

Pipes in Trench

General

- Supported along entire length Fig. p2 [2605.1] [314.3]
- Common trench for gas & electric services OK [utility] [utility]
- No sewer in common trench [utility] [utility]

Water Service

- Sizing pt-7a and b [2903.7] [t6-5]
- 6in. [12in.] below frost line (may vary with locale) [2603.6] [609.1]
- 12in. above & 12in. horiz. from clay sewer [2904.4.1] [609.2]
- Wrap pipe passing through concrete, do not embed ... [2603.3,5] [313.1,2]
- Support and protect pipe Fig. p2 [2605.1] [314]
- Three bathrooms usually means 1in. service [T2903.7] [t6-5]
- No reduction to inlet of service by softener, backflow [n/a] [610.2]
- Min. service 1/2in. [2903.7] [610.8]
- Accessible shutoff req'd at house [2903.9.1] [605.2]

Pressure Regulator

- Excessive water pressure >80psi must be regulated [2903.3.1] [608.2]
- Accessible strainer ahead of regulator [2903.3.1] [608.2]
- Exs'ive back pressure protection (bypass, exp. tank, etc.) .. [2903.4] [608.3]
- Min. static pressure 40psi [15psi] [2903.3] [608.1]

Gas Pipes

- Buried metal—min. 12in. deep & factory wrapped [2414.9,2414.8.2] [1211.6]
- Buried plastic outdoor only—min. 12in. deep [18in.] [2414.9] [1211.6]
- Buried plastic req's #18 tracer wire [2414.14.3] [1211.19]
- Protectively coat buried pipe joints [2414.8.2X] [1211.10]
- Remove 3in. of coating, prime & wrap min. 40mils tape .. [n/a] [1S 13]

Foundation

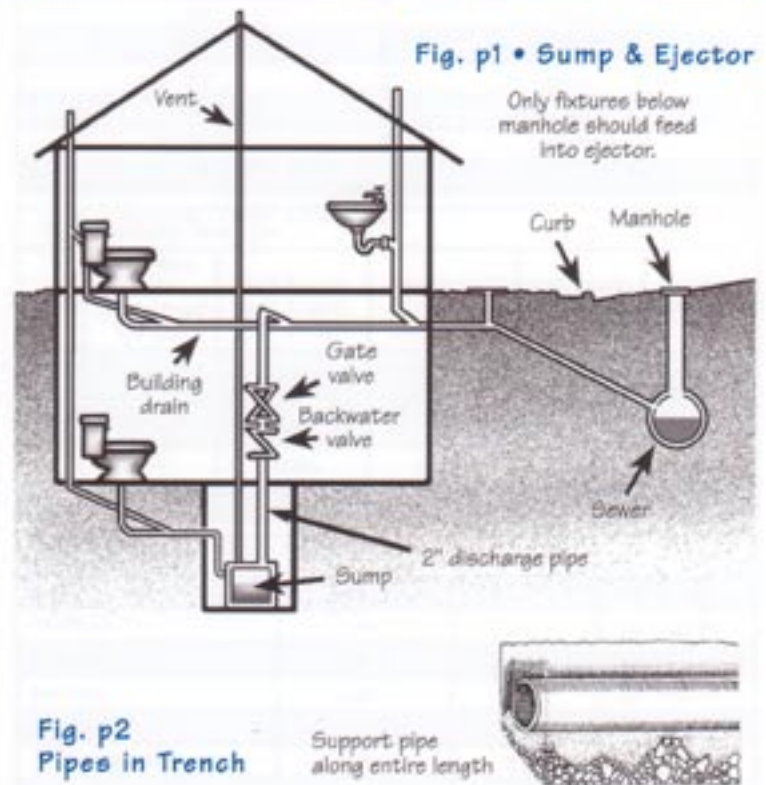
General

- No pipes directly embedded in concrete [2603.5] [313.1,2]
- No flat venting Fig. p3 [3104.3] [905.2]
- Vent downstream of trap [3101.2.1] [901.0]
- Pipe trench below footing offset min. 45° Fig. b2 [2603.7] [313.3]
- Test DWV before each coverup [2503.5.1] [712.0]
- DWV water test 10ft. head, 15 minutes OR [2503.5.1] [712.2,3]
- Air test 5psi (10in. mercury), 15 minutes [2503.5.1] [712.2,3]

Underslab

- Gas not permitted unless sleeved in conduit ... Fig. p14 [2414.11] [1211.4]
- Minimum type "M" (min. type "L") copper [2904.5.1] [604.2]
- Joints brazed, not soldered [2904.12] [609.3.2]
- Ferrous metals must be wrapped [trade] [609.3.1]

DWV Test



Ejector

- Only the fixtures below crown level of sewer may discharge through ejector Fig. p1 [3007.2.1] [710.2]
- Backwater & gate valves on pump discharge ... Fig. p1 [3007.1] [710.4]
- Sizing—1.5 {2} fixt. units per gal./min. of flow [t3004.1] [710.5]
- Min. 2in. discharge Fig. p1 [3007.1] [710.3.2]
- Lift to horizontal sewer then drain by gravity [3007.2.1] [710.4]

Fixtures below Manhole

- Only & all fixtures with flood rim below upstream manhole shall feed through accessible backwater valve [3008.1] [710.1]

Drains

Traps & Trap Arms

- Vent opening not below weir of trap except toilet [trade] {1002.4}
- Traps shall be plumb [3201.3] {1005.0}
- Trap & arm must be same size [3201.7] {1003.3}
- Fixture tailpiece max. 24in. [3201.6] {1001.4}
- Floor drain traps req. automatic primer [3201.2X] {1007.0}

Change of Direction

- Vert. to horiz. or horiz. to horiz. through wye branches or 45° wye branches or fittings of equal sweep Fig. p4 [3005.1] {706.3}
- Double sanitary tee—two pipe sizes larger than inlets, horiz. to vert. [n/a] {706.2}

Back-to-Back Fixtures

- Must use double fixture fitting [3005.1.1] {704.2}

ABS/PVC

- Draft stop around ceiling/wall penetrations [602.8] {n/a}
- Female threaded adapters must remain accessible [n/a] [ISS-316.1]
- Protect from nails [2603.2.1] {313.9}
- No metal straps [n/a] [ISS-314.1]
- Solidly support every 4ft. pt-3 [r2605.1] {T3-2}

Cleanouts

- Location must remain accessible [3005.2.5] {707.9}
- <3in. {2in.} req's 12in. clearance; ≥3in. {>2in.} req's 18in. [3005.2.5] {707.10}
- Req'd at upper terminal 1st floor runs & ea. 100ft. [3005.2.2] {707.4}
- For each 45° {135°} change [only 1 per 40ft. req'd] [3005.2.4] {707.5}
- All sinks at lowest floor level req. cleanout [n/a] {707.4X1}
- Underfloor cleanout not >20ft. from access door [n/a] {707.10}
- Take off vertically above flow line except wye branch or end of line [trade] {707.6}
- Extend above floor or outdoors if access limited [n/a] {707.10}

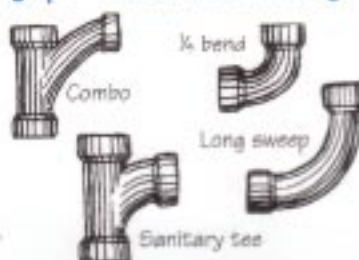
Cleanout Exceptions

- Runs <5ft. (except sinks) [n/a] {707.4ex.1}
- Slope of 72° {1/8 bend} vert. offsets [n/a] {707.4ex.2}
- Not req'd above first floor [n/a] {707.4ex.3}

Fig. p3
No Flat Venting



Fig. p4 • ABS/PVC Fittings



Sizing

pt-1 • Sizing Branch Drains & Vents

Pipe size		1 1/4"	1 1/2"	2"	3"	4"
Max # of Drain Units	Vert.	1	4 {2}	10 {16}	48	240 {256}
	Horiz.	1	3 {1}	6 {8}	20 {35}	160 {216}
Vents ^a (UPC)	Max Units	{1}	{8}	{24}	{84}	{256}
	Max Feet ^c	{45}	{60}	{120}	{212}	{300}

a. Based on 1/4in./ft. slope
 b. IRC vents must be ≥ 1/3 the required drain diameter
 c. IRC vents >40ft. must be increased one pipe size. UPC vents increase one pipe size if horiz. length exceeds 1/3 of vertical length
 Based on tables [3005.4.1] & [7-5]

pt-2 • Traps & Arms

	Min. size	Units	Length
Bathtubs	1 1/2in.	2	6ft. {3ft.6in.}
Floor Drains	2in.	0	8ft. {5ft.}
Laundry Tubs	1 1/2in.	2	6ft. {3ft.6in.}
Clothes Washer	2in.	2 {3}	8ft. {5ft.}
Shower	2in.	2	8ft. {5ft.}
Bar Sink	1 1/2in.	2	6ft. {3ft.6in.}
Kitchen Sink ^a	1 1/2in.	2	6ft. {3ft.6in.}
Lavatory	1 1/2in.	1	5ft. {2ft.6in.}
Water Closet	3in.	4	12ft. {6ft.}

a. {Min. drain size 2in.}
 Based on tables [3004.1] & [3105.1] & [7-3 & 10-1]

pt-3 • Pipe Support

	Gas	Plastic ^a	Cast	Screwed	Copper
Horiz.	1/2in.-6ft. 1/2in.&1in.-8ft. ≥1 1/2in.-10ft.	{≤1in.}CPVC-3ft. {>1in.}CPVC-4ft. ABS-4ft.	5ft. lgths-5ft. 10ft. lgths-10ft. {18in. of hub}	≤1/2in.-10ft. ≥1in.-12ft.	≤1/2in.-6ft. ≥3/4in.-10ft.
Vert.	1/2in.-6ft. 1/2in.&1in.-8ft. ≥1 1/2in.-each story	Base & each story + mid-story guides	Base & each story [not >15ft.]	{15ft.} [every other story]	10ft. or each story

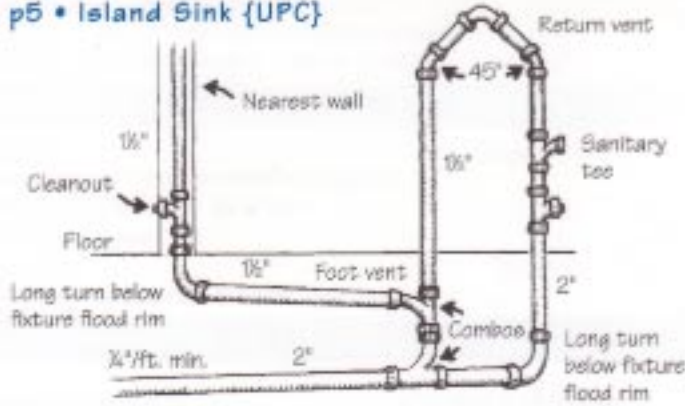
a. PEX tubing horiz. support 32in.
 Based on tables [2423.1] & [2605.1] & [3105.1] & [3-2]

pt-4 • Cleanout Sizes

Pipe size	Cleanout
1 1/2in.	1 1/2in.
2in.	1 1/2in.
2 1/2in.	2 1/2in.
3in.	2 1/2in.
4in.	3 1/2in.

Based on tables [3005.2.9] & [7-6]

Fig. p5 • Island Sink {UPC}



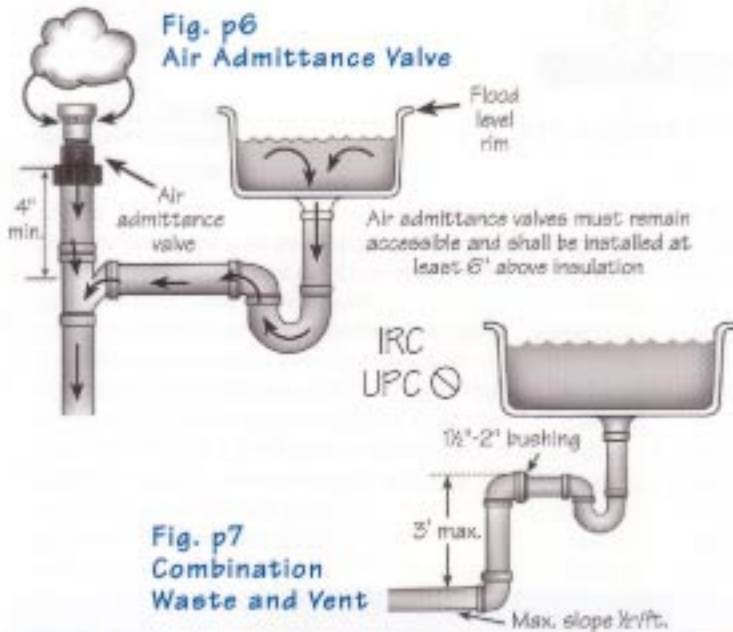
Island Sink Venting

Drain Loop Method:

- Island sink vented with drain fittings only Fig. p5 [3112.3] [909]
- Drain serving island shall serve no other fixtures upstream from return vent [n/a] [909]
- Island sink cleanout in vertical section of foot vent [3112.3] [909]

IRC Methods:

- Air admittance valve under sink OK Fig. p6 [3114.4] [Ø]
- Combo waste & vent OK max. 36in. vertical Fig. p7 [3111.2] [Ø]
- Combination drain & vent portion increased size Fig. p7 [T3111.3] [Ø]
- Max. slope of combo drain 1/4in./ft. Fig. p7 [3111.2.1] [Ø]



Vents

General

- Horiz. vent 6in. above fixture flood rim (except island sink or where structurally impossible) [3104.4] [905.3]
- Vent pipe below flood level rim must be drainage pattern (no horiz. san tees) (may req. cleanouts) Figs. p4 & p8 [3104.2] [905.3]
- Takeoff above weir (toilet excepted) Fig. p8 [3105.2] [905.5]
- No flat venting (takeoff above horiz. centerline) Fig. p3 [3104.3] [905.2]
- Minimum one vent to exterior (all vents to exterior) ... [3114.7] [906.1]
- [Aggregate vent area must be ≥ bldg. drain] [n/a] [904.1]

Heavy Snow and Frost

- Min. 3in. [2in.] vent size above roof [3103.2] [906.7]
- Terminate min. 6in. above snowline [10in. above roof] .. [3103.1] [906.7]

Vent Termination

- Roof—min. 6in. above [and 12in. to vert. surface] [3103.1] [906.1]
- Clearance to building openings—2ft. [3ft.] above OR 10ft. horiz. [or 4ft. below] mt-2 [3103.5] [906.2]
- Sidewall vent—min. 10ft. from Pl. and 10ft. above grade [3103.6] [Ø]

Air admittance valves

- Min. 4in. above drain Fig. p6 [3114.4] [Ø]
- Min. 6in. above insulation in attic [3114.4] [Ø]
- Must be accessible and open to air flow [3114.5] [Ø]

Wet Vents

- May be horizontal or vertical Fig. p8 [3108.1] [Ø]
- Min. 1 1/2in. [2in.] Fig. p9 [T3108.3] [908.2]
- Must be on the same floor [not longer than 6ft.] [3108.1.4] [908.1]
- Min. one pipe size larger than the req'd waste [n/a] [908.2]
- Limited to traps of one and two fixture units [n/a] [908.1]
- Not to serve as vent to more than four fixtures [n/a] [908.1]

Fig. p8 • Four Violations

1. Combo places weir above inlet. Use sanitary tee instead.
2. 2" cleanout too small. 3" branch to toilet requires min. 2 1/2".
3. Sanitary tee on its back not a drainage fitting. Use combo.
4. Horizontal wet venting. {Reroute vent}{OK in IRC}.

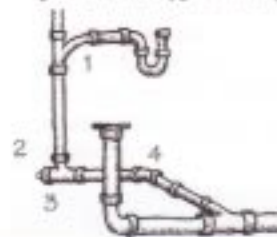
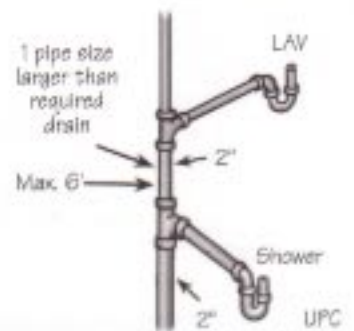


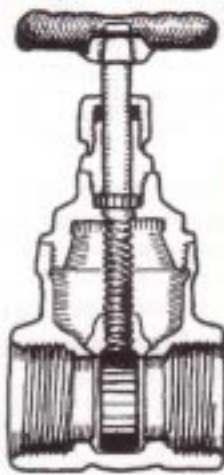
Fig. p9 • Vertical Wet Vent {UPC}



Water Pipe

- Min. water service 3/4in.[2903.7] (610.8)
- Min. static pressure 40psi (15psi)[2903.3] (608.1)
- Max. unregulated pressure 80psi[2903.3.1] (608.2)
- Regulated pressure computed at 80% of setting[2903.7] (608.2)
- Expansion tank req'd if regulator not internal bypass type [2903.4] (608.3)
- Test under working pressure or 50psi air 15 minutes ...[2503.6] (609.4)
- Main valve must be full-bore type **Figs. p10–p12** [2903.9.1] (605.2)
- Like materials throughout system except valves[n/a] (604.1)
- Dielectric fittings or brass between galv. and copper ..[2904.14.1] (316.2)
- Rigidly support faucet takeoff fittings[local] (609.1)
- Water hammer arrestors req'd if quick-close valves[2903.5] (609.10)
- Backflow protection from fire sprinkler piping[2902.4.4] (603.4.18)
- Support**see pt-3**

Fig. p10 • Gate Valve



Full-bore valves required for mains and water heater.

Fig. p11 • Ball Valve

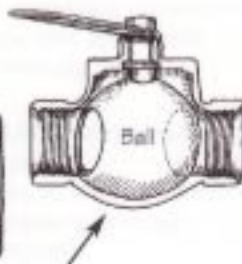
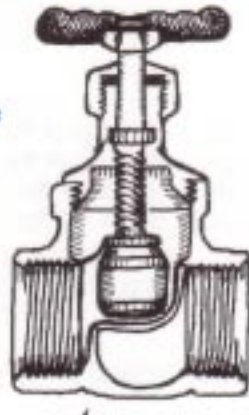


Fig. p12 • Globe Valve



Throttling valves not approved for mains & water heater.

Laundry

- Standpipe receptor ≥18in. & ≤42in. (30in. UPC) above trap[2706.2] (804.1)
- No trap below floor[n/a] (804.1)
- Trap min. 6in. max. 18in. above floor[n/a] (804.1)
- Laundry tub may drain to washer standpipe if 30in. min.[2706.2.1] (∅)

Kitchen

- Dishwasher waste ahead of garb. disposer discharge [n/a] (405.4)
- Dishwasher drain req's air gap [or integral backflow] .. [2717.1] (807.4)
- Island vent—use only when structurally req'd [n/a] (909)

Bathroom

Shower

- Shower valve, head/riser secure[2708.2] (412.12)
- Min. area 900sq.in. (1024sq.in.) to 70in. & 30in. circle ..[2708.1] (412.7)
- Min. rough pan 32in. x 32in. (34in. x 34in.)[2708.1] (412.7)
- Dam ≥2in. & ≤9in.[2709.1] (412.6)
- Pan liner plastic or 3 layers hot mop type 15 felt[2709.2.1] (412.8)
- Liner min. 3in. above dam[2709.2] (412.8)
- Slope underlayment 1/4in./ft.—1/2in./ft[2709.1] (412.6)
- No fasteners <1in. above dam[2709.3] (412.8)
- Weep holes at drain to remain clear[2709.4] (412.8)
- Special attention to corner installation[2709.2.1] (412.8)
- Door shall open outward (min. 22in. wide)[2708.1] (412.6)
- Listed anti-scald/pressure balance valve req'd. 120°max. [2708.3] (420.0)

Toilet & Bidet

- 30in. wide clearance, 21in. (24in.) at front[2705.1] (408.6)
- Flange secure & corrosion-resistant fasteners[2705.1] (408.3)
- Closet ring to vent—max. length 12ft. (6ft.) **pt-2** (t3105.1) (t10-1)

Tub

- Slip joints accessible, min. 12in. x 12in. door[2704.1] (405.2)
- Over-rim bath faucet—min. air gap 2in.[t2902.2.1] (t6-3)

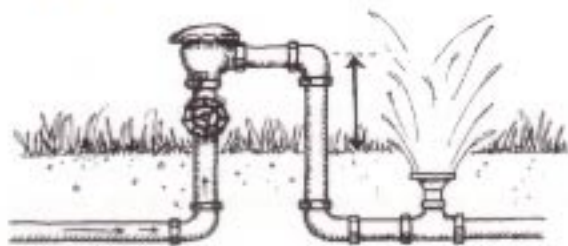
Exhaust Fan

- Backdraft damper req'd, exhaust to exterior[303.3X] (UMC504.1)
- Min. 3ft. from opening or property line[n/a] (UMC504.5)
- Duct material approved for application[1601.2] (UMC504.1)

Outdoors

- Vacuum breakers on all hose faucets[2902.3.3] (603.4.7)
- Backflow protection on irrigation systems[2902.4.3] (T6-2)
- Vacuum breaker 6in. above sprinkler heads **Fig. p13** [2902.2.2] (T6-2)
- No valves downstream of vacuum breaker[2902.4.3] (T6-2)
- Wrap outdoor PVC exposed to sun[local] (IS313.4)
- Accessible stop-&-waste hose bibbs in cold climate ... [2903.10] (n/a)

Fig. p13 • Vacuum Breaker



Vacuum breaker min. 6" above highest head

WATER-SIZING WORKSHEET

pt-5 • Procedures for Sizing a Water Service

1. Minimum daily static pressure at meter or source
2. Subtract (add) $\frac{1}{2}$ lb. pressure per ft. of rise (fall)
3. Deduct pressure losses for filters, regulators, etc.
4. Find pressure range group in pt-7a or pt-7b
5. Find column for developed length to most remote fixture
6. Find row meeting fixture unit req's (total from pt-6)
7. Find req'd meter and pipe size in left columns

Based on (2903.7) & (610.8)

pt-6 • Fixture Units Fill-in Table

Fixture	Units IRC/UPC	#	Extension
Bathtub	1.4 / 4.0		
Clothes Washer	1.4 / 4.0		
Dishwasher	1.4 / 1.5		
Hose Bibb	2.5 / 2.5		
Kitchen Sink	1.4 / 1.5		
Lavatory	0.7 / 1.0		
Laundry Tub	1.4 / 1.5		
Stall Shower	1.4 / 2.0		
Water Closet	2.2 / 2.5		
Full Bath Group ^a	3.6 / n/a		
Total			

a. Full bath group=WC+bathtub/shower+lavatory
Based on Tables (T2903.6) & (T6-4)

pt-7a • IRC Water Sizing Table^a

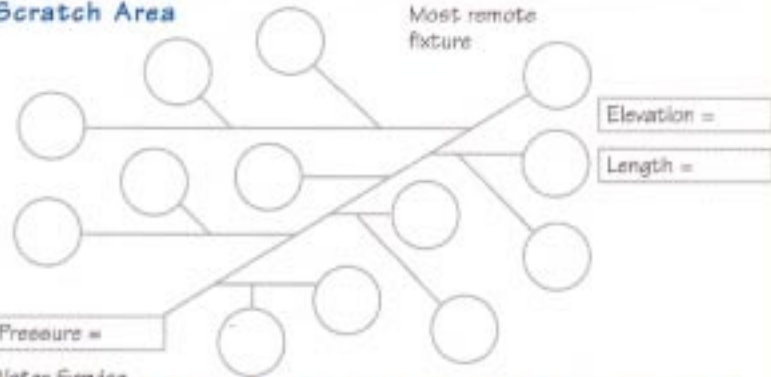
Meter	Supply	Units allowed per lengths ^a of pipe					
		40ft.	60ft.	80ft.	100ft.	150ft.	200ft.
40-49 psi		40ft.	60ft.	80ft.	100ft.	150ft.	200ft.
$\frac{3}{8}$ in.	$\frac{3}{8}$ in. ^b	3	2.5	2	1.5	1.5	1
$\frac{3}{8}$ in.	$\frac{1}{2}$ in.	9.5	9.5	8.5	7	5.5	4.5
$\frac{3}{8}$ in.	1in.	32	32	32	26	18	13.5
1in.	1in.	32	32	32	32	21	15
1in.	1 $\frac{1}{2}$ in.	80	80	80	80	65	52
50-60 psi		40ft.	60ft.	80ft.	100ft.	150ft.	200ft.
$\frac{3}{8}$ in.	$\frac{3}{8}$ in. ^b	3	3	2.5	2	1.5	1
$\frac{3}{8}$ in.	$\frac{1}{2}$ in.	9.5	9.5	9.5	8.5	6.5	5
$\frac{3}{8}$ in.	1in.	32	32	32	32	25	18.5
1in.	1in.	32	32	32	32	30	22
1in.	1 $\frac{1}{2}$ in.	80	80	80	80	68	57
over 60 psi		40ft.	60ft.	80ft.	100ft.	150ft.	200ft.
$\frac{3}{8}$ in.	$\frac{3}{8}$ in. ^b	3	3	3	2.5	2	1.5
$\frac{3}{8}$ in.	$\frac{1}{2}$ in.	9.5	9.5	9.5	9.5	7.5	6
$\frac{3}{8}$ in.	1in.	32	32	32	32	32	24
1in.	1in.	32	32	32	32	32	28
1in.	1 $\frac{1}{2}$ in.	80	80	80	80	80	80

a. Based on IRC table 2903.7
b. First multiply actual length to most remote fixture by 1.2 to compensate for loss at fittings
c. Minimum building supply is 1/2in.

pt-8 • Water-Sizing Fill-in Table

Section	Length	Fixture Units	Pipe Size	Section	Length	Fixture Units	Pipe Size

Scratch Area



Water Service

pt-7b • UPC Water Sizing Table^a

Meter	Supply	Units allowed per lengths ^a of pipe					
		40ft.	60ft.	80ft.	100ft.	150ft.	200ft.
30-45 psi		40ft.	60ft.	80ft.	100ft.	150ft.	200ft.
$\frac{3}{8}$ in.	$\frac{3}{8}$ in. ^b	6	5	4	3	2	1
$\frac{3}{8}$ in.	$\frac{1}{2}$ in.	16	16	14	12	9	6
$\frac{3}{8}$ in.	1in.	29	25	23	21	17	15
1in.	1in.	36	31	27	25	20	17
1in.	1 $\frac{1}{2}$ in.	54	47	42	38	32	28
46-60 psi		40ft.	60ft.	80ft.	100ft.	150ft.	200ft.
$\frac{3}{8}$ in.	$\frac{3}{8}$ in. ^b	7	7	6	5	4	4
$\frac{3}{8}$ in.	$\frac{1}{2}$ in.	20	20	19	17	14	11
$\frac{3}{8}$ in.	1in.	39	39	36	33	28	23
1in.	1in.	39	39	39	36	30	25
1in.	1 $\frac{1}{2}$ in.	78	78	76	67	52	44
over 60 psi		40ft.	60ft.	80ft.	100ft.	150ft.	200ft.
$\frac{3}{8}$ in.	$\frac{3}{8}$ in. ^b	7	7	7	6	5	4
$\frac{3}{8}$ in.	$\frac{1}{2}$ in.	20	20	20	20	17	13
$\frac{3}{8}$ in.	1in.	39	39	39	39	35	30
1in.	1in.	39	39	39	39	38	32
1in.	1 $\frac{1}{2}$ in.	78	78	78	78	74	62

a. Based on UPC table 6-5
b. Minimum building supply is 3/8in.

GAS-SIZING WORKSHEET

pt-9 • Procedures for Sizing Gas Pipe

1. Determine Btu/Cu.ft. gas from local supplier (usually 1100)
2. Divide appliance Btu by Btu/cu.ft to obtain appliance demand
3. [IRC - Measure developed length to most remote fixture]
4. [IRC - Use column from pt-13 for most remote fixture for all fixtures]
3. [UPC - Measure developed length to each fixture]
4. [UPC - select column from pt-13 for load on piping to each fixture]
5. Select row for pipe size equaling or exceeding demand each section

pt-10 • Gas Appliance Demand

Appliance ^a	Btu/hr.	cu.ft./hr. ^b	#	Extension
Clothes Dryer	35,000	32		
Gas Range	65,000	59		
Recessed Oven	25,000	22		
Recessed Top Burner	40,000	36		
Log Lighter	25,000	22		
Water Heater (30 gal.)	25-35K	22-32		
Water Heater (40-50 gal.)	35-55K	31-50		
Central Furnace/Boiler	50K-200K	45-180		
Swimming Pool	50K-250K	45-225		
Other				
Total cu. ft. /hr. gas demand:				

a. Typical appliance demands-use actual nameplate ratings
b. Based on 1100Btu/5cu.ft.-refer to gas provider for actual values

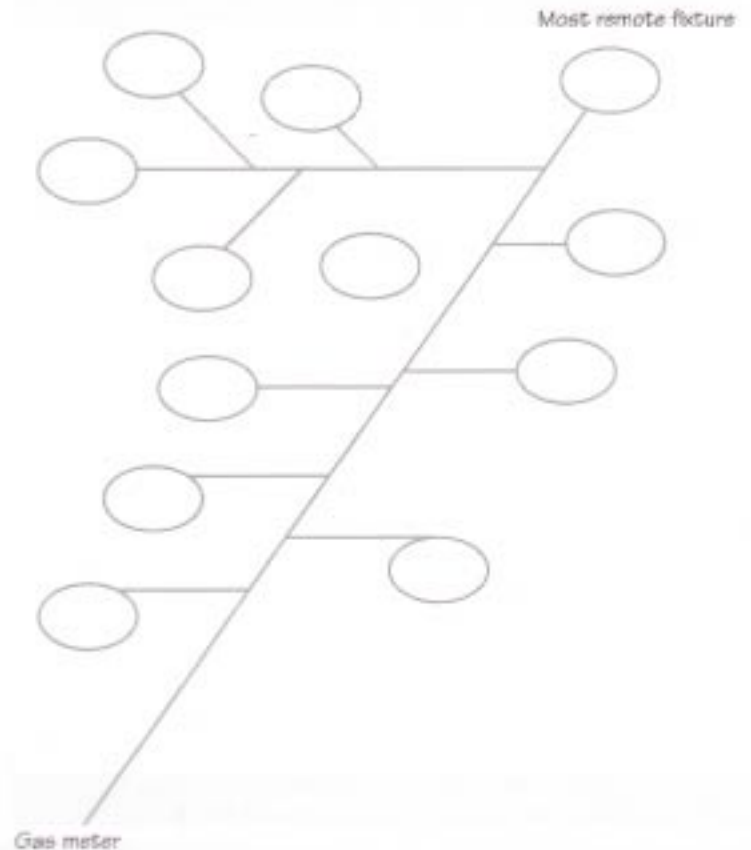
pt-11 • Gas-Sizing Fill-in Table

Section	Length	Cu.ft./hr.	Pipe size

pt-13 • Gas Piping

Pipe	Length (in feet)											
	10	20	30	40	50	60	70	80	90	100	125	150
Demand Capacity (in cu.ft./hr)												
3/8in.	95	65	52	45	40	36	33	31	29	27	24	22
1/2in.	175	120	97	82	73	66	61	57	53	50	44	40
5/8in.	360	250	200	170	151	138	125	118	110	103	93	84
1in.	680	465	375	320	285	260	240	220	205	195	175	160
1 1/2in.	1400	950	770	660	580	530	490	460	430	400	360	325

Based on IRC T2412.3(1)



Scratch Area

pt-12 • Capacities of Metal Gas Connectors (kBtu/hr.)

Semi-rigid O.D.	Flex I.D.	1ft.	1½ft.	2ft.	2½ft.	3ft.	Ranges & dryers only		
							4ft.	5ft.	6ft.
¼in.	⅜in.	40	33	29	27	25			
⅜in.	½in.	93	76	66	62	58			
½in.	⅝in.	189	155	134	125	116	101	90	80
—	¾in.	404	330	287	266	244			
	1in.	803	661	573	534	500			

Based on UPC T12-9

Gas Piping

General

- Gas test—3psi. {10psi-6in. mercury} for 10 {15} minutes . . .[2416.4] {1204.3.2}
- Material—wrought iron, steel (galv. or black) yellow brass [2413.1.] {1210.1}
- Labeled "Gas" for other than black pipe (Cu only)[2411.5] {1211.8}
- Copper OK only for low sulfur-content gas[2413.5.2] {1210.1.1}
- Corrugated stainless-steel tubing permitted[2413.5.3] {pending}
- Interior of pipe must be deburred[2413.7] {1210.2}
- Plastic pipe only at exterior buried[2413.6] {1210.1}
- No gas pipe in circulating or ventilating air duct[2414.1] {n/a}
- Supportsee pt-3

Underground

- Metal, min. 12in. deep plastic min. 12in. {18in.}[2414.9] {1211.6}
- Plastic requires #18 tracer wire[2414.14.3] {1211.19}
- Ferrous pipe must be protected[2414.8] {1211.6}
- Exposed underfloor piping min. 6in. above ground[n/a] {1211.4}
- Underslab only if run through gas-tight conduit Fig. p14 [2414.11] {1211.4}
- Buried plastic must connect to metal ≥30in. before vertical . . .[n/a] {1211.6}
- Electrically isolate buried ferrous gas pipes[2410] {1211.7}

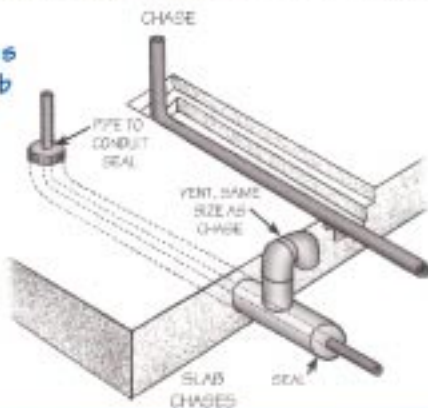
Connections

- Shutoff valve ahead of union ≤6ft. {3ft.} of appliance[2419.5] {1211.18}
- Unions adjacent to accessible equipment only[n/a] {1211.13}
- Drip leg if water vapor in gas[2418.2] {1211.5}
- Flex connection sizingpt-12 [2421.1.2] {1212.0}

Fireplace with Gas Appliance (see p.22)

- Req'd valve ≤6ft. {4ft.} of fireplace same room.[2419.5] {1211.17}

Fig. p14 • Gas Pipe in Slab



Final

Gas Connections

- Gas meter—access opening min. 22in. x 24in.[n/a] {1209.5}
- Gas test—3psi. {10psi-6in. mercury} for 10 {15} minutes [2416.4] {1204.3.2}
- Main shutoff ahead of meter, outside & readily accessible [2419.2] {1209.3}

Individual appliance shutoff valves

- Shutoff valve ahead of union ≤6ft. {3ft.} of appliance . . .[2419.5] {1211.18}
- May be inside wall furnace access panel[n/a] {1211.18}

Gas appliance connector

- Sizingpt-12 [2421.1.2] {1212.0}
- Max. length 3ft. {6ft. range or dryer}[2421.1.2] {1212.0X1}
- Not pass-through building or appliance wall[2421.1.2] {1212.0X2}
- Valve immediately ahead of & sized to connector[2421.1.2] {1212.0X3}
- Aluminum alloy for dry interiors only[2421.1] {1212.0X5}
- Gas hose (<15ft.) outdoor portable appliance only[2421.1.3] {1212.0X7}

Propane (L.P. Gas)

- Appliance not located where gas may pool[n/a] {1213.5}
- Bldg. openings below relief valves min. 5ft. horiz.[n/a] {1213.9}

Heat Exchanger Using Potable Water

- Water separated by two separate walls single wall if potable side pressure 10psi> than transfer fluid[2902.4.2] {603.4.4}
- Backflow preventer (reduced pressure) req'd on solar if chemicals used[2902.4.5] {603.0}

Bathroom

- Ballcock critical level min. 1in. above overflow pipe . . .[2902.3.1] {603.4.2}
- Toilet & plumbing fixtures sealed at walls and floors . . .[2705.1] {408.2}
- 1.6gal. flush water closets (new const. only)[local] {local}
- Access to tub waste and overflow if slip joints used[2704.1] {405.2}
- Tub hose attachments req. vacuum breaker[2902.3.3] {603.4.7}
- Shower walls non-absorbent surface[307.2] {401.1}
- Whirlpool tub motor access[2720.1] {415.1}
- Hot on left[2722.2] {416.0}

Kitchen

- Dishwasher air gap req'd above sink flood rim[n/a] {807.4}
- Sink-hose attachments req. vacuum breaker[2902.3] {603.4.8}

Outdoors

- ABS vents protected with latex paint[ASTM-D2661] {IS-5 313.3}
- Vacuum breakers on all hose faucets[2902.3.3] {603.4.7}
- Accessible stop & waste hose bibbs in cold climate[2903.10] {n/a}
- Vacuum breakers >6in. above highest sprinkler Fig. p-13 [2902.2.2] {T6-2}
- No valves downstream of vacuum breaker[2902.4.3] {T6-2}

General

- Potable water air gap of 2 pipe diameters or min. 1in. [T2902.2.1] {603.3.5}
- Water supply valves for each fixture or appliance[2903.9.3] {605.5}
- Traps seal min. 2in., max. 4in.[3201.2] {1005.0}
- Backwater valve accessible[3008.1] {710.6}
- Rainwater drains not connected to building drain[n/a] {714.2}
- AC, refrigeration & water softener drains min. 1in. airbreak [n/a] {801.1}
- Reverse osmosis water treatment drain through air gap [2907.2] {801.1}