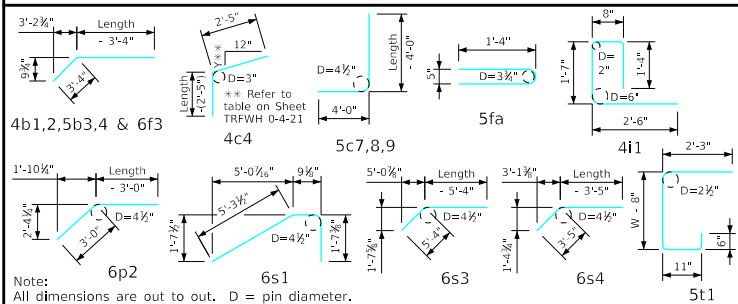


Bill of Reinforcing for One Headwall 0° Skew Span x Culvert Height

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		
5b5	Interior Wall, Both F.H.		18 Var.	2 Each 5'-5 to 15'-7	197	14 Var.	2 Each 5'-7 to 13'-7	140	10 Var.	2 Each 5'-9 to 11'-6	90	5b5		
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		
4c4	Interior Wall, Both F.V.		4	4'-2"	11	4	4'-2"	11	4	4'-1"	11	4c4		
4c5	Interior Wall, Both F.V.		52 Var.	2 Each 1'-11 to 6'-10	152	44 Var.	2 Each 1'-11 to 5'-10	114	36 Var.	2 Each 1'-11 to 4'-10	81	4c5		
5c6	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	5c6		
5c7	Wingwall, B,F,V.		28 Var.	2 Each 8'-10 to 13'-0	319	20 Var.	2 Each 8'-10 to 11'-9	215	14 Var.	2 Each 8'-10 to 10'-9	143	5c7		
5c8	Wingwall, B,F,V.		14	10'-6"	153	--	--	--	--	--	--	5c8		
5c9	Wingwall, B,F,V.		2	11'-9"	25	4	10'-9"	45	4	9'-9"	41	5c9		
4d1	Apron, Longit., Bott.		25	15'-11"	266	25	13'-11"	232	25	11'-11"	199	4d1		
4d2	Apron, Longit., Bott.		6	17'-8"	71	6	14'-7"	58	6	11'-6"	46	4d2		
6f1	Apron, Longit., Top		37	15'-11"	885	37	13'-11"	773	37	11'-11"	662	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		75	6'-1"	305	75	6'-1"	305	75	6'-1"	305	4i1		
7j1	Parapet, Horizontal		4	38'-8"	316	4	38'-8"	316	4	38'-8"	316	7j1		
6m1	Apron, Trans., Top		18 Var.	38'-10 to 45'-3	1187	15 Var.	38'-10 to 44'-1	974	13 Var.	38'-10 to 43'-4	835	6m1		
6m2	Apron, Trans., Bott.		12 Var.	33'-3 to 38'-9	649	10 Var.	33'-3 to 37'-9	533	8 Var.	33'-3 to 36'-9	421	6m2		
6p1	Curtain, Horizontal		4	37'-9"	227	4	37'-9"	227	4	37'-9"	227	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		
6s4	Interior Wall, Both F.		4	16'-10"	101	4	14'-7"	88	4	12'-4"	74	6s4		
5t1	Curtain, Vertical		39	6'-6"	264	37	6'-6"	251	35	6'-6"	237	5t1		
Estimated Quantities One Headwall			Reinf. Steel			6200 LB			5148 LB			4368 LB		
Concrete			Parapet Δ			3.5			3.5			3.5		
			Wingwalls			7.4			5.4			3.7		
			Apron *			34.6			29.7			24.9		
			45.5 CY						38.6 CY			32.1 CY		

Bent Bar Details



Headwall Notes:

- See Sheet TRFWH G1-21 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.

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.

LATEST REVISION DATE	APPROVED BY BRIDGE ENGINEER	IOWADOT Highway Division	
		Standard Design - Triple Reinforced Concrete Box Culverts	
		Flared Wing Headwalls	
		February, 2021	
Quantity Tabulation		TRFWH 0-5-21 Sheet 2 of 2	
12'-0" Span 0° Skew			