



# RESIDENTIAL WATER/SEWER PIPES

THESE REQUIREMENTS APPLY TO BUILDING PERMITS SUBMITTED ON OR AFTER JANUARY 1, 2017

## BUILDING DIVISION MINIMUM REQUIREMENTS

A plumbing permit is required to replace residential water supply piping (main water line from meter to the house), distribution pipes (plumbing within the building), and the sewer line. Permits shall be obtained prior to removal or installation of the plumbing system.

Following is a listing of the general requirements for replacing water and sewer lines based on the 2016 California Plumbing Code, 2016 California Electrical Code, 2016 California Energy Efficiency Standards, and the Sunnyvale Municipal Code. This brochure is intended to provide general information, contact the Building Safety Division for additional information.

### Sewer Line Replacement

- Material for sewer lines outside of the building (minimum 2' outside) can be cast iron, copper type DWV, or schedule 40 DWV ABS/PVC (when used in residential buildings, ABS/PVC is limited to two-story buildings; there is no limit on the number of stories for non-residential buildings). (CPC 701.2)
- Clean outs shall be installed at the exterior of the building, at each aggregate horizontal change in direction exceeding 135°, and at the property line. Property line clean outs shall be one-way and have a Christy Box G-5 or equal when in a paved area or F-8 or equal when in a landscaped area. (CPC 707.4, 719 and SMC 18.12.150)
- Sewer line shall be 12" below grade minimum and have a minimum of ¼" per one foot slope. (CPC 708)

### Main Water Supply Line Replacement (Outside the footprint of the building)

- Water supply pipes and fittings shall be PVC, copper (type L or M), malleable iron, galvanized steel, CPVC, or other approved material and shall be in accordance with NSF 61. (CPC 604)  
*Note: where plastic piping is used, a label shall be fastened to the main electrical meter panel stating, "This structure has a nonmetallic water service." (IAPMO IS 8-2006)*
- Underground water lines shall be buried a minimum of 12" below grade. (CPC 609)
- Non-metallic piping shall have a blue insulated 18-gauge copper tracer wire adjacent to the piping. The tracer wire shall terminate above ground at each end of the non-metallic pipe. (CPC 604.10)

### Water Distribution Pipe Replacement (Within and underneath of the building)

- Water distribution pipes shall be copper (Type L or M), malleable iron, galvanized steel, CPVC, PEX, or other approved material and shall be in accordance with NSF 61. (CPC 604)  
*Note: where plastic piping is used, a label shall be fastened to the main electrical meter panel stating, "This structure has a nonmetallic water distribution lines." (IAPMO IS 8-2006)*
- All domestic water piping in the following conditions/locations shall be insulated (CEES 150.0(j)2A):
  - The first 5' of hot and cold water pipes from the storage tank (i.e. water heater tank).
  - All hot water piping with a diameter of ¾" or larger.
  - All piping associated with a hot water recirculation system regardless of the pipe diameter.
  - Piping from the water heater to a storage tank or between storage tanks.
  - Hot water piping buried below grade.
  - All hot water pipes from the water heater to the kitchen fixtures.

- All materials used in the water distribution system shall be of like materials, except valves and similar devices, unless otherwise approved by the Chief Building Official (CPC 604.1). Following are acceptable methods of joining dissimilar materials:
  - Joints from copper tubing to threaded pipe shall be made by the use of brass adapter fittings.
  - Dielectric unions shall be used at all point of connection where dissimilar metals are used. Listed clamps and bonding jumpers shall be installed at all such connections (CEC 250.68(B) and 250.104).
  - When connecting plastic pipe to other types of piping, approved types of fittings and adapters designed for the specific transition shall be used.
- Non-removable backflow prevention devices are required on all hose bibs. (CPC 603.3)
- If shear walls, braced wall panels, or firewalls are compromised or altered during the re-pipe, these areas are required to be inspected prior to covering.

## Grounding and Bonding Requirements

Grounding shall consist of a continuous grounding electrode conductor run from the panel to a ground rod (grounding electrode) and to the cold water pipe. Grounding of the electrical service at the main water line must be within the first 5' of water piping into the building. The underground water service shall not be used as the grounding electrode without supplemental electrode. [CEC 250.52 (A)(1) and 250.53 (D)(2), 250.68(C)]

For new structures and additions to existing structures, a concrete encased ground electrode shall be installed. This shall consist of 20' of ½" bare or zinc-coated rebar or bare copper wire in the portion of the footing in contact with earth. (CEC 250.52(A)(3)(1) and 250.52(A)(3)(2))

For existing structures, the grounding electrode shall be nonferrous (copper), listed, and not be less than 5/8" in diameter. The electrode shall be installed such that at least 8' of length is in contract with the soil. The upper end of the electrode shall be flush with or below ground level unless the above-ground end and the grounding electrode conductor attachment is protected against physical damage. (CEC 250.52 (A)(5))

The required grounding electrode conductor (from electrode to panel) size is listed in the following table:

GROUNDING ELECTRODE CONDUCTOR SIZING (Table 250.66)		
Size of Main Panel	Copper Conductors	Aluminum or Copper-Clad Aluminum
100 Amps	#8 AWG	#6 AWG
125 Amps	#8 AWG	#6 AWG
150 Amps	#6 AWG	#4 AWG
200 Amps	#4 AWG	#2 AWG

Bonding of the hot, cold, and gas lines is required when the electrical panel is replaced. Bonding of the hot, cold, and gas lines is required with water service replacements (if using a less conductive material than is existing) and for all re-pipes. Bonding shall consist of a continuous bond jumper installed at the water heater between the hot, cold, and gas lines. The bonding jumper shall be sized based on the following table. (CEC250.4(A)(4))

BONDING JUMPER SIZING (Table 250.102(C)(1))		
Size of Main Panel	Copper Conductors	Aluminum or Copper-Clad Aluminum
100 Amps	#8 AWG	#6 AWG
125 Amps	#6 AWG	#4 AWG
150 Amps	#6 AWG	#4 AWG
200 Amps	#6 AWG	#4 AWG

## PERMIT PROCESS

### Building Permit Review

1. Building permits for water or sewer pipe replacements are available on-line at [www.e-OneStop.net](http://www.e-OneStop.net) or at the One-Stop Permit Center. The One-Stop Permit Center is open between the hours of 8:00 a.m. and 5:00 p.m., Monday - Friday.

### Inspections

2. Two inspections are required; a rough plumbing and a final. The rough plumbing inspection should be scheduled when the new pipes are installed before they are covered. The final inspection should be scheduled after all the work has been completed.

### Building Permit Application Requirements

- A completed Building Permit Worksheet application (available at the One-Stop Permit Center or on-line at [www.SunnyvaleBuilding.com](http://www.SunnyvaleBuilding.com))
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