



FOR CONCRETE PIPE OR CORRUGATED METAL PIPE		
PIPE I.D.	a	b
42"	0'-4 $\frac{1}{2}$ "	0'-3 $\frac{1}{2}$ "
48"	0'-5"	0'-4"
54"	0'-5 $\frac{3}{4}$ "	0'-4 $\frac{1}{2}$ "
60"	0'-6 $\frac{1}{4}$ "	0'-5"
66"	0'-7"	0'-5 $\frac{1}{2}$ "
72"	0'-7 $\frac{1}{2}$ "	0'-6"
78"	0'-8 $\frac{1}{4}$ "	0'-6 $\frac{1}{2}$ "
84"	0'-8 $\frac{3}{4}$ "	0'-7"
90"	0'-9 $\frac{1}{2}$ "	0'-7 $\frac{1}{2}$ "
96"	0'-10"	0'-8"

NOTES:

1. QUANTITIES GIVEN ARE FOR ONE ENDWALL.
2. PLEASE REFER TO STANDARD EW-2S, SHEET 101.08 AND 101.09, FOR ALL DIMENSIONS NOT GIVEN IN TABLES.
3. THIS ITEM MAY BE PRECAST OR CAST IN PLACE.
4. ON SHALLOW FILLS, WHERE ENDWALLS ARE 1' OR LESS BELOW SHOULDER LINE, THE TOP OF THE ENDWALL SHALL BE CONSTRUCTED PARALLEL TO THE GRADE OF ROAD.
5. ALL CAST IN PLACE CONCRETE TO BE CLASS A3. FOR PRECAST SEE SHEET 101.21.
6. IN NO CASE SHALL TOP OF ENDWALL PROJECT ABOVE FILL SLOPE, DITCH SLOPE, OR SHOULDER.
7. THIS STANDARD TO BE USED WITH SKEW ANGLES FROM 37° 30' TO 45°.
8. COST OF BARS FOR CRACK CONTROL TO BE INCLUDED IN PRICE BID PER CUBIC YARD CONCRETE.
9. HEADWALL TO BE BEVELED IN ALL AREAS EXCEPT WHERE A CONFLICT WITH INVERT AND WINGWALLS OCCUR.
10. BEVEL EDGE IS REQUIRED ON THE HEADWALL AT THE INLET END OF THE CULVERT (WHERE THE FLOW ENTERS THE CULVERT). HEADWALL AT THE OUTLET END OF THE CULVERT MAY BE EITHER SQUARE EDGE OR BEVEL EDGE.
11. FOR DETAILS OF HEADWALL BEVEL SEE STANDARD EW-2S, SHEETS 101.08 AND 101.09.
12. $\frac{3}{4}$ " CHAMFER MAY BE PROVIDED ON ALL EDGES AT MANUFACTURER'S OPTION.

FRONT VIEW

FOR CONCRETE PIPE							
D	S	S45	T45	FILL SLOPE 1/2:1		FILL SLOPE 2:1	
				CONCRETE IN ONE DOUBLE ENDWALL CUBIC YARDS	INCREASE FOR EACH ADDITIONAL PIPE CUBIC YARDS	CONCRETE IN ONE DOUBLE ENDWALL CUBIC YDS.	INCREASE FOR EACH ADDITIONAL PIPE CUBIC YDS.
42"	6'-0"	8'-5 $\frac{1}{8}$ "	13'-5 $\frac{1}{4}$ "	6.030	1.799	6.819	1.776
48"	6'-10"	9'-8"	15'-3 $\frac{1}{8}$ "	7.443	2.252	8.479	2.225
54"	7'-8"	10'-10 $\frac{1}{8}$ "	17'-2 $\frac{1}{2}$ "	9.621	2.909	10.949	2.878
60"	8'-6"	12'-0 $\frac{1}{4}$ "	19'-1 $\frac{1}{8}$ "	12.124	3.677	13.935	3.640
66"	9'-4"	13'-2 $\frac{3}{8}$ "	20'-11 $\frac{1}{4}$ "	15.003	4.562	17.148	4.520
72"	10'-2"	14'-4 $\frac{1}{2}$ "	22'-10 $\frac{3}{8}$ "	18.287	5.573	20.953	5.524
78"	11'-0"	15'-6 $\frac{5}{8}$ "	24'-9"	21.991	6.715	25.247	6.662
84"	11'-10"	16'-8 $\frac{1}{8}$ "	26'-7 $\frac{5}{8}$ "	26.158	8.008	30.089	7.947
90"	12'-8"	17'-11"	28'-6 $\frac{1}{4}$ "	31.209	9.789	35.937	9.779
96"	13'-6"	19'-1 $\frac{1}{8}$ "	30'-4 $\frac{1}{8}$ "	36.640	11.533	42.212	11.523

FOR CORRUGATED METAL PIPE							
D	S	S45	T45	FILL SLOPE 1/2:1		FILL SLOPE 2:1	
				CONCRETE IN ONE DOUBLE ENDWALL CUBIC YDS.	INCREASE FOR EACH ADDITIONAL PIPE CUBIC YDS.	CONCRETE IN ONE DOUBLE ENDWALL CUBIC YDS.	INCREASE FOR EACH ADDITIONAL PIPE CUBIC YDS.
42"	5'-3 $\frac{1}{2}$ "	7'-5 $\frac{3}{4}$ "	12'-5 $\frac{1}{4}$ "	6.331	1.789	7.118	1.767
48"	6'-0 $\frac{1}{2}$ "	8'-6 $\frac{1}{8}$ "	14'-2 $\frac{3}{4}$ "	7.866	2.262	8.900	2.236
54"	6'-9 $\frac{1}{2}$ "	9'-7 $\frac{1}{4}$ "	15'-11 $\frac{5}{8}$ "	10.223	2.949	11.526	2.917
60"	7'-6 $\frac{1}{2}$ "	10'-8"	17'-8 $\frac{1}{8}$ "	12.944	3.755	14.750	3.717
66"	8'-3 $\frac{1}{2}$ "	11'-8 $\frac{3}{4}$ "	19'-6"	16.090	4.690	18.236	4.646
72"	9'-0 $\frac{1}{2}$ "	12'-9 $\frac{1}{2}$ "	21'-3 $\frac{1}{4}$ "	19.690	5.763	22.347	5.712
78"	9'-9 $\frac{1}{2}$ "	13'-10 $\frac{1}{8}$ "	23'-0 $\frac{1}{2}$ "	23.757	6.974	27.003	6.917
84"	10'-6 $\frac{1}{2}$ "	14'-10 $\frac{1}{8}$ "	24'-9 $\frac{1}{4}$ "	28.347	8.350	32.265	8.284
90"	11'-3 $\frac{1}{2}$ "	15'-11 $\frac{5}{8}$ "	26'-7"	33.600	10.007	38.292	9.983
96"	12'-0 $\frac{1}{2}$ "	17'-0 $\frac{3}{8}$ "	28'-4 $\frac{1}{8}$ "	39.499	11.815	45.031	11.790



ROAD AND BRIDGE STANDARDS

SHEET 1 OF 1

REVISION DATE

101.20

STANDARD ENDWALLS FOR MULTIPLE PIPE CULVERTS

42" - 96" CIRCULAR PIPE WITH 45° SKEW

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

105
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