

ENGLISHDESIGNEDTRIPLECULVERTS.DGN - TRPWH 0-7-20 S1 - THIS SHEET ISSUED 07-2020.

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

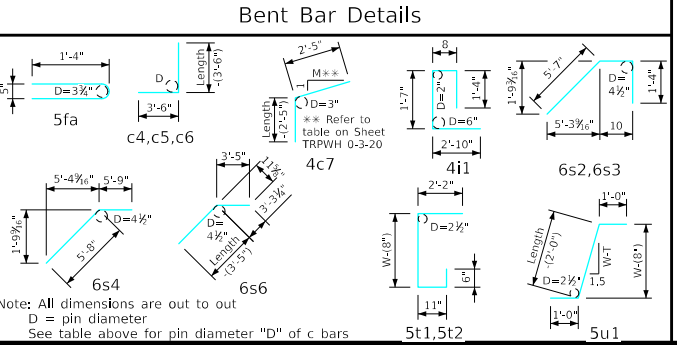
Location	Shape	10' x 12'				10' x 11'				10' x 10'				10' x 9'				10' x 8'				10' x 7'			
		Bar No.	No.	Length	Wt.	Bar No.	No.	Length	Wt.	Bar No.	No.	Length	Wt.	Bar No.	No.	Length	Wt.	Bar No.	No.	Length	Wt.	Bar No.	No.	Length	Wt.
Fence Anchor (Galv.)		5fa	2	2'-10"	6	5fa	2	2'-10"	6	5fa	2	2'-10"	6	5fa	2	2'-10"	6	5fa	2	2'-10"	6	5fa	2	2'-10"	6
Wingwall, F.F.H.		5b1	2	40'-3"	89	5b1	2	37'-3"	78	5b1	2	34'-3"	71	5b1	2	31'-3"	65	5b1	2	28'-3"	59	5b1	2	25'-3"	53
Wingwall, F.F.H.		5b2	22 Var.	2 Each 8'-10 to 38'-10	547	5b2	20 Var.	2 Each 8'-10 to 35'-10	466	5b2	18 Var.	2 Each 8'-10 to 32'-10	391	5b2	16 Var.	2 Each 8'-10 to 29'-10	323	5b2	14 Var.	2 Each 8'-10 to 26'-10	260	5b2	12 Var.	2 Each 8'-10 to 23'-10	204
Wingwall, B.F.H.		4b3	2	40'-3"	57	4b3	2	37'-3"	50	4b3	2	34'-3"	46	4b3	2	31'-3"	42	4b3	2	28'-3"	38	4b3	2	25'-3"	34
Wingwall, B.F.H.		4b4	20 Var.	2 Each 11'-10 to 38'-10	338	4b4	18 Var.	2 Each 11'-10 to 35'-10	287	4b4	16 Var.	2 Each 11'-10 to 32'-10	239	4b4	14 Var.	2 Each 11'-10 to 29'-10	195	4b4	12 Var.	2 Each 11'-10 to 26'-10	155	4b4	10 Var.	2 Each 11'-10 to 23'-10	119
Interior Wall, Both F.H.		5b5	42 Var.	2 Each 6'-3 to 39'-10	1009	5b5	38 Var.	2 Each 6'-3 to 36'-10	854	5b5	34 Var.	2 Each 6'-4 to 33'-10	712	5b5	30 Var.	2 Each 6'-4 to 30'-10	581	5b5	26 Var.	2 Each 6'-5 to 27'-10	464	5b5	22 Var.	2 Each 6'-6 to 24'-10	359
Wingwall, F.F.V.		5c1	74 Var.	2 Each 2'-7 to 14'-7	662	5c1	68 Var.	2 Each 2'-7 to 13'-7	573	4c1	62 Var.	2 Each 2'-7 to 12'-7	314	4c1	56 Var.	2 Each 2'-7 to 11'-7	265	4c1	66 Var.	2 Each 2'-7 to 10'-7	290	4c1	58 Var.	2 Each 2'-7 to 9'-7	236
Wingwall, F.F.V.		5c2	36 Var.	2 Each 9'-1 to 14'-9	447	5c2	30 Var.	2 Each 9'-1 to 13'-9	357	4c2	24 Var.	2 Each 9'-1 to 12'-9	175	4c2	18 Var.	2 Each 9'-1 to 11'-9	125	c2	--	--	--	c2	--	--	--
Wingwall, F.F.V. (L)		5c3	2	15'-0"	31	5c3	2	14'-0"	29	4c3	2	13'-0"	17	4c3	2	12'-0"	16	4c3	2	11'-0"	15	4c3	2	10'-0"	13
Wingwall, F.F.V. (R)		5c3	2	15'-0"	31	5c3	2	14'-0"	29	4c3	2	13'-0"	17	4c3	2	12'-0"	16	4c3	2	11'-0"	15	4c3	2	10'-0"	13
Wingwall, B.F.V.		6c4	74 Var.	2 Each 6'-3 to 18'-3	1362	5c4	68 Var.	2 Each 6'-3 to 17'-3	833	5c4	62 Var.	2 Each 6'-3 to 16'-3	727	5c4	56 Var.	2 Each 6'-3 to 15'-3	628	5c4	50 Var.	2 Each 6'-3 to 14'-3	535	5c4	44 Var.	2 Each 6'-3 to 13'-3	447
Wingwall, B.F.V. (L)		6c5	2	18'-6"	56	5c5	2	17'-6"	37	5c5	2	16'-6"	34	5c5	2	15'-6"	32	5c5	2	14'-6"	30	5c5	2	13'-6"	28
Wingwall, B.F.V. (R)		6c5	2	18'-6"	56	5c5	2	17'-6"	37	5c5	2	16'-6"	34	5c5	2	15'-6"	32	5c5	2	14'-6"	30	5c5	2	13'-6"	28
Wingwall, B.F.V.		6c6	50	8'-6"	638	5c6	44	8'-6"	390	5c6	38	8'-6"	337	5c6	32	8'-6"	284	5c6	26	8'-6"	231	5c6	20	8'-6"	177
Interior Wall, Both F.V		4c7	4	3'-9"	10	4c7	4	3'-9"	10	4c7	4	3'-9"	10	4c7	4	3'-9"	10	4c7	4	3'-9"	10	4c7	4	3'-9"	10
Interior Wall, Both F.V		4c8	146 Var.	2 Each 1'-6 to 12'-3	671	4c8	134 Var.	2 Each 1'-6 to 11'-3	571	4c8	122 Var.	2 Each 1'-6 to 10'-3	479	4c8	110 Var.	2 Each 1'-6 to 9'-3	395	4c8	98 Var.	2 Each 1'-6 to 8'-3	319	4c8	86 Var.	2 Each 1'-6 to 7'-3	251
Interior Wall, Both F.V		4c9	4	12'-6"	33	4c9	4	11'-6"	31	4c9	4	10'-6"	28	4c9	4	9'-6"	25	4c9	4	8'-6"	23	4c9	4	7'-6"	20
Apron, Longit., Bott.		4d1	33	40'-3"	941	4d1	33	37'-3"	821	4d1	33	34'-3"	755	4d1	33	31'-3"	689	4d1	33	28'-3"	623	4d1	33	25'-3"	557
Apron, Longit., Top		6f1	33	40'-3"	2115	6f1	33	37'-3"	1846	6f1	33	34'-3"	1698	6f1	33	31'-3"	1549	6f1	33	28'-3"	1400	6f1	33	25'-3"	1252
Parapet, Vertical		4i1	65	6'-5"	279	4i1	65	6'-5"	279	4i1	63	6'-5"	270	4i1	63	6'-5"	270	4i1	63	6'-5"	270	4i1	63	6'-5"	270
Parapet, Horizontal		7j1	4	33'-8"	275	7j1	4	33'-8"	275	7j1	4	33'-0"	270	7j1	4	33'-0"	270	7j1	4	33'-0"	270	7j1	4	32'-8"	267
Apron, Trans., Top		5m1	51	34'-2"	1817	5m1	47	34'-2"	1675	5m1	43	33'-6"	1502	5m1	39	33'-6"	1363	5m1	35	33'-6"	1223	5m1	31	33'-2"	1072
Apron, Trans., Top		m2	--	--	--	m2	--	--	--	m2	--	--	--	m2	--	--	--	m2	--	--	--	m2	--	--	--
Apron, Trans., Bott.		5m3	73	30'-7"	2329	5m3	67	30'-7"	2137	6m3	31	30'-9"	1432	5m3	28	29'-11"	874	5m3	25	29'-11"	780	5m3	22	29'-7"	679
Curtain, Horiz.		6p1	6	34'-2"	308	6p1	6	34'-2"	308	6p1	6	33'-6"	302	6p1	6	33'-6"	302	6p1	6	33'-6"	302	6p1	5	33'-2"	249
Wing Slope, Both F.		6s1	4	35'-8"	214	6s1	4	32'-7"	196	6s1	4	29'-5"	177	6s1	4	26'-3"	158	6s1	4	23'-1"	139	6s1	4	19'-11"	120
Wing Slope, Both F. (L)		6s2	2	7'-9"	23	6s2	2	7'-9"	23	6s2	2	7'-9"	23	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	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	6s4	2	11'-5"	34	6s4	2	11'-5"	34	6s4	2	11'-5"	34
Wing Slope, F.F.		6s5	2	33'-2"	100	6s5	2	30'-0"	90	6s5	2	26'-10"	81	6s5	2	23'-8"	71	6s5	2	20'-6"	62	6s5	2	17'-4"	52
Interior Wall, Both F.		6s6	4	41'-10"	266	6s6	4	38'-8"	232	6s6	4	35'-6"	213	6s6	4	32'-4"	194	6s6	4	29'-2"	175	6s6	4	26'-0"	156
Curtain, Vert.		5t1	33	7'-11"	272	5t1	33	7'-8"	264	5t1	32	7'-5"	248	5t1	32	7'-2"	239	5t1	32	6'-11"	231	5t1	32	6'-8"	223
Curtain, Vert. Ends		5t2	4	7'-11"	33	5t2	4	7'-8"	32	5t2	4	7'-5"	31	5t2	4	7'-2"	30	5t2	4	6'-11"	29	5t2	4	6'-8"	28
Bracket, Vert.		5u1	4	6'-7"	27	5u1	4	6'-4"	26	5u1	4	6'-2"	26	5u1	4	6'-1"	25	5u1	4	5'-8"	24	5u1	4	5'-6"	23
Estimated Quantities One Headwall	Reinf. Steel	15,099 LB				12,899 LB				10,722 LB				9154 LB				8088 LB				7026 LB			
	Concrete	3.3				3.3				3.1				3.1				3.1				3.0			
	Parapet Δ	38.5				32.8				22.9				18.9				15.2				10.7			
	Wingwalls	104.7 CY				94.1 CY				77.9 CY				69.1 CY				60.7 CY				50.9 CY			
	Apron *	62.9				58.0				51.9				47.1				42.4				37.2			

c Bar Pin Diameter	
Bar Size	D
5	3 3/8"
6	4 1/2"

Note: Weight of bars over 40'-0" long include an allowance of 2'-5" for lap. 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 TRPWH 0-1-20 for left and right corner locations.

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	 Standard Design - Triple Reinforced Concrete Box Culverts Parallel Wing Headwalls July, 2020 Quantity Tabulation 10'-0" Span 0° Skew	APPROVED BY BRIDGE ENGINEER 	TRPWH 0-7-20 Sheet 1 of 2
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