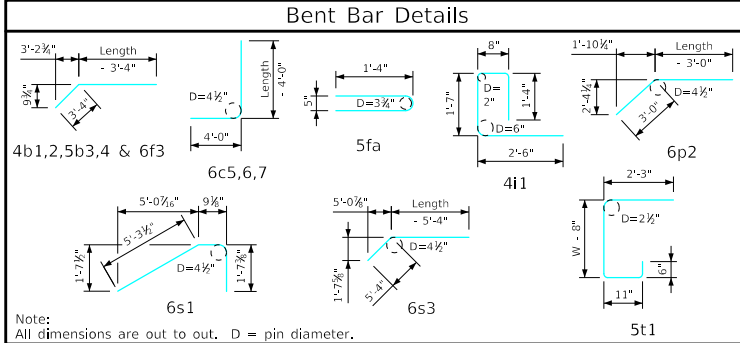


Bill of Reinforcing for One Headwall 0° Skew Span x Culvert Height												
Bar	Location	Shape	12' x 6'			12' x 5'			12' x 4'			Bar
			No.	Length	Wt.	No.	Length	Wt.	No.	Length	Wt.	
5fa	Fence Anchor (Galv.)		2	2'-10"	6	2	2'-10"	6	2	2'-10"	6	5fa
4b1	Wingwall, B.F.H.		2	22'-8"	30	2	19'-7"	26	2	16'-6"	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'-10 to 9'-0	158	32 Var.	2 Each 2'-10 to 7'-9	113	26 Var.	2 Each 2'-10 to 6'-9	83	4c1
4c2	Wingwall, F.F.V.		--	--	--	--	--	--	--	--	--	4c2
4c3	Wingwall, F.F.V.		2	7'-9"	10	4	6'-9"	18	4	5'-9"	15	4c3
5c4	Wingwall, B.F.V.		12 Var.	2 Each 2'-10 to 4'-6	46	12 Var.	2 Each 2'-10 to 4'-6	46	12 Var.	2 Each 2'-10 to 4'-6	46	5c4
6c5	Wingwall, B.F.V.		28 Var.	2 Each 8'-10 to 13'-0	459	20 Var.	2 Each 8'-10 to 11'-9	309	14 Var.	2 Each 8'-10 to 10'-9	206	6c5
6c6	Wingwall, B.F.V.		--	--	--	--	--	--	--	--	--	6c6
6c7	Wingwall, B.F.V.		2	11'-9"	35	4	10'-9"	65	4	9'-9"	59	6c7
4d1	Apron, Longit., Bott.		9	15'-11"	96	9	13'-11"	84	9	11'-11"	72	4d1
4d2	Apron, Longit., Bott.		6	17'-8"	71	6	14'-7"	58	6	11'-6"	46	4d2
6f1	Apron, Longit., Top		11	15'-11"	263	11	13'-11"	230	11	11'-11"	197	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		25	6'-1"	102	25	6'-1"	102	25	6'-1"	102	4i1
7j1	Parapet, Horizontal		4	13'-2"	108	4	13'-2"	108	4	13'-2"	108	7j1
6m1	Apron, Trans., Top		18 Var.	13'-4 to 19'-9	447	15 Var.	13'-4 to 18'-7	360	13 Var.	13'-4 to 17'-10	304	6m1
6m2	Apron, Trans., Bott.		12 Var.	7'-9 to 13'-3	189	10 Var.	7'-9 to 12'-3	150	8 Var.	7'-9 to 11'-3	114	6m2
6p1	Curtain, Horizontal		4	12'-3"	74	4	12'-3"	74	4	12'-3"	74	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		19	6'-6"	129	17	6'-6"	115	15	6'-6"	102	5t1
Reinf. Steel			3045 LB			2521 LB			2064 LB			
Concrete			22.8 CY			18.8 CY			15.1 CY			
Estimated Quantities One Headwall			1.6			1.6			1.6			
Parapet Δ			5.0			3.7			2.5			
Wingwalls			16.2			13.5			11.0			
Apron *												

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	IOWA DOT Highway Division	
		Standard Design - Single Reinforced Concrete Box Culverts	
		Flared Wing Headwalls	
		February, 2021	
Quantity Tabulation		FWH 0-7-21	Sheet 2 of 2
12'-0" Span 0° Skew			