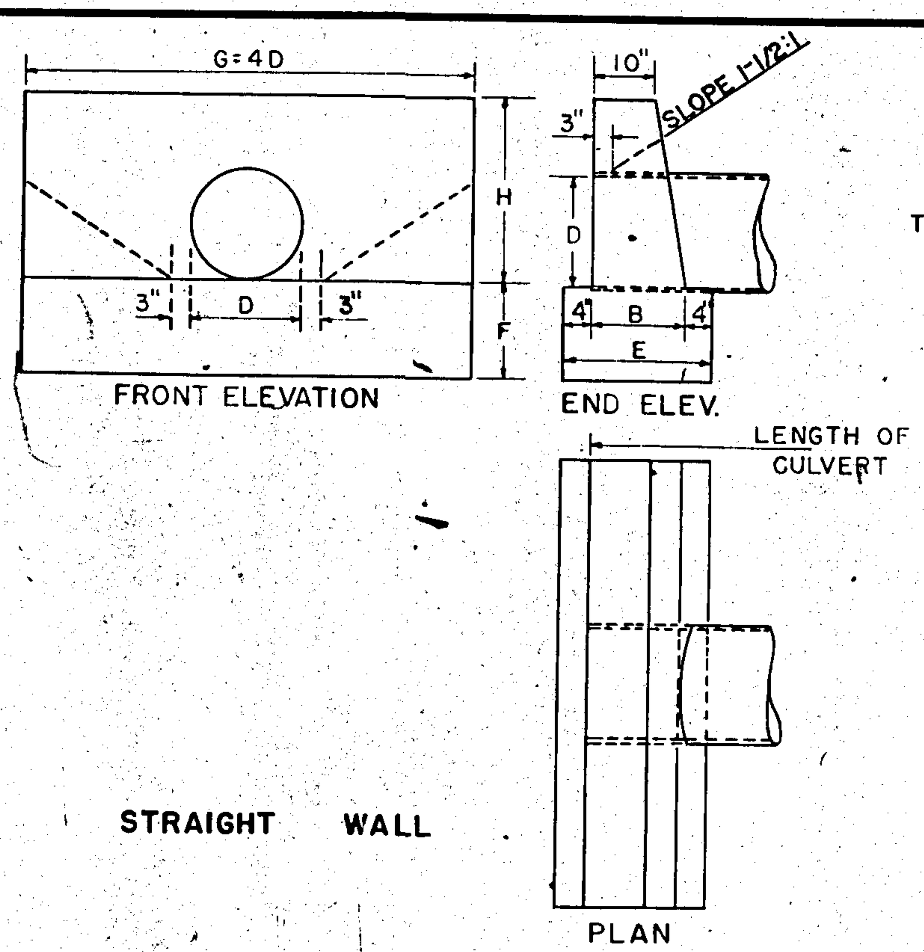
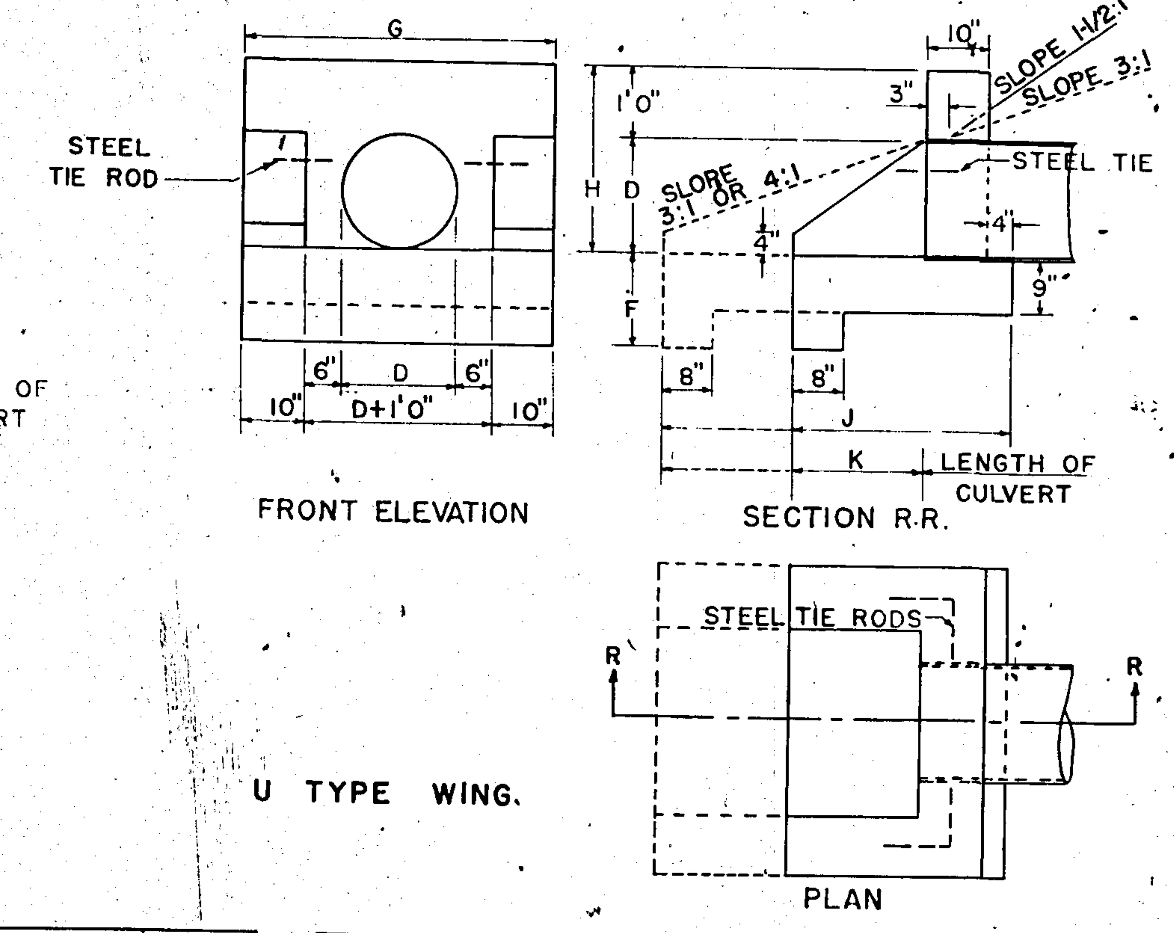
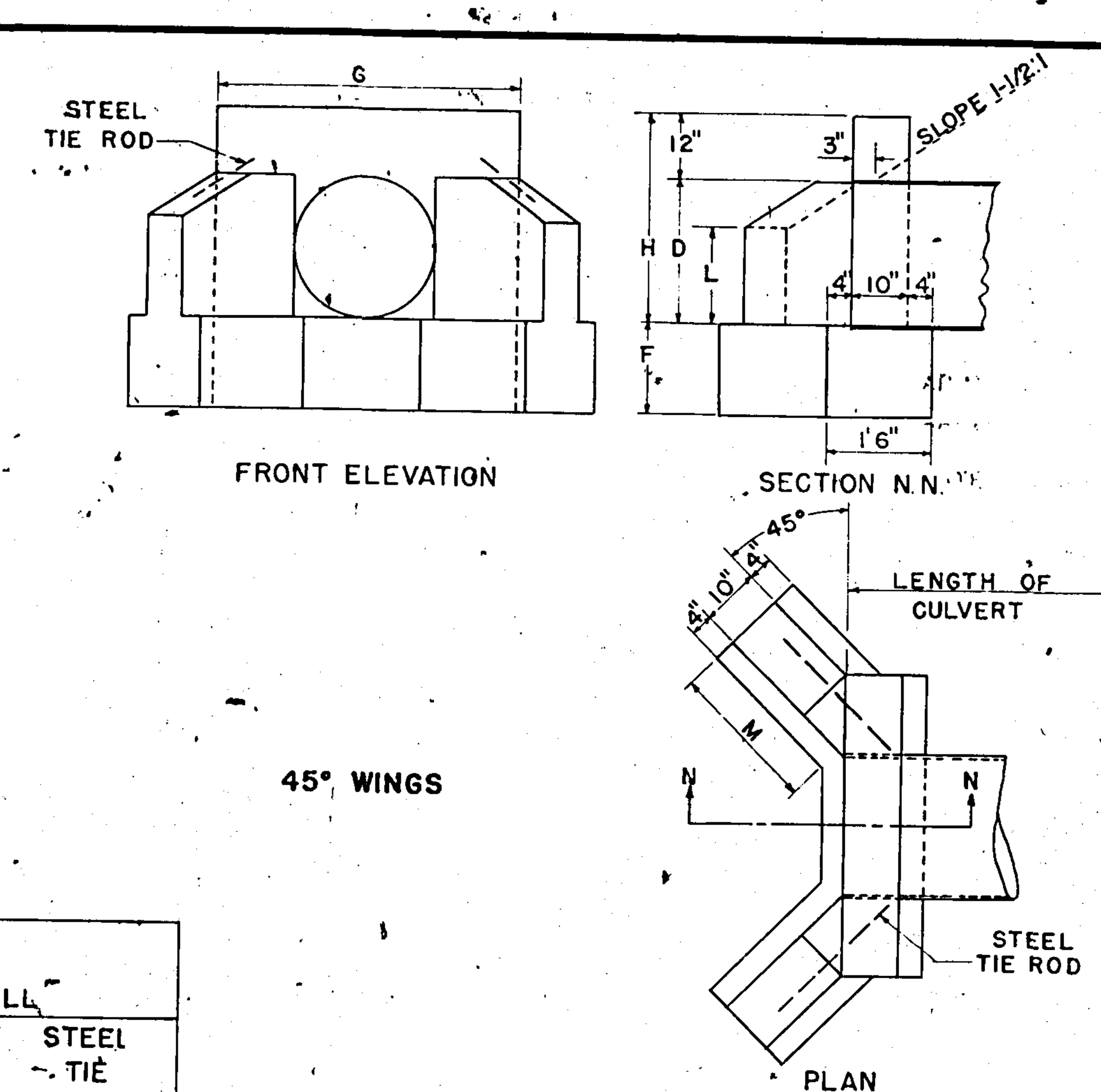


STRAIGHT WALL



U TYPE WING.



45° WINGS

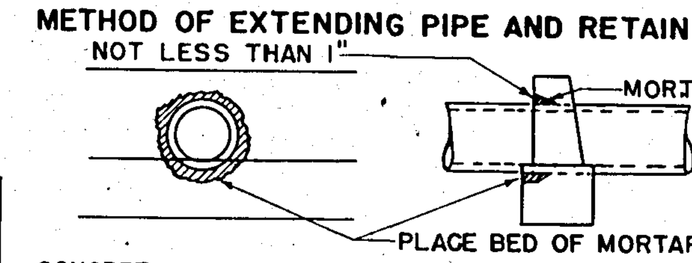
DIMENSIONS							QUANTITIES ONE STRAIGHT ENDWALL CLASS "B" CONCRETE				CONC IN WALL & FTG. FOR EACH ADD'L PIPE LINE
OPENING		WALL			FOOTING		CUBIC FEET		TOTAL		
D	AREA SQ. FT.	G	H	B	E	F	WALL	FOOT	CU. FT.	CU. YD.	
12"	0.8	4'0"	2'0"	1'2"	1'10"	1'0"	7.2	7.3	14.5	0.54	0.25
15"	1.2	5'0"	2'3"	1'2"	1'10"	1'2"	9.9	10.7	20.6	0.76	0.36
18"	1.8	6'0"	2'6"	1'3"	1'11"	1'3"	13.6	14.4	28.0	1.04	0.48
24"	3.1	8'0"	3'0"	1'4"	2'0"	1'4"	22.3	21.3	43.6	1.62	0.74
30"	4.9	10'0"	3'6"	1'6"	2'2"	1'6"	34.7	32.5	67.2	2.49	1.13
36"	7.1	12'0"	4'0"	1'8"	2'4"	1'8"	50.5	46.7	97.2	3.60	1.62
42"	9.6	14'0"	4'6"	1'10"	2'6"	2'0"	70.3	70.0	140.3	5.20	2.13
48"	12.6	16'0"	5'0"	2'1"	2'9"	2'0"	96.9	88.0	184.9	6.85	2.58
54"	16.0	18'0"	5'6"	2'4"	3'0"	2'0"	129.4	108.0	237.4	8.79	3.07
60"	19.6	20'0"	6'0"	2'6"	3'2"	2'0"	164.6	126.7	291.3	10.79	3.53

FOR EACH ADDITIONAL PIPE LINE, ADD TO G ID + (ID or 3 feet, whichever is smaller)

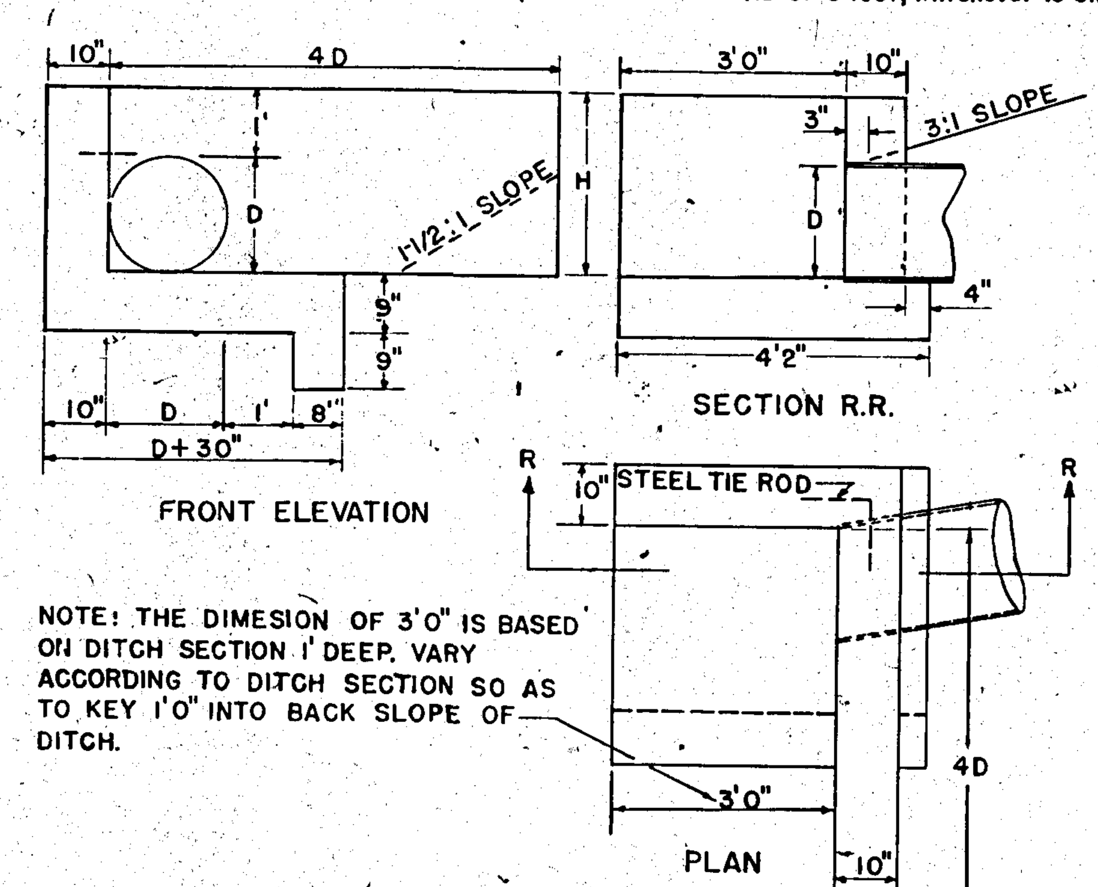
DIMENSIONS							QUANTITIES ONE "U" ENDWALL CLASS "B" CONCRETE				STEEL TIE RODS
OPENING		WALL			FOOTING		CUBIC FEET		TOTAL		
D	AREA SQ.FT.	G	H	K	F	J	WALL	FOOT	CU.FT.	CU. YD.	
					1-1/2:1 FILL SLOPES						
12"	0.8	3'8"	2'0"	1'0"	1'3"	2'2"	6.6	7.3	13.9	0.52	NONE
15"	1.2	3'11"	2'3"	1'5"	1'3"	2'7"	8.3	9.1	17.4	0.64	NONE
18"	1.8	4'2"	2'6"	1'9"	1'3"	2'11"	9.9	10.7	20.6	0.76	NONE
24"	3.1	4'8"	3'0"	2'6"	1'6"	3'8"	13.9	15.5	29.4	1.09	2-3/4" φ X 2'0"
30"	4.9	5'2"	3'6"	3'3"	1'6"	4'5"	18.7	20.0	38.7	1.43	2-3/4" φ X 2'0"
36"	7.1	5'8"	4'0"	4'0"	1'9"	5'2"	21.2	26.2	50.4	1.87	2-3/4" φ X 2'6"
42"	9.6	6'2"	4'6"	4'9"	2'0"	5'11"	30.3	33.2	63.5	2.35	2-3/4" φ X 2'6"
48"	12.6	6'8"	5'0"	5'6"	2'0"	6'8"	37.3	39.6	76.9	2.85	2-3/4" φ X 3'0"
54"	16.0	7'2"	5'6"	6'3"	2'0"	7'5"	44.2	45.9	90.1	3.33	2-3/4" φ X 3'6"
60"	19.6	7'8"	6'0"	7'0"	2'0"	8'2"	51.1	49.1	100.2	3.71	2-3/4" φ X 4'0"
					3:1 FILL SLOPES						
12"	0.8	3'8"	2'0"	2'0"	1'3"	3'2"	7.7	9.9	17.6	0.65	NONE
15"	1.2	3'11"	2'3"	2'9"	1'3"	3'11"	10.0	12.8	22.8	0.84	NONE
18"	1.8	4'2"	2'6"	3'6"	1'3"	4'8"	12.5	16.0	28.5	1.06	NONE
24"	3.1	4'8"	3'0"	5'0"	1'6"	6'2"	18.8	24.0	42.8	1.58	2-3/4" φ X 2'0"
30"	4.9	5'2"	3'6"	6'6"	1'6"	7'8"	26.3	32.3	58.6	2.17	2-3/4" φ X 2'0"
36"	7.1	5'8"	4'0"	8'0"	1'9"	9'2"	35.1	42.8	77.9	2.89	2-3/4" φ X 2'6"
42"	9.6	6'2"	4'6"	9'6"	2'0"	10'8"	45.4	54.5	99.9	3.70	2-3/4" φ X 2'6"
48"	12.6	6'8"	5'0"	11'0"	2'0"	12'2"	56.9	66.5	123.4	4.57	2-3/4" φ X 3'0"
54"	16.0	7'2"	5'6"	12'6"	2'0"	13'8"	66.7	79.5	146.2	5.41	2-3/4" φ X 3'6"
60"	19.6	7'8"	6'0"	13'4"	2'0"	17'2"	81.0	87.9	168.9	6.25	2-3/4" φ X 4'0"
					4:1 FILL SLOPES						
12"	0.8	3'8"	2'0"	2'8"	1'3"	3'10"	8.4	11.8	20.2	0.75	NONE
15"	1.2	3'11"	2'3"	3'8"	1'3"	4'10"	11.2	15.5	26.6	0.98	NONE
18"	1.8	4'2"	2'6"	4'8"	1'3"	5'10"	14.3	19.6	33.9	1.26	NONE
24"	3.1	4'8"	3'0"	6'8"	1'6"	7'10"	22.0	29.8	51.8	1.92	2-3/4" φ X 2'0"
30"	4.9	5'2"	3'6"	8'8"	1'6"	9'10"	31.3	40.7	72.0	2.67	2-3/4" φ X 2'0"
36"	7.1	5'8"	4'0"	10'8"	1'9"	11'10"	42.5	54.1	96.6	3.58	2-3/4" φ X 2'6"
42"	9.6	6'2"	4'6"	12'8"	2'0"	13'10"	55.4	69.2	124.6	4.61	2-3/4" φ X 2'6"
48"	12.6	6'8"	5'0"	14'8"	2'0"	15'10"	70.0	84.8	154.8	5.73	2-3/4" φ X 3'0"
54"	16.0	7'2"	5'6"	16'8"	2'0"	17'10"	86.4	101.9	188.3	6.97	2-3/4" φ X 3'6"
60"	19.6	7'8"	6'0"	18'8"	2'0"	19'10"	104.7	120.5	225.2	8.34	2-3/4" φ X 4'0"

DIMENSIONS							QUANTITIES ONE ENDWALL WITH 45° WING WALLS CLASS "B" CONCRETE				STEEL TIE RODS
OPENING		WALL			FOOTING		CUBIC FEET		TOTAL		
D	AREA SQ.FT.	H	G	L	M	F	WALL	FOOT	CU.FT.	CU.YD.	
					1-1/2:1 SLOPES						
18"	1.8	2'6"	3'10"	1'2"	1'7"	1'3"	9.3	10.7	20.0	0.74	NONE
24"	3.1	3'0"	4'4"	1'5"	2'1"	1'4"	13.1	14.4	27.5	1.02	2-3/4" φ X 2' 0"
30"	4.9	3'6"	4'10"	1'9"	2'5"	1'6"	17.4	18.8	36.7	1.34	2-3/4" φ X 2' 0"
36"	7.1	4'0"	5'4"	2'0"	2'11"	1'8"	22.6	24.6	47.2	1.75	2-3/4" φ X 3' 0"
42"	9.6	4'6"	5'10"	2'3"	3'6"	2'0"	29.1	34.6	63.7	2.36	2-3/4" φ X 3' 0"
48"	12.6	5'0"	6'4"	2'6"	4'0"	2'0"	35.9	39.1	75.0	2.78	2-3/4" φ X 3' 0"
54"	16.0	5'6"	6'10"	2'9"	4'6-1/4	2'0"	42.9	46.6	89.5	3.31	2-3/4" φ X 3' 0"
60"	19.6	6'0"	7'4"	3'0"	5'0-1/2	2'0"	51.8	51.1	102.9	3.81	2-3/4" φ X 3' 0"
					3:1 SLOPES						
18"	1.8	2'6"	3'10"	1'2"	1'9"	1'3"	10.7	14.5	25.2	0.93	NONE
24"	3.1	3'0"	4'4"	1'5"	2'10"	1'4"	16.6	17.8	34.4	1.27	2-3/4" φ X 2' 0"
30"	4.9	3'6"	4'10"	1'9"	3'6"	1'6"	22.9	24.4	47.3	1.71	2-3/4" φ X 2' 0"
36"	7.1	4'0"	5'4"	2'1"	4'3"	1'8"	30.2	32.0	62.2	2.30	2-3/4" φ X 3' 0"
42"	9.6	4'6"	5'10"	2'5"	4'11"	2'0"	38.8	44.0	82.8	3.07	2-3/4" φ X 3' 0"
48"	12.6	5'0"	6'4"	2'8"	5'6"	2'0"	47.5	48.6	96.1	3.56	2-3/4" φ X 3' 0"
54"	16.0	5'6"	6'10"	3'2"	6'1"	2'0"	57.0	53.4	110.4	4.09	2-3/4" φ X 3' 0"
60"	19.6	6'0"	7'4"	3'6"	6'9"	2'0"	68.5	59.1	127.6	4.73	2-3/4" φ X 3' 0"

METHOD OF EXTENDING PIPE AND RETAINING EXISTING HEADWALL



CONCRETE WITHIN THE HATCHED AREA TO BE REMOVED BY CHIPPING, OR IN A MANNER APPROVED BY THE ENGINEER, FORMING A RECESS NOT LESS 1" LARGER THAN THE OUTSIDE DIMENSION OF THE PIPE.



CONCRETE ENDWALLS WITH L TYPE WINGS

NOTE THESE QUANTITIES WILL VARY ACCORDING TO DITCH SECTION AND ARE TO BE USED FOR ESTIMATING PURPOSES ONLY. PAYMENT TO BE MADE ACCORDING TO QUANTITIES MEASURED AS ACTUALLY PLACED.

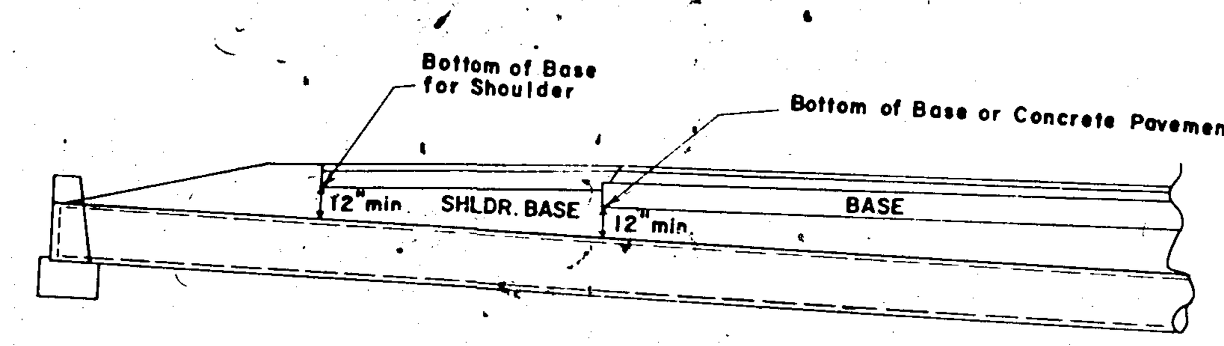
DIMENSIONS					QUANTITIES ONE "L" ENDWALL	
D	AREA SQ.FT.	H	4D	D+30	CU. YD. CONC.	STEEL TIE RODS
15"	1.2	2'3"	5'0"	3'9"	1.08	NONE
18"	1.8	2'6"	6'0"	4'0"	1.24	NONE
24"	3.1	3'0"	8'0"	4'6"	1.59	2-3/4" φ X 2'0"
30"	4.9	3'6"	10'0"	5'0"	2.00	2-3/4" φ X 2'0"
36"	7.1	4'0"	12'0"	5'6"	2.46	2-3/4" φ X 2'6"
42"	9.6	4'6"	14'0"	6'0"	2.98	2-3/4" φ X 3'0"
48"	12.6	5'0"	16'0"	6'6"	3.53	2-3/4" φ X 3'0"
54"	16.0	5'6"	18'0"	7'0"	4.13	2-3/4" φ X 3'0"
60"	19.6	6'0"	20'0"	7'6"	4.85	2-3/4" φ X 3'0"

3:1 FILL SLOPES

SPECIAL NOTE:

QUANTITES OF CONCRETE ARE BASED ON INSIDE DIAMETER OF PIPE. NO DEDUCTIONS SHALL BE MADE FOR SHELL THICKNESS OR SKEW OF PIPE IN COMPUTING PAY QUANTITIES.

SECTION SHOWING MINIMUM COVER OVER CULVERTS



NOTE: GRADE GENERALLY TO FOLLOW SLOPE OF STREAM. DESIRABLE LIMITS 2% to 4%

Revised & Redrawn: A.V.S. Feb., 1966

REVISIONS	DATE	BY
QUAN. ST. WALL ADD'L PIPE (46)	6/21/68	A.V.S.
ADDED SKEW TO SPECIAL NOTE	1-20-69	CRO

STATE HIGHWAY DEPARTMENT OF GEORGIA

ENGINEERING DEPARTMENT

STANDARD PIPE CULVERT

CONCRETE HEADWALL

DESIGNED 8-16-18
TRACED A.V.S.
CHECKED R.B.S.

STATE ROAD DESIGN ENGINEER

STATE HIGHWAY ENGINEER

NUMBER 1001-B