

TABLE OF DIMENSIONS & REINFORCEMENT - 75° SKEW - (ONE WALL)

OPENING PIPE SIZE "A" "B" AREA SQ. FT.	EQ. ROUND PIPE DIA.	DIMENSIONS										REINFORCEMENT															
		WALL					FOOTING & CUT-OFF WALL					BARS VS #4	BARS VS <sub>1</sub> #4	BARS LS #4	BARS DS #4	BARS TS <sub>1</sub> #4	BARS TS <sub>2</sub> #4	BARS HS #4									
		"L"	"H"	"VO"	"a"	"b"	"c"	"d"	"e"	"f"	"g"	"h"	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.			
23" 14"	1.8	18"	9'-6"	3'-4 1/2"	2'-4 1/2"	4'-9"	4'-9"	---	1'-0"	4"	9"	8"	1'-9"	10	4'-3"	---	---	6	9'-0"	---	---	3	3'-6"	3	3'-3"	10	1'-9"
30" 19"	3.3	24"	12'-0"	4'-0 1/2"	3'-0 1/2"	6'-0"	6'-0"	---	1'-0"	6"	9"	1'-0"	2'-3"	12	5'-0"	---	---	6	11'-6"	---	---	3	4'-7"	3	4'-0"	12	1'-9"
34" 22"	4.1	27"	13'-6"	4'-5"	3'-5"	6'-9"	6'-9"	---	1'-0"	7"	9"	1'-1"	2'-5"	14	5'-6"	---	---	6	13'-0"	---	---	4	5'-0"	4	5'-0"	14	2'-0"
38" 24"	5.1	30"	14'-6"	4'-9 1/2"	3'-9 1/2"	7'-3"	7'-3"	---	1'-0"	8"	9"	1'-3"	2'-8"	14	6'-0"	---	---	6	14'-0"	---	---	4	5'-3"	4	5'-0"	15	2'-3"
45" 29"	7.4	36"	17'-6"	5'-6"	4'-6"	8'-9"	8'-9"	---	1'-0"	9"	9"	1'-6"	3'-0"	16	6'-9"	---	---	6	17'-0"	---	---	5	6'-9"	5	6'-3"	18	2'-6"
53" 34"	10.2	42"	20'-6"	6'-3"	5'-3"	10'-3"	10'-3"	---	1'-0"	11"	10"	1'-9"	3'-6"	19	7'-9"	---	---	6	20'-0"	---	---	5	8'-0"	5	7'-9"	21	3'-0"
60" 38"	12.9	48"	23'-0"	6'-11"	5'-11"	11'-6"	11'-6"	---	1'-0"	11"	10"	1'-11"	3'-10"	25	8'-6"	---	---	6	22'-6"	---	---	9	1'-6"	6	8'-9"	28	3'-6"
68" 43"	16.6	54"	25'-6"	7'-8"	6'-8"	12'-9"	12'-9"	---	1'-0"	11"	10"	1'-2"	4'-3"	33	9'-6"	---	---	6	25'-0"	---	---	11	1'-6"	7	10'-0"	34	3'-9"
76" 48"	20.5	60"	28'-6"	8'-5"	7'-5"	14'-3"	14'-3"	---	1'-0"	11"	10"	1'-3"	4'-6"	47	10'-6"	---	---	6	28'-0"	---	---	8	11'-3"	8	10'-9"	43	4'-0"
83" 53"	24.8	66"	31'-0"	9'-1"	8'-1"	15'-6"	15'-6"	---	1'-0"	11"	10"	1'-4"	5'-0"	29	11'-6"	---	---	6	30'-6"	---	---	13	1'-6"	8	12'-3"	46	4'-6"
91" 58"	29.5	72"	34'-0"	9'-10"	8'-10"	17'-0"	17'-0"	---	1'-0"	11"	10"	1'-3"	5'-6"	36	12'-6"	---	---	6	33'-6"	---	---	15	1'-6"	9	13'-0"	58	5'-0"

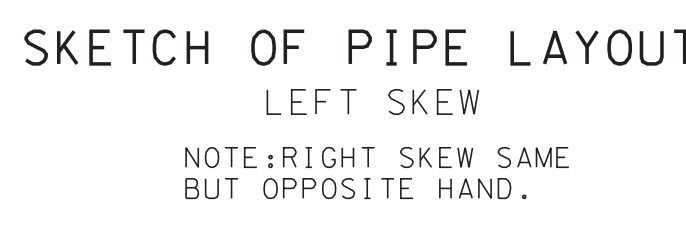


TABLE OF DIMENSIONS & REINFORCEMENT - 60° SKEW - (ONE WALL)

OPENING PIPE SIZE "A" "B" AREA SQ. FT.	EQ. ROUND PIPE DIA.	DIMENSIONS										REINFORCEMENT															
		WALL					FOOTING & CUT-OFF WALL					BARS VS #4	BARS VS <sub>1</sub> #4	BARS LS #4	BARS DS #4	BARS TS <sub>1</sub> #4	BARS TS <sub>2</sub> #4	BARS HS #4									
		"L"	"H"	"VO"	"a"	"b"	"c"	"d"	"e"	"f"	"g"	"h"	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.			
23" 14"	1.8	18"	10'-0"	3'-4 1/2"	2'-4 1/2"	4'-9"	5'-3"	---	1'-0"	4"	9"	8"	1'-9"	11	4'-3"	---	---	6	9'-6"	---	---	3	4'-0"	3	3'-0"	10	1'-3"
30" 19"	3.3	24"	12'-6"	4'-0 1/2"	3'-0 1/2"	6'-0"	6'-6"	---	1'-0"	6"	9"	1'-0"	2'-3"	13	5'-0"	---	---	6	12'-0"	---	---	3	5'-0"	3	4'-0"	13	1'-9"
34" 22"	4.1	27"	14'-3"	4'-5"	3'-5"	6'-9"	7'-6"	---	1'-0"	7"	9"	1'-1"	2'-5"	14	5'-6"	---	---	6	13'-9"	---	---	4	6'-0"	4	4'-7"	14	2'-0"
38" 24"	5.1	30"	15'-6"	4'-9 1/2"	3'-9 1/2"	7'-3"	8'-3"	---	1'-0"	8"	9"	1'-3"	2'-8"	14	6'-0"	---	---	6	15'-0"	---	---	4	6'-3"	4	5'-0"	16	2'-3"
45" 29"	7.4	36"	18'-6"	5'-6"	4'-6"	8'-9"	9'-9"	---	1'-0"	9"	9"	1'-6"	3'-0"	17	6'-9"	---	---	6	18'-0"	---	---	5	7'-6"	5	6'-0"	19	2'-6"
53" 34"	10.2	42"	21'-6"	6'-3"	5'-3"	10'-3"	11'-3"	---	1'-0"	11"	10"	1'-9"	3'-6"	20	7'-9"	---	---	6	21'-0"	---	---	5	9'-0"	5	7'-3"	22	3'-0"
60" 38"	12.9	48"	24'-3"	6'-11"	5'-11"	11'-6"	12'-9"	---	1'-0"	11"	10"	1'-11"	3'-10"	26	8'-6"	---	---	6	23'-9"	---	---	6	10'-6"	6	8'-3"	29	3'-6"
68" 43"	16.6	54"	27'-0"	7'-8"	6'-8"	12'-9"	14'-3"	---	1'-0"	11"	10"	1'-2"	4'-3"	34	9'-6"	---	---	6	26'-6"	---	---	7	11'-6"	7	9'-0"	36	3'-9"
76" 48"	20.5	60"	30'-0"	8'-5"	7'-5"	14'-3"	15'-9"	---	1'-0"	11"	10"	1'-3"	4'-6"	49	10'-6"	---	---	6	28'-0"	---	---	8	12'-9"	8	10'-3"	45	4'-0"
83" 53"	24.8	66"	32'-9"	9'-1"	8'-1"	15'-6"	17'-3"	---	1'-0"	11"	10"	1'-4"	5'-0"	29	11'-6"	---	---	6	32'-3"	---	---	16	1'-6"	8	14'-0"	49	4'-6"
91" 58"	29.5	72"	36'-0"	9'-10"	8'-10"	17'-0"	19'-0"	---	1'-0"	11"	10"	1'-3"	5'-6"	36	12'-6"	---	---	6	35'-6"	---	---	17	1'-6"	9	15'-6"	61	5'-0"

TABLE OF DIMENSIONS & REINFORCEMENT - 45° SKEW - (ONE WALL)  
 \* DIMENSIONS SHOWN ARE INSIDE DIMENSIONS - SEE DETAIL SHEET.

OPENING PIPE SIZE "A" "B" AREA SQ. FT.	EQ. ROUND PIPE DIA.	DIMENSIONS										REINFORCEMENT															
		WALL					FOOTING & CUT-OFF WALL					BARS VS #4	BARS VS <sub>1</sub> #4	BARS LS #4	BARS DS #4	BARS TS <sub>1</sub> #4	BARS TS <sub>2</sub> #4	BARS HS #4									
		"L"	"H"	"VO"	"a"	"b"	"c"	"d"	"e"	"f"	"g"	"h"	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.			
23" 14"	1.8	18"	11'-0"	3'-4 1/2"	2'-4 1/2"	4'-9"	6'-3"	---	1'-0"	4"	9"	8"	1'-9"	11	4'-3"	---	---	6	10'-6"	---	---	3	5'-0"	3	2'-6"	11	1'-3"
30" 19"	3.3	24"	14'-3"	4'-0 1/2"	3'-0 1/2"	6'-3"	8'-0"	---	1'-0"	6"	9"	1'-0"	2'-3"	13	5'-0"	---	---	6	13'-9"	---	---	3	6'-3"	3	3'-9"	14	1'-9"
34" 22"	4.1	27"	16'-0"	4'-5"	3'-5"	7'-0"	9'-0"	---	1'-0"	7"	9"	1'-1"	2'-5"	15	5'-6"	---	---	6	15'-6"	---	---	4	7'-3"	4	4'-3"	16	2'-0"
38" 24"	5.1	30"	17'-9"	4'-9 1/2"	3'-9 1/2"	7'-9"	10'-0"	---	1'-0"	8"	9"	1'-3"	2'-8"	17	6'-0"	---	---	6	17'-3"	---	---	4	8'-0"	4	5'-0"	18	2'-3"
45" 29"	7.4	36"	21'-0"	5'-6"	4'-6"	9'-0"	12'-0"	---	1'-0"	9"	9"	1'-6"	3'-0"	18	6'-9"	---	---	6	20'-6"	---	---	5	9'-9"	5	5'-9"	21	2'-6"
53" 34"	10.2	42"	24'-3"	6'-3"	5'-3"	10'-6"	13'-9"	---	1'-0"	11"	10"	1'-9"	3'-6"	21	7'-9"	---	---	6	23'-9"	---	---	5	11'-0"	5	6'-9"	24	3'-0"
60" 38"	12.9	48"	27'-3"	6'-11"	5'-11"	11'-9"	15'-6"	---	1'-0"	11"	10"	1'-11"	3'-10"	28	8'-6"	---	---	6	26'-9"	---	---	6	12'-9"	6	7'-6"	33	3'-6"
68" 43"	16.6	54"	29'-9"	7'-8"	6'-8"	12'-3"	17'-6"	---	1'-0"	11"	10"	1'-2"	4'-3"	36	9'-6"	---	---	6	29'-3"	---	---	7	14'-3"	7	7'-9"	40	3'-9"
76" 48"	20.5	60"	34'-3"	8'-5"	7'-5"	14'-9"	19'-6"	---	1'-0"	11"	10"	1'-3"	4'-6"	55	10'-6"	---	---	6	33'-9"	---	---	8	16'-0"	8	9'-9"	51	4'-0"
83" 53"	24.8	66"	37'-3"	9'-1"	8'-1"	16'-0"	21'-3"	---	1'-0"	11"	10"	1'-4"	5'-0"	33	11'-6"	---	---	6	36'-9"	---	---	14	1'-6"	8	10'-6"	56	4'-6"
91" 58"	29.5	72"	40'-9"	9'-10"	8'-10"	17'-9"	23'-0"	---	1'-0"	11"	10"	1'-3"	5'-6"	41	12'-6"	---	---	6	40'-3"	---	---	18	1'-6"	9	11'-9"	68	5'-0"

TABLE OF DIMENSIONS & REINFORCEMENT - 90° SKEW - (ONE WALL)  
 \* FOR PIPE SIZES 23" X 14" THRU 53" X 34"

OPENING PIPE SIZE "A" "B" AREA SQ. FT.	EQ. ROUND PIPE DIA.	DIMENSIONS										REINFORCEMENT											
		WALL					FOOTING & CUT-OFF WALL					BARS VS #4	BARS LS #4	BARS DS #4	BARS TS #4	BARS HS #4							
		"L"	"H"	"VO"	"a"	"b"	"c"	"d"	"e"	"f"	"g"	"h"	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	
23" 14"	1.8	18"	8'-9"	3'-4 1/2"	2'-4 1/2"	---	1'-0"	4"	9"	8"	1'-9"	10	4'-6"	6	8'-3"	---	---	6	3'-0"	9	1'-3"		
30" 19"	3.3	24"	11'-3"	4'-0 1/2"	3'-0 1/2"	---	1'-0"	6"	9"	1'-0"	2'-3"	12	5'-3"	6	10'-9"	---	---	6	4'-0"	12	1'-9"		
34" 22"	4.1	27"	12'-9"	4'-5"	3'-5"	---	1'-0"	7"	9"	1'-1"	2'-5"	14	6'-0"	6	12'-3"	---	---	7	1'-6"	8	5'-0"	13	2'-0"
38" 24"	5.1	30"	14'-0"	4'-9 1/2"	3'-9 1/2"	---	1'-0"	8"	9"	1'-3"	2'-8"	14	6'-3"	6	13'-6"	---	---	8	5'-3"	14	2'-3"		
45" 29"	7.4	36"	16'-9"	5'-6"	4'-6"	---	1'-0"	9"	9"	1'-6"	3'-0"	16	7'-0"	6	16'-3"	---	---	8	1'-6"	10	6'-0"	17	2'-6"
53" 34"	10.2	42"	19'-6"	6'-3"	5'-3"	---	1'-0"	11"	10"	1'-9"	3'-6"	22	8'-0"	6	19'-0"	---	---	9	1'-6"	10	7'-6"	24	3'-0"

ESTIMATED QUANTITIES - ONE WALL - ALL SKEWS

PIPE SIZE "A" "B"	CONC.-TOTAL CU. YDS. SKEWS	CONC. PER FT. CU. YDS.	REINF.-TOTAL LBS. SKEWS				REINF. PER FT. LBS.			
			90°	75°	60°	45°				
23" 14"	1.3	1.4	1.5	1.6	0.159	83	87	92	98	9.672
30" 19"	2.0	2.2	2.3	2.6	0.196	116	118	125	135	10.505
34" 22"	2.8	2.9	3.0	3.4	0.213	157	156	160	178	11.672
38" 24"	3.2	3.3	3.6	4.0	0.231	169	170	179	208	12.173
45" 29"	4.4	4.5	4.8	5.3	0.264	205	222	235	260	13.507
53" 34"	5.9	6.3	6.5	7.2	0.313	302	283	296	322	14.507
60" 38"	7.8	8.3	9.2	10.1	0.354	379	396	438	478	17.609
68" 43"	9.8	10.3	11.2	12.2	0.404	498	522	563	602	20.424
76" 48"	12.6	13.1	15.0	16.0	0.467	687	719	811	877	27.347
83" 53"	15.8	16.7	18.8	20.1	0.540	919	950	1074	1144	35.179
91" 58"	19.7	20.8	23.3	25.1	0.619	1232	1263	1433	1518	45.328

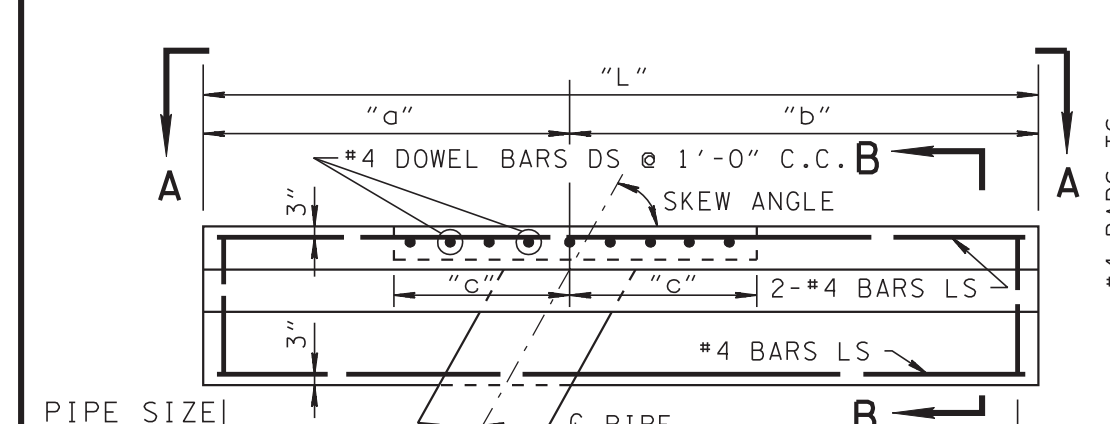
\* INCLUDES CUT-OFF WALL  
 NOTE: CUT-OFF WALL PER FOOT SAME FOR ALL SKEWS & PIPE SIZES  
 EQUALS 0.03 CU. YDS. & 1.0 LBS. REINFORCING STEEL.

MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE  
 DEPARTMENT OF TRANSPORTATION

STANDARD  
 STRAIGHT ENDWALLS  
 VERTICAL OVAL  
 CONCRETE PIPES

D-PE-6



PIPE SIZE "A" "B"	#4 BARS HS	9 SPA. @ 12" C.C.	SKEW
23" 14"	4	9	75°
23" 14"	4	12	60°
23" 14"	5	12	45°
30" 19"	4	12	75°
30" 19"	4	12	60°