall, B.F.V.		12 Var.	2 Each 2'-8 to 4'-4"	44	12 Var.	2 Each 2'-8 to 4'-4"	44	12 Var.	2 Each 2'-8 to 4'-4"	44	12 Var.	2 Each 2'-8 to 4'-4"	44	12 Var.	2 Each 2'-8 to 4'-4"	44	12 Var.	2 Each 2'-8 to 4'-4"	44	5c4		
6c5	Wingwall, B.F.V.		40 Var.	2 Each 8'-8 to 14'-9"	703	34 Var.	2 Each 8'-8 to 13'-10"	575	28 Var.	2 Each 8'-8 to 12'-10"	452	20 Var.	2 Each 8'-8 to 11'-7"	304	14 Var.	2 Each 8'-8 to 10'-7"	202	8 Var.	2 Each 8'-8 to 9'-7"	110	6c5		
6c6	Wingwall, B.F.V.		22	10'-6"	347	16	10'-6"	252	--	--	--	--	--	--	--	--	--	--	--	--	6c6		
6c7	Wingwall, B.F.V.		2	13'-7"	41	2	12'-7"	38	2	11'-7"	35	4	10'-7"	64	4	9'-7"	58	4	8'-7"	52	6c7		
4d1	Apron, Longit., Bott.		5	19'-11"	67	5	17'-11"	60	5	15'-11"	53	5	13'-11"	46	5	11'-11"	40	5	9'-11"	33	4d1		
4d2	Apron, Longit., Bott.		6	23'-11"	96	6	20'-10"	84	6	17'-8"	71	6	14'-7"	58	6	11'-6"	46	6	8'-5"	34	4d2		
6f1	Apron, Longit., Top		5	19'-11"	150	5	17'-11"	135	5	15'-11"	120	5	13'-11"	105	5	11'-11"	89	5	9'-11"	74	6f1		
6f2	Apron, Longit., Top		10 Var.	2 Each 5'-11 to 16'-10"	171	10 Var.	2 Each 3'-11 to 14'-10"	141	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	4 Var.	2 Each 4'-0 to 6'-10"	33	6f2		
6f3	Apron, Longit., Top		2	28'-11"	87	2	25'-9"	77	2	22'-8"	68	2	19'-7"	59	2	16'-6"	50	2	13'-5"	40	6f3		
4i1	Parapet, Vertical		13	6'-1"	53	13	6'-1"	53	13	6'-1"	53	13	6'-1"	53	13	6'-1"	53	13	6'-1"	53	4i1		
7j1	Parapet, Horizontal		4	7'-4"	60	4	7'-2"	59	4	7'-2"	59	4	7'-2"	59	4	7'-2"	59	4	7'-2"	59	7j1		
6m1	Apron, Trans., Top		23 Var.	7'-6 to 15'-9"	402	21 Var.	7'-4 to 14'-10"	350	18 Var.	7'-4 to 13'-9"	285	15 Var.	7'-4 to 12'-7"	224	13 Var.	7'-4 to 11'-10"	187	10 Var.	7'-4 to 10'-9"	136	6m1		
6m2	Apron, Trans., Bott.		15 Var.	2'-3 to 9'-3"	130	13 Var.	2'-3 to 8'-3"	103	11 Var.	2'-3 to 7'-3"	78	9 Var.	2'-3 to 6'-3"	57	7 Var.	2'-3 to 5'-3"	39	5 Var.	2'-3 to 4'-3"	24	6m2		
6p1	Curtain, Horizontal		4	6'-3"	38	4	6'-3"	38	4	6'-3"	38	4	6'-3"	38	4	6'-3"	38	4	6'-2"	37	6p1		
6p2	Curtain, Horizontal		8	13'-7"	163	8	12'-4"	148	8	11'-1"	133	8	9'-10"	118	8	8'-7"	103	8	7'-4"	88	6p2		
6s1	Wing Slope, Both F.		4	7'-8"	46	4	7'-8"	46	4	7'-8"	46	4	7'-8"	46	4	7'-8"	46	4	7'-8"	46	6s1		
6s2	Wing Slope, Both F.		4	24'-1"	145	4	20'-10"	125	4	17'-7"	106	4	14'-4"	86	4	11'-1"	67	4	7'-10"	47	6s2		
6s3	Wing Slope, F.F.		2	30'-2"	91	2	26'-11"	81	2	23'-8"	71	2	20'-5"	61	2	17'-2"	52	2	13'-11"	42	6s3		
5t1	Curtain, Vertical		19	7'-0"	139	17	6'-9"	120	15	6'-6"	102	13	6'-6"	88	11	6'-6"	75	9	6'-6"	61	5t1		
Estimated Quantities One Headwall			Reinf. Steel			3748 LB			3155 LB			2412 LB			1957 LB			1561 LB			1192 LB		
			Concrete			26.5 CY			21.0 CY			17.1 CY			13.9 CY			10.9 CY			8.2 CY		

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.



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		FWH 0-10-21
6'-0" Span 0° Skew		