



CITY OF TUCSON
Planning and Development Services
201 N Stone Ave, Tucson AZ 85701

RESIDENTIAL GAS PIPING INSTALLATIONS - 2018 IRC

These standards are intended to be a guide to the homeowner. It is the permit holder's responsibility to provide an installation that complies with the 2018 International Residential Code, and addendums. If you are not able to provide a system that complies with the minimum code requirements, please consult with a licensed professional. Multiple denied inspections will result in additional inspection fees.

A "gas system" includes all gas piping, equipment, and appliances. The inspector will need access to the entire system but may not enter an occupied structure without an adult escort. City staff does not supply ladders or tools. Please provide safe access to all areas including roof tops when necessary. If access to all parts of the system is not available your inspection may be delayed until the next business day.

Water heaters (WH) and furnaces require a permit when they are replaced or relocated and must comply with current codes. An appliance is only considered "existing" if it was permitted and approved at the time of installation. No part of any system may be concealed prior to approval from the inspector. All materials used in a piping system, including pipe supports, shall be "approved" or "listed" (designed and tested for a specific use). Listed materials shall be installed in accordance with the manufacturer's installation instructions.

Water heaters shall be provided with a temperature and pressure relief valve (T&P) with a relief drain to the outside of the building or to an approved location per code. In the event that there is no way to comply with this requirement due to existing conditions, an alternate solution may be granted **at the inspector's discretion**. The T&P valve shall be tested at the time of inspection and replaced if leaking.

The permit holder shall provide a 10 psi air test on the entire system using a 15 psi gage (exception: a mobile home interior may be tested with 3 psi). **The entire gas system shall be placed under test prior to the inspector's arrival.** For new residential construction, the pressure test shall be performed at the time of intermediate inspection. The utility clearance will be sent to the gas supplier upon approval of the intermediate inspection. City clearances are only valid for 90 days. If an additional City clearance is required, an additional inspection must occur and a re-inspection fee will apply.

Plan Review

If you are replacing or adding gas piping, a plan is required. It is important to verify that the pipe, being replaced or added to, is the correct size for the current code. Existing gas piping may not be properly sized for the currently adopted code. In order to perform a complete plan review, the following items must be specified:

- The total length of the pipe measured from the meter to the furthest appliance
- The Btu/h input all gas-fired appliances supplied by the gas meter
- Future connections or capped "tee" outlets must be included on your plan because the system must be sized to handle any future demand

Accessible shut-off valves shall be installed within 6 feet of the appliance ahead of the union connecting the appliance. Approved, and correctly sized flex connectors, shall be on site. When the gas meter is in a remote location (i.e. in an alley), an emergency gas shut-off valve (SOV) is required near the building.

All exposed gas piping shall be kept at least 6 inches above grade and 1½” above a roof. Pipe supports used outside of the building shall be weather resistant.

Piping installed below grade shall be “listed” for below grade installations (factory coated) and any uncoated fittings and tool marks shall be protected with the use of pipe wrap primer and PVC pipe wrap. Pipe wrap shall be installed neatly without wrinkles. Non-metallic piping requires a minimum #18 gage yellow tracer wire secured at 8 feet on center. All gas piping for mobile homes and all plastic gas piping requires 18 inches of cover from the top of the pipe to ground level. DO NOT cover the piping until it has been inspected. Provide clean fill material on site at the time of inspection for backfilling purposes. Remove all rocks from the trench and “shade the pipe” with clean sand or dirt. All below grade piping shall be continuously supported. Metallic piping may be installed with only 12 inches of cover if it is not in an area where damage may occur. Below grade offsets may not be made in a public right of way.

Things to remember:

- Unions and bushings may not be used in concealed locations
- Sediment traps are required at the water heater and furnace inlets
- All roof penetrations shall have an approved (listed) flashing
- All flashing shall be sealed and installed per listing
- Type B or other currently approved venting materials are required
- Exhaust vent piping shall be secured with galvanized sheet metal screws
- Proper vent terminations and clearances from combustibles are required
- Combustion air openings are required for gas-fired equipment
- Gas piping shall be electrically bonded
- A carbon monoxide detector shall be installed in the space leading to bedrooms.

Reference your code book and installation instructions for further information. This “guide” addresses some of the commonly noted requirements. There are too many codes that apply to list all of them here and not all codes will apply to each situation. The inspector will inform you of any additional requirements that apply to your situation.

The volume of gas to be provided, in cubic feet per hour, shall be determined directly from the manufacturer’s input ratings of the appliances served. Where an input rating is not indicated, the gas supplier, appliance manufacturer or a qualified agency shall be contacted, or the rating from Table G2413.2 shall be used for estimating the volume of gas to be supplied. The total connected hourly load shall be used as the basis for pipe sizing, assuming that all appliances could be operating at full capacity simultaneously. Where a diversity of load can be established, pipe sizing shall be permitted to be based on such loads.

TABLE G2413.4(1)
SCHEDULE 40 METALLIC PIPE

Gas	Natural					
Inlet Pressure	Less than 2 psi					
Pressure Drop	0.5 in. w.c.					
Specific Gravity	0.6					
	PIPE SIZE (inch)					
Nominal	½	¾	1	1¼	1½	2
Actual ID	0.622	0.824	1.049	1.38	1.61	2.067
Length (ft)	Capacity in Cubic Feet of Gas per Hour					
10	172	360	678	1,390	2,090	4,020
20	118	247	466	957	1,430	2,760
30	95	199	374	768	1,150	2,220
40	81	170	320	657	985	1,900
50	72	151	284	583	873	1,680
60	65	137	257	528	791	1,520
70	60	126	237	486	728	1,400
80	56	117	220	452	677	1,300
90	52	110	207	424	635	1,220
100	50	104	195	400	600	1,160
125	44	92	173	355	532	1,020
150	40	83	157	322	482	928
175	37	77	144	296	443	854
200	34	71	134	275	412	794
250	30	63	119	244	366	704
300	27	57	108	221	331	638

APPROXIMATE GAS INPUT (actual demand data required)

APPLIANCE	INPUT BTU/H
Warm-air furnace	100,000
Water heater, (40-gal. tank type)	35,000
Kitchen Range, free-standing, domestic	65,000
Barbecue	40,000
Clothes dryer, Type 1 (domestic)	35,000
Gas fireplace, direct vent	40,000

G2424.1 Interval of support.

Piping shall be supported at intervals not exceeding the spacing specified in Table G2424.1.

Spacing of supports for CSST shall be in accordance with the CSST manufacturer's instructions.

STEEL PIPE, NOMINAL SIZE OF PIPE (inches)	SPACING OF SUPPORTS (feet)	NOMINAL SIZE OF TUBING SMOOTH-WALL (inch O.D.)	SPACING OF SUPPORTS (feet)
$\frac{1}{2}$	6	$\frac{1}{2}$	4
$\frac{3}{4}$ or 1	8	$\frac{5}{8}$ or $\frac{3}{4}$	6
$1\frac{1}{4}$ or larger (horizontal)	10	$\frac{7}{8}$ or 1 (horizontal)	8
$1\frac{1}{4}$ or larger (vertical)	Every floor level	1 or Larger (vertical)	Every floor level