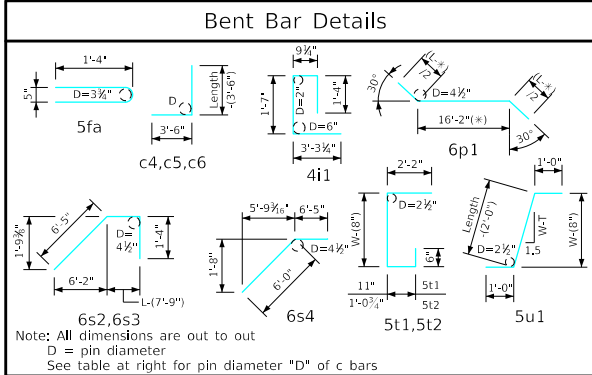


ENGLISHLRFDDESIGNEDSINGLECULVERTS.DGN - PWH 30-6-20 S2 - THIS SHEET ISSUED 07-2020.

Bill of Reinforcing for One Headwall 30° Skew Span x Culvert Height

Location	Shape	14' x 6'				14' x 5'				14' 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	25'-5"	53	5b1	2	22'-0"	46	5b1	2	18'-6"	39
Wingwall, F.F.H.		5b2	10 Var.	2 Each 10'-0" to 23'-10"	176	5b2	8 Var.	2 Each 10'-0" to 20'-5"	127	5b2	6 Var.	2 Each 10'-0" to 16'-11"	84
Wingwall, B.F.H.		4b3	2	25'-7"	34	4b3	2	22'-2"	30	4b3	2	18'-8"	25
Wingwall, B.F.H.		4b4	8 Var.	2 Each 13'-7" to 24'-0"	100	4b4	6 Var.	2 Each 13'-7" to 20'-7"	68	4b4	4 Var.	2 Each 13'-7" to 17'-1"	41
Wingwall, F.F.V.		4c1	58 Var.	2 Each 2'-9" to 8'-10"	224	4c1	36 Var.	2 Each 2'-9" to 7'-8"	125	4c1	30 Var.	2 Each 2'-9" to 6'-9"	95
Wingwall, F.F.V.		c2	--	--	--	c2	--	--	--	c2	--	--	--
Wingwall, F.F.V. (O)		4c3	2	9'-2"	12	4c3	2	8'-2"	11	4c3	2	7'-2"	10
Wingwall, F.F.V. (A)		4c3	2	9'-2"	12	4c3	2	8'-2"	11	4c3	2	7'-2"	10
Wingwall, B.F.V.		5c4	44 Var.	2 Each 6'-5" to 12'-6"	434	6c4	48 Var.	2 Each 6'-5" to 11'-5"	643	5c4	40 Var.	2 Each 6'-5" to 10'-7"	355
Wingwall, B.F.V. (O)		5c5	1	12'-8"	13	6c5	1	11'-8"	18	5c5	1	10'-8"	11
Wingwall, B.F.V. (A)		5c5	3	12'-8"	40	6c5	3	11'-8"	53	5c5	3	10'-8"	33
Wingwall, B.F.V.		5c6	14	8'-6"	124	c6	--	--	--	c6	--	--	--
Apron, Longit. Bott.		4d1	15	23'-4"	254	4d1	15	21'-10"	219	4d1	15	18'-4"	184
Apron, Longit. Top		6f1	15	25'-4"	571	6f1	15	21'-10"	492	6f1	15	18'-4"	413
Parapet, Vertical		4i1	29	7'-0"	136	4i1	29	7'-0"	136	4i1	29	7'-0"	136
Parapet, Horiz.		9j1	4	17'-6"	238	9j1	4	17'-6"	238	9j1	4	17'-6"	238
Apron, Trans., Top		5m1	37	15'-8"	605	5m1	31	15'-8"	507	5m1	24	15'-8"	392
Apron, Trans., Top		5m2	15 Var.	2'-9" to 14'-10"	138	5m2	14 Var.	2'-9" to 14'-0"	122	5m2	15 Var.	2'-0" to 14'-1"	126
Apron, Trans., Bott.		4m3	19	13'-8"	173	4m3	16	14'-2"	151	4m3	13	13'-8"	119
Curtain, Horiz.		6p1	5	17'-10"	134	6p1	5	17'-10"	134	6p1	5	17'-10"	134
Wing Slope, Both F.		6s1	4	18'-8"	112	6s1	4	15'-1"	91	6s1	4	11'-6"	69
Wing Slope, Both F. (O)		6s2	2	8'-4"	25	6s2	2	8'-4"	25	6s2	2	8'-4"	25
Wing Slope, Both F. (A)		6s3	2	8'-9"	26	6s3	2	8'-9"	26	6s3	2	8'-9"	26
Wing Slope, F.F.		6s4	2	12'-5"	37	6s4	2	12'-5"	37	6s4	2	12'-5"	37
Wing Slope, F.F.		6s5	2	16'-3"	49	6s5	2	12'-8"	38	6s5	2	9'-0"	27
Curtain, Vert.		5t1	17	6'-5"	114	5t1	17	6'-5"	114	5t1	17	6'-5"	114
Curtain, Vert. Ends		5t2	4	6'-7"	27	5t2	4	6'-7"	27	5t2	4	6'-7"	27
Bracket, Vert.		5u1	4	5'-4"	22	5u1	4	5'-4"	22	5u1	4	5'-4"	22
Estimated Quantities One Headwall	Reinf. Steel	Parapet Δ	1.9	3889 LB		1.9	3517 LB		1.9	2798 LB			
	Concrete	Wingwalls	5.6	27.6 CY		4.1	23.4 CY		2.8	19.4 CY			
		Apron *	20.1			17.4			14.7				

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.
 (A) - Indicates bar located at acute corner.
 (O) - Indicates bar located at obtuse corner.
 Refer to Sheet PWH 30-1-20 for acute and obtuse corner locations.
 Note: Weight of bars over 40'-0" long include an allowance of 2'-5" for lap.



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 14'-0" Span 30° Skew	PWH 30-6-20 SHEET 2 OF 2