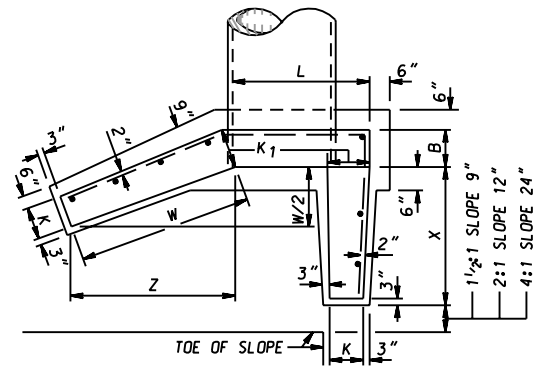
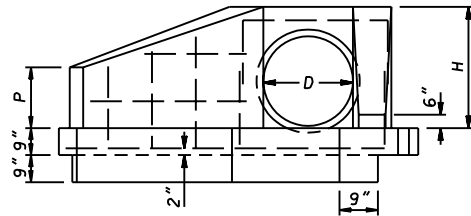


**ISOMETRIC VIEW**



**PLAN**



**ELEVATION**

QUANTITIES FOR ESTIMATING PURPOSES ONLY

SLOPE 1 1/2 : 1												
OPENING		DIMENSIONS									QUANTITIES	
PIPE DIA.	AREA	ENDWALL			WINGS						1-ENDWALL 2-WINGS	
		L	B	H	W	X	Z	K <sub>1</sub>	K	P	CONC. C.Y.	STEEL LBS.
12"	0.79	1'-9"	9"	1'-8"	2'-0"	1'-3"	1'-9"	9"	7"	1'-4"	0.51	38
15"	1.23	2'-0"	9"	2'-0"	2'-4"	1'-9"	2'-0"	9"	7"	1'-5"	0.63	42
18"	1.77	2'-3"	9"	2'-3"	2'-8"	2'-1"	2'-4"	9"	8"	1'-6"	0.77	48
21"	2.40	2'-6"	9"	2'-7"	3'-1"	2'-6"	2'-8"	9"	8"	1'-9"	1.10	61
24"	3.14	3'-0"	12"	2'-11"	3'-6"	2'-11"	3'-0"	12"	11"	2'-1"	1.43	73
27"	3.98	3'-3"	12"	3'-3"	3'-11"	3'-4"	3'-4"	12"	11"	2'-3"	1.66	85
30"	4.91	3'-6"	12"	3'-6"	4'-4"	3'-9"	3'-9"	12"	11"	2'-4"	1.88	96
33"	5.94	3'-9"	12"	3'-9"	4'-8"	4'-1"	4'-0"	12"	11"	2'-6"	2.10	107
36"	7.07	4'-0"	12"	4'-0"	5'-0"	4'-6"	4'-4"	12"	11"	2'-7"	2.32	118
42"	9.62	4'-6"	12"	4'-7"	5'-9"	5'-4"	5'-0"	12"	11"	2'-11"	2.85	144
48"	12.57	5'-0"	12"	5'-1"	6'-4"	6'-2"	5'-6"	12"	11"	3'-3"	3.37	170

**GENERAL NOTES**

- SPECIFICATIONS: LATEST S.H.A.
- CONCRETE SHALL BE MIX NO. 2
- REINFORCING: DEFORMED STEEL BARS
- VERTICAL NO. 6 BARS 12" C/C
- HORIZONTAL NO. 4 BARS 12" C/C HOOKED ON ONE END
- CHAMFER: ALL EXPOSED EDGES 1"x1" OR AS DIRECTED.

SLOPE 2 : 1												
OPENING		DIMENSIONS									QUANTITIES	
PIPE DIA.	AREA	ENDWALL			WINGS						1-ENDWALL 2-WINGS	
		L	B	H	W	X	Z	K <sub>1</sub>	K	P	CONC. C.Y.	STEEL LBS.
12"	0.79	1'-9"	9"	1'-7"	2'-3"	1'-10"	2'-0"	9"	7"	1'-3"	0.55	38
15"	1.23	2'-0"	9"	1'-11"	2'-6"	2'-6"	2'-2"	9"	8"	1'-5"	0.73	46
18"	1.77	2'-3"	9"	2'-2"	3'-0"	3'-0"	2'-7"	9"	8"	1'-7"	0.89	57
21"	2.40	2'-6"	9"	2'-5"	3'-6"	3'-6"	3'-0"	9"	8"	1'-10"	1.27	70
24"	3.14	3'-0"	12"	2'-9"	4'-0"	4'-0"	3'-5"	12"	11"	2'-1"	1.64	82
27"	3.98	3'-3"	12"	3'-0"	4'-4"	4'-6"	3'-9"	12"	11"	2'-3"	1.89	98
30"	4.91	3'-6"	12"	3'-4"	4'-8"	5'-2"	4'-1"	12"	11"	2'-6"	2.14	113
33"	5.94	3'-9"	12"	3'-7"	5'-0"	5'-8"	4'-4"	12"	11"	2'-8"	2.31	123
36"	7.07	4'-0"	12"	3'-10"	5'-4"	6'-2"	4'-7"	12"	11"	2'-10"	2.48	132
42"	9.62	4'-6"	12"	4'-5"	6'-4"	7'-4"	5'-6"	12"	11"	3'-2"	3.30	163
48"	12.57	5'-0"	12"	4'-11"	7'-0"	8'-4"	6'-1"	12"	11"	3'-6"	3.85	193

SLOPE 4 : 1												
OPENING		DIMENSIONS									QUANTITIES	
PIPE DIA.	AREA	ENDWALL			WINGS						1-ENDWALL 2-WINGS	
		L	B	H	W	X	Z	K <sub>1</sub>	K	P	CONC. C.Y.	STEEL LBS.
12"	0.79	1'-9"	9"	1'-5"	2'-6"	3'-8"	2'-2"	9"	8"	1'-3"	0.81	45
15"	1.23	2'-0"	9"	1'-9"	3'-0"	5'-0"	2'-7"	9"	8"	1'-5"	1.04	68
18"	1.77	2'-3"	9"	2'-0"	3'-6"	6'-0"	3'-0"	9"	8"	1'-7"	1.26	74
21"	2.40	2'-6"	9"	2'-3"	4'-0"	7'-0"	3'-5"	9"	8"	1'-11"	1.75	89
24"	3.14	3'-0"	12"	2'-6"	4'-6"	8'-0"	3'-11"	12"	11"	2'-2"	2.23	104
27"	3.98	3'-3"	12"	2'-9"	5'-0"	9'-2"	4'-4"	12"	11"	2'-4"	2.64	126
30"	4.91	3'-6"	12"	3'-1"	5'-6"	10'-4"	4'-9"	12"	11"	2'-7"	3.04	147
33"	5.94	3'-9"	12"	3'-4"	6'-0"	11'-4"	5'-2"	12"	11"	2'-9"	3.40	164
36"	7.07	4'-0"	12"	3'-7"	6'-6"	12'-4"	5'-8"	12"	11"	3'-0"	3.75	180
42"	9.62	4'-6"	12"	4'-2"	7'-6"	14'-8"	6'-6"	12"	11"	3'-5"	4.67	218
48"	12.57	5'-0"	12"	4'-8"	8'-3"	16'-8"	7'-2"	12"	11"	3'-10"	5.57	277

SPECIFICATION 305 CATEGORY CODE ITEMS

APPROVED *Kirk G. McCall*  
DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT

APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
APPROVAL 8-28-86	APPROVAL 12-12-86
REVISED 10-1-01	REVISED
REVISED	REVISED
REVISED	REVISED

**SHA** State Highway Administration

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

**STANDARD TYPE F ENDWALL**  
**METAL OR CONCRETE ROUND PIPE**

**STANDARD NO. MD 358.01**