CITY OF MILPITAS
Office of Building Safety
455 E. Calaveras Blvd.
Milpitas, CA 95035
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# RESIDENTIAL GAS PIPING

## 1. PERMIT INFORMATION:

- ❑ The replacement, repair, extension of existing or installation of new gas piping requires a permit.
- ❑ A Permit may be issued only to a State of California Licensed Contractor with the proper license classification, the property owner, or the property owner designee.

## 2. INSTALLATION REQUIREMENTS:

- ❑ **Codes:** All work must comply with the California Plumbing Code (CPC), the Milpitas Municipal Code (MMC), or other adopted codes as applicable.
- ❑ **Pipe Sizing:**
  - If new piping is to be installed, the individual run of piping must start from the gas meter location prior to any other branches. Otherwise drawings and calculations showing both the new and existing piping system must be submitted to the Office of Building Safety for review.
- ❑ **Materials:**
  - Pipe, fittings, valves, or other materials shall not be used again unless they are free of foreign materials and have been ascertained to be adequate for the service intended (CPC).
  - Pipe and fitting materials shall be per the CPC.
  - Cast-iron pipe shall not be used.
  - Changes in direction of gas pipe shall be made by the use of fittings, factory bends, or field bends. (CPC)
  - Metallic piping and fittings shall be coated with an approved corrosion-resistant material where in contact with material or atmosphere exerting a corrosive action. (CPC)
  - Plastic pipe, tubing, and fittings shall be in accordance with the CPC and shall be installed in accordance with the manufacturer's installation instructions.
  - Shut-off valves shall be approved and valves of size 1 inch (NPT) and smaller shall be listed. (CPC)
- ❑ Workmanship:
  - Gas pipe or tubing and fittings shall be clear and free from cutting burrs and defects in structure or threading and shall be thoroughly brushed and chip and scale blown. Defective pipe, tubing, and fittings shall be replaced, not repaired. (CPC)
  - It shall be unlawful to remove or disconnect any gas piping or gas appliance without capping or plugging with a screw joint or listed quick-disconnect device fitting the outlet from which said pipe or appliance was removed. Outlets to which gas appliances are not connected shall be left capped and gastight on any piping system that has been installed, altered, or repaired. (CPC)

## ❑ Installations:

- Underground gas piping shall be installed with enough clearance from structures to avoid contact therewith, to allow maintenance, and to protect against damage.
- Piping shall be installed with a minimum of 12 inches of cover.
- Where external damage to the pipe is likely (installed underneath concrete walks or drives), the minimum cover shall be 18 inches.
- Where 12 inches of cover cannot be provided, the pipe shall be installed in conduit or bridged.
- Trenches shall be graded so that the pipe has a firm, substantially continuous bearing on the bottom of the trench. (CPC)
- Where gas piping is installed underground beneath buildings, the piping shall be: Encased in an approved conduit designed to withstand the superimposed loads or; a piping or encasement system listed for installation beneath buildings.
- The conduit shall extend into a normally usable and accessible portion of the building and, at the point where the conduit terminates in the building, the space between the conduit and the gas piping shall be sealed to prevent the possible entrance of any gas leakage.
- The conduit shall extend at least 4 inches outside the building, be vented above grade to the outside, and be installed to prevent the entrance of water and insects. (CPC)
- An electrically continuous corrosion-resistant tracer wire (minimum AWG 14) or tape shall be buried with plastic gas pipe to facilitate locating. One end shall be brought aboveground at a building wall or riser. (CPC)
- Piping installed aboveground shall be securely supported and located where it will be protected from physical damage.
- Where passing through an outside wall, the piping shall also be protected against corrosion by a factory coating or field wrapping with a material approved for such applications.
- Where piping is encased in a protective pipe sleeve, the annular space between the gas piping and the sleeve shall be sealed at the wall to prevent the entry of water, insects, or rodents. (CPC)
- Piping shall be supported with metal pipe hooks, metal pipe straps, metal bands, metal brackets, metal hangers or building structural components approved for the size of piping; be of adequate strength and quality; and located at intervals so as to prevent or damp out excessive vibration.
- Piping shall be anchored to prevent undue strains on connected equipment and shall not be supported by other piping. (CPC)

- Spacing of supports in gas-piping installations shall not be greater than: (CPC)

1. Steel pipe:
   - ½", 6 feet max.
   - ¾" and 1", 8 feet max.
   - 1 ¼" or larger horizontal, 10 feet max.
   - 1 ¼" or larger vertical, every floor level

2. Tubing:
   - ½", 4 feet max.
   - 5/8" or ¾", 6 feet max.
   - 7/8" or 1" horizontal, 8 feet max.
   - 1" or larger vertical, every floor level
   - Spacing of supports for corrugated stainless steel tubing shall be in accordance with the manufacturer's instruction.

   - Supports, hangers, and anchors shall be installed so as not to interfere with the free expansion and contraction of the piping between anchors. All parts of the supporting equipment shall be designed and installed so they will not be disengaged by movement of the supported piping. (CPC)

- Where gas piping is to be concealed, unions, tubing fittings, and compression couplings made by combinations of fittings shall not be used. Connections shall be of the following type: (CPC)
  1. Pipe fittings such as elbows, tees, and right/left nipple/couplings.
  2. Joining tubing by brazing.
  3. Fittings listed for use in concealed spaces that have been demonstrated to sustain, without leakage, any forces due to temperature expansion or contraction, vibration, or fatigue based on their geographic location, application, or operation.
  4. Where necessary to insert fittings in gas pipe that has been installed in a concealed location, the pipe shall be reconnected by welding, flanges, or the use of a right/left nipple/coupling.

- Concealed gas piping shall not be located in solid partition. (CPC)

- Gas piping inside any building shall not be installed in or through a clothes chute, chimney or gas vent, dumbwaiter, elevator shaft or air duct, other than combustion air ducts. This provision shall not apply to ducts used to provide ventilation air in accordance with Section 506.0 or to above-ceiling spaces. (CPC)

- Grounding and bonding per CPC:

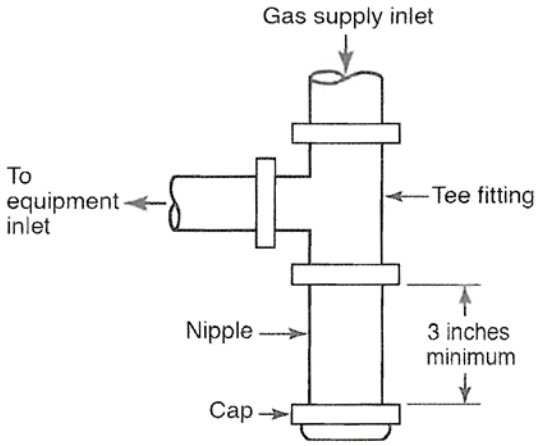
  1. Each above ground portion of a gas piping system other than CSST that is likely to become energized shall be electrically continuous and bonded to an effective ground-fault current path. Gas piping, other than CSST, shall be considered to be bonded when it is connected to appliances that are connected to the appliance grounding conductor of the circuit supplying that equipment.
  2. CSST gas piping systems shall be bonded to the electrical service grounding electrode system. The bonding jumper shall connect to a metallic pipe or fitting between the point of delivery and the first downstream CSST fitting. The bonding jumper shall not be smaller than 6 AWG copper wire.
  3. Gas piping systems that contain one or more segments of CSST shall be bonded in accordance with this section. [NFPA 54:7.13.2]
  4. Gas piping shall not be used as a grounding conductor or electrode.

❑ Equipment/Appliances:

- Outlets shall comply with the following: (CPC)

  1. The outlet fittings or piping shall be securely fastened in place.
  2. Outlets shall not be located behind doors.
  3. Outlets shall be located far enough from floors, walls, patios, slabs, and ceilings to permit the use of wrenches without straining, bending, or damaging the piping.
  4. The unthreaded portion of gas piping outlets shall extend not less than 1 inch through finished ceilings or indoor or outdoor walls.
  5. The unthreaded portion of gas-piping outlets shall extend not less than 2 inches above the surface of floors or outdoor patios or slabs.
  6. The above provisions for extending piping outlets shall not apply to listed quick-disconnect devices of the flush-mounted type or listed gas convenience outlets. Such devices shall be installed in accordance with the manufacturers' installation instructions.
  7. Each outlet, including a valve, shall be closed gastight with a threaded plug or cap immediately after installation and shall be left closed until the gas utilization equipment is connected thereto. When equipment is disconnected from an outlet and the outlet is not to be used again immediately, it shall be capped or plugged gastight.

- Where a sediment trap is not incorporated as part of the gas utilization appliance, a sediment trap shall be installed downstream of the appliance shutoff valve as close to the inlet of the appliance as practical, before the flex connector, where used at the time of appliance installation. The sediment trap shall be either a tee fitting with a capped nipple in the bottom outlet, or other device recognized as an effective sediment trap. Illuminating appliances, ranges, clothes dryers , decorative vented appliances for installation in vented fireplaces, gas fireplaces, and outdoor grills shall not be required to be so equipped. (CPC)

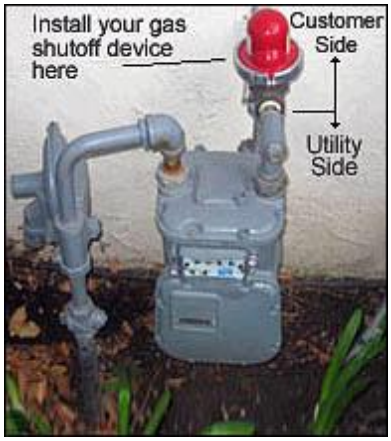



For SI units: 1 inch = 25.4 mm

**FIGURE 1312.7**
**METHOD OF INSTALLING A TEE FITTING SEDIMENT TRAP**

- Piping shall be installed in a manner not to interfere with inspection, maintenance, or servicing of the gas utilization equipment. (CPC)

- An approved Seismic Gas Shut-off Device (motion sensitive) *or* an approved Excess Flow Gas Shut-off Device (non-motion sensitive) shall be installed downstream of the gas utility meter (after PG&E service tee), but upstream of any appliances, when providing alteration or addition to the existing gas fuel line. (MMC)




"California Valve"

- Automatic Gas Shut-off Devices shall be installed manufacturer's installation instructions.

❑ Testing:

- Pressure testing and inspection: (CPC 1213.0)

  1. Prior to acceptance and initial operation, piping installations shall be visually inspected and pressure-tested.
  2. Inspection shall consist of visual examination after installation prior to covering.
  3. Where repairs are required to be made following the pressure test, the affected piping shall be re-tested.

4. Minor repairs and additions are not required to be pressure-tested provided that the work is inspected, and connections are tested with a non-corrosive leak-detecting fluid or other leak-detecting methods approved by the Inspector.
5. Where new branches are installed from the point of delivery to new appliances, only the newly installed branches shall be required to be pressure-tested.
6. A piping system shall be tested as a complete unit or in sections depending on size.
7. The test medium shall be air, nitrogen, carbon dioxide, or an inert gas. Oxygen shall never be used.
8. Appliances and equipment that are not to be included in the test shall be disconnected from the piping.
9. Test pressure inspection` of the gas piping involved shall stand a pressure of not less than 10 psi gauge pressure. Test pressure shall be held for no less than 15 minutes with no perceptible drop in pressure.
10. Test gage pressure range shall not exceed twice the test pressure applied. Test gage incrementation shall be as follows:
    - Test pressure 10 psi or less – gages with 0.10 psi incrementation or less.
    - Test pressure greater than 10 psi to 100 psi – gages with 1 psi incrementation or less

- After an interruption of service (meter removed), the gas piping system shall be tested for leakage prior to a gas meter release. Where leakage is indicated, the necessary repairs shall be completed, the system re-tested, and pass this test prior to approving a gas meter release.

**SMOKE ALARMS, CARBON MONOXIDE ALARMS & SPARK ARRESTERS:**

- ❑ In single family and multi-family residences (including townhomes, condominiums and apartments), installation of smoke alarms, carbon monoxide alarms and spark arresters on all chimneys is required prior to the final inspection. Refer to the *"Smoke Alarm, Carbon Monoxide Alarm and Spark Arrester Certificat*e" handout for detailed information.

**WATER CONSERVING FIXTURES:**

- ❑ When required, prior to final inspection, all non-compliant plumbing fixtures shall be replaced. Refer to the *"Water Conserving Certificate of Compliance"* handout for details on when this is required.

**INSPECTION PROCEDURES**

Two inspections are required. The first inspection is a pressure test when the gas line is installed and before any pipe is covered or concealed or any fixture or appliance is attached. The final inspection should be scheduled after all the work is completed. For each inspection, the Permit Card and the Approved Job Copy of the Drawings (if any) must be presented to the inspector.

**QUESTIONS:**

- ❑ If you have any questions regarding your project, please contact the Office of Building Safety at (408) 586-3240.