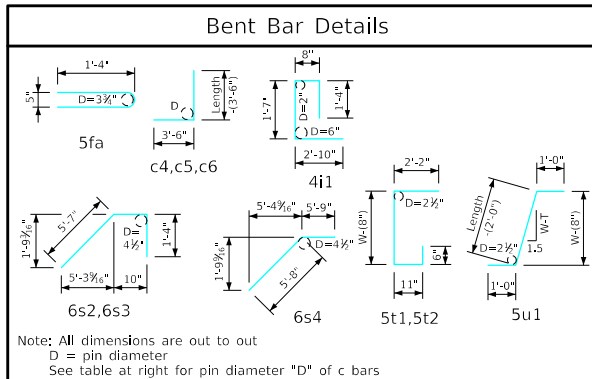


Bill of Reinforcing for One Headwall 0° Skew Span x Culvert Height													
Location	Shape	16' x 6'				16' x 5'				16' x 4'			
		Bar	No.	Length	Wt.	Bar	No.	Length	Wt.	Bar	No.	Length	Wt.
Fence Anchor (Galv.)		5fa	2	2'-10"	6	5fa	2	2'-10"	6	5fa	2	2'-10"	6
Wingwall, F.F.H.		5b1	2	22'-3"	46	5b1	2	19'-3"	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"	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"	59	4b4	4 Var.	2 Each 11'-10" to 14'-10"	36
Wingwall, F.F.V.		4c1	50 Var.	2 Each 2'-10" to 8'-10"	195	4c1	32 Var.	2 Each 7'-10"	114	4c1	26 Var.	2 Each 2'-10" to 6'-10"	84
Wingwall, F.F.V.		c2	--	--	--	c2	--	--	--	c2	--	--	--
Wingwall, F.F.V. (L)		4c3	2	9'-3"	12	4c3	2	8'-3"	11	4c3	2	7'-3"	10
Wingwall, F.F.V. (R)		4c3	2	9'-3"	12	4c3	2	8'-3"	11	4c3	2	7'-3"	10
Wingwall, B.F.V.		5c4	38 Var.	2 Each 6'-6" to 12'-6"	377	6c4	42 Var.	2 Each 11'-6"	568	5c4	34 Var.	2 Each 6'-6" to 10'-6"	301
Wingwall, B.F.V. (L)		5c5	2	12'-9"	27	6c5	2	11'-9"	35	5c5	2	10'-9"	22
Wingwall, B.F.V. (R)		5c5	2	12'-9"	27	6c5	2	11'-9"	35	5c5	2	10'-9"	22
Wingwall, B.F.V.		5c6	14	8'-6"	124	c6	--	--	--	c6	--	--	--
Apron, Longit. Bott.		4d1	17	22'-3"	253	4d1	17	19'-3"	219	4d1	17	16'-3"	185
Apron, Longit. Top		6f1	17	22'-3"	568	6f1	17	19'-3"	492	6f1	17	16'-3"	415
Parapet, Vertical		4i1	33	6'-5"	141	4i1	33	6'-5"	141	4i1	33	6'-5"	141
Parapet, Horiz.		9j1	4	17'-2"	233	9j1	4	17'-2"	233	9j1	4	17'-2"	233
Apron, Trans. Top		5m1	40	17'-8"	737	5m1	34	17'-8"	626	5m1	28	17'-8"	516
Apron, Trans. Top		m2	--	--	--	m2	--	--	--	m2	--	--	--
Apron, Trans. Bott.		4m3	19	13'-4"	169	4m3	16	13'-10"	148	4m3	13	13'-4"	116
Curtain, Horiz.		6p1	5	17'-8"	133	6p1	5	17'-8"	133	6p1	5	17'-8"	133
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	17	6'-5"	114	5t1	17	6'-5"	114	5t1	17	6'-5"	114
Curtain, Vert., Ends		5t2	4	6'-5"	27	5t2	4	6'-5"	27	5t2	4	6'-5"	27
Bracket, Vert.		5u1	4	5'-5"	23	5u1	4	5'-5"	23	5u1	4	5'-5"	23
Estimated Quantities One Headwall	Reinf. Steel	3720 LB				3367 LB				2691 LB			
	Concrete	Parapet Δ	1.8		1.8		1.8		1.8		1.8		
		Wingwalls	4.8		3.5		23.0		2.4		19.1		
		Apron *	20.5	27.1 CY	17.7		14.9						

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.  
 (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.



Bar Size	D
5	3 3/4"
6	4 1/2"
7	5 1/4"

### 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 0-5-20	
16'-0" Span 0° Skew			
		SHEET 2 OF 2	