

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

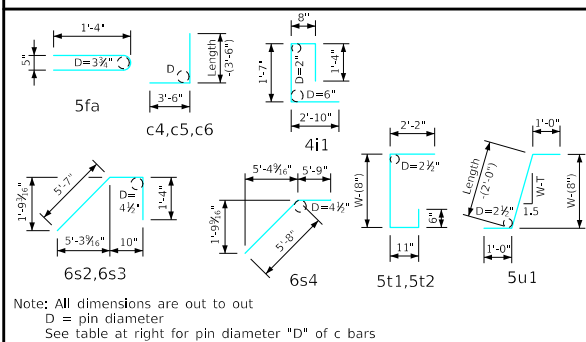
Location	Shape	10' x 6'				10' x 5'				10' x 4'			
		Bar No.	Length	Wt.	Bar No.	Length	Wt.	Bar No.	Length	Wt.			
Fence Anchor (Galv.)		5fa	2	2'-10"	6	5fa	2	2'-10"	6	5fa	2	2'-10"	6
Wingwall, F.F.H.		5b1	2	22'-3"	46	5b1	2	19'-3"	40	5b1	2	16'-3"	34
Wingwall, F.F.H.		5b2	10 Var.	2 Each 8'-10 to 20'-10	155	5b2	8 Var.	2 Each 17'-10 to 17'-10	111	5b2	6 Var.	2 Each 8'-10 to 14'-10	74
Wingwall, B.F.H.		4b3	2	22'-3"	30	4b3	2	19'-3"	26	4b3	2	16'-3"	22
Wingwall, B.F.H.		4b4	8 Var.	2 Each 11'-10 to 20'-10	87	4b4	6 Var.	2 Each 17'-10 to 17'-10	59	4b4	4 Var.	2 Each 11'-10 to 14'-10	36
Wingwall, F.F.V.		4c1	50 Var.	2 Each 2'-7 to 8'-7	186	4c1	32 Var.	2 Each 2'-7 to 7'-7	109	4c1	26 Var.	2 Each 2'-7 to 6'-7	80
Wingwall, F.F.V.		c2	--	--	--	c2	--	--	--	c2	--	--	--
Wingwall, F.F.V. (L)		4c3	2	9'-0"	12	4c3	2	8'-0"	11	4c3	2	7'-0"	9
Wingwall, F.F.V. (R)		4c3	2	9'-0"	12	4c3	2	8'-0"	11	4c3	2	7'-0"	9
Wingwall, B.F.V.		5c4	38 Var.	2 Each 6'-3 to 12'-3	367	5c4	32 Var.	2 Each 11'-3 to 11'-3	292	5c4	26 Var.	2 Each 6'-3 to 10'-3	224
Wingwall, B.F.V. (L)		5c5	2	12'-6"	26	5c5	2	11'-6"	24	5c5	2	10'-6"	22
Wingwall, B.F.V. (R)		5c5	2	12'-6"	26	5c5	2	11'-6"	24	5c5	2	10'-6"	22
Wingwall, B.F.V.		5c6	14	8'-6"	124	c6	--	--	--	c6	--	--	--
Apron, Longit. Bott.		4d1	11	22'-3"	163	4d1	11	19'-3"	141	4d1	11	16'-3"	119
Apron, Longit. Top		6f1	11	22'-3"	368	6f1	11	19'-3"	318	6f1	11	16'-3"	268
Parapet, Vertical		4i1	21	6'-5"	90	4i1	21	6'-5"	90	4i1	21	6'-5"	90
Parapet, Horiz.		7j1	4	11'-2"	91	7j1	4	11'-2"	91	7j1	4	11'-2"	91
Apron, Trans. Top		5m1	27	11'-8"	329	5m1	23	11'-8"	280	5m1	19	11'-8"	231
Apron, Trans. Bott.		m2	--	--	--	m2	--	--	--	m2	--	--	--
Apron, Trans. Bott.		4m3	19	7'-4"	93	4m3	16	7'-4"	78	4m3	13	7'-4"	64
Curtain, Horiz.		6p1	5	11'-8"	88	6p1	5	11'-8"	88	6p1	5	11'-8"	88
Wing Slope, Both F.		6s1	4	16'-9"	101	6s1	4	13'-7"	82	6s1	4	10'-5"	63
Wing Slope, Both F. (L)		6s2	2	7'-9"	23	6s2	2	7'-9"	23	6s2	2	7'-9"	23
Wing Slope, Both F. (R)		6s3	2	7'-9"	23	6s3	2	7'-9"	23	6s3	2	7'-9"	23
Wing Slope, F.F.		6s4	2	11'-5"	34	6s4	2	11'-5"	34	6s4	2	11'-5"	34
Wing Slope, F.F.		6s5	2	14'-2"	43	6s5	2	11'-0"	33	6s5	2	7'-10"	24
Curtain, Vert.		5t1	11	6'-5"	74	5t1	11	6'-5"	74	5t1	11	6'-5"	74
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	2646 LB				2117 LB				1779 LB			
	Concrete	Parapet Δ	1.4		1.4		1.4		1.4		1.4		
		Wingwalls	4.8	18.1 CY	3.5	15.2 CY	2.4	12.6 CY	8.8				
		Apron *	11.9		10.3								

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.

(L) - Indicates bar located at left corner.  
 (R) - Indicates bar located at right corner.  
 Refer to Sheet PWH 0-1-20 for left and right corner locations.

Note: Weight of bars over 40'-0" long include an allowance of 2'-5" for lap.

### Bent Bar Details



Bar Size	D
5	3 3/4"
6	4 1/2"

### 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	APPROVED BY BRIDGE ENGINEER	<b>IOWADOT Highway Division</b>	
		Standard Design - Single Reinforced Concrete Box Culverts	
		Parallel Wing Headwalls	
		July, 2020	
Quantity Tabulation		PWH 0-8-20	SHEET 2 OF 2
10'-0" Span 0° Skew			