

CHAPTER 6

WATER SUPPLY AND DISTRIBUTION

601.0 Running Water Required

601.1 Except where not deemed necessary for safety or sanitation by the Administrative Authority, each plumbing fixture shall be provided with an adequate supply of potable running water piped thereto in an approved manner, so arranged as to flush and keep it in a clean and sanitary condition without danger of backflow or cross-connection. Water closets and urinals shall be flushed by means of an approved flush tank or flushometer valve. In jurisdictions which adopt Appendix J, water closets, urinals, and trap primers in designated non-residential buildings may be provided with reclaimed water as defined and regulated by Appendix J of this Code.

601.1.1 [For HCD 1 w/exceptions & HCD 2 w/o exceptions] Except where not deemed necessary for safety or sanitation by the Administrative Authority each plumbing fixture shall be provided with an adequate supply of hot and /or cold potable runner water piped thereto in an approved manner, so arranged as to flush and keep it in a clean and sanitary condition without danger of backflow or cross connection. Water closets and urinals shall be flushed by means of an approved flush tank or flushometer valve.

Exceptions:

1. [For HCD 1] For limited-density owner-built rural dwellings, potable water shall be available to the dwelling site, although such water need not be pressurized. Where water is not piped from a well, spring, cistern or other source, there shall be a minimum reserve of 50 gallons (189 L) of potable water available. Where water delivery is pressurized, piping shall be installed in accordance with the provisions of this chapter.

2. [For HCD 1] Where deemed not necessary for safety or sanitation by the Administrative Authority.

601.2 Identification of a Potable and Nonpotable Water System. In all buildings where potable water and nonpotable water systems are installed, each system shall be clearly identified. Each system shall be color coded as follows:

601.2.1 Potable Water – Green background with white lettering.

601.2.2 Nonpotable Water. Yellow back-ground with black lettering, with the words "CAUTION: NONPOTABLE WATER, DO NOT DRINK". **[For HCD 1 & HCD 2]** A UNIVERSAL POISON SYMBOL OF SKULL AND CROSSBONES SHALL BE PROVIDED.

Each system shall be identified with a colored

band to designate the liquid being conveyed, and the direction of normal flow shall be clearly shown. The minimum size of the letters and length of the color field shall conform to Table 6-1.

A colored identification band shall be indicated every twenty (20) feet (6096 mm) but at least once per room, and shall be visible from the floor level.

Where vacuum breakers or backflow preventers are installed with fixtures listed in Table 14-1, identification of the discharge side may be omitted. Each outlet on the nonpotable water line which could be used for special purposes shall be posted as follows: "CAUTION: NONPOTABLE WATER, DO NOT DRINK"

TABLE 6-1

Minimum Length of Color Field and Size of Letters

Outside Diameter of Pipe or Covering, inches	Minimum Length of Color Field, inches (mm)	Minimum Size of Letters, inches (mm)
1/2 to 1-1/4 (15 to 32)	8 (203)	1/2 (12.7)
1-1/2 to 2 (40 to 50)	8 (203)	3/4 (19.1)
2-1/2 to 6 (65 to 150)	12 (305)	1-1/4 (32)
8 to 10 (200 to 250)	24 (619.0)	2-1/2 (64)
Over 10 (Over 250)	32 (813.0)	3-1/2 (89)

601.2.3 Reclaimed Water – Purple (Pantone color #512) background and shall be imprinted in nominal 1/2" (12.7 mm) high, black, upper case letters, with the words "CAUTION: RECLAIMED WATER, DO NOT DRINK". **[For HCD 1 & HCD 2]** A UNIVERSAL POISON SYMBOL OF SKULL AND CROSSBONES SHALL BE PROVIDED.

601.3 Faucets and diverters shall be connected to the water distribution system so that hot water corresponds to the left side of the fittings.

601.4 [For HCD 1 & HCD 2] All sources for drinking water shall be maintained in a clean and sanitary condition. Drinking fountain and portable water dispensers shall not be located in toilet rooms.

601.5 [For CA] Schools of Cosmetology and Cosmetological Establishments.

601.5.1 Hot-and Cold-running Water. At least one sink with hot- and cold-running water shall be provided in each work area or workroom where hairdressing is performed in each school and establishment.

601.5.2 Handwashing Facilities. Each school and establishment shall provide adequate handwashing facilities, including hot- and cold-running water, located within or adjacent to the toilet room or rooms in accordance with Appendix C, Table C-1.

601.5.3 Drinking Water. Each school and establishment

water service system, and any pipes, conduits, or fixtures containing or carrying water from any other source or containing or carrying water which has been used for any purpose whatsoever, or any piping carrying chemicals, liquids, gases, or any substances whatsoever, unless there is provided a backflow prevention device approved for the potential hazard and maintained in accordance with this Code.

602.3 No plumbing fixture, device, or construction shall be installed or maintained or shall be connected to any domestic water supply when such installation or connection may provide a possibility of polluting such water supply or may provide a cross-connection between a distributing system of water for drinking and domestic purposes and water which may become contaminated by such plumbing

fixture, device, or construction unless there is provided a backflow prevention device approved for the potential hazard.

602.4 No water piping supplied by any private water supply system shall be connected to any other source of supply without the approval of the Administrative Authority, Health Department, or other Department Having Jurisdiction.

603.0 Cross-Connection Control

Cross-connection control shall be provided in accordance with the provisions of this chapter.

No person shall install any water operated equipment or mechanism, or use any water treating chemical or substance, if it is found that such equipment, mechanism, chemical or substance may cause pollution or contamination of the domestic

TABLE 6-2
Backflow Prevention Devices, Assemblies and Methods

Device, Assembly or Method ¹	Degree of Hazard				Installation ^{2, 3}
	Pollution (Low Hazard)		Contamination (High Hazard)		
	Back-Siphon-age	Back-Pressure	Back-Siphon-age	Back-Pressure	
Airgap	X		X		See table in this chapter.
Atmospheric Vacuum Breaker	X		X		Upright position. No valves downstream. Minimum of six (6) inches (152 mm) or listed distance above all downstream piping and flood level rim of receptor. ^{4, 5}
Spill-Proof Pressure-Type Vacuum Breaker	X		X		Upright position. Minimum of six (6) inches (152 mm) or listed distance above all downstream piping and flood level rim of receptor. ⁵
Double Check Valve Backflow Preventer	X	X			Horizontal, unless otherwise listed. Requires one (1) foot (305 mm) minimum clearance at bottom for maintenance. May need platform/ladder for test and repair. Does not discharge water.
Pressure Vacuum Breaker	X		X		Upright position. May have valves downstream. Minimum of twelve (12) inches (305 mm) above all downstream piping and flood level rim of receptor. May discharge water.
Reduced Pressure Principle Backflow Preventer	X	X	X	X	Horizontal unless otherwise listed. Requires one (1) foot (305 mm) minimum clearance at bottom for maintenance. May need platform/ladder for test and repair. May discharge water.

¹ See description of devices and assemblies in this chapter.
² Installation in pit or vault requires previous approval by the Administrative Authority.
³ Refer to general and specific requirements for installation.
⁴ Not to be subjected to operating pressure for more than 12 hours in any 24 hour period.
⁵ For deck-mounted and equipment-mounted vacuum breakers, see Section 603.4.16.

water supply. Such equipment or mechanism may be permitted only when equipped with an approved backflow prevention device or assembly.

603.1 Approval of Devices or Assemblies. Before any device or assembly is installed for the prevention of backflow, it shall have first been approved by the Administrative Authority. Devices or assemblies shall be tested for conformity with recognized standards or other standards acceptable to the Administrative Authority which are consistent with the intent of this Code.

All devices or assemblies installed in a potable water supply system for protection against backflow shall be maintained in good working condition by the person or persons having control of such devices or assemblies. The Administrative Authority or other department having jurisdiction may inspect such devices or assemblies and, if found to be defective or inoperative, shall require the repair or replacement thereof. No

device or assembly shall be removed from use or relocated or other device or assembly substituted, without the approval of the Administrative Authority.

603.2 Backflow Prevention Devices, Assemblies, and Methods

603.2.1 Airgap. The minimum airgap to afford backflow protection shall be in accordance with Table 6-3.

603.2.2 Atmospheric Vacuum Breaker (AVB). An atmospheric vacuum breaker consists of a body, a checking member and an atmospheric opening.

603.2.3 Hose Connection Backflow Preventer. Consists of two independent check valves with an independent atmospheric vent between and a means of field testing and draining.

603.2.4 Double Check Valve Backflow Prevention Assembly (DC). A double check

TABLE 6-3 Minimum Airgaps for Water Distribution ⁴		
Fixtures	When not affected by side walls ¹ Inches (mm)	When affected by side walls ² Inches (mm)
Effective openings ³ not greater than one-half (1/2) inch (12.7 mm) in diameter	1 (25.4)	1-1/2 (38)
Effective openings ³ not greater than three-quarters (3/4) inch (20 mm) in diameter	1-1/2 (38)	2-1/4 (57)
Effective openings ³ not greater than one (1) inch (25 mm) in diameter	2 (51)	3 (76)
Effective openings ³ greater than one (1) inch (25 mm) in diameter	Two (2) times diameter of effective opening	Three (3) times diameter of effective opening
<p>¹ Side walls, ribs or similar obstructions do not affect airgaps when spaced from the inside edge of the spout opening a distance greater than three times the diameter of the effective opening for a single wall, or a distance greater than four times the effective opening for two intersecting walls.</p> <p>² Vertical walls, ribs or similar obstructions extending from the water surface to or above the horizontal plane of the spout opening other than specified in Note 1 above. The effect of three or more such vertical walls or ribs has not been determined. In such cases, the airgap shall be measured from the top of the wall.</p> <p>³ The effective opening shall be the minimum cross-sectional area at the seat of the control valve or the supply pipe or tubing which feeds the device or outlet. If two or more lines supply one outlet, the effective opening shall be the sum of the cross-sectional areas of the individual supply lines or the area of the single outlet, whichever is smaller.</p> <p>⁴ Airgaps less than one (1) inch (25.4 mm) shall only be approved as a permanent part of a listed assembly that has been tested under actual backflow conditions with vacuums of 0 to 25 inches (635 mm) of mercury.</p>		

valve backflow prevention assembly consists of two independently acting internally loaded check valves, four properly located test cocks and two isolation valves.

603.2.5 Pressure Vacuum Breaker Backflow Prevention Assembly (PVB). A pressure vacuum breaker backflow prevention assembly consists of a loaded air inlet valve, an internally loaded check valve, two (2) properly located test cocks and two (2) isolation valves. This device shall be installed outdoors only unless provisions for spillage are provided.

603.2.6 Pressure Vacuum Breaker Spill-Proof Type Backflow Prevention Assembly (SVB). A pressure type vacuum breaker backflow prevention assembly consisting of one (1) check valve force-loaded closed and an air inlet vent valve force-loaded open to atmosphere, positioned downstream of the check valve, and located between and including two (2) tightly closing shut-off valves and test cock(s).

603.2.7 Reduced Pressure Principle Backflow Prevention Assembly (RP). A reduced pressure principle backflow prevention assembly consists of two independently acting internally loaded check valves, a differential pressure relief valve, four properly located test cocks and two isolation valves.

603.3 General Requirements

603.3.1 All assemblies shall conform to listed standards and be acceptable to the Administrative Authority having jurisdiction over the selection and installation of backflow prevention assemblies.

603.3.2 Where more than one (1) backflow prevention valve is installed on a single premise, and they are installed in one location, each separate valve shall be permanently identified by the permittee in a manner satisfactory to the Administrative Authority.

603.3.3 The premise owner or responsible person shall have the backflow prevention assembly tested by a certified backflow assembly tester at the time of installation, repair, or relocation and at least on an annual schedule thereafter or more often when required by the Administrative Authority. The periodic testing shall be performed in accordance with the procedures referenced in Table 14-1 by a tester qualified in accordance with those standards.

603.3.4 Access and clearance shall be provided for the required testing, maintenance and repair. Access and clearance shall require a minimum of one (1) foot (305 mm) between the lowest

portion of the assembly and grade, floor or platform. Installations elevated more than five (5) feet (1524 mm) above the floor or grade shall be provided with a permanent platform capable of supporting a tester or maintenance person.

603.3.5 Direct connections between potable water piping and sewer connected wastes shall not exist under any condition with or without backflow protection. Where potable water is discharged to the drainage system it shall be by means of an approved airgap of two (2) pipe diameters of the supply inlet, but in no case shall the gap be less than one (1) inch (25 mm). Connection may be made to the inlet side of a trap provided that an approved vacuum breaker is installed not less than six (6) inches (152 mm) or the distance according to the device's listing, above the flood level rim of such trapped fixture, so that at no time will any such device be subjected to any back-pressure.

603.3.6 Backflow preventers for hot water over 110°F (43.3°C) shall be a listed type designed to operate at temperatures of 110°F (43.3°C) or more without rendering any portion of the assembly inoperative.

603.3.7 Fixtures, appliances or appurtenances with integral backflow preventers or integral airgaps manufactured as a unit shall be installed in accordance with their listing requirements and the manufacturers' instructions.

603.3.8 In cold climate areas, backflow assemblies and devices shall be protected from freezing by a method acceptable to the Administrative Authority.

603.4 Specific Requirements

603.4.1 Water Closet and Urinal Flushometer Valves shall be equipped with a listed atmospheric vacuum breaker. The vacuum breaker shall be installed on the discharge side of the flushometer valve with the critical level at least six (6) inches (152 mm) or the distance according to its listing above the overflow rim of a water closet bowl or the highest part of a urinal.

603.4.2 Water Closet and Urinal Tanks shall be equipped with a listed ballcock. The ballcock shall be installed with the critical level at least one (1) inch (25.4 mm) above the full opening of the overflow pipe. In cases where the ballcock has no hush tube, the bottom of the water supply inlet shall be installed one (1) inch (25.4 mm) above the full opening of the overflow pipe.

603.4.3 Water Closet Flushometer Tanks shall be protected against backflow by an approved backflow prevention assembly, device or method.

603.4.4 Heat Exchangers

603.4.4.1 Heat exchangers used for heat transfer, heat recovery, or solar heating shall protect the potable water system from being contaminated by the heat transfer medium. Double-wall heat exchangers shall separate the potable water from the heat transfer medium by providing a space between the two walls which is vented to the atmosphere.

603.4.4.2 For alternate design see Appendix L.

603.4.5 Water supply inlets to tanks, vats, sumps, swimming pools and other receptors shall be protected by one of the following means:

1. An approved airgap;
2. A listed vacuum breaker installed on the discharge side of the last valve with the critical level not less than six (6) inches (152 mm) or in accordance with its listing;
3. A backflow preventer suitable for the contamination or pollution, installed in accordance with the requirements for that type of device or assembly as set forth in this chapter.

603.4.6 Protection from Lawn Sprinklers and Irrigation Systems

603.4.6.1 Potable water supplies to systems having no pumps or connections for pumping equipment, and no chemical injection or provisions for chemical injection, shall be protected from backflow by one of the following devices:

1. Atmospheric vacuum breaker
2. Pressure vacuum breaker
3. Reduced pressure backflow preventor

603.4.6.2 Where sprinkler and irrigation systems have pumps, connections for pumping equipment, auxiliary air tanks or are otherwise capable of creating back-pressure, the potable water supply shall be protected by the following type of device if the backflow device is located upstream from the source of back-pressure.

1. Reduced pressure backflow preventor

603.4.6.3 Where systems have a backflow device installed downstream from a potable water supply pump or a potable water supply pump connection, the device shall be one of the following:

1. Atmospheric vacuum breaker

2. Pressure vacuum breaker

3. Reduced pressure backflow preventor

603.4.6.4 Where systems include a chemical injector or any provisions for chemical injection, the potable water supply shall be protected by the following:

1. Reduced pressure backflow preventor

603.4.7 Potable Water Outlets with Hose Attachments, other than water heater drains, boiler drains, and clothes washer connections, shall be protected by a listed non-removable hose bibb type backflow preventer, a listed non-removable hose bibb type vacuum breaker or by a listed atmospheric vacuum breaker installed at least six (6) inches (152 mm) above the highest point of usage located on the discharge side of the last valve. In climates where freezing temperatures occur, a listed self-draining frost proof hose bibb with an integral backflow preventer or vacuum breaker shall be used.

603.4.8 Faucets with Pull-Out Spouts shall be in compliance with the appropriate standards listed in Table 14-1 that include these specific types of faucets and require an atmospheric vacuum breaker or vent to atmosphere to protect the water supply.

603.4.9 Water Cooled Compressors, Degreasers or any other water cooled equipment shall be protected by a listed backflow preventer installed in accordance with the requirements of this chapter.

Note: Water cooled equipment which produces back-pressure shall be equipped with the appropriate protection.

603.4.10 Water Inlets to Water Supplied Aspirators shall be equipped with a listed vacuum breaker installed in accordance with its listing requirements and this chapter. The discharge shall drain through an airgap. When using the tailpiece of a fixture to receive the discharge of an aspirator, the airgap shall be located above the flood level rim of the fixture.

603.4.11 Potable Water Make Up Connections to Steam or Hot Water Boilers shall be provided with a listed backflow protection assembly.

603.4.12 Non-potable Water Piping. In cases where it is impractical to correct individual cross-connections on the domestic water line, the line supplying such outlets shall be considered a non-potable water line. No drinking or domestic water outlets shall be connected to the non-potable water line. Whenever possible, all portions of the non-potable water line shall be exposed and all

antifreeze, corrosion inhibitors, or other chemicals are added to a fire protection system supplied from a potable water supply, the potable water system shall be protected by one of the following:

1. Reduced pressure backflow preventor
2. Reduced pressure detector assembly

603.4.18.4 [Not adopted by HCD]

Whenever a backflow device is installed in the potable water supply to a fire protection system, the hydraulic design of the system shall account for the pressure drop through the backflow device. If such devices are retrofitted for an existing fire protection system, the hydraulics of the sprinkler system design shall be checked to verify that there will be sufficient water pressure available for satisfactory operation of the fire sprinklers.

603.4.18.5 [Not adopted by HCD] Residential Sprinkler Systems.

When residential sprinkler systems are installed using the potable water system they shall be installed in accordance with the standards listed in Table 14-1.

603.4.19 Special Equipment, Water Supply Protection. Vacuum breakers for washer-hose bedpans shall be located not less than five (5) feet (1524 mm) above the floor. Hose connections in health care or laboratory areas shall not be less than six (6) feet (1829 mm) above the floor.

603.4.20 Portable cleaning equipment, dental vacuum pumps and chemical dispensers shall be protected from backflow by an airgap, an atmospheric vacuum breaker, a spill-proof vacuum breaker, or a reduced pressure principle backflow preventer.

603.4.21 Water Heater Connectors. Flexible metallic water heater connectors or reinforced flexible water heater connectors connecting water heaters to the piping system shall be in compliance with the appropriate standards listed in Table 14-1.

603.4.22 Combination stop-and-waste valves or cocks shall not be installed underground.

604.0 Materials

604.1 [Not adopted by HCD] Water distribution pipe, building supply water pipe and fittings shall be of brass, copper, cast iron, galvanized malleable iron, galvanized wrought iron, galvanized steel, or other approved materials. Asbestos-cement, CPVC, PE, PVC, or PEX water pipe manufactured to recognized

standards may be used for cold water distribution systems outside a building. CPVC, PEX water pipe, tubing, and fittings, manufactured to recognized standards may be used for hot and cold water distribution systems within a building. All materials used in the water supply system, except valves and similar devices shall be of a like material, except where otherwise approved by the Administrative Authority.

Exception: 1. [For OSHPD 1, 2, 3 & 4] Use of CPVC is not permitted for applications under authority of the Office of Statewide Health Planning and Development.

Exception: 2. [For BSC, DSAISS, DHS, AGR] Use of PEX piping is not adopted for applications under the authority of the Building Standards Commission, the Division of the State Architect, the Department of Health Services, and the Department of Food and Agriculture.

Exception: 3. [For OSHPD 1, 2, 3 & 4] Use of PEX piping is not permitted for applications under the authority of the Office of Statewide Health Planning and Development.

604.1.1 [For HCD 1 & HCD 2] Water distribution pipe, building supply water pipe and fittings shall be of brass, copper, cast iron, galvanized malleable iron, galvanized wrought iron, galvanized steel, or other approved materials. Asbestos-cement, CPVC, PE or PVC, water pipe manufactured to recognized standards may be used for cold water distribution systems outside a building except as provided for CPVC use pursuant to section 604.1.2. All materials used in the water supply system, except valves and similar devices shall be of a like material, except where otherwise approved by the Administrative Authority.

Section 604.1.2 [HCD 1] Local Authority to Approve CPVC Pipe Within Residential Buildings Under Specified Conditions.

The local responsible building official of any city or county, in accordance with the procedures set forth in Chapter 3 (with the exception of section 301.2.7) may authorize by permit the use of CPVC for hot and cold-water distribution systems within the interior of residential buildings provided all of the following conditions are satisfied:

(a) Finding Required. The building official shall first make a determination that there is or will be the premature failure of metallic pipe if installed in such residential buildings due to existing water or soil conditions.

(b) Permit Conditions. Any building permit issued pursuant to this section shall be conditioned on compliance with the mitigation measures set forth in this section.

(c) Approved Materials. Only CPVC plumbing material listed as an approved material in, and installed in

accordance with this code may be used.

(d) Installation and Use. Any installation and use of CPVC plumbing material pursuant to this section shall comply with all applicable requirements of this code and Section 301.0 of Appendix I of this code, Installation Standard for CPVC Solvent Cemented Hot and Cold Water Distributions Systems, IAPMO IS 20-98.

(e) Certification of Compliance. Prior to issuing a building permit pursuant to this section, the building official shall require as part of the permitting process that the contractor, or the appropriate plumbing subcontractors, provide written certification: (1) that is required in subdivision (f); and (2) that he or she will comply with the flushing procedures and worker safety measures set forth in Section 301.0 of Appendix I of this code, Installation Standard for CPVC Solvent Cemented Hot and Cold Water Distribution Systems IAPMO IS 20-98.

(f) Worker Safety. Any contractor applying for a building permit that includes the use of CPVC plumbing materials authorized pursuant to this section shall include in the permit application a signed written certification stating that:

(1) They are aware of the health and safety hazards associated with CPVC plumbing installations.

(2) They have included in their Illness and Injury Prevention Plan the hazards associated with CPVC plumbing pipe installations; and

(3) The worker safety training elements of their Injury and Illness Prevention Plan meets the Department of Industrial Relation's guidelines.

(g) Findings of Compliance. The building official shall not give final permit approval of any CPVC plumbing materials installed pursuant to this section unless he or she finds that the material has been installed in compliance with the requirements of this code and that the installer has complied with the requirements in section 301.0.1, of Appendix I of this code, Installation Standards for CPVC Solvent Cemented Hot and Cold Water Distribution Systems, IAPMO IS 20-98.

(h) Penalties. Any contractor or subcontractor found to have failed to comply with the ventilation, glove or flushing requirements of section 301.0 of Appendix I of this code, Installation Standards for CPVC Solvent Cemented Hot and Cold Water Distribution Systems, IAPMO IS 20-98 shall be subject to the penalties in Health and Safety Code, division 13, part 1.5, chapter 6 (section 17995 et seq.). In addition, if during the conduct of any building inspection the building official finds that the ventilation and glove requirements of section 301.0 of Appendix I of this code, Special Requirements for CPVC Installation within Residential Buildings, are being violated, such buildings officials shall cite the contractor or subcontractor for that violation.

604.2 Copper tube for water piping shall have a

weight of not less than Type L.

Exception: Type M copper tubing may be used for water piping when piping is above ground in, or on, a building or underground outside of structures.

604.3 In addition to the required incised marking, all hard drawn copper tubing shall be marked by means of a continuous and indelibly colored stripe at least one quarter (1/4) inch (6.4 mm) in width, as follows: Type K, green; Type L, blue; Type M, red; Type DWV, yellow.

604.4 Listed flexible copper water connectors shall be installed in readily accessible locations, unless otherwise listed.

604.5 Cast iron fittings up to and including two (2) inches (51 mm) in size, when used in connection with potable water piping shall be galvanized.

604.6 All malleable iron water fittings shall be galvanized.

604.7 Piping and tubing which has previously been used for any purpose other than for potable water systems shall not be used.

604.8 Approved plastic materials may be used in water service piping, provided that where metal water service piping is used for electrical grounding purposes, replacement piping therefore shall be of like materials.

Exception: Where a grounding system, acceptable to the Administrative Authority is installed, inspected, and approved, metallic pipe may be replaced with non-metallic pipe.

604.9 Solder shall conform to the requirements of Section 316.1.3.

604.10 Water pipe and fittings with a lead content which exceeds eight (8) percent shall be prohibited in piping systems used to convey potable water.

604.11 PEX. [Not adopted by BSC, HCD, DSA/ISS, DHS, AGR, & OSHPD 1, 2, 3 & 4] Cross-linked polyethylene (PEX) tubing shall be marked with the appropriate standard designation(s) listed in Table 14-1 for which the tubing has been listed or approved. Pex tubing shall be installed in compliance with the provisions of this section.

604.11.1 PEX Fittings. [Not adopted by BSC, HCD, DSA/ISS, DHS, AGR, & OSHPD 1, 2, 3 & 4] Metal Insert Fittings and Metal Compression Fittings used with PEX tubing shall be manufactured to and marked in accordance with the standards for the fittings in Table 14-1.

604.11.2 Water Heater Connections. [Not adopted by BSC, HCD, DSA/ISS, DHS, AGR, & OSHPD 1, 2, 3 & 4] PEX tubing shall not be

Department of Health Services, and the Department of Food and Agriculture.

Exception: 3. [For OSHPD 1, 2, 3 & 4] Use of PEX piping is not permitted for applications under the authority of the Office of Statewide Health Planning and Development.

604.1.1 [For HCD 1 & HCD 2] Water distribution pipe, building supply water pipe and fittings shall be of brass, copper, cast iron, galvanized malleable iron, galvanized wrought iron, galvanized steel, or other approved materials. Asbestos-cement, CPVC, PE or PVC, water pipe manufactured to recognized standards may be used for cold water distribution systems outside a building except as provided for CPVC use pursuant to section 604.1.2. All materials used in the water supply system, except valves and similar devices shall be of a like material, except where otherwise approved by the Administrative Authority.

|| Section 604.1.2 [HCD 1] Local Authority to Approve CPVC Pipe Within Residential Buildings Under Specified Conditions.

The local responsible building official of any city or county, in accordance with the procedures set forth in Chapter 3 (with the exception of section 301.2.7) may authorize by permit the use of CPVC for hot and cold-water distribution systems within the interior of residential buildings provided all of the following conditions are satisfied:

(a) Finding Required. The building official shall first make a determination that there is or will be the premature failure of metallic pipe if installed in such residential buildings due to existing water or soil conditions.

(b) Permit Conditions. Any building permit issued pursuant to this section shall be conditioned on compliance with the mitigation measures set forth in this section.

(c) Approved Materials. Only CPVC plumbing material listed as an approved material in, and installed in accordance with this code may be used.

(d) Installation and Use. Any installation and use of CPVC plumbing material pursuant to this section shall comply with all applicable requirements of this code and Section 301.0 of Appendix I of this code, Installation Standard for CPVC Solvent Cemented Hot and Cold Water Distributions Systems, IAPMO IS 20-98.

(e) Certification of Compliance. Prior to issuing a building permit pursuant to this section, the building official shall require as part of the permitting process that the contractor, or the appropriate plumbing subcontractors, provide written certification: (1) that is required in subdivision (f); and (2) that he or she will comply with the flushing procedures and worker safety measures set forth in Section 301.0 of Appendix I of this code, Installation Standard for CPVC Solvent Cemented Hot and Cold Water Distribution Systems IAPMO IS 20-98.

(f) Worker Safety. Any contractor applying for a building permit that includes the use of CPVC plumbing materials authorized pursuant to this section shall include in the permit application a signed written certification stating that:

(1) They are aware of the health and safety hazards associated with CPVC plumbing installations.

(2) They have included in their Illness and Injury Prevention Plan the hazards associated with CPVC plumbing pipe installations; and

(3) The worker safety training elements of their Injury and Illness Prevention Plan meets the Department of Industrial Relation's guidelines.

(g) Findings of Compliance. The building official shall not give final permit approval of any CPVC plumbing materials installed pursuant to this section unless he or she finds that the material has been installed in compliance with the requirements of this code and that the installer has complied with the requirements in section 301.0.1, of Appendix I of this code, Installation Standards for CPVC Solvent Cemented Hot and Cold Water Distribution Systems, IAPMO IS 20-98.

(h) Penalties. Any contractor or subcontractor found to have failed to comply with the ventilation, glove or flushing requirements of section 301.0 of Appendix I of this code, Installation Standards for CPVC Solvent Cemented Hot and Cold Water Distribution Systems, IAPMO IS 20-98 shall be subject to the penalties in Health and Safety Code, division 13, part 1.5, chapter 6 (section 17995 et seq.). In addition, if during the conduct of any building inspection the building official finds that the ventilation and glove requirements of section 301.0 of Appendix I of this code, Special Requirements for CPVC Installation within Residential Buildings, are being violated, such buildings officials shall cite the contractor or subcontractor for that violation.

604.2 Copper tube for water piping shall have a weight of not less than Type L.

Exception: Type M copper tubing may be used for water piping when piping is above ground in, or on, a building or underground outside of structures.

604.3 In addition to the required incised marking, all hard drawn copper tubing shall be marked by means of a continuous and indelibly colored stripe at least one quarter (1/4) inch (6.4 mm) in width, as follows: Type K, green; Type L, blue; Type M, red; Type DWV, yellow.

604.4 Listed flexible copper water connectors shall be installed in readily accessible locations, unless otherwise listed.

604.5 Cast iron fittings up to and including two (2) inches (51 mm) in size, when used in connection

with potable water piping shall be galvanized.

604.6 All malleable iron water fittings shall be galvanized.

604.7 Piping and tubing which has previously been used for any purpose other than for potable water systems shall not be used.

604.8 Approved plastic materials may be used in water service piping, provided that where metal water service piping is used for electrical grounding purposes, replacement piping therefore shall be of like materials.

Exception: Where a grounding system, acceptable to the Administrative Authority is installed, inspected, and approved, metallic pipe may be replaced with non-metallic pipe.

604.9 Solder shall conform to the requirements of Section 316.1.3.

604.10 Water pipe and fittings with a lead content which exceeds eight (8) percent shall be prohibited in piping systems used to convey potable water.

604.11 PEX. [Not adopted by BSC, HCD, DSA/SS, DHS, AGR, & OSHPD 1, 2, 3 & 4] Cross-linked polyethylene (PEX) tubing shall be marked with the appropriate standard designation(s) listed in Table 14-1 for which the tubing has been listed or approved. Pex tubing shall be installed in compliance with the provisions of this section.

604.11.1 PEX Fittings. [Not adopted by BSC, HCD, DSA/SS, DHS, AGR, & OSHPD 1, 2, 3 & 4] Metal Insert Fittings and Metal Compression Fittings used with PEX tubing shall be manufactured to and marked in accordance with the standards for the fittings in Table 14-1.

604.11.2 Water Heater Connections. [Not adopted by BSC, HCD, DSA/SS, DHS, AGR, & OSHPD 1, 2, 3 & 4] PEX tubing shall not be installed within the first eighteen (18) inches (457 mm) of piping connected to a water heater.

604.12 Flexible Corrugated Connectors. Flexible corrugated connectors of copper or stainless steel shall be limited to the following connector lengths:

Water Heater Connectors - twenty-four (24) inches (609 mm).

Fixture Connectors - thirty (30) inches (762 mm).

Washing Machine Connectors - seventy-two (72) inches (1827 mm).

Dishwasher and Icemaker Connectors - one hundred twenty (120) inches (3048 mm).

605.0 Valves

605.1 Valves up to and including two (2) inches (51

mm) in size shall be brass or other approved material. Sizes over two (2) inches (51 mm) may have cast iron or brass bodies. Each gate or ball valve shall be a fullway type with working parts of non-corrosive material.

605.2 A fullway valve controlling all outlets shall be installed on the discharge side of each water meter and on each unmetered water supply. Water piping supplying more than one building on any one premises shall be equipped with a separate fullway valve to each building, so arranged that the water supply can be turned on or off to any individual or separate building; provided however, that supply piping to a single family residence and building accessory thereto, may be controlled on one valve. Such shutoff valves shall be accessible at all times. A fullway valve shall be installed on the discharge piping from water supply tanks at or near the tank. A fullway valve shall be installed on the cold water supply pipe to each water heater at or near the water heater.

605.3 In multi-dwelling units, one (1) or more shutoff valves shall be provided in each dwelling unit so that the water supply to any plumbing fixture or group of fixtures in that dwelling unit can be shut off without stopping water supply to fixtures in other dwelling units. These valves shall be accessible in the dwelling unit that they control.

605.4 All valves used to control two (2) or more openings shall be fullway gate valves, ball valves or other approved valves designed and approved for the service intended.

605.5 A control valve shall be installed immediately ahead of each water supplied appliance and immediately ahead of each slip joint or non-metallic fixture supply or appliance supply.

605.6 All required shutoff or control valves shall be accessible.

605.7 A single control valve shall be installed on a water supply line ahead of any automatic metering valve which supplies a battery of fixtures.

605.8 [For OSHPD 1, 2 & 4] Each riser or branch shall be provided with an accessible sectionalizing valve in hot- and cold-water systems to permit servicing or replacement of piping or equipment. Stop valves shall be provided at each fixture.

606.0 Joints and Connections

606.1 Types of Joints

606.1.1 Flared Joints. Flared joints for soft copper water tubing shall be made with fittings meeting approved standards. The tubing shall be reamed to the full bore, resized to round and expanded with a proper flaring tool.

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