

PIPE GRATE

TYPE I - 3/2" O.D.
 TYPE II - 4" O.D.
 TYPE III - 4 1/2" O.D.

LENGTH OF GRATE TO BE DETERMINED
 BY L₂ x NUMBER OF PIPES REQUIRED

4 : 1 SLOPE

PIPE SIZE	H	L	W	T							
					PIPE O.D.	NO. PIPES REQUIRED	L ₂	L ₃	L ₄	L ₅	
12"	1'-10"	7'-4"	2'-0"	8"	3 1/2"	1	8'-6 3/4"	NO CENTER SUPPORT REQUIRED			
15" or 18"	2'-4 1/2"	9'-6"	2'-0"	8"	3 1/2"	1	10'-9 1/2"				
21" or 24"	2'-11"	11'-8"	3'-0"	8"	4"	2	13'-0 1/4"				
27" or 30"	3'-5 1/2"	13'-10"	3'-0"	8"	4"	2	15'-3"				
33" or 36"	4'-0"	16'-0"	4'-0"	8"	4 1/2"	3	17'-6"				
42"	4'-6 1/2"	18'-2"	4'-0"	12"	4 1/2"	3	19'-8 3/4"				
48"	5'-1"	20'-4"	5'-0"	12"	4 1/2"	3	22'-2 5/8"	10'-5 1/4"	11'-10 1/2"	10'-4 1/4"	
54"	5'-7 1/2"	22'-6"	6'-0"	12"	4 1/2"	4	24'-5 1/2"	12'-8 1/8"	11'-10 1/2"	12'-7 1/8"	
60"	6'-2"	24'-8"	6'-0"	12"	4 1/2"	4	26'-8 1/2"	14'-11"	11'-10 1/2"	14'-10"	

DIMENSIONS FOR BEVEL ON HEADWALL

PIPE I.D.	a	b
12"	0'-1 1/4"	0'-1"
15" or 18"	0'-2"	0'-1 1/2"
21" or 24"	0'-2 1/2"	0'-2"
27" or 30"	0'-3 1/4"	0'-2 1/2"
33" or 36"	0'-3 3/4"	0'-3"
42"	0'-4 1/2"	0'-3 1/2"
48"	0'-5"	0'-4"
54"	0'-5 3/4"	0'-4 1/2"
60"	0'-6 1/4"	0'-5"

6 : 1 SLOPE

PIPE SIZE	H	L	W	T							
					PIPE O.D.	NO. PIPES REQUIRED	L ₂	L ₃	L ₄	L ₅	
12"	1'-10"	11'-0"	2'-0"	8"	3 1/2"	1	12'-1 1/4"	NO CENTER SUPPORT REQUIRED			
15" or 18"	2'-4 1/2"	14'-3"	2'-0"	8"	4"	1	15'-5 1/4"				
21" or 24"	2'-11"	17'-6"	3'-0"	8"	4 1/2"	2	18'-9"				
27" or 30"	3'-5 1/2"	20'-9"	3'-0"	8"	4 1/2"	2	22'-0"	4'-8 1/8"	17'-4 1/2"	4'-7 1/2"	
33" or 36"	4'-0"	24'-0"	4'-0"	8"	4 1/2"	3	25'-3 3/8"	7'-11 5/8"	17'-4 1/2"	7'-11"	
42"	4'-6"	27'-3"	4'-0"	12"	4 1/2"	3	28'-11"	11'-7 1/4"	17'-4 1/2"	11'-6 1/2"	
48"	5'-1"	30'-6"	5'-0"	12"	4 1/2"	3	32'-2"	14'-10 3/4"	17'-4 1/2"	14'-10 1/8"	
54"	5'-7 1/2"	33'-9"	6'-0"	12"	4 1/2"	4	35'-6"	18'-2 1/4"	17'-4 1/2"	18'-1 1/2"	
60"	6'-2"	37'-0"	6'-0"	12"	4 1/2"	4	38'-9 1/2"	19'-5 1/2"	19'-4 3/4"	19'-4 3/4"	

3 : 1 SLOPE

PIPE SIZE	H	L	W	T	PIPE GRATE			NO CENTER SUPPORT REQUIRED
					PIPE O.D.	NO. PIPES REQUIRED	L ₂	
15" or 18"	2'-4 1/2"	7'-1 1/2"	2'-0"	8"	3 1/2"	1	8'-6 1/4"	
21" or 24"	2'-11"	8'-9"	3'-0"	8"	3 1/2"	2	10'-2 3/4"	
27" or 30"	3'-5 1/2"	10'-4 1/2"	3'-0"	8"	3 1/2"	2	11'-11 1/4"	
33" or 36"	4'-0"	12'-0"	4'-0"	8"	4"	3	13'-7 3/4"	
42"	4'-6 1/2"	13'-7 1/2"	4'-0"	12"	4"	3	15'-4 1/4"	
48"	5'-1"	15'-3"	5'-0"	12"	4 1/2"	3	17'-0 1/2"	
54"	5'-7 1/2"	16'-10 1/2"	6'-0"	12"	4 1/2"	4	18'-9 1/2"	
60"	6'-2"	18'-6"	6'-0"	12"	4 1/2"	4	20'-6"	

APPROXIMATE QUANTITIES

PIPE SIZE	3 : 1			PIPE SIZE	4 : 1			PIPE SIZE	6 : 1		
	CONCRETE CUBIC YARDS		lbs. REINF. STEEL		CONCRETE CUBIC YARDS		lbs. REINF. STEEL		CONCRETE CUBIC YARDS		lbs. REINF. STEEL
	CONC. PIPE	C.M. PIPE			CONC. PIPE	C.M. PIPE			CONC. PIPE	C.M. PIPE	
12"	.95	.97	240	12"	1.17	1.18	308	12"	1.64	1.66	443
15" or 18"	1.27	1.29	328	15" or 18"	1.59	1.61	425	15" or 18"	2.28	2.31	618
21" or 24"	2.30	2.35	483	21" or 24"	2.44	2.49	628	21" or 24"	3.55	3.59	917
27" or 30"	2.38	2.44	608	27" or 30"	3.01	3.01	788	27" or 30"	4.35	4.41	1157
33" or 36"	3.28	3.38	809	33" or 36"	4.20	4.29	1059	33" or 36"	6.01	6.09	1556
42"	6.27	6.46	1050	42"	8.05	8.22	1368	42"	11.59	11.76	1997
48"	8.07	8.29	1327	48"	10.29	10.50	1647	48"	14.84	15.04	2514
54"	10.02	10.29	1612	54"	12.80	13.06	2105	54"	18.47	18.73	3094
60"	11.18	11.50	1826	60"	14.36	14.68	2391	60"	20.82	21.14	3517



ROAD AND BRIDGE STANDARDS

PIPE ENDWALL WITH LOAD-CARRYING GRATE

12" - 60" CIRCULAR PIPES

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

105
233
302

SHEET 3 OF 3

REVISION DATE

101.28