Designation: D 3311 – 02

An American National Standard

Standard Specification for Drain, Waste, and Vent (DWV) Plastic Fittings Patterns[1]

This standard is issued under the fixed designation D 3311; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification provides standard fitting geometries and laying lengths for plastic fittings intended for use in drain, waste, and vent applications.

1.2 Fittings meeting the requirements of this standard specification are designed for use with outside diameter controlled pipe. The inside diameter can vary significantly as the wall thickness and outside diameter varies and therefore is not suitable for use as a fitting socket.

1.3 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are provided for information only.

2. Referenced Documents

2.1 *ASTM Standards:*

D 2661 Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe Fittings[2]

D 2665 Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings[2]

D 2749 Symbols for Dimensions of Plastic Pipe Fittings[2]

F 628 Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe with a Cellular Core[2]

F 891 Specification for Coextruded Poly(Vinyl Chloride) (PVC) Plastic Pipe with a Cellular Core[2]

3. Requirements

3.1 Fittings shall conform to the geometries and laying lengths as shown in Tables 1-44 and Fig. 1. Tolerances shall be ±1/16 in. unless otherwise specified.

3.2 Spigot and hub dimensions shall conform to the requirements of the referencing standard.

3.3 The exact outside shape of a fitting is not determined by the outline drawings shown in this specification but rather by the socket dimensions, wall thickness requirements, waterway, laying lengths, and any other critical dimensions that may be specified.

3.4 The pitch of sockets for patterns with 90° angles (except vent fittings) shall be ¼ in./ft or 1° 12 min.

3.5 On double reducing sanitary tees, the *G2* dimension on branches will be calculated on the larger size and centerlines shall remain the same for both branches.

3.6 All other dimensions, materials and property requirements shall be in conformance with the referencing standard.

4. Keywords

4.1 DWV; fittings; plastic; Schedule 40; thermoplastic

[1] This specification is under the jurisdiction of ASTM Committee F17 on Plastic Piping Systems and is the direct responsibility of Subcommittee F17.63 on Drain, Waste, and Vent Pipe and Tube.

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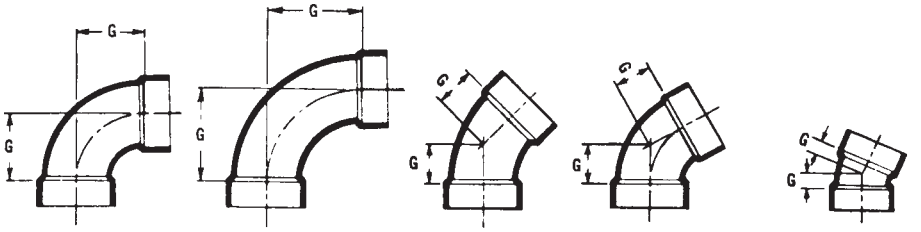
[2] *Annual Book of ASTM Standards*, Vol 08.04.

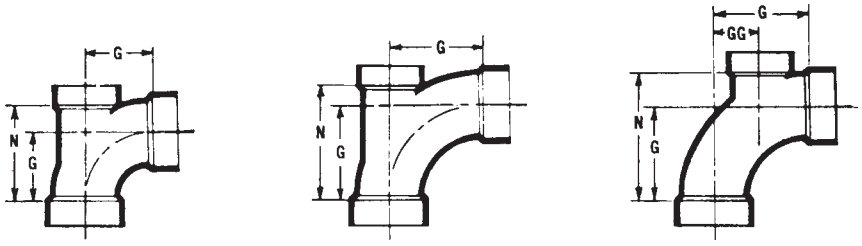
TABLE 1 Bends, in. (mm)



1/4 BEND | LONG SWEEP 1/4 BEND | 1/8 BEND | 1/6 BEND | 1/16 BEND

Nominal Pipe Size	¼ Bend	Long Sweep ¼ Bend	⅛ Bend	⅙ Bend	1/16 Bend
	G	*G*	*G*	*G*	*G*
1¼	1 9/16 (40)	2¼ (57)	1 (25)	7/8 (22)	7/16 (11)
1½	1¾ (44)	2¾ (70)	1⅛ (29)	1 (25)	½ (13)
2	2 5/16 (59)	3¼ (83)	1½ (38)	1 5/16 (33)	11/16 (17)
3	3 1/16 (78)	4 1/16 (103)	1¾ (44)	1 11/16 (43)	13/16 (21)
4	3 7/8 (98)	4 15/16 (125)	2 3/16 (56)	2 1/16 (52)	1 (25)
6	5 (min) (127)	9 (229)	2 (min) (51)	3⅜ (86)	1½ (38)
8	6 (152)	. . .	2 1/16 (52)	. . .	1½ (38)

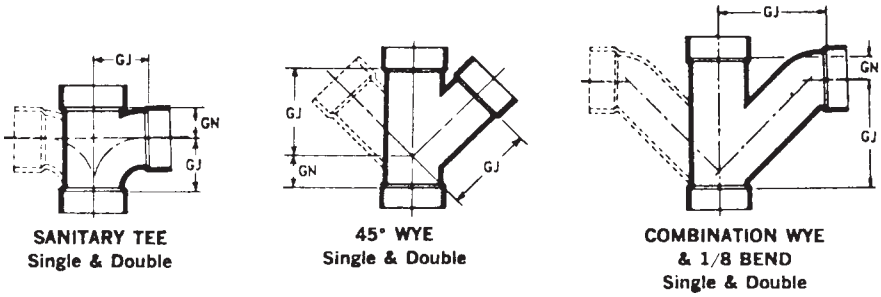
TABLE 2 Bends with Inlets, in. (mm)



1/4 BEND With Low Heel Inlet | LONG SWEEP 1/4 BEND With Low Heel Inlet | LONG SWEEP 1/4 BEND With High Heel Inlet

Nominal Pipe Size	¼ Bend with Low Heel Inlet		Long-Sweep ¼ Bend with Low Heel Inlet		Long-Sweep ¼ Bend with High Heel Inlet		
	G	*N*	*G*	*N*	*G*	*N*	*GG*
3 by 3 by 1½	3 1/16 (78)	4 3/16 (106)	4 1/16 (103)	4¾ (121)	. . .	. . .	. . .
3 by 3 by 2	3 1/16 (78)	4 7/16 (113)	4 1/16 (103)	4 15/16 (125)	4 1/16 (103)	5 5/8 (143)	2¼ (57)
4 by 4 by 2	3 7/8 (98)	5 7/16 (138)	4 15/16 (125)	6 (152)	. . .	. . .	. . .

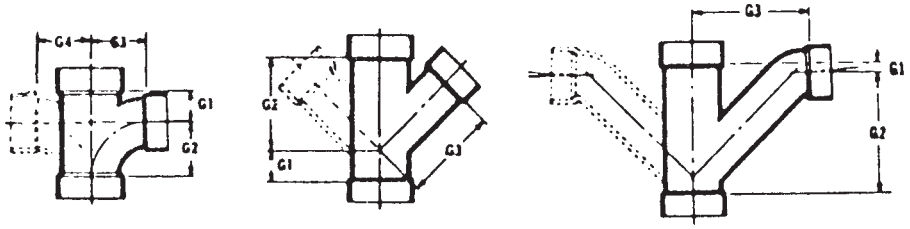
TABLE 3 Sanitary Tees, 45° Wyes, Combination Wyes and ⅛ Bends, in. (mm)



Nominal Pipe Size	Sanitary Tee Single and Double[A]		45° Wye, Single and Double		Combination Wye and 1 / 8 Bend Single and Double	
	GN	*GJ*	*GN*	*GJ*	*GN*	*GJ*
1¼	¾ (19)	1⁹⁄₁₆ (40)	1¹⁄₁₆ (27)	2⁹⁄₁₆ (65)	⁷⁄₁₆ (11)	2¹⁵⁄₁₆ (75)
1½	1 (25)	1¾ (44)	1⅛ (29)	2⅞ (73)	½ (13)	3⅜ (86)
2	1⅜ (35)	2⁵⁄₁₆ (59)	1⅜ (35)	3⅝ (92)	1 (25)	4½ (114)
3	1¹³⁄₁₆ (46)	3¹⁄₁₆ (78)	1⅝ (41)	5 (127)	1⅛ (29)	6⁵⁄₁₆ (160)
4	2¼ (57)	3⅞ (98)	1⅞ (48)	6⅜ (162)	1¹³⁄₁₆ (46)	8⅝ (219)
6	3½ (89)	5 (127)	1¾ (44)	8⁷⁄₁₆ (214)	[B]	[B]
8	4½ (114)	6 (152)	2⅜ (60)	11¾ (298)	[B]	[B]

[A] Non-reducing double sanitary tees are for vent use only.
[B] Combination wye and ⅛ bend is assembled from two standard fittings.

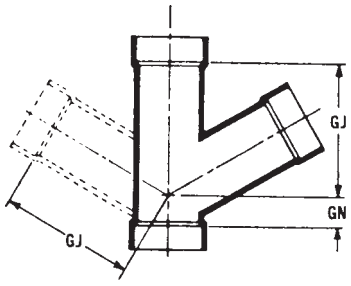
TABLE 4 Reducing Sanitary Tees, 45° Wyes, Combination Wyes, and ⅛ Bends, in. (mm)



Nominal Pipe Size	Sanitary Tee, Reducing Single and Double[A]				45° Wye, Reducing Single and Double			Combination Wye and ⅛ Bend Reducing Single and Double		
	G1	G2	G3	G4	G1	G2	G3	G1	G2	G3
1½ by 1¼ by 1¼	¹¹⁄₁₆ (17)[B]	1½ (38)[B]	1¹¹⁄₁₆ (43)[B]	1¹¹⁄₁₆ (43)[B]	—	—	—	—	—	—
1½ by 1¼ by 1½	1 (25)	1¾ (44)	1¾ (44)	1¾ (44)	—	—	—	—	—	—
1½ by 1½ by 1¼	¹³⁄₁₆ (21)	1¹¹⁄₁₆ (43)	1¹³⁄₁₆ (46)	1¹³⁄₁₆ (46)	—	—	—	½ (13)	3¼ (83)	3³⁄₁₆ (81)
2 by 1¼ by 1½	1³⁄₁₆ (30)	1¹⁵⁄₁₆ (49)	2³⁄₁₆ (56)	2³⁄₁₆ (56)	—	—	—	—	—	—
2 by 1½ by 1½	1³⁄₁₆ (30)	1¹⁵⁄₁₆ (49)	2³⁄₁₆ (56)	2³⁄₁₆ (56)	¾ (19)[B]	2¹³⁄₁₆ (71)[B]	2¹⁵⁄₁₆ (75)[B]	⁹⁄₁₆ (14)	3¹¹⁄₁₆ (94)	3⅝ (92)
2 by 1½ by 2	1⅜ (35)	2⁵⁄₁₆ (59)	2⁵⁄₁₆ (59)	2⁵⁄₁₆ (50)	1 (25)[B]	3½ (89)[B]	3⅜ (86)[B]	1 (25)	4½ (114)	4½ (114)
2 by 2 by 1¼	1³⁄₁₆ (30)	1¹⁵⁄₁₆ (49)	2³⁄₁₆ (56)	2³⁄₁₆ (56)	—	—	—	—	—	—
2 by 2 by 1½	1³⁄₁₆ (30)	1¹⁵⁄₁₆ (49)	2³⁄₁₆ (56)	2³⁄₁₆ (56)	1¹⁄₁₆ (27)	3⁵⁄₁₆ (84)	3⁷⁄₁₆ (87)	⁹⁄₁₆ (14)	3¹¹⁄₁₆ (170)	3⅝ (92)
3 by 3 by 1½	¹⁵⁄₁₆ (24)	1¾ (44)	2⁹⁄₁₆ (65)	2⁹⁄₁₆ (65)	½ (13)	3¾ (95)	4⁵⁄₁₆ (110)	⅛ (3)	3⁷⁄₁₆ (87)	4¼ (108)
3 by 3 by 2	1³⁄₁₆ (30)	2⅛ (54)	2⅞ (73)	2⅞ (73)	⅞ (22)	4⅛ (105)	4⅝ (117)	⁷⁄₁₆ (11)	4¾ (121)	5⁵⁄₁₆ (135)
3 by 3 by 2 by 1½	¹⁵⁄₁₆ (24)[B]	2¹⁄₁₆ (52)[B]	2⁷⁄₁₆ (62)[B]	2½ (64)[B]	—	—	—	—	—	—
4 by 4 by 1½	1¹⁄₁₆ (27)[B]	2 (51)[B]	3¼ (83)[B]	3¼ (83)[B]	0 (0)[B]	3⁵⁄₁₆ (84)[B]	3¹⁵⁄₁₆ (100)[B]	—	—	—
4 by 4 by 2	1⅛ (29)	2¹⁄₁₆ (52)	3⁵⁄₁₆ (84)	3⁵⁄₁₆ (84)	⅜ (10)	4¹¹⁄₁₆ (119)	5⁹⁄₁₆ (141)	⁵⁄₁₆ (8)	4¾ (121)	5⅞ (149)
4 by 4 by 3	1¾ (44)	3 (76)	3⁹⁄₁₆ (90)	3⁹⁄₁₆ (90)	1¹⁄₁₆ (27)	5⁹⁄₁₆ (141)	6 (152)	1¹⁄₁₆ (27)	6⅜ (162)	6⅞ (175)
6 by 6 by 3	—	—	—	—	³⁄₁₆ (5)[B]	6¹⁵⁄₁₆ (176)[B]	7⁷⁄₁₆ (189)[B]	¹¹⁄₁₆ (17)[B]	7¹³⁄₁₆ (198)[B]	8¹³⁄₁₆ (224)[B]
6 by 6 by 4	2³⁄₁₆ (56)[B]	3⅝ (92)[B]	4⁵⁄₁₆ (110)[B]	4⁵⁄₁₆ (110)[B]	³⁄₁₆ (5)[B]	6¹¹⁄₁₆ (170)[B]	7⁷⁄₁₆ (189)[B]	⁹⁄₁₆ (14)[B]	7¹³⁄₁₆ (198)[B]	8¹⁵⁄₁₆ (227)[B]
8 by 8 by 4	2⅝ (67)	4⅛ (105)	5¼ (133)	5¼ (133)	⅜ (10)	7⅝ (194)	8⅝ (219)	[C]	[C]	[C]
8 by 8 by 6	3⁹⁄₁₆ (90)	4¹³⁄₁₆ (122)	5½ (140)	5½ (140)	1 (25)	9½ (241)	9¹³⁄₁₆ (249)	[C]	[C]	[C]

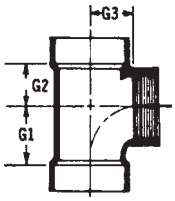
[A] Non-reducing double sanitary tees are for vent use only.
[B] This dimension is a minimum with no upper maximum limit.
[C] Combination Wye and ⅛ bend is assembled from two standard fittings.

TABLE 5 60° Wyes, Single, and Double, in. (mm)



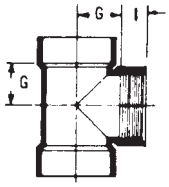
Nominal Pipe Size	GN	GJ
1½	1⅛ (40)	2⅞ (73)
2	1⅜ (37)	3⅝ (92)
3	1⅝ (37)	5 (127)

TABLE 6 Fixture Tees, in. (mm)



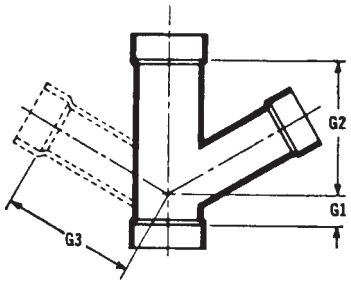
Nominal Pipe Size	G1	G2	G3
1½	1⁹⁄₁₆ (40)	1³⁄₁₆ (30)	1¼ (32)
2 by 1½ by 1½	1⁷⁄₁₆ (37)	1³⁄₁₆ (30)	1¼ (32)
2 by 2 by 1½	1⁷⁄₁₆ (37)	1⁵⁄₁₆ (33)	1¼ (32)

TABLE 7 Cleanout Tees, in. (mm)



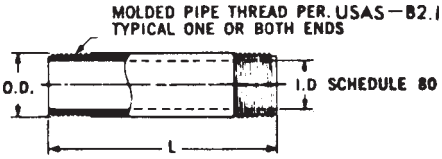
Nominal Pipe Size	G	I
1½	1³⁄₁₆ (30)	⅝ (16)
2	1½ (38)	⅝ (16)
3	1⅞ (48)	¾ (19)
4	2½ (64)	⅞ (22)

TABLE 8 60° Reducing Wyes, Single and Double, in. (mm)



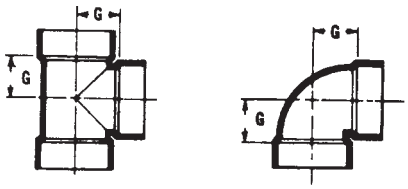
Nominal Pipe Size	G1	G2	G3
2 by 2 by 1½	1¹⁄₁₆ (27)	3⁷⁄₁₆ (87)	3⁷⁄₁₆ (87)
3 by 3 by 1½	½ (13)	3¾ (95)	4⁵⁄₁₆ (110)
3 by 3 by 2	⅞ (22)	4⅛ (105)	4⅝ (117)

TABLE 9 Molded Nipples, in. (mm)



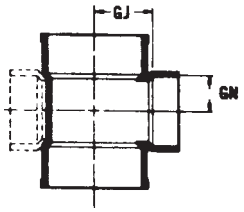
Nominal Pipe Size	OD	ID	Length
1½	1.900	1.500	½ -in. increments from close to 18 in. long
2	2.375	1.939	
3	3.500	2.900	

TABLE 10 Vent Tees and ¼ Bend Vents, in. (mm)



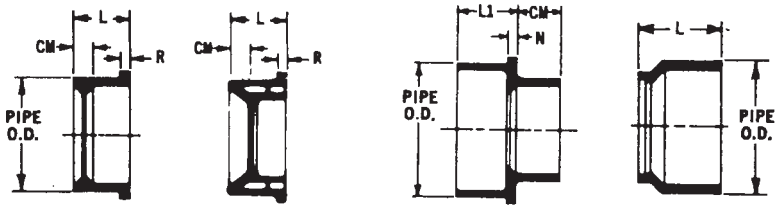
Nominal Pipe Size	Vent Tee	¼ Bend Vent
1¼	1 (25)	1 (25)
1½	1³⁄₁₆ (30)	1³⁄₁₆ (30)
2	1½ (38)	1½ (38)
3	1⅞ (48)	1⅞ (48)
4	2½ (64)	2½ (64)

TABLE 11 Reducing Vent Tees, Single, and Double, in. (mm)



Nominal Pipe Size	GN	GJ
2 by 1½ by 1½	1 3/16 (30)	1½ (38)
2 by 2 by 1½	1 3/16 (30)	1½ (38)
3 by 3 by 1½	1 3/16 (30)	1 7/8 (48)
3 by 3 by 2	1½ (38)	1 7/8 (48)

TABLE 12 Bushings, in. (mm)

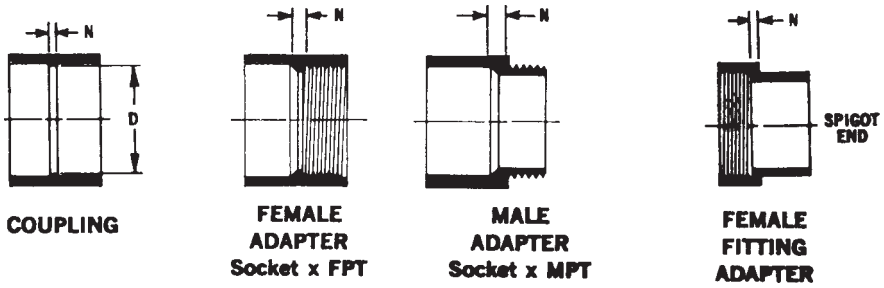


BUSHING Style 1 **BUSHING Style 2** **BUSHING Style 3**

Nominal Pipe Size	Style 1 (a and b)[A]			Style 2			Style 3
	L	CM	R	L1	CM	N	L
1½ by 1¼	15/16 (24)	3/16 (5)	3/16 (5)	. . .	. . .	. . .	1 (25)
2 by 1¼	1 1/16 (27)	5/16 (8)	3/16 (5)	. . .	. . .	. . .	1 1/8 (29)
2 by 1½	1 1/16 (27)	5/16 (8)	3/16 (5)	. . .	. . .	. . .	1 3/32 (28)
3 by 1½	1¾ (44)	1 (25)	¼ (6)	1¾ (44)	¾ (19)	¼ (6)	1½ (38)
3 by 2	1¾ (44)	7/8 (22)	¼ (6)	1¾ (44)	7/8 (22)	¼ (6)	1 5/8 (41)
4 by 2	2 (51)	1 1/8 (29)	¼ (6)	2 (51)	7/8 (22)	¼ (6)	. . .
4 by 3	2 (51)	½ (13)	¼ (6)	2 (51)	1½ (38)	¼ (6)	. . .
6 by 4	3½ (89)	1¾ (44)	½ (13)	. . .	. . .	. . .	. . .
8 by 4	4 5/8 (117)	2 7/8 (73)	5/8 (16)	. . .	. . .	. . .	. . .
8 by 6	4 5/8 (117)	1 5/8 (41)	5/8 (16)	. . .	. . .	. . .	. . .

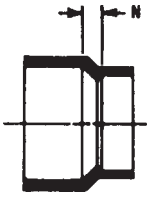
[A] No less than four ribs shall be used to support walls.

TABLE 13 Couplings, Adapters, in. (mm)



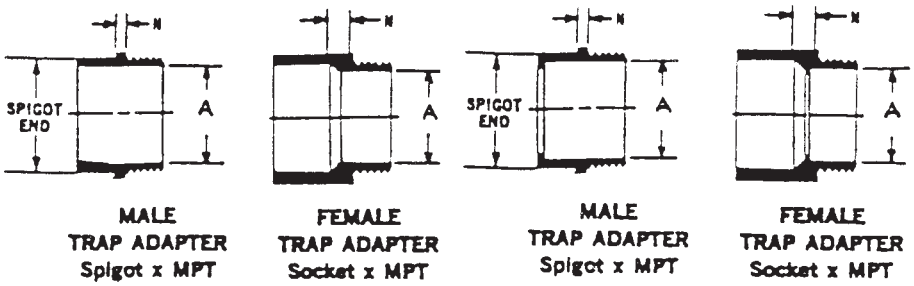
Nominal Pipe Size	Coupling		Female Adapter	Male Adapter		Female Fitting Adapter
	D	*N*, min	*N*, min	*N*, min	*A*, max	*N*, min
1¼	1.600 to 1.380	⅛ (3)	¼ (6)	3⁄16 (5)	1.290 (32.77)	5⁄32 (4)
1½	1.840 to 1.610	⅛ (3)	¼ (6)	3⁄16 (5)	1.552 (39.42)	5⁄32 (4)
2	2.320 to 2.067	⅛ (3)	¼ (6)	3⁄16 (5)	2.067 (52.50)	5⁄32 (4)
3	3.440 to 3.068	3⁄16 (5)	5⁄16 (8)	⅜ (10)	3.068 (77.93)	7⁄32 (6)
4	4.440 to 4.026	¼ (6)	11⁄32 (9)	⅜ (10)	4.026 (102.26)	¼ (6)
6	6.550 to 6.065	¼ (6)	. . .	. . .	. . .	. . .
8	8.655 to 8.610	¼ (6)	. . .	. . .	. . .	. . .

TABLE 14 Pipe Increasers, in. (mm)



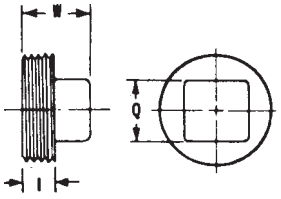
Nominal Pipe Size	*N*, min
1¼ by 1½	13⁄32 (10)
1½ by 2	17⁄32 (13)
1½ by 3	1 3⁄32 (28)
2 by 3	⅞ (22)
2 by 4	1⅜ (35)
3 by 4	15⁄16 (24)

TABLE 15 Trap Adapters, in. (mm)



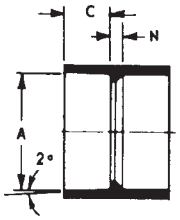
Without stop		*With Stop*
Nominal Pipe Size	*N*, min	*A*, min
1¼	3/16 (5)	1.250 (32)
1½	3/16 (5)	1.500 (38)
2	3/16 (5)	2.000 (51)
1¼ by 1½	3/16 (5)	1.250 (32)

TABLE 16 Pipe Plugs, in. (mm)

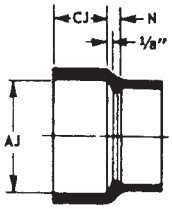


Nominal Pipe Size	I	W	Q
1¼	½ (13)	1 (25)	1 (25)
1½	5/8 (16)	1 3/8 (35)	1 (25)
2	5/8 (16)	1 3/8 (35)	1¼ (32)
2½	¾ (19)	1½ (38)	1¼ (32)
3	¾ (19)	1¾ (44)	1 5/8 (41)
3½	¾ (19)	1¾ (44)	1 5/8 (41)
4	7/8 (22)	1 7/8 (48)	2 (51)

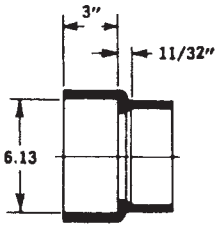
TABLE 17 Hubs, in. (mm)



PLASTIC HUB
Adapts Bituminized Fibre Spigot to Plastic Pipe



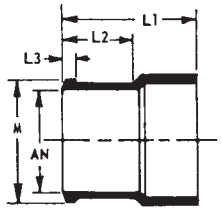
PLASTIC HUB
Adapts Cast Iron Spigot to Plastic Pipe



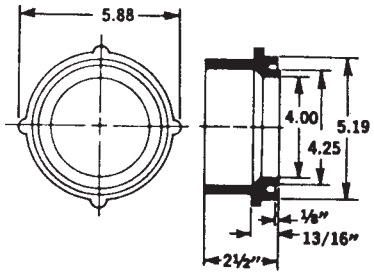
PLASTIC HUB
Adapts Clay Pipe Spigot to Plastic Pipe

Nominal Pipe Size	A	C	N	AJ	CJ	N
2	. . .	. . .	. . .	2.94 (74.7)	2⅜ (60)	⅜ (10)
3	3.448 (87.58)	1 11/16 (43)	5/16 (8)	3.94 (100.1)	2⅝ (67)	7/16 (11)
4	4.493 (114.12)	1 15/16 (49)	11/32 (9)	4.94 (125.5)	2⅞ (73)	½ (13)
Reducing 4 by 3	4.493 (114.12)	1 15/16 (49)	5/16 (8)	4.94 (125.5)	2⅞ (73)	7/16 (11)

TABLE 18 Spigots, in. (mm)



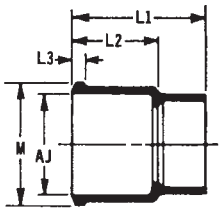
PLASTIC SPIGOT
Adapts Cast Iron Hub to Plastic Pipe



PLASTIC SPIGOT
Adapts Clay Pipe Hub to Plastic Pipe

Nominal Pipe Size	*L2*, min	*L1*, min	*L3*, min	*M*		*AN*
				max	min	
2	3½ (89)	4⅝ (117)	⅜ (10)	2.75 (69.9)	2.63 (66.8)	2.00 (50.8)
3	3¾ (95)	5⅝ (143)	⅜ (10)	3.88 (98.6)	3.63 (92.2)	3.00 (76.2)
4	4 (102)	6⅛ (156)	⅜ (10)	4.88 (124.0)	4.63 (117.6)	4.00 (101.6)

TABLE 19 Reducing Spigots, in. (mm)

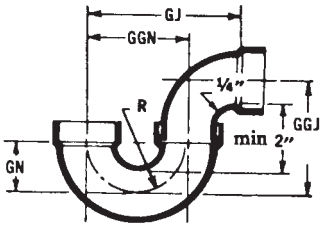


**PLASTIC SPIGOT, Reducing
Adapts Cast Iron Hub
to Plastic Pipe**

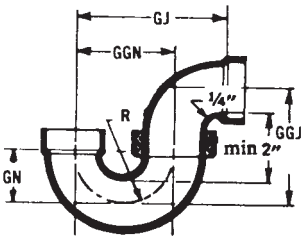
Nominal Pipe Size	*L2* min	*L1* min	*L3* min	*M*		*AJ*
				max	min	
2 by 1½	3½ (89)	4¼ (108)	⅜ (10)	2.75 (69.9)	2.63 (66.8)	2.00 (50.8)
3 by 1½	3¾ (95)	4½ (114)	⅜ (10)	3.88 (98.6)	3.63 (92.2)	3.00 (76.2)
3 by 2	3¾ (95)	4⅝ (117)	⅜ (10)	3.88 (98.6)	3.63 (92.2)	3.00 (76.2)
4 by 2	4 (102)	4⅞ (124)	⅜ (10)	4.88 (124.0)	4.63 (117.6)	4.00 (101.6)
4 by 3	4 (102)	5½ (140)	⅜ (10)	4.88 (124.0)	4.63 (117.6)	4.00 (101.6)

TABLE 20 P Traps, in. (mm)

**'P' TRAP
With
Solvent Weld
Joint**

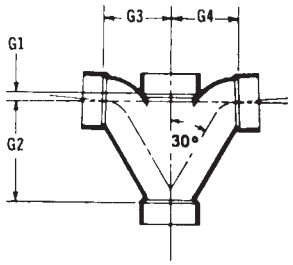


**'P' TRAP
With
Union Seal**



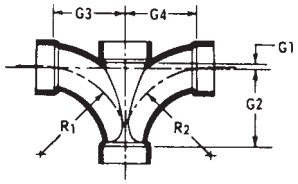
Nominal Pipe Size	min *GJ*	min *GGJ*	min *GGN*	min *GN*	min *R*
1¼	4⅛ (105)	3⅜ (86)	3 (76)	1⅜ (35)	1⅝ (41)
1½	4⁷⁄₃₂ (107)	3⅝ (92)	3 (76)	1⅜ (35)	1⅝ (41)
2	7¼ (184)	4¹⁄₁₆ (103)	5 (127)	2¼ (57)	2½ (64)
3	8⁷⁄₁₆ (214)	6⁵⁄₁₆ (160)	6¼ (159)	2⅝ (67)	3⅛ (79)
4	10¹³⁄₁₆ (275)	7⅞ (200)	8¹⁄₁₆ (205)	3⁷⁄₁₆ (87)	4¹⁄₁₆ (103)

TABLE 21 Double Fixture Fitting, in. (mm)



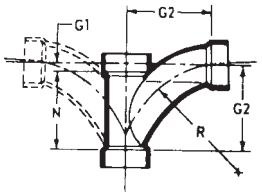
Nominal Pipe Size	G1	G2	G3	G4
1½	⅜ (10)	3⁹⁄₁₆ (90)	2⁷⁄₁₆ (62)	2⁷⁄₁₆ (62)
2	⅜ (10)	4⁹⁄₁₆ (116)	3¹⁄₁₆ (78)	3¹⁄₁₆ (78)
3	½ (13)	6¾ (171)	4½ (114)	4½ (114)
Reducing:				
2 by 1½ by 1½ by 1½	⅜ (10)	3⁹⁄₁₆ (90)	2⁷⁄₁₆ (62)	2⁷⁄₁₆ (62)
2 by 1½ by 2 by 2	⅜ (10)	4⁹⁄₁₆ (116)	3¹⁄₁₆ (78)	3¹⁄₁₆ (78)
2 by 1½ by 2 by 1½	⅜ (10)	4⁹⁄₁₆ (116)	3¹⁄₁₆ (78)	3¹⁄₁₆ (78)

TABLE 22 Double Fixture Fitting, in. (mm)



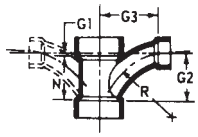
Nominal Pipe Size	Interchanges with Double Fixture Fittings					
	Double Fixture Fitting					
	G1	*G2*	*G3*	*G4*	*R1*	*R2*
1½	⅜ (10)	3⅛ (79)	2¹¹⁄₁₆ (68)	2¹¹⁄₁₆ (68)	3⅝ (92)	3⅝ (92)
2	⅜ (10)	4¼ (108)	3½ (89)	3½ (89)	4½ (114)	4½ (114)
3	½ (13)	6¼ (159)	4¹⁵⁄₁₆ (125)	4¹⁵⁄₁₆ (125)	6⅝ (168)	6⅝ (168)
	Reducing					
2 by 1½ by 1½ by 1½	⅜ (10)	3⅛ (79)	2⅞ (73)	2⅞ (73)	3⅝ (92)	3⅝ (92)
2 by 1½ by 1½ by 2	⅜ (10)	4¼ (108)	2⅞ (73)	3½ (69)	3⅝ (92)	4½ (114)
2 by 1½ by 2 by 2	⅜ (10)	4¼ (108)	3½ (89)	3½ (89)	4½ (114)	4½ (114)
3 by 2 by 3 by 3	½ (13)	6¼ (159)	4¹⁵⁄₁₆ (125)	4¹⁵⁄₁₆ (125)	6⅝ (168)	6⅝ (168)

TABLE 23 Single and Double Long Turn Tee, in. (mm)



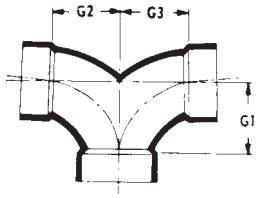
Interchanges with Combination Wye 1 / 8 Bend				
Nominal Pipe Size	Single and Double Long Turn Tee			
	G1	*G2*	*N*	*R*
1¼	⅜ (10)	3 7/16 (87)	3 1/16 (78)	4¾ (121)
1½	7/16 (11)	3 15/16 (100)	3½ (89)	5⅞ (149)
2	11/16 (17)	5⅛ (130)	4 7/16 (113)	7 (178)
3	1 1/16 (27)	7 9/16 (192)	6½ (165)	10⅛ (257)
4	1½ (38)	10 (254)	8½ (216)	13¼ (337)
6	2½ (64)	15⅜ (391)	12⅞ (327)	19 (483)

TABLE 24 Single and Double Long Turn Tee Reducing, in. (mm)



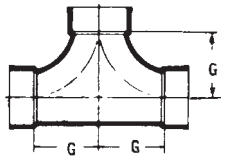
Interchanges with Reducing Combination Wye 1 / 8 Bend					
Nominal Pipe Size	Single and Double Long Turn Tee Reducing				
	G1	*G3*	*N*	*G2*	*R*
1½ by 1¼ by 1¼	⅜ (10)	3⅝ (92)	3 1/16 (78)	3 7/16 (87)	4¾ (121)
1½ by 1½ by 1¼	⅜ (10)	3⅝ (92)	3 1/16 (78)	3 7/16 (87)	4¾ (121)
2 by 1½ by 1½	7/16 (11)	4 3/16 (107)	3½ (89)	3 15/16 (100)	5⅞ (200)
2 by 1½ by 2	11/16 (17)	5⅛ (130)	4 7/16 (113)	5⅛ (130)	7 (178)
2 by 2 by 1¼	⅜ (10)	3 13/16 (97)	3 1/16 (78)	3 7/16 (87)	4¾ (121)
2 by 2 by 1½	7/16 (11)	4 3/16 (102)	3½ (89)	3 15/16 (100)	5⅞ (149)
3 by 3 by 1½	7/16 (11)	4¾ (121)	3½ (89)	3 15/16 (100)	5⅞ (149)
3 by 3 by 2	11/16 (17)	5 11/16 (128)	4 7/16 (113)	5⅛ (130)	7 (178)
4 by 4 by 1½	⅜ (10)	5 3/16 (132)	3 9/16 (90)	3 15/16 (100)	5⅞ (149)
4 by 4 by 2	⅝ (16)	6⅛ (156)	4½ (114)	5⅛ (130)	7 (178)
4 by 4 by 3	1 1/16 (27)	8 1/16 (205)	6½ (165)	7 9/16 (192)	10⅛ (257)
6 by 6 by 2	9/16 (14)	7⅛ (181)	4 9/16 (116)	5⅛ (130)	7 (178)
6 by 6 by 3	15/16 (24)	9 1/16 (230)	6⅝ (168)	7 9/16 (192)	10⅛ (257)
6 by 6 by 4	1½ (38)	11 (279)	8½ (216)	10 (254)	13¼ (337)
6 by 6 by 5	2 (51)	13 5/16 (338)	10¾ (273)	12¾ (324)	16 (406)

TABLE 25 Three-Way Ell, in. (mm)



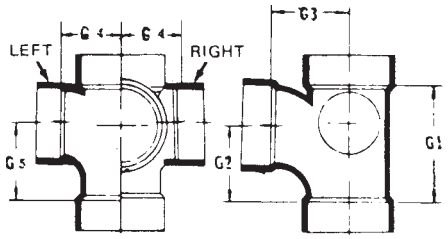
Nominal Pipe Size	*G1*	*G2*	*G3*
1½	1¾ (44)	1¾ (44)	1¾ (44)
2	2⁵⁄₁₆ (59)	2⁵⁄₁₆ (59)	2⁵⁄₁₆ (59)
3	3¹⁄₁₆ (78)	3¹⁄₁₆ (78)	3¹⁄₁₆ (78)
4	3⅞ (98)	3⅞ (98)	3⅞ (98)
Reducing			
2 by 1½ by 1½ (short)	1⅝ (41)	1⅝ (41)	1⅝ (41)
3 by 2 by 3	3¹⁄₁₆ (78)	2⅞ (73)	3¹⁄₁₆ (78)
2 by 1½ by 1½ (long)	1¹⁵⁄₁₆ (49)	2³⁄₁₆ (56)	2³⁄₁₆ (56)

TABLE 26 Two Way Cleanout, in. (mm)



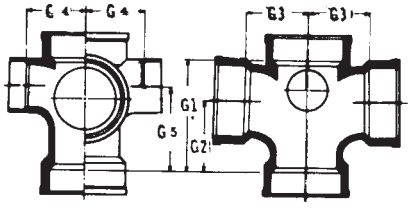
Nominal Pipe Size	*G*
3	4¹⁄₁₆ (103)
4	4¹⁵⁄₁₆ (125)

TABLE 27 Sanitary Tees, with Side Inlet, in. (mm)



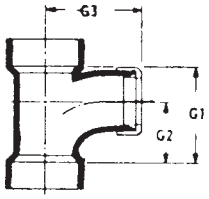
Nominal Pipe Size	*G1*	*G2*	*G3*	*G4*	*G5*
Left-Hand Side Inlet					
1½ by 1½ by 1½ by 1½	2¾ (70)	1¾ (44)	1¾ (44)	1¾ (44)	1¾ (44)
2 by 2 by 1½ by 1½	3 11/16 (94)	2 5/16 (59)	2 5/16 (59)	2 5/16 (59)	2 5/16 (59)
3 by 3 by 2 by 1½	3 5/16 (84)	2⅛ (54)	2⅞ (73)	2 9/16 (65)	2⅛ (54)
3 by 3 by 2 by 2	3 5/16 (84)	2⅛ (54)	2⅞ (73)	2⅞ (73)	2⅛ (54)
3 by 3 by 3 by 1½	4⅞ (124)	3 1/16 (78)	3 1/16 (78)	2 9/16 (65)	3 11/16 (94)
3 by 3 by 3 by 2	4⅞ (124)	3 1/16 (78)	3 1/16 (78)	2⅞ (73)	3 11/16 (94)
4 by 4 by 4 by 2	6⅛ (156)	3⅞ (98)	3⅞ (98)	3 5/16 (84)	5 (127)
Right-Hand Side Inlet					
3 by 3 by 2 by 1½	3 5/16 (84)	2⅛ (54)	2⅞ (73)	2 9/16 (65)	2⅛ (54)
3 by 3 by 2 by 2	3 5/16 (84)	2⅛ (54)	2⅞ (73)	2⅞ (73)	2⅛ (54)
3 by 3 by 3 by 1½	4⅞ (124)	3 1/16 (78)	3 1/16 (78)	2 9/16 (65)	3 11/16 (94)
3 by 3 by 3 by 2	4⅞ (124)	3 1/16 (78)	3 1/16 (78)	2⅞ (73)	3 11/16 (94)
4 by 4 by 4 by 2	6⅛ (156)	3⅞ (98)	3⅞ (98)	3 5/16 (84)	5 (127)
Side Inlet Both Sides					
3 by 3 by 2 by 1½ by 1½	3 5/16 (84)	2⅛ (54)	2⅞ (73)	2 9/16 (65)	2⅛ (54)
3 by 3 by 2 by 2 by 2	3 5/16 (84)	2⅛ (54)	2⅞ (73)	2⅞ (73)	2⅛ (54)
3 by 3 by 3 by 1½ by 1½	4⅞ (124)	3 1/16 (78)	3 1/16 (78)	2 9/16 (65)	3 11/16 (94)
3 by 3 by 3 by 2 by 2	4⅞ (124)	3 1/16 (78)	3 1/16 (78)	2⅞ (73)	3 11/16 (94)
4 by 4 by 4 by 2 by 2	6⅛ (156)	3⅞ (98)	3⅞ (98)	3 5/16 (84)	5 (127)

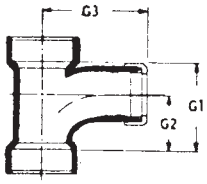
TABLE 28 Sanitary Tee, Double with Side Inlets, in. (mm)



Nominal Pipe Size	*G1*	*G2*	*G3*	*G4*	*G5*
Single Side Inlet					
3 by 3 by 3 by 3 by 1½	4⅞ (124)	3 1/16 (78)	3 1/16 (78)	2 9/16 (65)	3 11/16 (94)
3 by 3 by 3 by 3 by 2	4⅞ (124)	3 1/16 (78)	3 1/16 (78)	2⅞ (73)	3 11/16 (94)
4 by 4 by 4 by 4 by 2	6⅛ (156)	3⅞ (98)	3⅞ (98)	3 5/16 (84)	3⅞ (min) (98)
Inlet Both Sides					
3 by 3 by 3 by 3 by 1½ by 1½	4⅞ (124)	3 1/16 (78)	3 1/16 (78)	2 9/16 (65)	3 11/16 (94)
3 by 3 by 3 by 3 by 2 by 2	4⅞ (124)	3 1/16 (78)	3 1/16 (78)	2⅞ (73)	3 11/16 (94)
4 by 4 by 4 by 4 by 2 by 2	6⅛ (156)	3⅞ (98)	3⅞ (98)	3 5/16 (84)	5 (127)

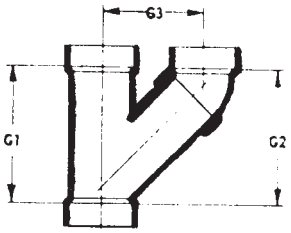
TABLE 29 Sanitary Tees, with Slip Joint, in. (mm)





Nominal Pipe Size	Sanitary Tee			Sanitary Tee Through Wall		
	G1	*G2*	*G3*, min	*G1*	*G2*	*G3, min*
1¼	2¼ (57)	1½ (38)	2³⁄₁₆ (56)	2¼ (57)	1½ (38)	3 (76)
1½	2¾ (70)	1¾ (44)	2⁷⁄₁₆ (62)	2¾ (70)	1¾ (44)	3 (76)
1½ by 1¼ by 1½	2½ (64)	1¾ (44)	2⁷⁄₁₆ (62)	2½ (64)	1¾ (44)	3 (76)

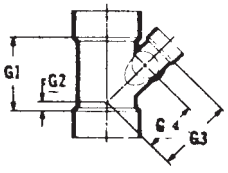
TABLE 30 Upright Wye, in. (mm)

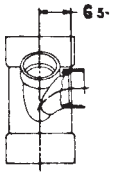


Nominal Pipe Size	*G1* min	*G2* min	*G3* min
2 by 2 by 2	5½ (140)	5³⁄₁₆ (132)	3¾ (95)
3 by 3 by 3	7½ (191)	7⅜ (187)	5¼ (133)
Reducing			
2 by 2 by 1½	4¼ (108)	4⅛ (105)	3¹⁄₁₆ (78)
3 by 3 by 2	5³⁄₁₆ (132)	5⁵⁄₁₆ (135)	4⁹⁄₁₆ (116)

TABLE 31 Single 45° Wye, with Auxiliary Inlet, in. (mm)

NOTE—RH.AI = Right Hand Auxiliary Inlet
LH.AI = Left Hand Auxiliary Inlet
DBL.AI = Double Auxiliary Inlets
V = Vent

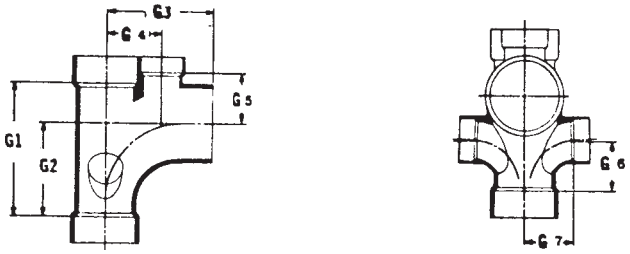




Nominal Pipe Size	G1	G2	G3	G4	G5
3 by 3 by 1½ V by 1½ RH.AI	4¼ (108)	½ (13)	4⁵⁄₁₆ (110)	3³⁄₁₆ (81)	1¾ (44)
3 by 3 by 1½ V by 1½ LH.AI	4¼ (108)	½ (13)	4⁵⁄₁₆ (110)	3³⁄₁₆ (81)	1¾ (44)
3 by 3 by 2 V by 2 RH.AI	5 (127)	⅞ (22)	4⅝ (117)	3¼ (83)	2⁵⁄₁₆ (59)
3 by 3 by 2 V by 2 LH.AI	5 (127)	⅞ (22)	4⅝ (117)	3¼ (83)	2⁵⁄₁₆ (59)

TABLE 32 Vertical Closet Bend, with Auxiliary Inlets, in. (mm)

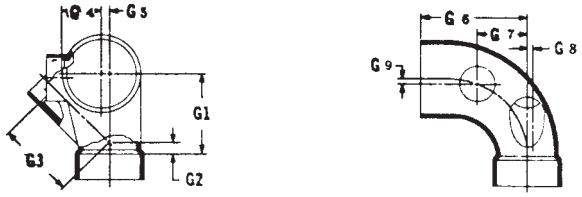
NOTE—RH.AI = Right Hand Auxiliary Inlet
LH.AI = Left Hand Auxiliary Inlet
DBL.AI = Double Auxiliary Inlets
V = Vent



Nominal Pipe Size	G1	G2	G3	G4	G5	G6	G7
3 by 3 by 4 by 2V by 2 RH.AI	7½ (191)	5⅜ (137)	6⅛ (156)	3⁵⁄₃₂ (80)	2¾ (70)	2⅞ (73)	2⅞ (73)
3 by 3 by 4 by 2V by 2 LH.AI	7½ (191)	5⅜ (137)	6⅛ (156)	3⁵⁄₃₂ (80)	2¾ (70)	2⅞ (73)	2⅞ (73)
3 by 3 by 4 by 2V by 2 by 2 DBL.AI	7½ (191)	5⅜ (137)	6⅛ (156)	3⁵⁄₃₂ (80)	2¾ (70)	2⅞ (73)	2⅞ (73)

TABLE 33 Horizontal Closet Bend, with Auxiliary Inlets, in. (mm)

NOTE—RH.AI = Right Hand Auxiliary Inlet
LH.AI = Left Hand Auxiliary Inlet
DBL.AI = Double Auxiliary Inlets
V = Vent



Nominal Pipe Size	G1	G2	G3	G4	G5	G6	G7	G8	G9
3 by 4 by 2V by 2 RH.AI	4⅝ (117)	⁹⁄₁₆ (14)	4½ (114)	2⁵⁄₁₆ (59)	¹⁵⁄₃₂ (12)	6³⁄₁₆ (157)	2⅞ (73)	⁹⁄₃₂ (7)	¼ (6)
3 by 4 by 2V by 2 LH.AI	4⅝ (117)	⁹⁄₁₆ (14)	4½ (114)	2⁵⁄₁₆ (59)	¹⁵⁄₃₂ (12)	6³⁄₁₆ (157)	2⅞ (73)	⁹⁄₃₂ (7)	¼ (6)

TABLE 34 Strainer Adapter, in. (mm)

TRAY PLUG ADAPTER
Fem. NPSM x Spigot

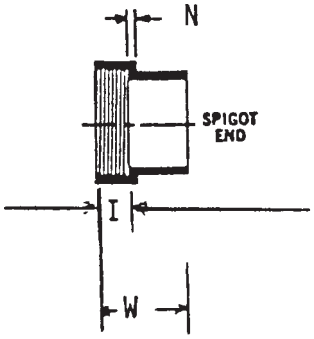
TRAY PLUG ADAPTER
Fem. NPSM x Hub

Nominal Pipe Size	Fem. NPSM × Spigot	Fem. NPSM ×Hub
	L	*L*, min
1½	3⅜ (86)	1⅞ (48)

TABLE 35 Swivel Strainer, Adapter, in. (mm)

Nominal Pipe Size	Short		Long	
	L1	*L2*	*L1*	*L2*
1½	1$^{11}/_{16}$ (43)	⅝ (16)	2$^{7}/_{16}$ (62)	⅝ (16)

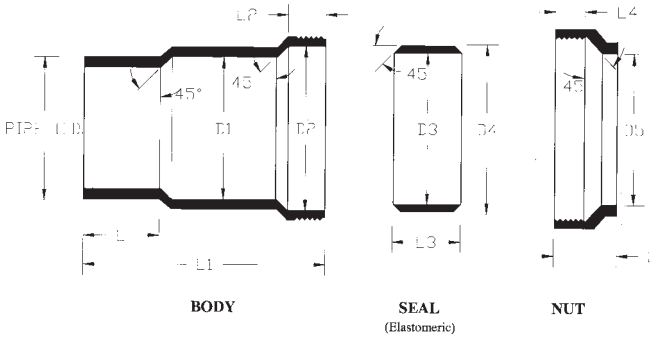
TABLE 36 Cleanout Female Fitting Adapter, in. (mm)



Nominal Pipe Size	*N*, min	*I*, min	*W*, min
1¼	$^{5}/_{32}$ (4)	½ (13)	1$^{11}/_{32}$ (34)
1½	$^{5}/_{32}$ (4)	⅝ (16)	1$^{15}/_{32}$ (37)
2	$^{5}/_{32}$ $^{7}/_{32}$ (4)	⅝ (16)	1$^{17}/_{32}$ (39)
3	(6)	¾ (19)	2$^{15}/_{32}$ (63)
4	¼ (6)	⅞ (22)	2¾ (70)

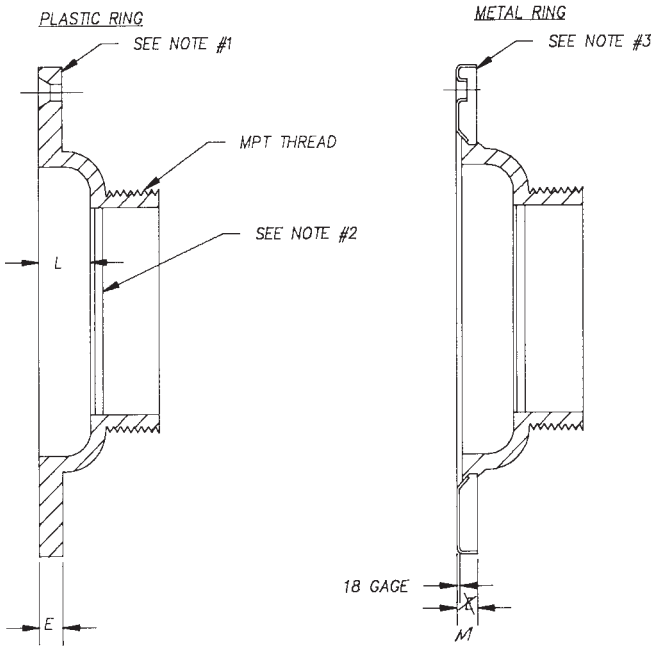
TABLE 37 Cut-In Adapter

NOTE 1—Adjustable plastic ring optional.
NOTE 2—Knockout optional in all configurations.
NOTE 3—Adjustable metal ring optional and must be protected by a corrosion-resisant coating.



	Minimum Dimensions, in. (mm)			
	1½	2	3	4
L	. . .	1¼ (32)	. . .	. . .
L1	. . .	2½ (64)	. . .	. . .
L2	. . .	0.60 (15.2)	. . .	. . .
L3	. . .	1 (25)	. . .	. . .
L4	. . .	0.53 (13.5)	. . .	. . .
L5	. . .	1¼ (32)	. . .	. . .
D1	. . .	2.385 (60.58)	. . .	. . .
D2	. . .	2.940 (74.69)	. . .	. . .
D3	. . .	2.380 (60.45)	. . .	. . .
D4	. . .	2.577 (65.46)	. . .	. . .
D5	. . .	2.385 (60.58)	. . .	. . .

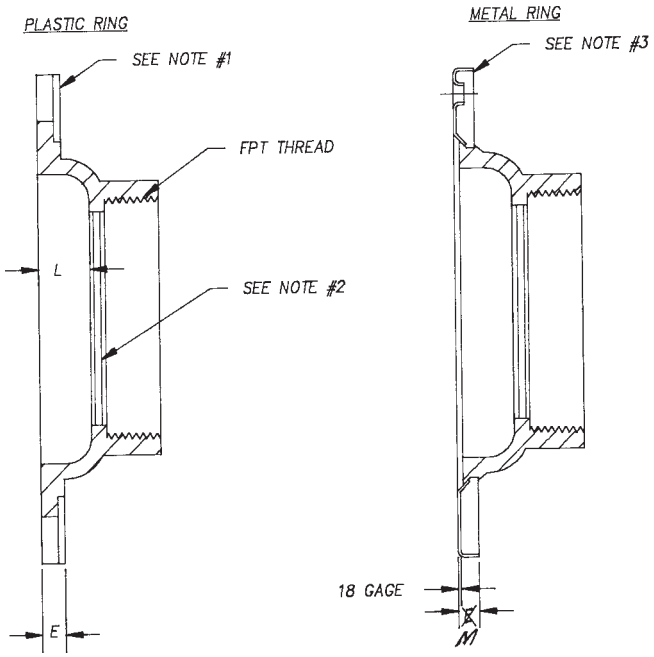
TABLE 38 4 by 3 in. Closet Flange (MPT)



M (min)	E (min)	L (min)	TH'D (min)
1 7/32 (5½)	¼ (6)	¾ (18)	3″–8

TABLE 39 4 by 3 in. Threaded Closet Flange (FPT)

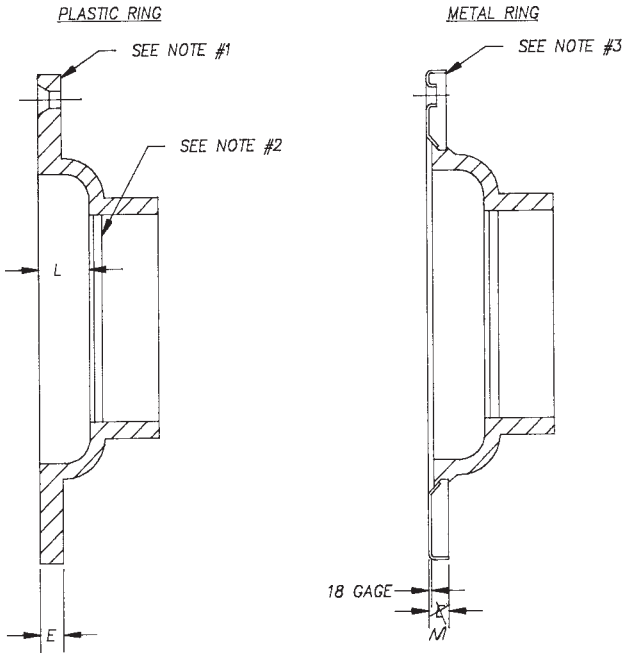
NOTE 1—Adjustable plastic ring optional.
NOTE 2—Knockout optional in all configurations.
NOTE 3—Adjustable metal ring optional and must be protected by a corrosion-resisant coating.



M (min)	E (min)	L (min)	TH'D (min)
7/32 (5½)	¼ (6)	¾ (18)	3″–8

TABLE 40 4 by 3 in. Closet Flange (Spigot)

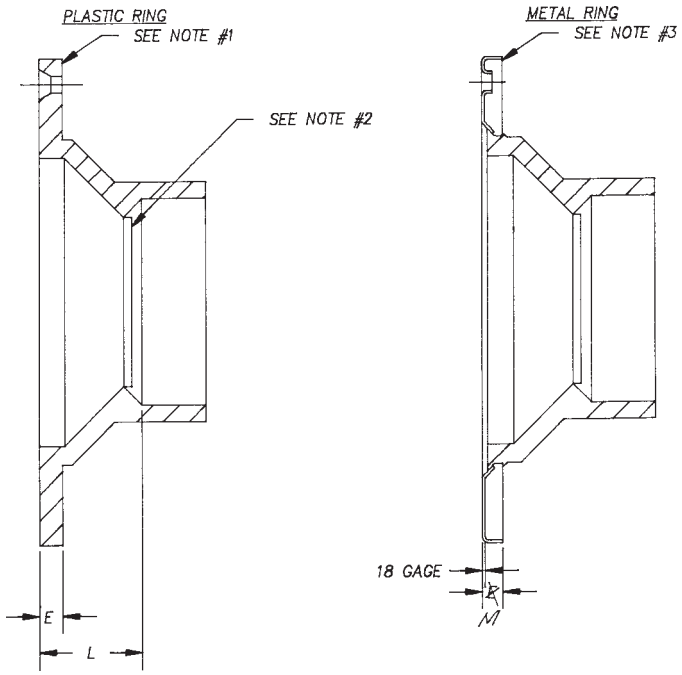
NOTE 1—Adjustable plastic ring optional.
NOTE 2—Knockout optional in all configurations.
NOTE 3—Adjustable metal ring optional and must be protected by a corrosion-resisant coating.



M (min)	E (min)	L (min)
7/32 (5½)	¼ (6)	¾ (18)

TABLE 41 4 by 3 in. Closet Flange (HUB)

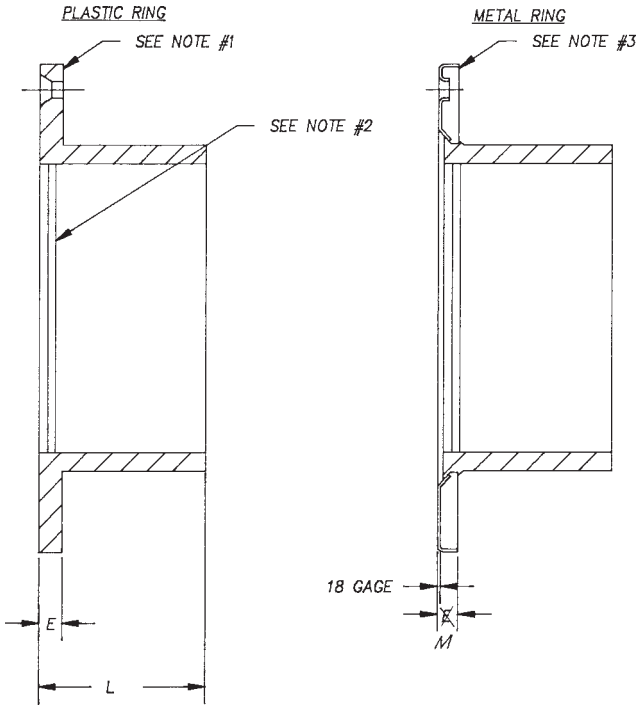
NOTE 1—Adjustable plastic ring optional.
NOTE 2—Knockout optional in all configurations.
NOTE 3—Adjustable metal ring optional and must be protected by a corrosion-resisant coating.



M (min)	E (min)	L (min)
7/32 (5½)	¼ (6)	1¼ (32)

TABLE 42 4 by 4 in. Closet Flange (HUB)

NOTE 1—Adjustable plastic ring optional.
NOTE 2—Knockout optional in all configurations.
NOTE 3—Adjustable metal ring optional and must be protected by a corrosion-resisant coating.

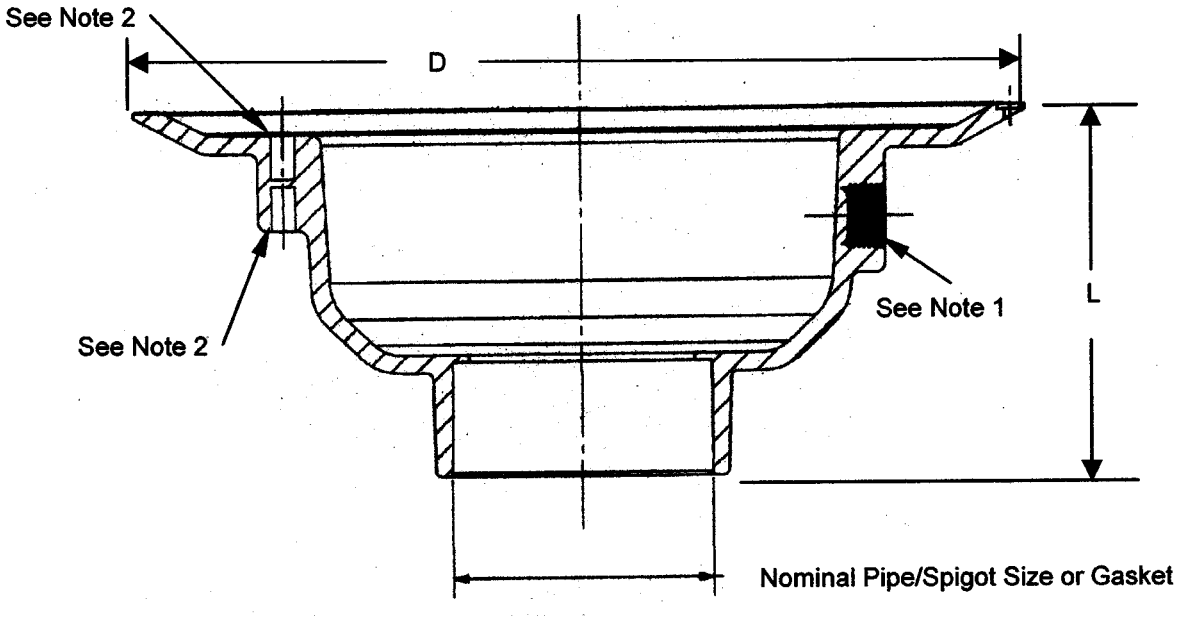


M (min)	E (min)	L (min)
7/32 (5½)	¼ (6)	2 (51)

TABLE 43 Drain Base Hub/Spigot for Roof, Floor and Sediment Drains

NOTE 1—½ in. FPT Primer Tap, Optional in All Configurations with Optional Knockout

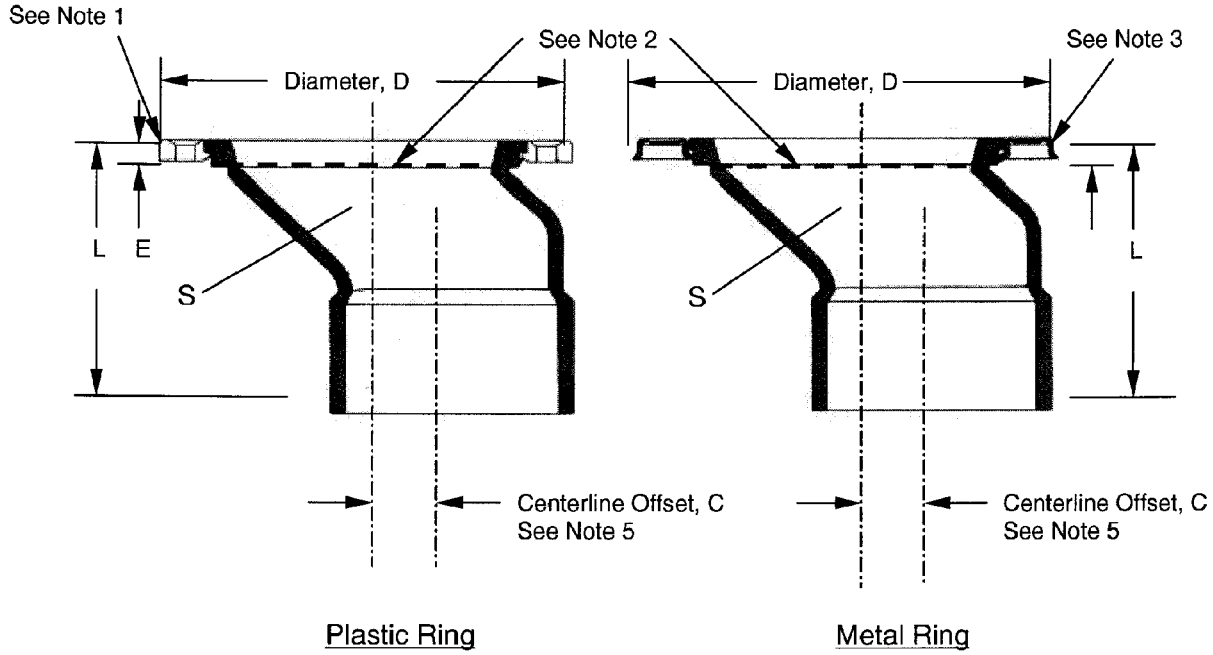
NOTE 2—Inserts Used in Securing Clamping Collars or Underdeck Clamp, Optional in all Configurations Nominal Pipe/Spigot or Gasket Sizes: 1 ½ in., 2 in., 3 in., 4 in., 6 in.



Nominal Pipe Size	L	D
2	5.25 ± 0.10 (13.3 ± 0.25)	12 (30.5)
3	5.00 ± 0.10 (12.7 ± 0.25)	12 (30.5)
4	5.25 ± 0.10 (13.3 ± 0.25)	12 (30.5)
6	6.00 ± 0.10 (15.2 ± 0.25)	12 (30.5)

TABLE 44 4 by 3in. Offset Closet Flange (Hub)

NOTE 1—Adjustable Plastic Ring Optional
NOTE 2—Knockout Optional in all Configurations
NOTE 3—Adjustable Metal Ring Optional Cylinder B must be Free of Ledges and Corners and must be protected by a corrosion-resistant coating
NOTE 4—Cylinder S must be Free of Ledges and Corners
NOTE 5—Offset, Centerline to Centerline



L, Typical Height	C, Offset	D, Diameter	E, Flange Thickness
4.5 ± -⅛ (11.4 ± 0.32)	2 ± -¼ (5.1 ± 0.64)	7 ± -¼ (17.8 ± 0.64)	¼ min. (0.64)

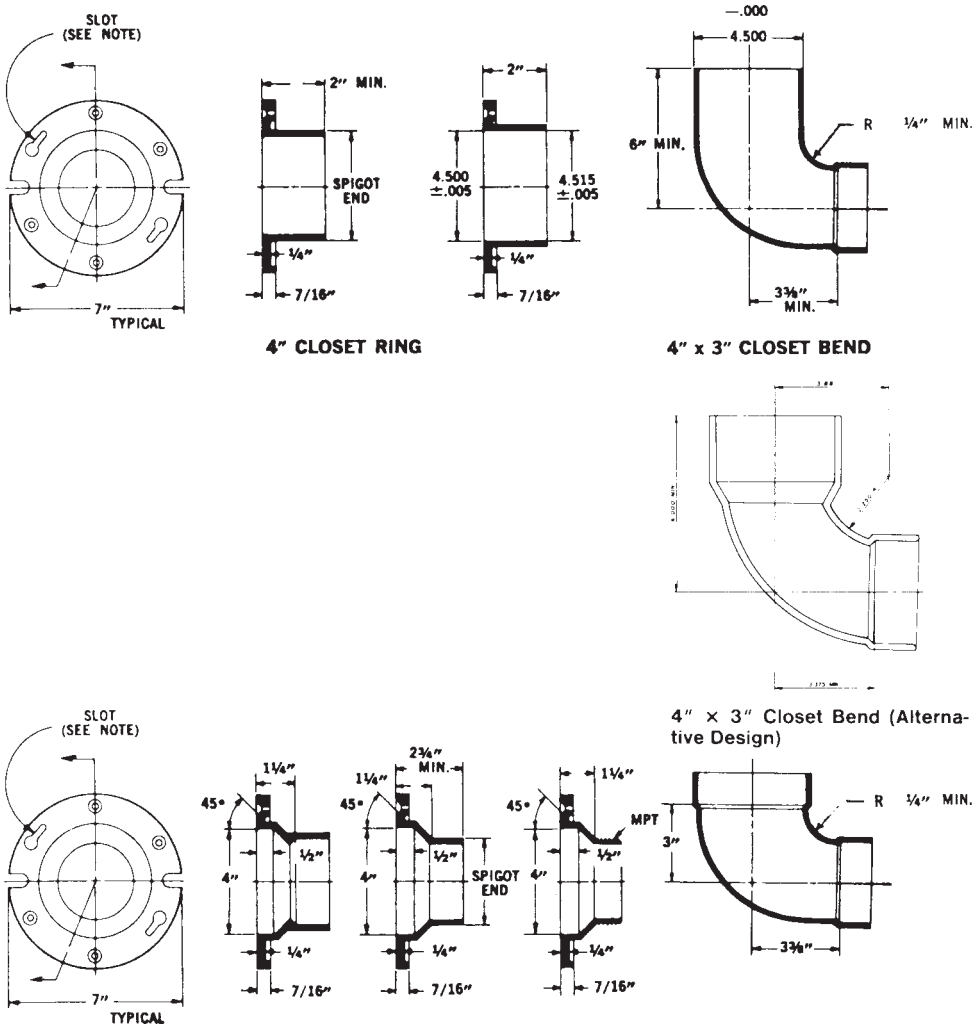


FIG. 1 Closet Rings and Closet Bends[A], in.

NOTE-Slot is optional if fully reinforced with a corrosion-resistant material.

[A] All dimensions minimum, unless otherwise noted.