



2025-26 CALBO Training Institute

2025 California Plumbing Code: Code Changes & Review

IGGY CONTRERAS

IAPMO

Environmental Note:

In consideration of the environment, this handout has been designed to conserve printing supplies and paper.

Contact:

IAPMO Training and Certification Department at:
Chicago Regional Office
18927 Hickory Creek Dr., Suite 220
Mokena, IL 60448-8399
Email: seminars@iapmo.org
Toll free: 1-877-427-6601

Have a code question, get your answers here:

<https://www.iapmo.org/codes-standards-development/code-development/ask-a-code-question/>

**Copyright:**

The content provided here is copyrighted material. Use of any of the material for other than personal use is strictly prohibited without the written consent of the International Association of Plumbing and Mechanical Officials (IAPMO).

Image Disclaimer:

The graphics and illustrations used in this course are presented for educational purposes only. IAPMO does not endorse or recommend the vendor/product depicted, nor any vendor or product. IAPMO makes no representations, warranties or guarantees as to, and assumes no responsibility for, the product(s) depicted and IAPMO expressly disclaims all liability for damages of any kind arising out of the use or performance of the vendors, products or services depicted.

Content Disclaimer

The information herein is provided for educational purposes only and shall not be treated as an official interpretation of the referenced codes or standards. Always refer to the complete code or standard when installing, replacing, or repairing any plumbing or mechanical system.



This course is approved by The American Institute of Architects (AIA) for 6 Learning Units and International Code Council Preferred Provider Program (ICC PPP) for 0.6 Continuing Education Units.

- AIA: 6 LU | HSWs (Course Number - 24: 2025)
- ICC PPP in-person course: 0.6 CEUs (Course Number - 45816)
- ICC PPP online course: 0.6 CEUs (Course Number - 45817)

Course Schedule: 8:00 – 3:30pm (6 hours of instruction)

Certificate of Attendance: A certificate of attendance is emailed within 72 hours to each registrant who attends the entire course, no exceptions. Attendance is monitored at all times. If you have any questions, please contact the CALBO Office at 916-457-1103 or info@calbo.org.

Learning Objectives

1. Identify and explain the most significant changes in the 2025 California Plumbing Code compared to the 2022 edition.
2. Understand the reasoning behind these updates and their impact on plumbing system design, installation, and code enforcement.
3. Evaluate how the new regulations affect compliance requirements for contractors, inspectors, engineers, and other industry professionals.
4. Apply the updated code standards to real-world plumbing scenarios to ensure safety and regulatory adherence.
5. Discuss best practices for integrating the revised CPC regulations into plumbing projects and inspections.

******Chapter Matrices have not been included in the handout to save printing cost. Please consider purchasing the 2025 California Plumbing Code or visiting the read-only version by scanning the QR code.**



Within the Content of This Handout...

Added Code Text will be underlined

Removed Code Text will be ~~struck out~~

California Code and Code Changes will be *italicized*.

Chapter 1 Administration

1.10.6 OSHPD 6.

Specific scope of application of the agency responsible for enforcement, enforcement agency and the specific authority to adopt and enforce such provisions of this code, unless otherwise stated.

OSHPD 6

Application – *Chemical dependency recovery hospital not within an acute care hospital building or an acute psychiatric facility.*

Enforcing Agency – *Local building department.*

1.10.6.1 Applicable Administrative Standards.



1. Title 24, Part 1, California Code of Regulations: Chapter 7.
2. Title 24, Part 2, California Code of Regulations: Section 1.1.0 and 1.10.0, Chapter 1 Division I, and as indicated in the adoption matrix for Chapter I, Division II.

1.10.6 OSHPD 6.

1.10.6.2 Applicable Building Standards. California Building Standards Code, Title 24, Parts 2, 3, 4, 5, 6, 9, 10 and 11.

The provision of Title 24, Part 2, as adopted and amended by OSHPD, shall apply to the applications listed in Section 1.10.6.

Authority Cited – Health and Safety Code Sections 1275, 18929 and 129850.

References – Health and Safety Code Sections 1250.3 and 129675-130070.

1.10.6.3 Adopting Agency Identification. The provisions of this code applicable to buildings identified in this Subsection 1.10.6 will be identified in the Matrix Adoption Tables under the Acronym OSHPD 6.

Chapter 2 Definitions

Definitions are very important as some terms are used throughout the code and may have different meanings than a typical dictionary.

Anodeless Riser.

- An assembly of steel-cased plastic pipe used to make the transition between plastic piping installed underground and metallic piping installed aboveground. [NFPA 54:3.3.3]

Appliance

A device that utilizes fuel or electricity as an energy source to produce light, heat, power, refrigeration, or air conditioning. This definition also includes vented decorative appliances and electric storage or tankless water heaters.

Body Spray.

A shower device for spraying water onto a bather from other than the overhead position.

Handwashing Fixture. [OSHPD 1, 2, 3, 4, 5 & 6]

(1) Faucets and Trim

c. Faucets shall not be equipped with an aerator but may be equipped with a non-aerating laminar flow device. The flow rate for handwashing fixtures shall not be less than 1.0 (3.79 L) gallons per minute.



Scrub Sink. [OSHPD 1, 2, 3, 4 & 5]

Is a sink used to wash and scrub the hands and arms during the septic preparation for surgery and equipped with a supply spout as required for a handwashing fixture. The scrub sink shall be trimmed with foot, knee or electronic sensor controls that do not involve contact with the upper extremities. Sensor operated fixtures shall be capable of functioning during loss of normal power. Single-lever wrist blades shall not be permitted except for the temperature pre-set valve.

Valve, Balancing.

A valve that regulates and controls the return of water to the water heater in a recirculating hot water piping system.

Vented Appliance

Category 1.

...nonpositive vent static pressure... vent gas temperature that avoids excessive condensate...

Category 2.

...nonpositive vent static pressure... vent gas temperature that can cause excessive condensate...

Category 3.

...positive vent static pressure... vent gas temperature that avoids excessive condensate...

Category 4.

...positive vent static pressure... vent gas temperature that can cause excessive condensate...

Water Heater, Dual Purpose.

An appliance intended to be a heat source for both space heating and domestic hot water applications.

Water Station.

A designated location intended to provide access to drinking water through a device or appliance.

Chapter 3 General Regulations

301.6 Tall Wood (Mass Timber) Buildings.

Plumbing systems installed in tall wood (mass timber) buildings, shall comply with the following:

- (1) Be designed by a licensed plumbing contractor or a registered design professional in accordance with this code and the building code.
- (2) Be designed to accommodate expansion, contraction, and differential movement between parts of a tall wood (mass timber) building in accordance with Section 312.2.



310.9 Female Plastic Connections

Female plastic tapered (NPT) threaded connections shall not be allowed to be used when threaded onto a male metallic connection.

Exception: Female plastic parallel (straight) threaded connections shall be permitted.

310.10 ABS and PVC Transition Joints

Except as provided in Section 705.9.4, PVC and ABS pipe and fittings shall not be solvent welded to dissimilar material.

Chapter 4 Fixtures and Fixture Fittings

404.2 Overflows.

~~Where a fixture is provided with an overflow, the overflow shall be so arranged that the standing water in the fixture shall not rise in the overflow where the stopper is closed or remain in the overflow where the fixture is empty comply with Section 404.2.1 Section 404.2.2., but it shall be unlawful to connect such overflows with any other part of the drainage system~~

404.2.1 Sinks, Lavatories, and Bathtubs. The waste shall be so arranged that the standing water in the fixture shall not rise in the overflow where the stopper is closed or remain in the overflow where the fixture is empty. The overflow pipe from a fixture shall be connected to the house or inlet side of the fixture trap.

404.2.2 Water Closets and Urinals. Overflows on flush tanks shall be permitted to discharge into the water closets or urinals served by them.

408.3 Water Consumption.

Showerheads shall have a maximum flow rate of not more than 1.8 gpm at 80 psi (6.81 L/m at 552 kPa). Body sprays shall have a flow rate of not more than 1.8 gpm at 80 psi (6.81 L/m at 552 kPa). [HCD 1] Residential showerheads shall comply with Division 4.3 of the California Green Building Standards Code (CALGreen). Residential body sprays shall comply with the showerhead requirements in Division 4.3 of CALGreen. [BSC-CG & DSA-SS] Nonresidential body sprays shall comply with the showerhead requirements in Division 5.3 of CALGreen.

408.4.3 Temperature-Actuated, Flow-Reduction Devices for Individual Fixture Fittings.

Temperature- actuated, flow-reduction devices, where installed for individual fixture fittings, shall comply with ASSE 1062. Such devices shall not be used alone as a substitute for the balanced pressure, thermostatic or combination shower valves requirements or as a substitute for bathtub or whirlpool tub water temperature-limiting valves requirements.



408.5 Waste Outlet.

Showers shall have a waste outlet and fixture tailpiece not less than 2 inches(50mm) in diameter. Fixture tailpieces shall be constructed from the materials specified in Section 701.2 for drainage piping. Strainers serving shower drains shall have a waterway at least equivalent to the area of the tailpiece. Comply with ASME A112.18.2/CSAB125.2

408.8.5 Test for Shower Receptors.

Showers shall be tested for watertightness by filling with water to the level of the rough threshold a depth of not less than 2 inches (51mm) barrier shall be temporarily constructed for testing.

The test plug shall be so placed that both upper and under sides of the subpan shall be subjected to the test at the point where it is clamped to the drain.

417.6 Low-Pressure Water Dispenser.

Beverage faucets shall comply with ASME A112.18.1/CSA B125.1. Electrically heated or cooled water dispensers shall comply with ASSE 1023.

417.7 Head Shampoo Sink Faucets.

Head shampoo sink faucets shall be supplied with hot water that is limited to not more than 120°F (49°C). Each faucet shall have integral check valves to prevent crossover flow between the hot and cold water supply connections. The means for regulating the maximum temperature shall be in accordance with one of the following:

- (1) A limiting device conforming to ASSE 1070/ASME A112.1070/CSA B125.70.
- (2) A water heater conforming to ASSE 1084.
- (3) A temperature-actuated, flow-reduction device conforming to ASSE 1062.

420.3 Pre-Rinse Spray Valve.

Commercial food service pre-rinse spray valves shall have a maximum flow rate in accordance with Table 420.3 and shall be equipped with an integral automatic shutoff.

TABLE 420.3
COMMERCIAL PRE-RINSE SPRAY VALVE MAXIMUM FLOW RATE

PRODUCT CLASS BY SPRAY FORCE	MAXIMUM FLOW RATE, GPM
Product Class 1 (≤ 5.0 ounces-force)	1.00
Product Class 2 (> 5.0 ounces-force and ≤ 8.0 ounces-force)	1.20
Product Class 3 (> 8.0 ounces-force)	1.28

For SI units: 1 gallon per minute = 3.785 L/min, 1 ounce-force = 0.278 N

422.1.1 Fixture Calculations.

... For toilet facilities designed for use by all genders, the minimum number of fixtures shall be the aggregate calculated at 50 percent female and 50 percent male in accordance with Table 422.1. Where all gender fixtures are provided in addition to separate men’s and women’s facilities, those all gender fixtures shall be included in determining the number of fixtures provided in an occupancy...



422.1.2 Single Use, Family or Assisted-Use Toilet, and Bathing Facilities.

Where single use, family or assisted-use toilet, and bathing rooms are required, in applicable building regulations, the facilities shall be installed in accordance with those regulations. Fixtures located in single use, family or assisted-use, and bathing room facilities shall contribute to the total number of required fixtures in accordance with Section 422.1.

422.2 Separate Facilities.

(4) Separate facilities shall not be required where rooms have fixtures designed for use by both sexes and the water closets are installed in privacy compartments. Urinals shall be located in a privacy compartment [BSC & DSA-SS], as defined, or separate private area and be visually separated from the remainder of the room. Water closet and urinal compartments shall comply with sections 422.6 and 422.7 respectively.

422.3.1 [OSHPD 1, 2, 3, 4, 5 & 6]

Separate toilet facilities shall be provided for the use of patients, staff personnel and visitors.

Exceptions:

(1) For Primary Care Clinics where a facility contains no more than three examination and/or treatment rooms, the patient toilet shall be permitted to serve waiting areas.

(2) For public waiting areas with an occupant load of 10 or less, one toilet facility, designed for use by no more than one person at a time, shall be permitted for use by both sexes.

422.6 Water Closet Compartment.

Public water closets shall occupy a separate compartment with walls or partitions and a door enclosing the fixtures to ensure privacy. Partitions for water closets located in separate gender toilet or bathrooms shall comply with the Type B security requirements of IAPMO Z124.10. Partitions for water closets located in all gender toilet or bathrooms shall comply with the Type A security requirements of IAPMO Z124.10.

Exceptions:

(1) Water closet compartments shall not be required in a single- occupant toilet room having a lockable door.

(2) Toilet rooms in day care facilities having more than one water closets shall be permitted to have one water closet without an enclosing compartment.

422.6 Water Closet Compartment.

...

(3) [BSC & DSA-SS]. Type A Security Requirements of IAPMO Z124.10 in all gender toilet or bathrooms shall not be allowed. Compartments for water closets located in all-gender multi-user bathrooms shall be privacy compartments, as defined. Each compartment door shall be lockable from the inside of the compartment, with a door locking device that is readily distinguishable as locked from the outside of the compartment. Privacy compartments and doors which are not full height or floor to ceiling may be permitted by the enforcing agency.



422.7 Urinal Partitions.

Each urinal shall be separated with walls or partitions to provide privacy. The horizontal dimension between walls or partitions at each urinal shall comply with Section 402.5. Partitions for urinals shall comply with the Type C security requirements of IAPMO Z124.10. Walls or partitions shall extend from not less than 12 inches (305 mm) above the finished floor to not less than 60 inches (1524 mm) above the finished floor. Walls shall extend outward from the wall surface not less than 18 inches (457 mm). Urinals located in all gender toilet rooms shall be visually separated from the remainder of the room or each urinal shall be installed in a privacy compartment complying with Type A security requirements of IAPMO Z124.10.

Exceptions:

(1) Urinal partitions shall not be required in a single occupant or family/assisted-use toilet room with a lockable door.

...
(2) [BSC & DSA-SS]. Type A Security Requirements of IAPMO Z124.10 in all gender toilet rooms shall not be allowed. Urinals in all gender toilet rooms not located in a separate private area shall be privacy compartments, as defined. Each compartment door shall be lockable from the inside of the compartment, with a door locking device that is readily distinguishable as locked from the outside of the compartment. Privacy compartments and doors which are not full height or floor to ceiling may be permitted by the enforcing agency.

Chapter 5 Water Heaters

504.3.2 Unlisted Water Heaters.

Except as otherwise permitted in this code, unlisted water heaters shall be approved by the Authority Having Jurisdiction prior to being installed. Clearance for unlisted water heaters shall be not less than 12 inches (305 mm) on all sides. Combustible floors under unlisted water heaters shall be protected in an approved manner. {NFPA 54-2018:10.27.2.2}

504.4 Pressure-Limiting Devices.

A water heater installation shall be provided with overpressure protection using an approved, listed device installed in accordance with the terms of its listing and the manufacturer's installation instructions. Pressure relief devices shall have a pressure setting greater than the water service pressure and not exceed 150 psi (1034 kPa) as required in Section 608.4.

507.5 Drainage Pan.

Where a water heater is located in an attic, in or on an attic ceiling assembly, floor-ceiling assembly, floor-subfloor assembly or where damage results from a leaking water heater, a watertight pan of corrosion resistant materials shall be installed beneath the water heater in accordance with the following:



- (1) The drainage pan shall be provided with not less than 3/4 of an inch (20 mm) diameter drain to an approved location. The terminating end of the drainpipe shall be readily visible.
- (2) ~~Such~~ The drainage pan shall be not less than 1 1/2 inches (38 mm) in depth.
- (3) Where a drainage pan pipe is installed, the material of the piping shall be rated for the temperature rating of the water heater and shall be approved for use with the liquid being discharged.
- (4) Discharge from a relief valve into a drainage pan shall be prohibited.

507.13 Installation in Residential Garages.

Appliances in residential garages and in adjacent spaces that open to the garage and are not part of the living space of a dwelling unit shall be installed so that all heating elements, switches, burners, and burner-ignition devices are located not less than 18 inches (457mm) above floor.

Exception: Listed flammable vapor ignition resistant (FVIR) appliances. {NFPA 54:9.1.10.1}

507.25 Accessibility for Service.

Per the latest UPC, if no clearances for a water heater are specified, a minimum of 30" x 30" x 30" of clearance shall be provided. Aside from that there must be enough space to remove and replace the unit.

508.4.1 Length of Passageway.

Where the height of the passageway is 6 feet (1829 mm) or more, the distance from the passageway access to the appliance shall not exceed 50 feet (15 240 mm) measured along the centerline of the passageway.

509.6.3 Gas Vents Serving Appliances on More than One Floor

Where a common vent is installed in a multistory installation to vent Category I appliances located on more than one floor level, the venting system shall be designed and installed in accordance with engineering methods. Crawl spaces, basements, and attics shall be considered as floor levels. [NFPA 54:12.7.5.1]



509.8 Through-the-Wall Vent Termination.

Refer to the table below for clearances based on vent types.

TABLE 509.8.1
THROUGH-THE-WALL DIRECT-VENT TERMINATION CLEARANCES
[NFPA 54: TABLE 12.9.1]

FIGURE CLEARANCE	CLEARANCE LOCATION	MINIMUM CLEARANCES FOR DIRECT-VENT TERMINALS	MINIMUM CLEARANCES FOR NON-DIRECT-VENT TERMINALS
A	Clearance above finished grade level, veranda, porch, deck, or balcony	12 inches	12 inches
B	Clearance to window or door that is operable	6 inches for appliances ≤ 10 000 Btu/hr	4 feet below or to side of opening or 1 foot above opening
		9 inches for appliances > 10 000 Btu/hr ≤ 50 000 Btu/hr	
C	Clearance to non-operable window	12 inches for appliances > 50 000 Btu/hr ≤ 150 000 Btu/hr	4 feet below or to side of opening or 1 foot above opening
		Appliances > 150 000 Btu/hr, in accordance with the appliance manufacturer's instructions and not less than the clearances specified for non-direct vent terminals in row B	
D	Vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 2 feet (610 mm) from the center line of the terminal	None unless otherwise specified by the appliance manufacturer	
E	Clearance to unventilated soffit	None unless otherwise specified by the appliance manufacturer	
F	Clearance to outside corner of building	None unless otherwise specified by the appliance manufacturer	
G	Clearance to inside corner of building	None unless otherwise specified by the appliance manufacturer	
H	Clearance to non-mechanical air supply inlet to building and the combustion air inlet to any other appliance	Same clearance as specified for row B	
I	Clearance to a mechanical air supply inlet	10 feet horizontally from inlet or 3 feet above inlet	
J	Clearance above paved sidewalk or paved driveway located on public property or other areas where condensate or vapor can cause a nuisance or hazard	7 feet and not located above public walkways or other areas where condensate or vapor can cause a nuisance or hazard	
K	Clearance to underside of veranda, porch, deck, or balcony	12 inches where the area beneath the veranda, porch, deck, or balcony is open on not less than two sides. The vent terminal is prohibited in this location where only one side is open.	

For SI Units: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1000 British thermal units per hour = 0.293 kW

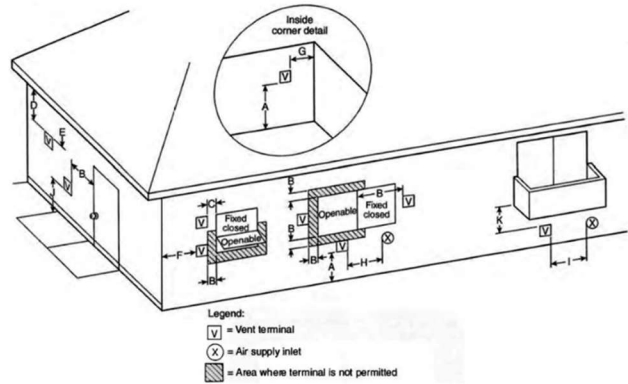


FIGURE 509.8.1
EXIT TERMINALS OF MECHANICAL DRAFT AND DIRECT-VENT VENTING SYSTEMS
[NFPA 54: FIGURE 12.9.1]

509.10.5 Joints.

Joints between sections of connector piping and connections to flue collars or draft hood outlets shall be fastened in accordance with one of the following methods:

- (1) Mechanically fastened by means of not less than three sheet-metal screws equally spaced around the joint.
- (2) Vent connectors of listed vent material assembled and connected to flue collars or draft hood outlets in accordance with the manufacturer's instructions.
- (3) Other approved means. {NFPA 54:12.11.6}

509.13 Manually Operated Dampers.

A manually operated damper shall not be placed in any appliance vent connector. Fixed baffles and balancing baffles shall not be classified as manually operated dampers.

Balancing baffles shall be mechanically locked in the desired position before placing the appliance in service. Balancing baffles shall be listed in accordance with UL 378. [NFPA 54:12.14.1 – 12.14.3]

Chapter 6 Water Distribution

603.5.12 Beverage Dispensers.

Potable water supply to carbonated beverage dispensers, ~~carbonated beverage dispensers, or coffee machines~~ shall be protected by an air gap or a vented backflow preventer that complies with ASSE 1022. For carbonated beverage dispensers, piping material installed downstream of the backflow preventer shall not be affected by carbon dioxide gas. Non-carbonated beverage dispensers, such as ice makers and coffee machines, shall be protected by an air gap or dual check backflow preventer that comply with ASSE 1032 or ASSE 1024.



603.5.19 Garbage Can Washers.

Where garbage can washers are connected to a potable water supply system, the connection shall be protected against backflow in accordance with Table 603.2.

606.5.1 Manifolds.

Field installed manifolds for water distribution shall conform with the applicable requirements for valves, pipes, and fittings as referenced in this code. Manufactured water distribution manifolds shall be in accordance with IAPMO IGC 109.

608.3 Expansion Tanks, and Combination Temperature and Pressure-Relief Valves.

...

Exception: An expansion tank shall not be required for an instantaneous non-storage water heater.

609.8.3 Hot-Water Recirculating Pumps.

For healthcare facilities, long term care facilities, hotels, or motels, devices that automatically turn off the recirculation pump(s) shall not be required.

609.10 Disinfection of Potable Water System.

(5) [OSHPD 1, 1R, 2, 3, 4 & 5] Disinfection shall be completed no more than three weeks before whole or partial beneficial occupancy.

(a) Where occupancy is delayed two weeks from disinfection, flushing of all fixtures shall again be completed.

(b) Where occupancy is delayed four weeks after disinfection, disinfection and flushing shall again be completed.

613.0 Domestic Hot-Water Distribution Systems for Health Facilities and Clinics. [OSHPD 1, 2, 3, 4 & 5]

613.2 At least two pieces of hot-water-heating equipment shall be provided to supply hot water for dishwashing and minimum patient services such as handwashing and bathing. The arrangement of water-heating equipment shall be based on the capacity and capability of the equipment to provide the required hot water during periods of breakdown or maintenance of any

TABLE 613.1
[OSHPD 1, 2, 3, 4 & 5] HOT WATER USE

	CLINICAL	DIETARY ¹	LAUNDRY ²
Liter/Hour/Bed	11.9	7.2	7.6
Gallons/Hour/Bed	3	2	2
Temperature °C	41-49.0	49.0 ³	71.0
Temperature °F	105-120.0	120.0 ³	160.0

¹ Rinse water temperature at warewasher or potsinks shall be 180°F (82°C) unless a chemical disinfection is provided.

² The required temperature of 160°F (71°C) in the laundry is that measure in the washing machine and shall be supplied so that the temperature may be maintained over the entire wash and rinse period.

Exception: A lower water temperature of 140°F (60°C) may be utilized, provided linens are subsequently passed through a tumbler dryer at 180°F (82°C) or a flatwork ironer at 300°F (149°C).

³ Dietary hot water temperature shall meet minimum temperature requirements at the point of use per the health authority.



one water heater. Booster heaters for 125°F to 180°F (52°C to 82°C) water are acceptable as a second piece of equipment for dishwashing. Where storage tanks are separate from the water heater, at least two independent storage tanks shall be provided. Storage water heaters and hot-water storage tanks shall be maintained at 140°F (60°C) or above.

613.6 Hot-water distribution system serving patient care areas shall be under constant mechanical recirculation to provide continuous hot water at each hot water outlet. Hot water recirculation piping shall return the recirculation loop back through the hot water source. Non-recirculated fixture branch piping shall not exceed 25 feet (7.62 meters) 10 feet (3.05 meters) in length. Dead-end piping (risers with no flow, branches with no fixture) shall not be installed. In renovation projects, dead-end piping shall be removed in the area of renovation. Empty risers, mains, and branches installed for future use shall be permitted.

613.9 Hot water distribution shall include test ports and valved openings for flushing of portions of the system in accordance with the facilities water management program as defined in Appendix N.

614.0 Dialysis Water-Distribution Systems. [OSHPD 1,2, 3, 4 & 5]

614.1 Dialysis water feedlines shall be CPVC (chlorinated polyvinyl chloride), PVC (polyvinyl chloride), glass, stainless steel, PEX, PVDF (polyvinylidene fluoride), or other material deemed acceptable by ANSI/AAMI/ISO 23500-2 and sized to provide a minimum velocity of 1.5 feet per second (0.46 m/s). The piping shall be a single loop system with or without recirculation. Branches to dialysis machines shall be 1/4 inch (6.4 mm) inside dimension and take off from the bottom of the main feedline. Branch lines may be PFA (perfluoroalkoxy).

614.7 Water treatment equipment and water used for dialysis treatment shall meet the latest edition of American Association of Medical Instrumentations (AAMI)/ISO ANSI/AAMI/ISO 23500-2 and 23500-3, Preparation And Quality Management Of Fluids For Haemodialysis And Related Therapies—Part 2: Water Treatment Equipment for Hemodialysis Applications And Related Therapies and Part 3: Water For Haemodialysis And Related Therapies.

616.0 Emergency Water Supply. [OSHPD 1]

616.3 Storage tank connections and circulation shall be designed to limit water stagnation and temperature stratification. Supplemental disinfection and circulation shall be provided where the disinfection levels of the public water supply are not adequate to maintain minimum levels of disinfectant for water quality consistent with the facility's water management program.



Chapter 7 Sanitary Drainage

Table 703.2 Foot Note 4

Not to exceed six water closets or five six-unit traps

TABLE 703.2
MAXIMUM UNIT LOADING AND MAXIMUM LENGTH OF DRAINAGE AND VENT PIPING

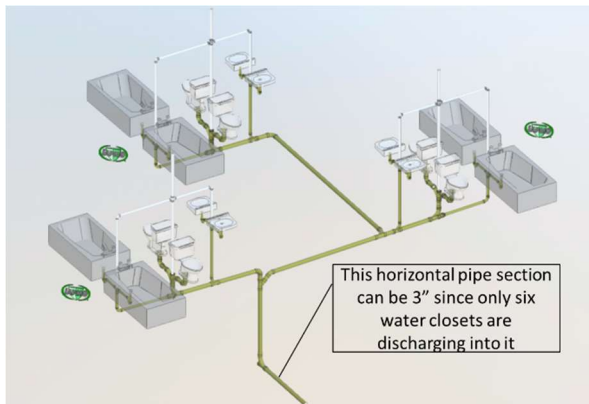
SIZE OF PIPE (inches)	1¼	1½	2	3	4	5	6	8	10	12
Maximum Units										
Drainage Piping¹										
Vertical	1	2 ^{2,7}	16 ³	48 ⁴	256	600	1380	3600	5600	8400
Horizontal	1	1 ⁷	8 ³	35 ⁴	216 ⁵	428 ⁵	720 ⁵	2640 ⁵	4680 ⁵	8200 ⁵
Maximum Length										
Drainage Piping										
Vertical (feet)	45	65	85	212	300	390	510	750	–	–
Horizontal (unlimited)										
Vent Piping										
Horizontal and Vertical⁶										
Maximum Units	1	8 ³	24	84	256	600	1380	3600	5600	8400
Maximum Lengths, (feet)	45	60	120	212	300	390	510	750	–	–

Note 4 now reads:
Not to exceed six water closets or five six-unit traps

For SI units: 1 inch = 25 mm, 1 foot = 304.8 mm

Notes:

- ¹ Excluding trap arm.
- ² Except for sinks, urinals, and dishwashers – exceeding 1 fixture unit.
- ³ Except for six-unit traps or water closets.
- ⁴ Not to exceed six water closets or five six-unit traps.
- ⁵ Based on ¼ inch per foot (20.8 mm/m) slope. For ⅛ of an inch per foot (10.4 mm/m) slope, multiply horizontal fixture units by a factor of 0.8.
- ⁶ The diameter of an individual vent shall be not less than 1¼ inches (32 mm) nor less than one-half the diameter of the drain to which it is connected. Fixture unit load values for drainage and vent piping shall be computed from Table 702.1 and Table 702.2. Not to exceed one-third of the total permitted length of a vent shall be permitted to be installed in a horizontal position. Where vents are increased one pipe size for their entire length, the maximum length limitations specified in this table do not apply. This table is in accordance with the requirements of Section 901.3.
- ⁷ Up to 8 public lavatories are permitted to be installed on a 1½ inch (40 mm) vertical branch or horizontal sanitary branch sloped at ¼ inch per foot (20.8 mm/m).



<https://drive.autodesk.com/de2867684/shares/SH30dd5QT870c25f12fcc23ec39b4bfc559c>



708.0 Grade of Horizontal Drainage Piping.

708.1 General.

Building drain and other horizontal drainage piping shall be run in practical alignment and a uniform slope of less than ¼ inch per foot(20.8 mm/m) or 2 percent toward the point of disposal. ~~provided that, where~~ ~~Where~~ it is impractical due to the depth of the street sewer, to the structural features, or to the arrangement of a building or structure to obtain a slope of ¼ inch per foot (20.8 mm/m) or 2 percent, ~~such pipe or building drain piping~~ 4 inches (100mm) or larger in diameter shall be permitted to have a slope of not less than 1/8 inch per foot (10.4 mm/m) or 1 percent, ~~where~~ when first approved by the Authority Having Jurisdiction.

Table 707.2

**TABLE 707.2
CLEANOUT MATERIALS FOR DRAIN, WASTE, AND VENT**

MATERIAL	STANDARD	
ABS ¹	ASTM D2661, CSA B79, IAPMO IGC 78, IAPMO IGC 224	
Cast Iron	ASME A112.36.2M, ASTM A888, CISPI 301, CSA B79, IAPMO IGC 224	
Copper or Copper Alloy	ASME A112.36.2M, CSA B79	
Ductile Iron	CSA B79	
Elastomers	CSA B79, IAPMO PS 90	
Polyethylene (PE)	CSA B79	
Polypropylene (PP)	CSA B79	
PVC ¹	ASTM D2665, CSA B79, IAPMO IGC 78, IAPMO IGC 224	
Polyvinylidene Fluoride (PVDF)	CSA B79	
Stainless Steel	CSA B79	

¹ [HCD 1 & HCD 2] ABS and PVC installations are limited to not more than two stories of areas of residential accommodation.

715.3 Existing Sewers.

Where permitted by the Authority Having Jurisdiction, trenchless methods of rehabilitation of existing building sewer and building storm sewers shall be installed in accordance with Section 715.3.1 or Section 715.3.2.

715.3.1 Sewer Pipe Lining. For trenchless installation of resin-impregnated flexible tubing to line existing building sewers and building storm sewers installation shall be in accordance with ASTM F1216, ASTM F2561, ASTM F2599, or ASTM F3240.

715.3.2 Sewer Pipe Replacement. For trenchless installation of polyethylene (PE) pipe using the pipe bursting method to replace existing building sewers and building storm sewers materials shall be in accordance with ASTM F714.



Chapter 8 Indirect Waste

814.3 Condensate Waste Pipe Material and Sizing.

...

Air-conditioning waste pipes, 1¼ of an inch (32 mm) and larger in size, shall be constructed of materials specified in Chapter 7. Condensate waste piping less than 1¼ of an inch (32 mm) in size shall be permitted to be PVC, CPVC, PE, PP, copper, or other rigid materials approved by the Authority Having Jurisdiction.

814.4 Appliance Condensate Drains.

Condensate drain lines from individual condensing appliances shall be sized as required by the manufacturer's instructions. Condensate drain lines serving more than one appliance shall be approved by the Authority Having Jurisdiction prior to installation connecting to a common indirect waste pipe shall have the connections to the indirect waste pipe protected by a sanitary waste valve complying with ASME A112.18.8, condensate trap complying with IAPMO IGC 196, or trap with a trap primer.

Condensate Drains

IAPMO IGC 196 Condensate Traps And Overflow Switches As Used In Central Air Conditioning Systems

1 Scope

1.1 General

1.1.1 This Standard covers condensate traps and overflow switches intended for use in air conditioning system applications and specifies requirements for materials, physical characteristics, performance testing, and markings.

1.1.2 Products covered by the scope of this standard may include waterless condensate traps, special purpose PVC fittings and/or condensate trap and/or overflow switch assemblies.

814.5 Point of Discharge.

Air-conditioning condensate waste pipes shall connect indirectly, except where permitted in Section 814.6, to the drainage system through an air gap or air break to trapped and vented receptors, dry wells, mop sinks, leach pits, or the tailpiece of plumbing fixtures. An individual condensate drain shall be trapped in accordance with the appliance manufacturer's instructions or as approved in accordance with Section 814.4.



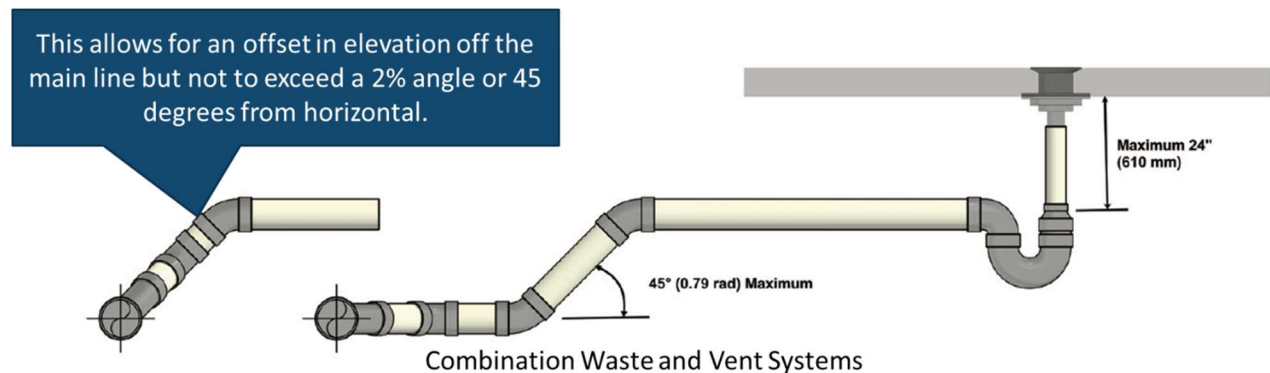
Chapter 9 Vents

906.7 Frost or Snow Closure.

Where frost or snow closure is likely to occur in locations having minimum design temperature below 0°F (-17.8°C), vent terminals shall be not less than 23 inches (5076 mm) in diameter, but in no event smaller than the required vent pipe. The change in diameter shall be made inside the building not less than 1 foot (305mm) below the roof in an insulated space and terminate not less than 10 inches (254 mm) above the roof, or in accordance with the Authority Having Jurisdiction.

910.4 Connections and Size.

Branches serving traps shall connect to the main line at an angle not exceeding 2 percent. Each waste pipe and each trap in such a system shall be not less than two pipe sizes exceeding the sizes required by Chapter 7 of this code, and not less than two pipe sizes exceeding a fixture tailpiece or connection.



910.0 Combination Waste and Vent Systems.

Scan this QR Code to see it in the system.



<https://drive.autodesk.com/de2867684/shares/SH30dd5QT870c25f12fcf17121f2b19ac271>

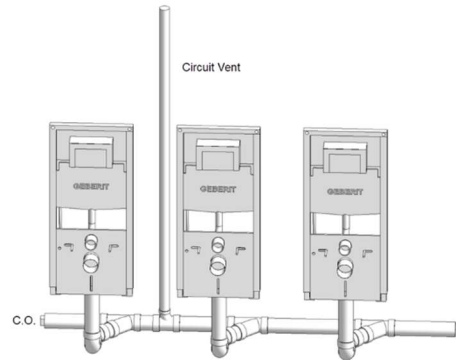


911.0 Circuit Venting

911.1 Circuit Vent Permitted.

...

Exception: Back-outlet and wall-hung water closets shall be permitted to be circuit vented provided that no floor-outlet fixtures are connected to the same horizontal branch. Back-outlet and wall-hung water closets shall connect horizontally to the horizontal circuit vented drain.



Chapter 10 Traps and Interceptors

TABLE 1002.2
HORIZONTAL LENGTHS OF TRAP ARMS
(EXCEPT FOR WATER CLOSETS AND SIMILAR FIXTURES)^{1, 2, 3}

TRAP ARM PIPE DIAMETER (inches)	DISTANCE TRAP TO VENT MINIMUM (inches)	LENGTH MAXIMUM (inches)
1¼	2½	30
1½	3	42
2	4	60
3	6	72
4	8	120
Exceeding 4	2 x Diameter	120

For SI units: 1 inch = 25.4 mm

Notes:

- ¹ Maintain ¼ inch per foot slope (20.8 mm/m).
- ² The developed length between the trap of a water closet or similar fixture (measured from the face of the closet flange to the inner edge of the vent) and its vent shall not exceed 6 feet (1829 mm).
- ³ Horizontally wet vented bathtubs, showers and similar fixtures shall be limited to a maximum of 6 feet (1829 mm) for 1½ inch (40 mm) fixture drains and 8 feet (2438 mm) for 2 inch (50 mm) fixture drains, maintaining ¼ inch per foot slope (20.8 mm/m).

TABLE 1009.1
APPROVED INTERCEPTORS (CLARIFIERS)

APPLICATION	STANDARD
Fats, Oil, Grease (FOG)	ASME A112.14.3, ASME A112.14.4, ASME A112.14.6, CSA B481, ANSI/CAN/IAPMO Z1001, PDI G-101, PDI G-102
Solid Waste	IAPMO IGC 167
Non-petroleum Oil	ASME A112.14.6, IAPMO PS 80, PDI G-102
Petroleum Oil	ASTM D6104, IAPMO IGC 183, IAPMO IGC 325



Chapter 11- Storm Drainage

1101.13.1 Rain Leaders and Conductors.

Rain leaders and conductors connected to a building storm sewer shall have a cleanout installed at the base of the outside leader or conductor before it connects to the horizontal drain.

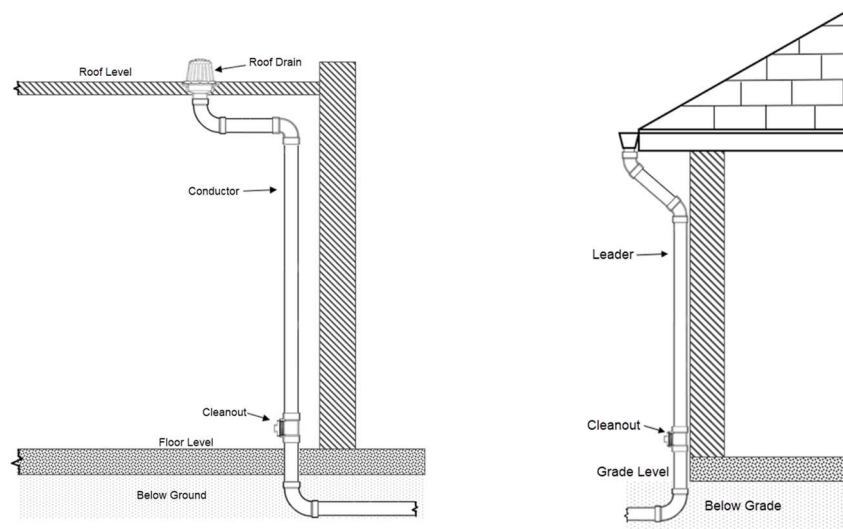


Image Retrieved 2023/1/23, From, <https://www.mass.gov/doc/pl-board-draft-changes-to-248-cmr-1000-clean/download>

Chapter 12 Fuel Gas Piping

~~1208.2 Provision for Location of Point of Delivery.~~

~~The location of the point of delivery shall be acceptable to the serving gas supplier.
[NFPA 54:5.2]~~

1208.23 Interconnections Between Gas Piping Systems Supplying Separate Users.

Where two or more meters, or two or more service regulators where meters are not provided, are located on the same premises and supply separate users, the gas piping system shall not be interconnected on the outlet side of the meter or service regulators.
[NFPA 54:5.32.1]

1208.3.2 Sizing Methods.

Gas piping shall be sized in accordance with one of the following:

- (1) Pipe Sizing tables or sizing equations in this chapter.
 - ~~(2)~~ (23) Sizing tables included in a listed piping system manufacturer's installation instructions
 - ~~(2)~~ (23) Other approved Engineering methods
- [NFPA 54:5.34.3.]



1208.3.3 Allowable Pressure Drop.

The design pressure loss in anya piping system ~~under maximum probable flow conditions~~, from the point of delivery to the inlet connection of ~~the appliance~~,all appliances served shall be such ~~that~~ the supply pressure at ~~the~~each appliance inlet is greater than or equal to the minimum pressure required by the appliance. [NFPA 54:5.3.4]

1208.45 Maximum Operating Pressure in Buildings.

The maximum operating pressure for any piping systems located inside buildings shall not exceed 5 psi (34 kPa) unless one or more of the following conditions are met:

- (1) The piping joints are welded or brazed.
- (2) The piping is joined by fittings listed to ANSI LC 4/CSA 6.3, Press-Connect Metallic Fittings for Use in Fuel Gas Distribution Systems, and installed according to the manufacturer's installation instructions.
- (3~~2~~) The piping joints are flanged and all pipe-to-flange connections are made by welding or brazing.
- (4~~3~~) The piping is located in a ventilated chase or otherwise enclosed for protection against accidental gas accumulation.
- (5~~4~~) The piping is located inside buildings or separate areas of buildings used exclusively for one of the following:
 - (a) Industrial processing or heating
 - (b) Research
 - (c) Warehousing
 - (d) Boiler or mechanical rooms
- (6~~5~~) The piping is a temporary installation for buildings under construction.
- (7~~6~~) The piping serves appliances or equipment used for agricultural purposes.
- (8~~7~~) The piping system is an LP-Gas piping system with an operating pressure greater than 20 psi (138 kPa) and complies with NFPA 58. [NFPA 54:5.45.4]

1208.45.1 LP-Gas Systems Operating Below -5°F (-21°C).

LP-Gas systems designed to operate below -5°F (-21°C) or with butane or a propane-butane mix shall be designed to either accommodate liquid LP-Gas or to prevent LP-Gas vapor from condensing back into a liquid. [NFPA 54:5.45.5]

1208.56.23 Metallic Pipe.

~~Cast iron pipe shall not be used. [NFPA 54:5.6.2.1]~~ Metallic pipe shall be in accordance with the Section 1208.6.3.1 through Section 1208.6.3.4.

1208.56.56 Regulator Vent Piping.

Plastic pipe and fittings used to connect regulator vents to remote vent terminations shall be PVC conforming to UL 651, Schedule 40 and 80 Rigid PVC Conduit and Fittings. PVC vent piping shall not be installed indoors. [NFPA 54:5.56.4.2]



1208.56.89.3 Thread Joint Compounds Sealing.

Threaded joints shall be made using a thread joint sealing material. [NFPA 54:5.5.6.4.1]

Thread joint sealing materials shall be compatible with the pipe and fitting material on which the compounds are used. [NFPA 54:5.5.6.4.2]

Thread joint sealing materials shall be resistant to the chemical constituents of the gases to be conducted through the piping. [NFPA 54:5.5.6.4.3]

1208.56.910.2 Copper Tubing Joints.

Copper tubing joints shall be assembled with approved gas tubing fittings, shall be brazed with a material having a melting point in excess of 1000°F (538°C), or shall be assembled with press-connect fittings listed to ANSI LC 4/CSA 6.32 CSA LC 4, Press-Connect Metallic Fittings for Use in Fuel Gas Distribution Systems. Brazing alloys shall not contain more than 0.05 percent phosphorus. [NFPA 54:5.5.6.7.2]

1208.56.910.3 Stainless Steel Tubing Joints.

Stainless steel joints shall be welded, assembled with approved tubing fittings, brazed with a material having a melting point in excess of 1000°F (538°C), or assembled with press-connect fittings listed to ANSI LC 4/CSA 6.32 CSA LC 4, Press-Connect Metallic Fittings for Use in Fuel Gas Distribution Systems. Brazing alloys and fluxes shall be recommended by the manufacturer for use on stainless steel alloys. [NFPA 54:5.5.6.7.3]

1208.56.1044.2 Heat Fusion Joint.

Heat-fusion joints shall be made in accordance with qualified procedures that have been established and proven by test to produce gastight joints at least as strong as the pipe or tubing being joined. Joints shall be made with the joining method recommended by the pipe manufacturer. Polyethylene heat-fusion fittings shall be marked “ASTM D2513.” Polyamide heat-fusion fittings shall be marked “ASTM F2945.” [NFPA 54:5.5.8(2)]

1208.67.1.1 Subject to Protection from Damage

Gas meters shall not be placed where they will be subjected to damage, such as adjacent to a driveway, under a fire escape, in public passages, halls, or where they will be subject to excessive corrosion or vibration. [NFPA 54:5.6.7.2.2]

1208.134 Shutoff Valves.

Shutoff valves shall be selected in accordance with Table 1208.13, approved and shall be selected giving consideration to pressure drop, service involved, emergency use, and reliability of operation. Shutoff valves of size 1 inch (25 mm) National Pipe Thread and smaller shall be listed and labeled. Where used outdoors, such use shall be in accordance with the manufacturer’s recommendation. [NFPA 54:5.112]



TABLE 1208.13
MANUAL GAS VALVE STANDARDS
[NFPA 54: TABLE 5.11]

SHUTOFF VALVE APPLICATION	STANDARDS
Appliance shutoff valve up to ½ psi	CSA/ANSI Z21.15/CSA 9.1
	ASME B16.44
	ASME B16.33 marked 125 G
	ANSI LC 4/CSA 6.32
Valve up to ½ psi	ASME B16.44
	ASME B16.33 marked 125 G
	ANSI LC 4/CSA 6.32
Valve up to 2 psi	ASME B16.44 labeled 2G
	ASME B16.33 marked 125 G
	ANSI LC 4/CSA 6.32 with ASME B16.44 labeled 2G or labeled 5G
	ANSI LC 4/CSA 6.32 with ASME B16.33 marked 125 G
Valve up to 5 psi	ASME B16.44 labeled 5G
	ASME B16.33
	ANSI LC 4/CSA 6.32 with ASME B16.44 marked 5G
	ANSI LC 4/CSA 6.32 with ASME B16.33 marked 125 G
Valve up to 125 psi	ASME B16.33 marked 125 G
	ANSI LC 4/CSA 6.32 with ASME B16.33 marked 125 G

For SI Units: 1 pound-force per square inch = 6.8947 kPa

1208.158.4 Pressure Regulator Vents and Pressure Control Venting of Line Pressure Regulators.

The venting of the atmospheric side of diaphragms in line pressure regulators, gas appliance regulators, and gas pressure limit controls shall be in accordance with all of the following:

- (1) An independent vent pipe to the outdoors, sized in accordance with the device manufacturer’s instructions, shall be provided where the location of a device is such that a discharge of fuel gas will cause a hazard. For devices other than appliance regulators, vents are not required to be independent where the vents are connected to a common manifold designed in accordance with engineering methods to minimize backpressure in the event of diaphragm failure and such design is approved.

Exception

- 1. A regulator and vent limiting means combination listed as complying with ANSI Z21.80/CSA 6.22 CSA Z21.80, Line Pressure Regulators, shall not be required permitted to be used without a vented to the outdoors.
- 2. A listed gas appliance regulator factory equipped with a vent limiting device is not required to be vented to the outdoors.

1208.158.4 Pressure Regulator Vents and Pressure Control Venting of Line Pressure Regulators.

- ~~(2)~~ (b) Materials for vent piping shall be in accordance with Section 1208.6 through Section 1208.6.13.5.
- ~~(3)~~ (2) The vent terminus shall be designed to prevent the entry of water, insects, or other foreign materials that could cause blockage.



(4) Vent piping shall be installed to minimize static loads and bending moments placed on the regulators and gas pressure control devices.

(5) ~~(3) The regulator Vents shall terminate not less at least 3 feet (914 mm) from a possible source of ignition.~~

(6) ~~(4) At locations where a vent termination could regulators might be submerged during floods or snow accumulations, an special antiflood-type breather vent fitting shall be installed, or the vent termination line shall be located extended above the height of the expected flood waters snow.~~

(7) ~~(5) A regulator shall not be vented to the appliance flue or exhaust system.~~
Vent piping from pressure regulators and gas pressure controls shall be connected to a common manifold that serves a bleed line from a diaphragm-type gas valve. [NFPA 54:5.8.5.14]

1210.1.5 Piping through Foundation Wall.

Piping through a foundation wall shall comply with all f the following:

(1) Underground piping, where installed through the outer foundation or basement wall of a building, shall be encased in a protective sleeve or protected by an approved device or method.

(2) The space between the gas piping and the sleeve and between the sleeve and the wall shall be sealed to prevent entry of gas and water.

(3) Sealing materials shall be compatible with the piping and sleeve. [NFPA 54:7.1.5]

1210.3 Installation of Aboveground Piping.

Piping installed aboveground shall comply with all of the following:

(1) Piping shall be securely supported and located where it will be protected from physical damage.

(2) Where passing through an exterior wall, the piping shall also be protected from corrosion by coating or wrapping with an inert material approved for such applications.

(3) The piping shall be sealed around its circumference at the point of the exterior penetration to prevent the entry of water, insects, and rodents.

(4) Where piping is encased in a protective pipe sleeve, the annular spaces between the gas piping and the sleeve and between the sleeve and the wall opening shall be sealed. [NFPA 54:7.2.1]

(5) Piping installed outdoors shall be elevated not less than 3-1/2 in. (89 mm) above the ground.

(6) Sealing materials shall be compatible with the piping and sleeve. [NFPA 54:7.2.1]



1210.3.5.3 Piping on Roofs.

Gas piping installed on the roof surfaces shall be elevated above the roof surface and shall be supported in accordance with Table 1210.3.5.1. Gas piping shall be elevated not less than 3½ inches (89 mm) above the roof surface. [NFPA 54:7.2.6.4.1, 7.2.6.4.2]

Table 1210.3.5.1

TABLE 1210.3.5.1
SUPPORT OF PIPING
[NFPA 54: TABLE 7.2.6.2]

STEEL PIPE, NOMINAL SIZE OF PIPE (inches)	SPACING OF SUPPORTS (feet)	NOMINAL SIZE OF TUBING SMOOTH WALL (inches O.D.)	SPACING OF SUPPORTS (feet)
½	6	½	4
¾ or 1	8	¾ or ¾	6
1¼ or larger (horizontal)	10	¾ or 1 (horizontal)	8
1¼ or larger (vertical)	Every floor level	1 or larger (vertical)	Every floor level

For SI units: 1 inch = 25 mm, 1 foot = 304.8 mm

1210.9.1 Accessibility of Gas Valves Controlling Multiple Systems.

System Main gas shutoff valves controlling several gas piping systems shall be readily accessible for operation and installed so as to be protected from physical damage. They System shutoff valves shall be marked with a metal tag or other permanent means attached by the installing agency so that the gas piping systems supplied through them can be readily identified. [NFPA 54:7.8.12.1]

1210.9.5 System Shutoff Valves.

Where a system shutoff valve is installed, the valve shall comply with Section 1208.13. [NFPA 54:7.8.4]

1212.1 Connecting Appliances and Equipment.

Appliances and equipment shall be connected to the building piping in compliance with Section 1212.6 through Section 1212.8 by one of the following:

- (1) Rigid metallic pipe and fittings.
- (2) Semirigid metallic tubing and metallic fittings. Aluminum alloy tubing shall not be used in exterior locations.
- (3) A connector for gas appliances listed connector in accordance compliance with ANSI Z21.24/CSA 6.10, Connectors for Gas Appliances. CSA Z21.24. The connector shall be used in accordance with the manufacturer’s installation instructions and shall be in the same room as the appliance. Only one connector shall be used per appliance.
- (4) A listed connector for outdoor gas appliances and manufactured homes listed in accordance with ANSI Z21.75/CSA 6.27, Connectors for Outdoor Gas Appliances and Manufactured Homes in compliance with CSA Z21.75. Only one connector shall be used per appliance.
- (5) CSST where installed in accordance with the manufacturer’s installation instructions. CSST shall not be directly routed into a metallic appliance enclosure where the appliance is connected to a metallic vent that terminates above a roofline. CSST shall connect only to appliances that are fixed in place.
- (6) Listed nonmetallic gas hose connectors in accordance with Section 1212.3.



(7) Unlisted gas hose connectors for use in laboratories and educational facilities in accordance with Section 1212.4. [NFPA 54:9.6.43]

1212.1.1 Protection of Connectors.

- Connectors and tubing addressed in Sections 1212.1(2), Section 1212.1(3), Section 1212.1(4), Section 1212.1(5), and Section 1212.1(6) shall be installed to be protected against physical and thermal damage. Aluminum alloy tubing and connectors shall be coated to protect against external corrosion where they are in contact with masonry, plaster, or insulation as detergents, sewage, or water other than rainwater. [NFPA 54:9.6.1.1]
- Materials addressed in Section 1212.1(2), Section 1212.1(3), Section 1212.1(4), Section 1212.1(5), and Section 1212.1(6) shall not be installed through an opening in an appliance housing, cabinet, or casing, unless the tubing or connector is protected against damage. [NFPA 54:9.6.1.2]

Chapter 13 Health Care Facilities and Medical Gas and Medical Vacuum Systems

1308.2 Pressure Relief Valves.

...

(5) They shall have a vent discharge line that is not smaller than the size of the relief valve outlet or $\frac{3}{4}$ NPS (20 mm), whichever is larger.

(6) Where two or more relief valves discharge into a common vent line, its the internal cross-sectional area of the common line shall be not less than the aggregate cross-sectional area of all relief valve vent discharge lines served.

...

1314.5 Valve Types.

(1) They have a minimum Cv factor in accordance with Table 1314.5(1) or Table 1314.5(2).

...

(8) They have threaded purge ports on the patient side and the source side.

(9) They have a minimum working pressure equal to or greater than the relief valve protecting the piping system on which the valve is installed for any positive-pressure service. [NFPA 99:5.1.4.1.6]



TABLE 1314.5(2)
VACUUM AND WAGD
[NFPA 99:TABLE 5.1.4.1.6(b)]

VALVE SIZE (inch)	MINIMUM Cv (full open)
1/2	17
3/4	31
1	60
1 1/4	110
1 1/2	169
2	357
2 1/2	196
3	302
4	600
5	1022
6	1579
8	3136

For SI units: 1 inch = 25.4 mm

TABLE 1314.5(1)
POSITIVE PRESSURE GASES
[NFPA 99: TABLE 5.1.4.1.6(a)]

VALVE SIZE (inch)	MINIMUM Cv (full open)
1/2	17
3/4	31
1	60
1 1/4	110
1 1/2	169
2	357
2 1/2	390
3	912
4	1837

For SI units: 1 inch = 25.4 mm

1323.13.2 Pipe Pressure Labeling.

Where positive pressure gas piping systems operate at pressures other than the standard gauge pressure in Table 1305.1, the operating pressure in addition to the name of the gas shall be labeled. [NFPA 99:5.1.11.1.2]

1324.5.5.5 Conclusion of Test.

The leakage over the 24-hour test shall not exceed 0.5 percent of the starting pressure [e.g., 0.125 inch (0.3 mm) HgV starting at 25 inches (635 mm) HgV] except that attributed to specific changes in ambient temperature. [NFPA 99:5.1.12.2.7.5]



Chapter 15 - Alternate Water Sources for Nonpotable 1501.7 Minimum Water Quality Requirements.

The minimum water quality for alternate water source systems shall meet the applicable water quality requirements for the intended application as determined by the Authority Having Jurisdiction. In the absence of water quality requirements, for on-site treated nonpotable systems, the water quality requirements of EPA/600/R-12/618-2012, IAPMO IGC 324 or NSF 350 shall apply. The EPA/625/R-04/108 contains recommended water reuse guidelines to assist regulatory agencies to develop, revise, or expand alternate water source water quality standards. **[BSC-CG & HCD 1]** Water quality requirements for on-site treated nonpotable graywater shall comply with this section and Section 1506.109.2.

Exception:

- (1) Water treatment is not required for gray water used in a disposal field or for subsurface irrigation.
- (2) **[DWR]** Recycled water shall comply with the water quality requirements of Section 1505.15.

TABLE 1504.5.3
SUBSOIL IRRIGATION FIELD CONSTRUCTION

DESCRIPTION	MINIMUM	MAXIMUM
Number of drain lines per valved zone ¹	1	—
Length of each perforated line ¹	—	100 feet
Bottom width of trench ¹	12 inches	24 inches
Spacing of lines, center to center ¹	4 feet	—
Depth of earth covers of lines	10 inches	—
Depth of filter material cover of lines	2 inches	—
Depth of filter material beneath lines ¹	3 inches	—
Grade of perforated lines level	level	3 inches per 100 feet

For SI units: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 inch per foot = 83.3 mm/m

¹ Manufactured leaching chambers shall be installed in compliance with the manufacturer's installation instructions.

1505.4 Connections to Potable or Recycled Water Supply Systems.

...

(4) In order to use potable water as an auxiliary water supply when there is an interruption to the reclaimed (recycled) water supply, a changeover device, swivel ell, or other assembly is permitted if the following two conditions are met:

(a) The water user maintains ongoing compliance with State Water Resources Control Board's Cross-Connection Control Policy Handbook requirements.

(b) The changeover device, swivel ell, or other assembly complies with the State Water Resources Control Board's Cross-Connection Control Policy Handbook requirements.



1506.5 Water Pressure.

On-site treated non-potable gray water systems supplying water to water closets, urinals, and trap primers shall be capable of delivering not less than 15 pounds-force per square inch (psi) (103 kPa) residual pressure at the highest and most remote outlet served. Where the water pressure in the on-site treated non-potable gray water supply system within the building exceeds 80 psi (552 kPa), a pressure reducing valve reducing the pressure to 80 psi (552 kPa) or less to water outlets in the building shall be installed.

1506.78 On-Site Treated Nonpotable Water Devices and Systems.

Devices or equipment used to treat on-site treated nonpotable water to maintain the minimum water quality requirements determined by the Authority Having Jurisdiction shall be listed ~~or~~ and labeled (third-party certified) by a listing agency (accredited conformity assessment body) or approved for the intended application. Devices or equipment used to treat on-site treated nonpotable water for use in the water closet and urinal flushing, surface irrigation, and similar applications shall comply with IAPMO IGC 324, NSF 350 or approved by the Authority Having Jurisdiction.

1506.10.2 Minimum Water Quality. [BSC-CG & HCD 1] ... *In the absence of local water quality requirements for on-site treated nonpotable gray water, the requirements of IAPMO IGC 324 or NSF/ANSI 350 shall apply.*

IAPMO IGC 324-2019

1 Scope

1.1.1 This Standard covers alternate water source systems for single-family dwellings intended to process water from alternate water sources such as greywater, rainwater, atmospheric generated water, and air conditioning condensate, for use in subsurface and/or surface irrigation and toilet/urinal flushing applications, and specifies requirements for materials, physical characteristics, performance testing, and markings. IAPMO IGC 324-2019

1.1.2 Alternate water source systems covered by this Standard are of the

(a) catch basin only type, intended to supply water for use in subsurface irrigation; or
Note: An example of a schematic for the catch basin only type system is shown in Figure 1.

(b) catch basin plus separate, connected, reverse osmosis and UV processing station type, intended to supply water for surface irrigation and toilet/urinal flushing applications.

Note: An example of a schematic for the reverse osmosis and UV processing is shown in Figure 2.



Chapter 16 - Nonpotable Rainwater Catchment Systems

1603.45 Minimum Water Quality.

The minimum water quality for harvested rainwater shall meet the applicable water quality requirements for the intended applications as determined by the Authority Having Jurisdiction. In the absence of water quality requirements determined by the Authority Having Jurisdiction, the minimum treatment and water quality shall be in accordance with Table 1603.5, ~~EPA/600/R-12/618-2012~~, IAPMO IGC 324 or NSF 350.

Exception: No treatment is required for rainwater used for subsurface or nonsprinkled surface irrigation where the maximum storage volume is less than 360 gallons (1363 L).

~~**1603.5.1 Treatment.** If the quality of the tested water cannot consistently be maintained at the minimum levels specified in Table 1603.5, then the system shall be equipped with an appropriate treatment device meeting applicable NSF standards referenced in Chapter 17.~~

1503.2.4 1603.20 Rainwater Diversion Valves.

Rainwater diversion valves ranging from 2 inches (50 mm) through 12 inches (300 mm) in diameter shall be an approved diverter valve. Valves shall be readily accessible and include a filter located upstream of the valve when required.

Chapter 17 Referenced Standards

TABLE 1701.1
REFERENCED STANDARDS

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTION
EPA/625/R-04/108	Guidelines for Water Reuse	Miscellaneous	1501.7

Table 1701.2 Table 1701.2

TABLE 1701.2
STANDARDS, PUBLICATIONS, PRACTICES, AND GUIDES

DOCUMENT NUMBER	DOCUMENT TITLE	APPLICATION
EPA		
EPA/600/R-12/618	Guidelines for Water Reuse	Miscellaneous



Water Demand Calculator® (WDC): An Overview

Learn more about WeStand scan the QR Code.

<https://iapmo.org/we-stand>



Scan this QR Code to gain access to the free Excel version of the Water Demand Calculator®

<https://iapmo.org/we-stand/water-demand-calculator>



Want the Water Demand Calculator® Pro, use this QR Code.

<https://wdcpro.iapmo.org/>



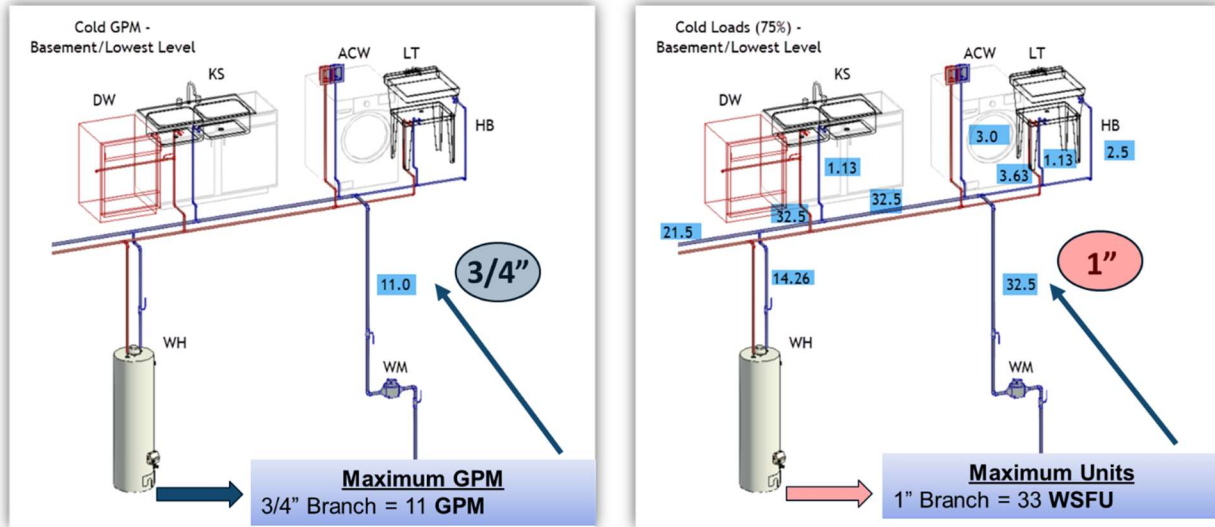
The Water Demand Calculator® Determines – GPMs

GPMs Relate to Friction Loss

- Water Meters
- Water Service
- Water Treatment Devices
- Less GPMs = Less Friction Loss
- Less Friction Loss = Smaller Sizes



Sizing Based on GPM vs. WSFU



Get Involved with Code Development

- Scan the QR code to learn more about getting involved with the development of the Uniform Codes.





Intentionally left blank for notes