

ENGLISHLRFDDESIGNEDSINGLECULVERTS.DGN - PWH 0-7-20 52 - THIS SHEET ISSUED 07-2020.

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

Location	Shape	12' x 6'				12' x 5'				12' 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 8'-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 11'-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'-8" to 8'-8"	189	4c1	32 Var.	2 Each 2'-8" to 7'-8"	110	4c1	26 Var.	2 Each 2'-8" to 6'-8"	81
Wingwall, F.F.V.		c2	--	--	--	c2	--	--	--	c2	--	--	--
Wingwall, F.F.V. (L)		4c3	2	9'-1"	12	4c3	2	8'-1"	11	4c3	2	7'-1"	9
Wingwall, F.F.V. (R)		4c3	2	9'-1"	12	4c3	2	8'-1"	11	4c3	2	7'-1"	9
Wingwall, B.F.V.		5c4	38 Var.	2 Each 6'-4" to 12'-4"	370	5c4	42 Var.	2 Each 6'-4" to 11'-4"	387	5c4	26 Var.	2 Each 6'-4" to 10'-4"	226
Wingwall, B.F.V. (L)		5c5	2	12'-7"	26	5c5	2	11'-7"	24	5c5	2	10'-7"	22
Wingwall, B.F.V. (R)		5c5	2	12'-7"	26	5c5	2	11'-7"	24	5c5	2	10'-7"	22
Wingwall, B.F.V.		5c6	14	8'-6"	124	c6	--	--	--	c6	--	--	--
Apron, Longit. Bott.		4d1	13	22'-3"	193	4d1	13	19'-3"	167	4d1	13	16'-3"	141
Apron, Longit. Top		6f1	13	22'-3"	434	6f1	13	19'-3"	376	6f1	13	16'-3"	317
Parapet, Vertical		4i1	25	6'-5"	107	4i1	25	6'-5"	107	4i1	25	6'-5"	107
Parapet, Horiz.		7j1	4	13'-2"	108	7j1	4	13'-2"	108	7j1	4	13'-2"	108
Apron, Trans. Top		5m1	27	13'-8"	385	5m1	23	13'-8"	328	5m1	19	13'-8"	271
Apron, Trans. Top		m2	--	--	--	m2	--	--	--	m2	--	--	--
Apron, Trans. Bott.		4m3	19	9'-4"	118	4m3	21	9'-4"	131	4m3	13	9'-4"	81
Curtain, Horiz.		6p1	5	13'-8"	103	6p1	5	13'-8"	103	6p1	5	13'-8"	103
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	13	6'-5"	87	5t1	13	6'-5"	87	5t1	13	6'-5"	87
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	2891 LB				2460 LB				1972 LB			
	Concrete	Parapet Δ	1.5		1.5		1.5		1.5		1.5		
		Wingwalls	4.8		3.5		17.6		2.4		14.6		
		Apron *	14.5	20.8	12.6		10.7		10.7				

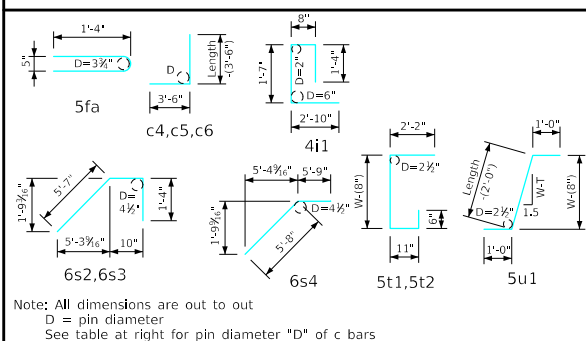
Δ Includes top of wingwall quantities.

* 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"
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	IOWADOT Highway Division	
		Standard Design - Single Reinforced Concrete Box Culverts	
		Parallel Wing Headwalls	
		July, 2020	
		Quantity Tabulation	PWH 0-7-20
		12'-0" Span	SHEET 2 OF 2
		0° Skew	