REVISION RECORD
FOR THE STATE OF CALIFORNIA
ERRATA

January 1, 2026

2025 Title 24, Part 5, California Plumbing Code

General Information:

1. The date of this erratum is for identification purposes only. See the History Note Appendix on the backside or accompanying page.

2. This erratum is issued by the California Building Standards Commission to correct non-substantive printing errors or omissions in the 2025 California Plumbing Code, California Code of Regulations, Title 24, Part 5. Instructions are provided below.

3. Health and Safety Code Section 18938.5 establishes that only building standards in effect at the time of the application for a building permit may be applied to the project plans and construction. This rule applies to both adoptions of building standards for Title 24 by the California Building Standards Commission, and local adoptions and ordinances imposing building standards. An erratum to Title 24 is a non-regulatory correction because of a printing error or omission that does not differ substantively from the official adoption by the California Building Standards Commission. Accordingly, the corrected code text provided by this erratum may be applied on and after the stated effective date.

4. You may wish to retain the superseded material with this revision record so that the prior wording of any section can be easily ascertained.

Title 24, Part 5

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PREFACE

This document is Part 5 of thirteen parts of the official triennial compilation and publication of the adoptions, amendments and repeal of administrative regulations to *California Code of Regulations, Title 24,* also referred to as the *California Building Standards Code*. This part is known as the *California Plumbing Code*.

The *California Building Standards Code* is published in its entirety every three years by order of the California legislature, with supplements published in intervening years. The California legislature delegated authority to various state agencies, boards, commissions and departments to create building regulations to implement the State's statutes. These building regulations, or standards, have the same force of law, and take effect 180 days after their publication unless otherwise stipulated. The *California Building Standards Code* applies to occupancies in the State of California as annotated.

A city, county, or city and county may establish more restrictive building standards reasonably necessary because of local climatic, geological or topographical conditions. Findings of the local condition(s) and the adopted local building standard(s) must generally be filed with the California Building Standards Commission (or other filing if indicated) to become effective, and may not be effective sooner than the effective date of this edition of *California Building Standards Code*. Local building standards that were adopted and applicable to previous editions of the *California Building Standards Code* do not apply to this edition without appropriate adoption and the required filing.

Should you find publication (e.g., typographical) errors or inconsistencies in this code or wish to offer comments toward improving its format, please address your comments to:

California Building Standards Commission
2525 Natomas Park Drive, Suite 130
Sacramento, CA 95833-2936
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Web Page: www.dgs.ca.gov/bsc
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ACKNOWLEDGEMENTS

The 2025 *California Building Standards Code* (Code) was developed through the outstanding collaborative efforts of the Department of Housing and Community Development, Division of the State Architect, Office of the State Fire Marshal, Department of Health Care Access and Information, California Energy Commission, California Department of Public Health, California State Lands Commission, Board of State and Community Corrections, Department of Water Resources, State Historical Building Safety Board, Department of Consumer Affairs, State Librarian, Department of Food and Agriculture, and the California Building Standards Commission (Commission).

This collaborative effort included the assistance of the Commission's Code Advisory Committees and many other volunteers who worked tirelessly to assist the Commission in the production of this Code.

Governor Gavin Newsom

Members of the California Building Standards Commission
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James Haskin

Stoyan Bumbalov – Executive Director
Kevin Day – Deputy Executive Director

For questions on California state agency amendments, please refer to the contact list on page iv.

California Code of Regulations Title 24

California State Agency Contact List

The following state agencies may propose building standards for buildings, structures and applications under their authority for publication in Title 24. Notice of such proposals may be requested from each agency. See Sections 1.2 through 1.14 of the California Building Code (Part 2, T24) for detailed information on the regulatory authority of most state agencies summarized below. Note [agency acronyms] shown in banners/Matrix Adoption Tables in T24.

Board of State & Community Corrections [BSCC]
bscc.ca.gov BSCC-Mail@bscc.ca.gov
(916) 445-5073 *Local Detention Facilities*

Building Standards Commission [BSC, BSC-CG]
dgs.ca.gov/bsc cbsc@dgs.ca.gov
(916) 263-0916 *State Buildings including UC & CSU, Nonresidential Green Building Standards*

Department of Consumer Affairs Boards/Bureaus:

Acupuncture Board [CA]
acupuncture.ca.gov AcuPolicy@dca.ca.gov
(916) 515-5200 *Acupuncture Offices*

Board of Pharmacy [CA]
pharmacy.ca.gov
(916) 518-3100 *Pharmacies*

Board of Barbering & Cosmetology [CA]
barbercosmo.ca.gov barbercosmo@dca.ca.gov
(916) 574-7570 *Barber, Cosmetology & Electrolysis Establishments*

Bureau of Household Goods & Services [CA]
bhgs.dca.gov
(916) 999-2041 *Insulation Testing*

Structural Pest Control Board [CA]
pestboard.ca.gov pestboard@dca.ca.gov
(800) 737-8188 *Structural Pest Control Locations*

Veterinary Medical Board [CA]
vmb.ca.gov vmb@dca.ca.gov
(916) 515-5220 *Veterinary Facilities*

Department of Food & Agriculture [AGR]
cdfa.ca.gov
(916) 900-5004 *Rendering & Collection Centers*
(916) 900-5064 *Meat & Poultry Packing Plants*
(916) 900-5008 *Milk & Dairy Food Safety*

Department of Health Care Access and Information
Office of Statewide Hospital Planning and Development [OSHPD 1, 1R, 2, 3, 4, 5, 6]
hcai.ca.gov regsunit@hcai.ca.gov
(916) 440-8300 *Hospital Standards, Skilled Nursing Facility Standards & Clinic Standards*

Department of Public Health [DPH]
cdph.ca.gov (Recreational Health)
(916) 449-5661 *Food Establishments, Organized Camps, Public Swimming Pools*

Department of Housing and Community Development [HCD 1, 2, 1-AC]
hcd.ca.gov Title24@hcd.ca.gov
(800) 952-8356
Option 5 > Option 2 *State Housing Law: including Housing Accessibility, Hotels/Motels, Apartments/Condominiums, Dormitories, Single-Family Dwellings, ADUs, Permanent Structures in Mobile Home Parks*
Option 5 > Option 4 *Factory-Built Housing*
Option 5 > Option 5 *Employee Housing*

Department of Water Resources [DWR]
water.ca.gov DWRwebcomment@water.ca.gov
(916) 653-5791 *Plumbing for Recycled Water, Floodplain Construction*

Division of the State Architect
dgs.ca.gov/dsa
(916) 445-8100

Access Compliance [DSA-AC]
(916) 445-5827 DSAaccess@dgs.ca.gov
Access for Persons with Disabilities

Structural Safety [DSA-SS, DSA-SS/CC]
Public Schools & Community Colleges, State Essential Services Buildings

State Historical Building Safety Board [SHBSB]
(916) 445-7627 shbsb@dgs.ca.gov
Historical Building Rehabilitation, Preservation, Restoration or Relocation

CHAPTER 2
DEFINITIONS

201.0 General.

201.1 Applicability. For the purpose of this code, the following terms have the meanings indicated in this chapter.

No attempt is made to define ordinary words, which are used in accordance with their established dictionary meanings, except where a word has been used loosely, and it is necessary to define its meaning as used in this code to avoid misunderstanding.

202.0 Definition of Terms.

202.1 General. The definitions of terms are arranged alphabetically according to the first word of the term.

203.0 – A –

ABS. Acrylonitrile-butadiene-styrene.

Accepted Engineering Practice. That which conforms to technical or scientific-based principles, tests, or standards that are accepted by the engineering profession.

Accessible. Where applied to a fixture, connection, appliance, or equipment, "accessible" means having access thereto, but which first may require the removal of an access panel, door, or similar obstruction.

Accessible, Readily. Having a direct access without the necessity of removing a panel, door, or similar obstruction.

Accessory Dwelling Unit. [HCD 1 & HCD 2] *An attached or detached residential dwelling unit that provides complete independent living facilities for one or more persons and is located on a lot with a proposed or existing primary residence. Accessory dwelling units shall include permanent provisions for living, sleeping, eating, cooking, and sanitation on the same parcel as the single-family or multifamily dwelling is or will be situated. (See Government Code Section 66313)*

Air Break. A physical separation which may be a low inlet into the indirect waste receptor from the fixture, appliance, or device indirectly connected.

Air Gap, Drainage. The unobstructed vertical distance through the free atmosphere between the lowest opening from a pipe, plumbing fixture, appliance, or appurtenance conveying waste to the flood-level rim of the receptor.

Air Gap, Water Distribution. The unobstructed vertical distance through the free atmosphere between the lowest opening from a pipe or faucet conveying potable water to the flood-level rim of a tank, vat, or fixture.

Alternate Water Source. Nonpotable source of water that includes but not limited to gray water, on-site treated nonpotable water, *on-site treated nonpotable gray water,* rainwater, and reclaimed (recycled) water.

Anchors. See Supports.

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.

Appliance, Low-Heat. A fuel-burning appliance that produces a continuous flue gas temperature, at the point of entrance to the flue, of not more than 1000°F (538°C).

Appliance, Medium-Heat. A fuel-burning appliance that produces a continuous flue gas temperature, at the point of entrance to the flue, of more than 1000°F (538°C) and less than 2000°F (1093°C).

Appliance Categorized Vent Diameter/Area. The minimum vent diameter/area permissible for Category I appliances to maintain a nonpositive vent static pressure when tested in accordance with nationally recognized standards. [NFPA 54:3.3.5]

Appliance Fuel Connector. An assembly of listed semirigid or flexible tubing and fittings to carry fuel between a fuel-piping outlet and a fuel-burning appliance.

Approved. Acceptable to the Authority Having Jurisdiction.

Exception: [HCD 1 & HCD 2] *"Approved" means meeting the approval of the Enforcing Agency, except as otherwise provided by law, when used in connection with any system, material, type of construction, fixture or appliance as the result of investigations and tests conducted by the agency, or by reason of accepted principles or tests by national authorities, or technical, health, or scientific organizations or agencies.*

Notes:

1. *See Health and Safety Code Section 17920 for "Approved" as applied to residential construction and buildings or structures accessory thereto as referenced in Section 1.8.2.*
2. *See Health and Safety Code Section 17921.1 for "Approved" as applied to the use of the hotplates in residential construction as referenced in Section 1.8.2.*
3. *See Health and Safety Code 19966 for "Approved" as applied to Factory-Built Housing as referenced in Section 1.8.3.2.5.*
4. *See Health and Safety Code Section 18201 for "Approved" as applied to Mobilehome Parks as referenced in Section 1.8.2.*
5. *See Health and Safety Code Section 18862.1 for "Approved" as applied to Special Occupancy Parks as referenced in Section 1.8.2.*

Approved Testing Agency. An organization primarily established for purposes of testing to approved standards and approved by the Authority Having Jurisdiction.

[HCD 1 & HCD 2] *"Approved Testing Agency" is any agency which is determined by the enforcing agency, except*

as otherwise provided by statute, to have adequate personnel and expertise to carry out the testing of systems, materials, and construction fixtures or appliances.

Area Drain. A receptor designed to collect surface or storm water from an open area.

Aspirator. A fitting or device supplied with water or other fluid under positive pressure that passes through an integral orifice or constriction, causing a vacuum.

Authority Having Jurisdiction. The organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, installations, or procedures. The Authority Having Jurisdiction shall be a federal, state, local, or other regional department or an individual such as a plumbing official, mechanical official, labor department official, health department official, building official, or others having statutory authority. In the absence of statutory authority, the Authority Having Jurisdiction may be some other responsible party. This definition shall include the Authority Having Jurisdiction's duly authorized representative.

[HCD 1 & HCD 2] *"Authority Having Jurisdiction" shall mean "Enforcing Agency" as defined in Section 207.0 of this code.*

204.0 – B –

Backflow. The flow of water or other liquids, mixtures, or substances into the distributing pipes of a potable supply of water from sources other than its intended source. See Backpressure Backflow and Backsiphonage.

Backflow Connection. An arrangement whereby backflow can occur.

Backflow Preventer. A backflow prevention device, an assembly, or another method to prevent backflow into the potable water system.

Backpressure Backflow. Backflow due to an increased pressure above the supply pressure, which may be due to pumps, boilers, gravity, or other sources of pressure.

Backsiphonage. The flowing back of used, contaminated, or polluted water from a plumbing fixture or vessel into a water supply pipe due to a pressure less than atmospheric in such pipe. See Backflow.

Backwater Valve. A device installed in a drainage system to prevent reverse flow.

Bathroom. A room equipped with a shower, bathtub, or combination bath/shower.

Bathroom, Half. A room equipped with only a water closet and lavatory.

Bathroom Group. Any combination of fixtures, not to exceed one water closet, two lavatories, either one bathtub or one combination bath/shower, and one shower, and may include a bidet and an emergency floor drain.

Battery of Fixtures. A group of two or more similar, adjacent fixtures that discharge into a common horizontal waste or soil branch.

Bedpan Steamer. A fixture that is used to sterilize bedpans by way of steam.

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

Boiler Blowoff. An outlet on a boiler to permit emptying or discharge of sediment.

Bonding Jumper. A reliable conductor to ensure the required electrical conductivity between metal parts required to be electrically connected. [NFPA 70:100 (Part I)]

Bottle Filling Station. A plumbing fixture connected to the potable water distribution system and sanitary drainage system that is designed and intended for filling personal use drinking water bottles or containers not less than 10 inches (254 mm) in height. Such fixtures can be separate from or integral to a drinking fountain and can incorporate a water filter and a cooling system for chilling the drinking water.

Branch. A part of the piping system other than a main, riser, or stack.

Branch, Fixture. See Fixture Branch.

Branch, Horizontal. See Horizontal Branch.

Branch Vent. A vent connecting one or more individual vents with a vent stack or stack vent.

Building. A structure built, erected, and framed of component structural parts designed for the housing, shelter, enclosure, or support of persons, animals, or property of any kind.

Exceptions: [HCD 1 & HCD 2] *"BUILDING" shall not include the following:*

1. *Any mobilehome as defined in Health and Safety Code Section 18008.*
2. *Any manufactured home as defined in Health and Safety Code Section 18007.*
3. *Any commercial modular as defined in Health and Safety Code Section 18001.8 or any special purpose commercial modular as defined in Section 18012.5.*
4. *Any recreational vehicle as defined in Health and Safety Code Section 18010.*
5. *Any multifamily manufactured home as defined in Health and Safety Code Section 18008.7.*

For additional information, see Health and Safety Code Section 18908.

Building Drain. That part of the lowest piping of a drainage system that receives the discharge from soil, waste, and other drainage pipes inside the walls of the building and conveys it to the building sewer beginning 2 feet (610 mm) outside the building wall.

Building Drain (Sanitary). A building drain that conveys sewage only.

Building Drain (Storm). A building drain that conveys storm water or another drainage, but no sewage.

Building Sewer. That part of the horizontal piping of a drainage system that extends from the end of the building drain and that receives the discharge of the building drain and conveys it to a public sewer, private sewer, private sewage disposal system, or another point of disposal.

Building Sewer (Combined). A building sewer that conveys both sewage and storm water or other drainage.

installed within the structure, it shall be installed in accordance with the provisions of this code. Alternative materials and methods shall be permitted provided that the design complies with the intent of the code, and that such alternatives shall perform to protect health and safety for the intended purpose.

305.0 Damage to Drainage System or Public Sewer.

305.1 Unlawful Practices. It shall be unlawful for a person to deposit, by any means whatsoever, into a plumbing fixture, floor drain, interceptor, sump, receptor, or device, which is connected to a drainage system, public sewer, private sewer, septic tank, or cesspool, any ashes; cinders; solids; rags; inflammable, poisonous, or explosive liquids or gases; oils; grease; or any other thing whatsoever that is capable of causing damage to the drainage system or public sewer.

306.0 Industrial Wastes.

306.1 Detrimental Wastes. Wastes detrimental to the public sewer system or detrimental to the functioning of the sewage treatment plant shall be treated and disposed of as found necessary and directed by the Authority Having Jurisdiction.

306.2 Safe Discharge. Sewage or other waste from a plumbing system that is capable of being deleterious to surface or subsurface waters shall not be discharged into the ground or a waterway unless it has first been rendered safe by some acceptable form of treatment in accordance with the Authority Having Jurisdiction.

307.0 Location.

307.1 System. Except as otherwise provided in this code, no plumbing system, drainage system, building sewer, private sewage disposal system, or parts thereof shall be located in a lot other than the lot that is the site of the building, structure, or premises served by such facilities.

307.2 Ownership. No subdivision, sale, or transfer of ownership of existing property shall be made in such manner that the area, clearance, and access requirements of this code are decreased.

308.0 Prohibited Locations.

308.1 General. Piping, fixtures, appliances, or equipment shall not be so located as to interfere with the normal use thereof or with the normal operation and use of windows, doors, or other required facilities.

309.0 Workmanship.

309.1 Engineering Practices. Design, construction, and workmanship shall be in accordance with accepted engineering practices and shall be of such character as to secure the results sought to be obtained by this code.

309.2 Concealing Imperfections. It is unlawful to conceal cracks, holes, or other imperfections in materials by welding, brazing, or soldering or by using therein or thereon paint, wax, tar, solvent cement, or other leak-sealing or repair agent.

309.3 Burred Ends. Burred ends of pipe and tubing shall be reamed to the full bore of the pipe or tube, and chips shall be removed.

309.4 Installation Practices. Plumbing systems shall be installed in a workmanlike manner which is in accordance with this code, applicable standards, and the manufacturer's installation instructions. All materials shall be installed so as not to adversely affect the systems and equipment or the structure of the building, and in compliance with all laws and other provisions of this code. All plumbing systems shall be in accordance with construction documents approved by the Authority Having Jurisdiction.

309.5 Sound Transmission. Plumbing piping systems shall be designed and installed in conformance with sound limitations as required in the *California Building Code*.

309.6 Dead Legs. Dead legs shall have a method of flushing.

310.0 Prohibited Fittings and Practices.

310.1 Fittings. No double hub fitting, single or double tee branch, single or double tapped tee branch, side inlet quarter bend, running thread, band, or saddle shall be used as a drainage fitting.

310.2 Drainage and Vent Piping. No drainage or vent piping shall be drilled and tapped for the purpose of making connections thereto, and no cast-iron soil pipe shall be threaded.

310.3 Waste Connection. No waste connection shall be made to a closet bend or stub of a water closet or similar fixture.

310.4 Use of Vent and Waste Pipes. Except as hereinafter provided in Section 908.0 through Section 911.0, no vent pipe shall be used as a soil or waste pipe, nor shall a soil or waste pipe be used as a vent. Also, single-stack drainage and venting systems with unvented branch lines are prohibited.

310.5 Obstruction of Flow. No fitting, fixture and piping connection, appliance, device, or method of installation that obstructs or retards the flow of water, wastes, sewage, or air in the drainage or venting systems, in an amount exceeding the normal frictional resistance to flow, shall be used unless it is indicated as acceptable in this code or is approved in accordance with Section 301.2 of this code. The enlargement of a 3 inch (80 mm) closet bend or stub to 4 inches (100 mm) shall not be considered an obstruction.

310.6 Dissimilar Metals. Except for necessary valves, where intermembering or mixing of dissimilar metals occurs, the point of connection shall be confined to exposed or accessible locations.

310.7 Direction of Flow. Valves, pipes, and fittings shall be installed in correct relationship to the direction of flow.

310.8 Screwed Fittings. Screwed fittings shall be ABS, cast-iron, copper, copper alloy, malleable iron, PVC, steel, or other approved materials. Threads shall be tapped out of solid metal or molded in solid ABS or PVC.

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.

310.11 [OSHPD 1, 2, 3, 4 & 5] *Drainage piping over operating and delivery rooms, nurseries, food preparation centers, food-serving facilities, food storage areas, compounding ante and buffer rooms and other sensitive areas shall be kept to a minimum and shall not be exposed. Special precautions shall be taken to protect these areas from possible leakage from necessary overhead drainage piping systems. Piping over switchboards, panel boards, and motor control centers are subject to restrictions of the California Electrical Code where applicable.*

310.12 [OSHPD 1, 3, 4 & 5] *Floor drains, waste traps, sanitary drainage cleanouts and handwashing fixtures shall not be installed in operating and delivery rooms. Floor drains with self-priming traps may be installed in cystoscopic rooms. Floor drains shall not be installed in compounding buffer or ante rooms.*

310.13 [SFM] *For applications listed in Section 1.11.0 regulated by the Office of the State Fire Marshal, plastic piping shall not be exposed as a portion of the interior room finish in a building or structure if the piping has a flame-spread rating exceeding 75 when tested in accordance with ASTM E84, "Test for Surface Burning Characteristics of Building Materials."*

310.14 Services/Systems and Utilities. [OSHPD 1, 2, 4 & 5] *Refer to Sections 1224.4.1, 1225.2.1 and 1228.4.1.1, California Building Code.*

310.15 Telephone and Data Equipment Rooms. [OSHPD 1, 4 & 5] *Where telecommunications service entrance rooms, technology equipment centers, or technology distribution rooms are provided in accordance with Section 1224.5 of the California Building Code, plumbing equipment and fixtures that are not directly related to the support of the room shall not be installed in or pass through the room.*

311.0 Independent Systems.

311.1 General. The drainage system of each new building and new work installed in an existing building shall be separate and independent from that of any other building, and, where available, every building shall have an independent connection with a public or private sewer.

Exception: Where one building stands in the rear of another building on an interior lot, and no public or private sewer is available or can be constructed to the rear building through an adjoining court, yard, or driveway, the building drain from the front building shall be permitted to be extended to the rear building.

Note: *Accessory dwelling units are not required to have independent service utility (drainage) connections provided they meet the specific requirements in Government Code Section 66313.*

312.0 Protection of Piping, Tubing, Materials, and Structures.

312.1 General. Piping passing under or through walls shall be protected from breakage. Piping passing through or under cinders or other corrosive materials shall be protected from external corrosion in an approved manner. Approved provisions shall be made for expansion of hot water piping. Voids around piping passing through concrete floors on the ground shall be sealed.

312.2 Installation. Piping in connection with a plumbing system shall be so installed that piping or connections will not be subject to undue strains or stresses, and provisions shall be made for expansion, contraction, and structural settlement. No plumbing piping shall be directly embedded in concrete or masonry. No structural member shall be seriously weakened or impaired by cutting, notching, or otherwise, as defined in the *California Building Code or California Residential Code.*

312.3 Building Sewer and Drainage Piping. No building sewer or other drainage piping or part thereof, constructed of materials other than those approved for use under or within a building, shall be installed under or within 2 feet (610 mm) of a building or structure, or less than 1 foot (305 mm) below the surface of the ground.

312.4 Corrosion, Erosion, and Mechanical Damage. Piping subject to corrosion, erosion, or mechanical damage shall be protected in an approved manner.

312.5 Protectively Coated Pipe. Protectively coated pipe or tubing shall be inspected and tested, and a visible void, damage, or imperfection to the pipe coating shall be repaired in an approved manner.

312.6 Freezing Protection. No water, soil, or waste pipe shall be installed or permitted outside of a building, in attics or crawl spaces, or in an exterior wall unless, where necessary, adequate provision is made to protect such pipe from freezing.

312.7 Fire-Resistant Construction. Piping penetrations of fire-resistance-rated walls, partitions, floors, floor/ceiling assemblies, roof/ceiling assemblies, or shaft enclosures shall be protected in accordance with the requirements of the *California Building Code or California Residential Code.*

312.8 Waterproofing of Openings. Joints at the roof around pipes, ducts, or other appurtenances shall be made watertight by the use of lead, copper, galvanized iron, or other approved flashings or flashing material. Exterior wall openings shall be made watertight. Counterflashing shall not restrict the required internal cross-sectional area of the vent.

312.9 Steel Nail Plates. Plastic piping or tubing, and copper or copper alloy piping or tubing penetrating framing members to within 1 inch (25.4 mm) of the exposed framing shall be protected by steel nail plates not less than No. 18 gauge (0.0478 inches) (1.2 mm) in thickness. The steel nail plate shall extend along the framing member not less than 1½ inches (38 mm) beyond the outside diameter of the pipe or tubing. Fuel gas piping shall be protected in accordance with Section 1210.4.3.

312.10 Sleeves. Sleeves shall be provided to protect piping through concrete and masonry walls, and concrete floors.

Exception: Sleeves shall not be required where openings are drilled or bored.

CHAPTER 4

PLUMBING FIXTURES AND FIXTURE FITTINGS

Note: *In addition to the requirements of this chapter, buildings or facilities where accessibility is required for applications listed in California Code of Regulations, Title 24, Part 2 (California Building Code), Chapter 1, Section 1.9.1 regulated by the Division of the State Architect–Access Compliance shall also comply with Title 24, Part 2 , Chapter 11A or 11B, as applicable under authority cited by CA Government Code Section 4450 and in reference cited by CA Government Code Sections 4450 through 4461, 12955.1(c), and CA Health and Safety Code Sections 18949.1, 19952 through 19959.*

401.0 General.

401.1 Applicability. This chapter shall govern the materials and installation of plumbing fixtures, including faucets and fixture fittings, and the minimum number of plumbing fixtures required based on occupancy.

401.2 Quality of Fixtures. Plumbing fixtures shall be constructed of dense, durable, non-absorbent materials and shall have smooth, impervious surfaces, free from unnecessary concealed fouling surfaces.

401.3 Water-Conserving Fixtures and Fittings.

Note 1: [BSC-CG & DSA-SS] *Flow rates for specified plumbing fixtures for mandatory nonresidential construction are contained in Chapter 5, Division 5.3 of the California Green Building Standards Code (Part 11, Title 24, California Code of Regulations - CALGreen). Scoping provisions applicable to nonresidential additions and alterations are contained in Section 301.3 of CALGreen.*

Note 2: [BSC-CG] *On and after January 1, 2014, certain commercial real property, as defined in Civil Code Section 1101.3, shall have its noncompliant plumbing fixtures replaced with appropriate water-conserving plumbing fixtures under specific circumstances. See Civil Code Section 1101.1 et seq. for definitions, types of commercial real property affected, effective dates, circumstances necessitating replacement of noncompliant plumbing fixtures, and duties and responsibilities for ensuring compliance.*

[HCD-1] *All noncompliant plumbing fixtures in any residential real property shall be replaced with water-conserving plumbing fixtures. Plumbing fixture replacement is required prior to issuance of a certificate of final completion, certificate of occupancy, or final permit approval by the local building department. See Civil Code Section 1101.1, et seq., for the definition of a noncompliant plumbing fixture, types of residential buildings affected and other important enactment dates.*

Note 3: [OSHPD 1, 2, 3 & 4] *Also refer to Title 20, California Code of Regulations, Division 2, Chapter 4, Article 4, Section 1605.3 (i).*

Note 4: Appliance Efficiency Regulations – Water Efficiency. [CEC] *Where California law in Title 20 Sections 1601 et seq. applying to water-using appliances sold or offered for sale within the state specifies a lower maximum flow rate than specified in Section 407.2, 408.3, or 411.2, the lower maximum flow rate shall be required.*

402.0 Installation.

402.1 Cleaning. Plumbing fixtures shall be installed in a manner to afford easy access for repairs and cleaning. Pipes from fixtures shall be run to the nearest wall.

402.2 Joints. Where a fixture comes in contact with the wall or floor, the joint between the fixture and the wall or floor shall be made watertight.

402.3 Securing Fixtures. Floor-outlet or floor-mounted fixtures shall be rigidly secured to the drainage connection and to the floor, where so designed, by screws or bolts of copper, copper alloy, or other equally corrosion-resistant material.

402.4 Wall-Hung Fixtures. Wall-hung fixtures shall be rigidly supported by metal supporting members so that no strain is transmitted to the connections. Floor-affixed supports for off-the-floor plumbing fixtures for public use shall comply with ASME A112.6.1M. Framing-affixed supports for off-the-floor water closets with concealed tanks shall comply with ASME A112.6.2. Flush tanks and similar appurtenances shall be secured by approved non-corrosive screws or bolts.

402.5 Setting. Fixtures shall be set level and in proper alignment with reference to adjacent walls. No water closet or bidet shall be set closer than 15 inches (381 mm) from its center to a side wall or obstruction or closer than 30 inches (762 mm) center to center to a similar fixture. The clear space in front of a water closet, lavatory, or bidet shall be not less than 24 inches (610 mm). No urinal shall be set closer than 12 inches (305 mm) from its center to a side wall or partition or closer than 24 inches (610 mm) center to center.

Exception: The installation of paper dispensers or accessibility grab bars shall not be considered obstructions.

402.6 Flanged Fixture Connections. Fixture connections between drainage pipes and water closets, floor outlet service sinks and urinals shall be made using an approved copper alloy, hard lead, ABS, PVC, or iron flanges caulked, soldered, solvent cemented; rubber compression gaskets; or screwed to the drainage pipe. The connection shall be bolted with an approved gasket, washer, or setting compound between the fixture and the connection. The bottom of the flange shall be set on the top of the finished floor.

Wall-mounted water closet fixtures shall be securely bolted to an approved carrier fitting. The approved carrier fitting shall be securely attached to the structure. The connecting pipe between the carrier fitting and the fixture shall be an approved material and designed to accommodate an adequately sized gasket. Gasket material shall be neoprene, felt, or similar approved types.

402.6.1 Closet Rings (Closet Flanges). Closet rings (closet flanges) for water closets or similar fixtures shall be of an approved type and shall be copper alloy, copper, hard lead, cast-iron, galvanized malleable iron,

ABS, PVC, or other approved materials. Closet rings (closet flanges) shall be approximately 7 inches (178 mm) in diameter and, where installed, shall, together with the soil pipe, present a 1½ inch (38 mm) wide flange or face to receive the fixture gasket or closet seal.

Caulked-on closet rings (closet flanges) shall be not less than ¼ of an inch (6.4 mm) thick and not less than 2 inches (51 mm) in overall depth.

Closet rings (closet flanges) shall be burned or soldered to lead bends or stubs, shall be caulked to cast-iron soil pipe, shall be solvent cemented to ABS and PVC, and shall be screwed or fastened in an approved manner to other materials.

Closet bends or stubs shall be cut-off to present a smooth surface even with the top of the closet ring before the rough inspection is called.

Closet rings (closet flanges) shall be adequately designed and secured to support fixtures connected thereto.

402.6.2 Securing Closet Flanges. Closet screws, bolts, washers, and similar fasteners shall be of copper alloy, copper, or other listed equally corrosion-resistant materials. Screws and bolts shall be of a size and number to properly support the fixture installed.

402.6.3 Securing Floor-Mounted, Back-Outlet Water Closet Bowls. Floor-mounted, back-outlet water closet bowls shall be set level with an angle of 90 degrees (1.57 rad) between the floor and wall at the centerline of the fixture outlet. The floor and wall shall have a flat mounting surface not less than 5 inches (127 mm) to the right and left of the fixture outlet centerline. The closet flange shall be secured to the wall mounting surface. Offset, eccentric, or reducing closet flanges shall not be permitted with these fixtures.

The fixture shall be secured to the wall outlet flange or drainage connection and the floor by corrosion-resistant screws or bolts.

402.7 Supply Fittings. The supply lines and fittings for every plumbing fixture shall be so installed as to prevent backflow in accordance with Chapter 6.

402.8 Installation. Fixtures shall be installed in accordance with the manufacturer's installation instructions.

402.9 Design and Installation of Plumbing Fixtures. Plumbing fixtures shall be installed in accordance with the manufacturer's installation instructions. The means of backflow prevention shall not be compromised by the designated fixture fitting mounting surface.

402.10 Slip Joint Connections. Fixtures having concealed slip joint connections shall be provided with an access panel or utility space not less than 12 inches (305 mm) in its least dimension and so arranged without obstructions as to make such connections accessible for inspection and repair.

402.11 Future Fixtures. Where provisions are made for the future installation of fixtures, those provided for shall be considered in determining the required sizes of the drain and water supply piping. Construction for future installations shall be terminated with a plugged fitting or fittings. Where the plugged fitting is at the point where the trap of a fixture is installed, the plumbing system for such fixture shall be complete and be in accordance with the plumbing requirements of this code.

403.0 Accessible Plumbing Facilities.

403.1 General. Where accessible facilities are required in applicable building regulations, the facilities shall be installed in accordance with those regulations. ***[HCD 1-AC]*** *For specific requirements regarding accommodations for persons with disabilities, see Chapter 11A of the California Building Code.*

403.2 Fixtures and Fixture Fittings for Persons with Disabilities. Plumbing fixtures and fixture fittings for persons with disabilities shall be in accordance with the applicable standards referenced in Chapter 4. ***[HCD 1-AC]*** *Specific requirements regarding accommodations for persons with disabilities are contained in Chapter 11A of the California Building Code.*

403.3 Exposed Pipes and Surfaces. Water supply and drainpipes under accessible lavatories and sinks shall be insulated or otherwise be configured to protect against contact. Protectors, insulators, or both shall comply with ASME A112.18.9 or ASTM C1822. ***[HCD 1-AC]*** *Specific requirements regarding accommodations for persons with disabilities are contained in Chapter 11A of the California Building Code.*

404.0 Waste Fittings and Overflows.

404.1 Waste Fittings. Waste fittings shall comply with ASME A112.18.2/CSA B125.2, ASTM F409 or Table 701.2 for aboveground drainage piping and fittings.

404.2 Overflows. Where a fixture is provided with an overflow, the overflow shall comply with Section 404.2.1 or Section 404.2.2.

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.

405.0 Prohibited Fixtures.

405.1 Prohibited Water Closets. Water closets having an invisible seal or an unventilated space or having walls which are not thoroughly washed at each discharge shall be prohibited. A water closet that might permit siphonage of the contents of the bowl back into the tank shall be prohibited.

405.2 Prohibited Urinals. Trough urinals and urinals with an invisible seal shall be prohibited.

405.3 Miscellaneous Fixtures. Fixed wooden, or tile wash sinks for domestic use shall not be installed in a building designed or used for human habitation. No sheet metal-lined wooden bathtub shall be installed or reconnected. No dry or chemical closet (toilet) shall be installed in a building used for human habitation unless first approved by the Health Officer.

422.4.1 Access to Toilet Facilities. In multi-story buildings, accessibility to the required toilet facilities shall not exceed one vertical story. Access to the required toilet facilities for customers shall not pass through areas designated as for employee use only such as kitchens, food preparation areas, storage rooms, closets, or similar spaces. Toilet facilities accessible only to private offices shall not be counted to determine compliance with this section.

422.5 Toilet Facilities for Workers. Toilet facilities shall be provided and maintained in a sanitary condition for the use of workers during construction.

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.

(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.*

422.8 Cosmetology. [CA] *Each school shall provide public toilet rooms for each sex on the licensed premises in accordance with the California Plumbing Code, Table 422.1.*

422.9 Cosmetology Establishments. [CA] *Each establishment where hairdressing services are performed shall provide at least one public toilet room located on the premises in accordance with the California Plumbing Code, Table 422.1.*

422.10 Commissaries Serving Mobile Food Preparation Units. [DPH] *Commissaries serving mobile food preparation units shall have at least one hose bib. The hose bib shall be supplied with hot and cold water and be provided with a single spout, a backflow-preventer device and shall be located on the premises of the establishment.*

422.11 Employee Lavatories in Food Establishments. [DPH] *Employee lavatories installed in food establishments shall be equipped with an approved single spout capable of providing tempered (100ºF - 115ºF) (37.8ºC - 46.1ºC) running water.*

Note: *This requirement applies only to commissaries serving mobile food preparation units.*

TABLE 422.1
MINIMUM PLUMBING FACILITIES[1, 9]

Each building shall be provided with sanitary facilities, including provisions for persons with disabilities as prescribed by the Department Having Jurisdiction[8]. Table 422.1 applies to new buildings, additions to a building, and changes of occupancy or type in an existing building resulting in increased occupant load.

For requirements for persons with disabilities, Chapter 11A or 11B of the California Building Code shall be used.

Exceptions:

(1) ***[HCD 1-AC & HCD 2]*** *For applications listed in Sections 1.8.2.1.2 and 1.8.2.1.3 regulated by the Department of Housing and Community Development, each building shall be provided with sanitary facilities, including provisions for persons with disabilities as prescribed by the Department. Covered multifamily dwellings required to be accessible to persons with disabilities shall comply with Chapter 11A of the California Building Code. Permanent buildings in mobilehome parks and special occupancy parks required to be accessible by persons with disabilities, shall comply with Chapter 11B of the California Building Code.*

(2) ***[HCD 1]*** *For limited density owner-built rural dwelling sanitary facilities, the type, design and number of facilities as required and approved by the local health official shall be provided to the dwelling sites. It shall not be required that such facilities be located within the dwelling.*

TYPE OF OCCUPANCY[2]	WATER CLOSETS (FIXTURES PER PERSON)[3]		URINALS (FIXTURES PER PERSON)[4]	LAVATORIES (FIXTURES PER PERSON)[5]		BATHTUBS OR SHOWERS (FIXTURES PER PERSON)	DRINKING FOUNTAINS/ FACILITIES (FIXTURES PER PERSON)	OTHER[6, 7]
A-1 Assembly occupancy (fixed or permanent seating)- theaters, concert halls, and auditoriums	Male 1: 1-100 2: 101-200 3: 201-400	Female 1: 1-25 2: 26-50 3: 51-100 4: 101-200 6: 201-300 8: 301-400	Male 1: 1-200 2: 201-300 3: 301-400 4: 401-600	Male 1: 1-200 2: 201-400 3: 401-600 4: 601-750	Female 1: 1-100 2: 101-200 4: 201-300 5: 301-500 6: 501-750	—	1: 1-250 2: 251-500 3: 501-750	1 service sink or laundry sink
	Over 400, add 1 fixture for each additional 500 males and 1 fixture for each additional 125 females.		Over 600, add 1 fixture for each additional 300 males.	Over 750, add 1 fixture for each additional 250 males and 1 fixture for each additional 200 females.			Over 750, add 1 fixture for each additional 500 persons.	
A-2 Assembly occupancy- restaurants, pubs, lounges, nightclubs and banquet halls	Male 1: 1-50 2: 51-150 3: 151-300 4: 301-400	Female 1: 1-25 2: 26-50 3: 51-100 4: 101-200 6: 201-300 8: 301-400	Male 1: 1-200 2: 201-300 3: 301-400 4: 401-600	Male 1: 1-150 2: 151-200 3: 201-400	Female 1: 1-150 2: 151-200 4: 201-400	—	1: 1-250 2: 251-500 3: 501-750	1 service sink or laundry sink
	Over 400, add 1 fixture for each additional 250 males and 1 fixture for each 125 females.		Over 600, add 1 fixture for each additional 300 males.	Over 400, add 1 fixture for each additional 250 males and 1 fixture for each additional 200 females			Over 750, add 1 fixture for each additional 500 persons.	
A-3 Assembly occupancy (typical without fixed or permanent seating)- arcades, places of worship, museums, libraries, lecture halls, gymnasiums (without spectator seating), indoor pools (without spectator seating)	Male 1: 1-100 2: 101-200 3: 201-400	Female 1: 1-25 2: 26-50 3: 51-100 4: 101-200 6: 201-300 8: 301-400	Male 1: 1-100 2: 101-200 3: 201-400 4: 401-600	Male 1: 1-200 2: 201-400 3: 401-600 4: 601-750	Female 1: 1-100 2: 101-200 4: 201-300 5: 301-500 6: 501-750	—	1: 1-250 2: 251-500 3: 501-750	1 service sink or laundry sink
	Over 400, add 1 fixture for each additional 500 males and 1 fixture for each additional 125 females.		Over 600, add 1 fixture for each additional 300 males.	Over 750, add 1 fixture for each additional 250 males and 1 fixture for each additional 200 females.			Over 750, add 1 fixture for each additional 500 persons.	

TABLE 422.1
MINIMUM PLUMBING FACILITIES[1, 9] (continued)

TYPE OF OCCUPANCY[2]	WATER CLOSETS (FIXTURES PER PERSON)[3]		URINALS (FIXTURES PER PERSON)[4]	LAVATORIES (FIXTURES PER PERSON)[5]		BATHTUBS OR SHOWERS (FIXTURES PER PERSON)	DRINKING FOUNTAINS/ FACILITIES (FIXTURES PER PERSON)	OTHER[6, 7]
A-4 Assembly occupancy (indoor activities or sporting events with spectator seating)- swimming pools, skating rinks, arenas, and gymnasiums	Male 1: 1-100 2: 101-200 3: 201-400	Female 1: 1-25 2: 26-50 3: 51-100 4: 101-200 6: 201-300 8: 301-400	Male 1: 1-100 2: 101-200 3: 201-400 4: 401-600	Male 1: 1-200 2: 201-400 3: 401-750	Female 1: 1-100 2: 101-200 4: 201-300 5: 301-500 6: 501-750	—	1: 1-250 2: 251-500 3: 501-750	1 service sink or laundry sink
	Over 400, add 1 fixture for each additional 500 males and 1 fixture for each additional 125 females.		Over 600, add 1 fixture for each additional 300 males.	Over 750, add 1 fixture for each additional 250 males and 1 fixture for each additional 200 females.			Over 750, add 1 fixture for each additional 500 persons.	
A-5 Assembly occupancy (outdoor activities or sporting events)- amusement parks, grandstands and stadiums	Male 1: 1-100 2: 101-200 3: 201-400	Female 1: 1-25 2: 26-50 3: 51-100 4: 101-200 6: 201-300 8: 301-400	Male 1: 1-100 2: 101-200 3: 201-400 4: 401-600	Male 1: 1-200 2: 201-400 3: 401-750	Female 1: 1-100 2: 101-200 4: 201-300 5: 301-500 6: 501-750	—	1: 1-250 2: 251-500 3: 501-750	1 service sink or laundry sink
	Over 400, add 1 fixture for each additional 500 males and 1 fixture for each additional 125 females.		Over 600, add 1 fixture for each additional 300 males.	Over 750, add 1 fixture for each additional 250 males and 1 fixture for each additional 200 females.			Over 750, add 1 fixture for each additional 500 persons.	
B Business occupancy (office, professional or service type transactions)- banks, vet clinics, hospitals, car wash, banks, beauty salons, ambulatory health care facilities, laundries and dry cleaning, educational institutions (above high school), or training facilities not located within school, post offices and printing shops	Male 1: 1-50 2: 51-100 3: 101-200 4: 201-400	Female 1: 1-15 2: 16-30 3: 31-50 4: 51-100 8: 101-200 11: 201-400	Male 1: 1-100 2: 101-200 3: 201-400 4: 401-600	Male 1: 1-75 2: 76-150 3: 151-200 4: 201-300 5: 301-400	Female 1: 1-50 2: 51-100 3: 101-150 4: 151-200 5: 201-300 6: 301-400	—	1 per 150	1 service sink or laundry sink
	Over 400, add 1 fixture for each additional 500 males and 1 fixture for each additional 150 females.		Over 600, add 1 fixture for each additional 300 males.	Over 400, add 1 fixture for each additional 250 males and 1 fixture for each additional 200 females.				
E Educational occupancy-private or public schools	Male 1 per 50	Female 1 per 30	Male 1 per 100	Male 1 per 40	Female 1 per 40	—	1 per 150	1 service sink or laundry sink
F1, F2 Factory or Industrial occupancy-fabricating or assembly work	Male 1: 1-50 2: 51-75 3: 76-100	Female 1: 1-50 2: 51-75 3: 76-100	—	Male 1: 1-50 2: 51-75 3: 76-100	Female 1: 1-50 2: 51-75 3: 76-100	1 shower for each 15 persons exposed to excessive heat or to skin contamination with poisonous, infectious or irritating material	1: 1-250 2: 251-500 3: 501-750	1 service sink or laundry sink
	Over 100, add 1 fixture for each additional 40 persons.		—	Over 100, add 1 fixture for each additional 40 persons.			Over 750, add 1 fixture for each additional 500 persons.	

TABLE 422.1
MINIMUM PLUMBING FACILITIES[1, 9] (continued)

TYPE OF OCCUPANCY[2]		WATER CLOSETS (FIXTURES PER PERSON)[3]		URINALS (FIXTURES PER PERSON)[4]	LAVATORIES (FIXTURES PER PERSON)[5]		BATHTUBS OR SHOWERS (FIXTURES PER PERSON)	DRINKING FOUNTAINS/ FACILITIES (FIXTURES PER PERSON)	OTHER[6, 7]
I-1 Institutional occupancy (houses more than 16 persons on a 24-hour basis)- substance abuse centers, assisted living, group homes, or residential facilities		Male 1 per 15	Female 1 per 15	—	Male 1 per 15	Female 1 per 15	1 per 8	1 per 150	1 service sink or laundry sink
I-2 Institutional occupancy-medical, psychiatric, surgical or nursing homes	Hospitals and nursing homes-individual rooms and ward room	1 per room		—	1 per room		1 per room	1 per 150	1 service sink or laundry sink
		1 per 8 patients		—	1 per 10 patients		1 per 20 patients		
	Hospital Waiting or Visitor Rooms	1 per room		—	1 per room		—	1 per room	—
	Employee Use	Male 1: 1-15 2: 16-35 3: 36-55	Female 1: 1-15 3: 16-35 4: 36-55	—	Male 1 per 40	Female 1 per 40	—	—	—
		Over 55, add 1 fixture for each additional 40 persons.							
I-3 Institutional occupancy (houses more than 5 people)	Prisons	1 per cell		—	1 per cell		1 per 20	1 per cell block/floor	—
	Correctional facilities or juvenile center	1 per 8		—	1 per 10		1 per 8	1 per floor	1 service sink or laundry sink
	Employee Use	Male 1: 1-15 2: 16-35 3: 36-55	Female 1: 1-15 3: 16-35 4: 36-55	—	Male 1 per 40	Female 1 per 40	—	1 per 150	—
		Over 55, add 1 fixture for each additional 40 persons.							
I-4 Institutional occupancy (any age that receives care for less than 24 hours)		Male 1: 1-15 2: 16-35 3: 36-55	Female 1: 1-15 3: 16-35 4: 36-55	—	Male 1 per 40	Female 1 per 40	—	1 per 150	1 service sink or laundry sink
		Over 55, add 1 fixture for each additional 40 persons.							
M Mercantile occupancy (the sale of merchandise and accessible to the public)		Male 1: 1-100 2: 101-200 3: 201-400	Female 1: 1-100 2: 101-200 4: 201-300 6: 301-400	Male 0: 1-200 1: 201-400	Male 1: 1-200 2: 201-400	Female 1: 1-200 2: 201-300 3: 301-400	—	1: 1-250 2: 251-500 3: 501-750	1 service sink or laundry sink
		Over 400, add 1 fixture for each additional 500 males and 1 fixture for each 200 females.		Over 400, add 1 fixture for each additional 500 males.	Over 400, add 1 fixture for each additional 500 males and 1 fixture for each 400 females.		—	Over 750, add 1 fixture for each additional 500 persons.	—

TABLE 422.1
MINIMUM PLUMBING FACILITIES[1, 9] (continued)

TYPE OF OCCUPANCY[2]		WATER CLOSETS (FIXTURES PER PERSON)[3]		URINALS (FIXTURES PER PERSON)[4]	LAVATORIES (FIXTURES PER PERSON)[5]		BATHTUBS OR SHOWERS (FIXTURES PER PERSON)	DRINKING FOUNTAINS/ FACILITIES (FIXTURES PER PERSON)	OTHER[6, 7]
R-1 Residential occupancy (minimal stay)-hotels, motels, bed and breakfast homes		1 per sleeping room		—	1 per sleeping room		1 per sleeping room	—	1 service sink or laundry sink
R-2 Residential occupancy (long-term or permanent)	Dormitories	Male 1 per 10	Female 1 per 8	Male 1 per 25	Male 1 per 12	Female 1 per 12	1 per 8	1 per 150	1 service sink or laundry sink
		Add 1 fixture for each additional 25 males and 1 fixture for each additional 20 females.		Over 150, add 1 fixture for each additional 50 males.	Add 1 fixture for each additional 20 males and 1 fixture for each additional 15 females.				
	Employee Use	Male 1: 1-15 2: 16-35 3: 36-55	Female 1: 1-15 3: 16-35 4: 36-55	—	Male 1 per 40	Female 1 per 40	—	—	
		Over 55, add 1 fixture for each additional 40 persons							
	Apartment house/unit	1 per apartment		—	1 per apartment		1 per apartment	—	1 kitchen sink per apartment. 1 laundry sink or 1 automatic clothes washer connection per unit or 1 laundry sink or 1 automatic clothes washer connection for each 12 units
R-3 Residential occupancy (long-term or permanent in nature) for more than 5 but does not exceed 16 occupants)		Male 1 per 10	Female 1 per 8	—	Male 1 per 12	Female 1 per 12	1 per 8	1 per 150	1 service sink or laundry sink
		Add 1 fixture for each additional 25 males and 1 fixture for each additional 20 females.			Add 1 fixture for each additional 20 males and 1 fixture for each additional 15 females.				
R-3 Residential occupancy (one and two family dwellings)		1 per one and two family dwelling		—	1 per one and two family dwelling		1 per one and two family dwelling	—	1 kitchen sink and 1 automatic clothes washer connection per one and two family dwelling
R-4 Residential occupancy (residential care or assisted living)		Male 1 per 10	Female 1 per 8	—	Male 1 per 12	Female 1 per 12	1 per 8	1 per 150	1 service sink or laundry sink
		Add 1 fixture for each additional 25 males and 1 fixture for each additional 20 females.			Add 1 fixture for each additional 20 males and 1 fixture for each additional 15 females.				

TABLE 422.1
MINIMUM PLUMBING FACILITIES[1, 9] (continued)

TYPE OF OCCUPANCY[2]	WATER CLOSETS (FIXTURES PER PERSON)[3]		URINALS (FIXTURES PER PERSON)[4]	LAVATORIES (FIXTURES PER PERSON)[5]		BATHTUBS OR SHOWERS (FIXTURES PER PERSON)	DRINKING FOUNTAINS/ FACILITIES (FIXTURES PER PERSON)	OTHER[6, 7]
S-1, S-2 Storage occupancy-storage of goods, warehouse, aircraft hanger, food products, appliances	Male 1: 1-100 2: 101-200 3: 201-400	Female 1: 1-100 2: 101-200 3: 201-400	—	Male 1: 1-200 2: 201-400 3: 401-750	Female 1: 1-200 2: 201-400 3: 401-750	—	1: 1-250 2: 251-500 3: 501-750	1 service sink or laundry sink
	Over 400, add 1 fixture for each additional 500 males and 1 fixture for each additional 150 females.			Over 750, add 1 fixture for each additional 500 persons.			Over 750, add 1 fixture for each additional 500 persons.	

Notes:

1 The figures shown are based upon one fixture being the minimum required for the number of persons indicated or any fraction thereof.

2 A restaurant is defined as a business that sells food to be consumed on the premises.
a. The number of occupants for a drive-in restaurant shall be considered as equal to the number of parking stalls.
b. Hand-washing facilities shall be available in the kitchen for employees.

3 The total number of required water closets for females shall be not less than the total number of required water closets and urinals for males. ***[BSC]*** *This requirement shall not apply when single occupancy toilet facilities are provided for each sex in an A or E occupancy with an occupant load of less than 50. Either*
a. The required urinal shall be permitted to be omitted or
b. If installed, the urinal shall not require a second water closet to be provided for the female.

4 For each urinal added in excess of the minimum required, one water closet shall be permitted to be deducted. The number of water closets shall not be reduced to less than two-thirds of the minimum requirement.

5 Metering or self-closing faucets shall be installed on lavatories intended to serve the transient public.

6 Service sinks shall not be required for non-residential occupancies with an occupant load of 15 or less.

7 For business and mercantile occupancies, one common service sink shall be permitted when accessible to all businesses and mercantile within 300 feet (91 440 mm) and within the same story.

8 ***[BSC, DSA-AC, DSA-SS, HCD 1 & HCD 2, OSHPD 1, 2, 3, 4 & 5]*** *In accordance with Sections 1.8.7 and 301.3, the Authority Having Jurisdiction may approve alternative design criteria when determining the minimum number of plumbing fixtures.*

9 ***[BSC & DSA-SS]*** *The total occupant load shall be determined in accordance with the California Building Code or Table 4-1 Occupant Load Factor.*

TABLE 4-1
OCCUPANT LOAD FACTOR:
[BSC & DSA-SS]

FUNCTION OF SPACE ***	*OCCUPANT LOAD FACTOR (square feet)*
Assembly - *without fixed seats* *Auditorium, convention and dance hall, lodge, stage, indoor sport/spectator event, worship, arcade, gaming (standing space)*	*11*
Waiting, terminal (portable seating space)	*15*
Conference, dining/drinking, lounge (portable seating/table space)	*30*
Gallery, museum, exhibit (standing space)	*30*
Assembly *– with fixed seats*	*See CBC 1004.6* *Use 50% of the fixed seating value*
Business *(office, sales/soliciting, administration, food processing, courtroom, ambulatory clinic)*	*150* *See CBC 1004.8*
Dormitory	*50*
Day care	*35*
Education *(classroom)* *Through 12th grade*	*30*
Education *(classroom)* *Beyond 12th grade*	*50*
Exercise *(fitness)*	*50*
Industrial *(fabrication, foundry, workshop, component assembly, repair)*	*500*
Kitchen/food prep *(commercial)*	*50*
Laboratory *Educational*	*50*
Laboratory *Non-educational*	*100*
Library	*50*
Mercantile *(wholesale, retail)*	*100*
Mall building *(covered/open)*	*See CBC 402.8.2*
Residential *(long term: central toilet facilities)*	*200*
Warehouse *Storage portions*	*4000*
Warehouse *Distribution portions (selecting, processing, packing, receiving, shipping)*	*500*

* *Any uses not specifically listed shall be based on similar uses listed in this table.*

** *For a building or space with mixed occupancies, use appropriate occupancy group for each area (for example, a school may have an "A" occupancy for the gymnasium, a "B" occupancy for the office, an "E" occupancy for the classrooms, etc.). Accessory areas such as, but not limited to, hallways/corridors, stairways, ramps, toilet rooms, mechanical rooms, closets and fixed equipment, may be excluded.*

TABLE 4-2
[OSHPD 1, 2, 3, 4 & 5][24] MINIMUM PLUMBING FACILITIES

SPACE	HANDWASHING FIXTURE	SCRUB SINKS[3]	TOILETS	BATHTUBS OR SHOWERS	SERVICE SINKS[1]	CLINIC SINKS
Administration Lobby						
Public Toilet - Male	*1*[2]		*1*			
Public Toilet - Female	*1*[2]		*1*			
Airborne infection isolation room	*1*[20]					
Airborne infection isolation treatment/exam room	*1*[20]					
Airborne infection isolation anteroom	*1*					
Airborne infection isolation toilet room	*1*[2]		*1*[5]	*1*[5]		
Cardiac Catheterization procedure room		*1*[4, 33]				
Central Sterile Supply	*1*[15]					
Cesarean/Delivery Service Space						
Labor Rooms	*1*[33]		*1*[9]	*1*[9]		
Recovery Room	*1*[33]					*1*
Drug distribution station	*1*					
Cesarean operating room		*2*[10, 33]				
Delivery room		*1*[10, 33]				
LDR or LDRP room	*1*[33]		*1*	*1*		
Staff lounge						
Staff Toilet - Male	*1*[2]		*1:1-15*			
Staff Toilet - Female	*1*[2]		*1:1-15*			
Waiting area/room						
Public Toilet - Male	*1*[2]		*1*			
Public Toilet - Female	*1*[2]		*1*			
Clinical Laboratory Service Space[11]	*1*					
Dietetic Service Space					*1*	
Kitchen	*1*[33]					
Dining Area	*1*[16]		*1*[16]			
Food serving area	*1*[33]					
Food Preparation	*1*[33]					
Dietary Staff Toilet - Male	*1*[2]		*1:1-15*			
Dietary Staff Toilet - Female	*1*[2]		*1:1-15*			
Emergency Service	*1*					
Open plan	*1:4 cubicles*		*1*			
Observation unit(s)	*1:4 cubicles*		*1:6 beds*			
Trauma/Cardiac, Emergency surgery, Cystoscopy, Cast Room		*1*[4,33]				
Intensive Care Units[7]					*1*	*1*
Open plan	*1:3 beds*[33]					
Patient rooms[28]	*1*[33]					
Newborn Intensive Care Unit (NICU)	*1:4 bassinets*[17, 33]				*1*	*1*
Treatment area/room	*1*					
Control station	*1*[33]					
Staff lounge						
Staff Toilet - Male	*1*[2]		*1:1-15*			
Staff Toilet - Female	*1*[2]		*1:1-15*			

CHAPTER 15

ALTERNATE WATER SOURCES FOR NONPOTABLE APPLICATIONS

1501.0 General.

1501.1 Applicability. ***[BSC-CG, DWR & HCD 1]*** The provisions of this chapter shall apply to the construction, alteration, *discharge, use* and repair of alternate water source systems for nonpotable applications.

1501.1.1 Allowable Use of Alternate Water. Where approved or required by the Authority Having Jurisdiction, alternate water sources [reclaimed (recycled) water, gray water, and on-site treated nonpotable *gray* water] shall be permitted to be used instead of potable water for the applications identified in this chapter.

1501.2 System Design. ***[BSC-CG, HCD 1 & DWR]*** Alternate water source systems shall be designed in accordance with this chapter by a registered design professional *or licensed person who demonstrates competency to design the alternate water source system as required by the Authority Having Jurisdiction*. Components, piping, and fittings used in any alternate water source system shall be listed.

[BSC-CG & HCD 1] *Irrigation design plans shall meet the requirements of the California Code of Regulations, Title 23, Division 2, Chapter 2.7, Model Water Efficient Landscape Ordinance.*

Exceptions:

(1) A registered design professional *or a licensed person who demonstrates competency to design the alternate water source system* is not required to design gray water systems having a maximum discharge capacity of 250 gallons per day (gal/d) (0.011 L/s) for single family and multi-family dwellings.

(2) A registered design professional *or a licensed person who demonstrates competency to design the alternate water source system* is not required to design an on-site treated nonpotable water system for single-family dwellings having a maximum discharge capacity of 250 gal/d (0.011 L/s).

1501.3 Permit. ***[BSC-CG, HCD 1 & DWR]*** It shall be unlawful for a person to construct, install, alter, or cause to be constructed, installed, or altered an alternate water source system in a building or on *its* premise*s* without first obtaining a permit to do such work from the Authority Having Jurisdiction. *No changes or connections shall be made to either the alternate water source system or the potable water system within a site containing an alternate water source system without approval by the Authority Having Jurisdiction.*

Exception: [BSC-CG & HCD 1] *A construction permit shall not be required for a clothes washer system meeting the requirements of Section 1503.1.1.*

1501.4 Component Identification. System components shall be properly identified as to the manufacturer.

1501.5 Maintenance and Inspection. ***[BSC-CG, HCD 1 & DWR]*** Alternate water source systems and components shall be inspected and maintained in accordance with *the manufacturer's recommendations and/or as required by the Authority Having Jurisdiction.* ***[BSC-CG]*** *Where no manufacturer's recommendations exist, additional recommendations are listed in Table 1501.5*.

Exception: [DWR] *Recycled water supply systems that are within or a part of a building shall comply with Section 1505.16*.

1501.5.1 **Maintenance Responsibility.** The required maintenance and inspection of alternate water source systems shall be the responsibility of the property owner unless otherwise required by the Authority Having Jurisdiction.

1501.6 Operation and Maintenance Manual. ***[BSC-CG, HCD 1 & DWR]*** An operation and maintenance manual for gray water, on-site treated *nonpotable* water*,* ***[DWR]*** *and recycled water supply* systems required to have a permit in accordance with Section 1501.3, *Section 1505.2, and Section 1506.2* shall be supplied to the building owner by the system designer *or installer*. The operation and maintenance manual shall include the following:

(1) *Diagram(s)* of the entire system and the location of system components.

(2) Instructions for operating and maintaining the system.

(3) *Instructions* on maintaining the required water quality for on-site *treated* nonpotable water systems.

(4) Details on *startup, shutdown, and* deactivating the system for maintenance, repair, or other purposes.

(5) Applicable testing, inspection, and maintenance frequencies in accordance with *Section 1501.5* ***[DWR]*** *or Section 1505.16 as applicable*.

(6) A method of contacting the *installer and/or* manufacturer(s).

(7) Directions to the owner or occupant that the manual shall remain with the building throughout the life cycle of the structure.

1501.7 Minimum Water Quality Requirements. ***[BSC-CG, HCD 1 & DWR]*** 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 IAPMO IGC 324 or NSF/ANSI 350 shall apply. ***[BSC-CG & HCD 1]*** *Water quality requirements for on-site treated nonpotable graywater shall comply with this section and Section 1506.10.2.*

Exceptions:

(1) Water treatment is not required for gray water used *in a disposal field or* for subsurface *or subsoil* irrigation.

(2) ***[DWR]*** *Recycled water shall comply with the water quality requirements of Section 1505.15.*

TABLE 1501.5 *[BSC-CG]*
***RECOMMENDED* MINIMUM ALTERNATE WATER SOURCE TESTING, INSPECTION, AND MAINTENANCE FREQUENCY**

DESCRIPTION	MINIMUM FREQUENCY
Inspect and clean filters and screens, and replace (where necessary).	*In accordance with manufacturer's instructions, and/or the Authority Having Jurisdiction, or every 3 months.*
Inspect and verify that disinfection, filters, and water quality treatment devices and systems are operational and maintaining minimum water quality requirements as determined by the Authority Having Jurisdiction.	In accordance with manufacturer's instructions, and the Authority Having Jurisdiction.
Inspect pumps and verify operation.	*In accordance with manufacturer's instructions, and/or the Authority Having Jurisdiction, or after installation and every 12 months thereafter.*
Inspect valves and verify operation.	*In accordance with manufacturer's instructions, and/or Authority Having Jurisdiction, or after installation and every 12 months thereafter.*
Inspect pressure tanks and verify operation.	*In accordance with manufacturer's instructions, and/or the Authority Having Jurisdiction, or after installation and every 12 months thereafter.*
Clear debris from and inspect storage tanks, locking devices, and verify operation.	*In accordance with manufacturer's instructions, and/or the Authority Having Jurisdiction, or after installation and every 12 months thereafter.*
Inspect caution labels and marking.	*In accordance with manufacturer's instructions, and/or the Authority Having Jurisdiction, or after installation and every 12 months thereafter.*
Inspect and maintain mulch basins for gray water irrigation systems.	As needed to maintain mulch depth and prevent ponding and runoff.
Cross-connection inspection and test*	*In accordance with this chapter, and/or the Authority Having Jurisdiction, or after installation and every 12 months thereafter.*

* The cross-connection test shall be performed in the presence of the Authority Having Jurisdiction in accordance with the requirements of this chapter*, unless site conditions do not require it. Alternate testing requirements shall be permitted by the Authority Having Jurisdiction.*.

1501.8 Material Compatibility. Alternate water source systems shall be constructed of materials that are compatible with the type of pipe and fitting materials, water treatment, and water conditions in the system.

1501.9 Signage. [BSC-CG, HCD 1, HCD 2 & HCD 1-AC] *Signage for on-site treated nonpotable gray water shall comply with Sections 1501.9.1 and 1501.9.2.* ***[DWR]*** *Signage for reclaimed (recycled) water shall comply with Section 1505.13.*

1501.9.*1* Commercial, Industrial, Institutional*, and Residential* Restroom Signs. A sign shall be installed in restrooms in commercial, industrial, and institutional occupancies *and in residential common use areas* using on-site treated *nonpotable gray* water, for water closets, urinals, or both. *Signs shall comply with all applicable requirements of the California Building Code.* Each sign shall contain the following text:

"TO CONSERVE WATER, THIS BUILDING USES *ON-SITE TREATED NONPOTABLE GRAYWATER* TO FLUSH TOILETS AND URINALS."

1501.9.2 Equipment Room Signs. Each room containing on-site treated *nonpotable gray* water equipment shall have a sign posted in a location that is visible to anyone working on or near nonpotable *gray* water equipment with the following wording in 1 inch (25.4 mm) letters:

"CAUTION: *ON-SITE TREATED NONPOTABLE GRAYWATER*, DO NOT DRINK. DO NOT CONNECT TO DRINKING WATER SYSTEM. NOTICE: CONTACT BUILDING MANAGEMENT BEFORE PERFORMING ANY WORK ON THIS WATER SYSTEM."

1501.10 System Controls. Controls for pumps, valves, and other devices that contain mercury that come in contact with alternate water source water supply shall not be permitted.

1502.0 Inspection and Testing.

1502.1 General. Alternate water source systems shall be inspected and tested in accordance with Section 1502.2 through Section *1502.3.3, and/or as required by the Authority Having Jurisdiction*.

Exception: [DWR] *Recycled water supply systems that are within or a part of a building shall comply with Section 1505.14.*

1502.2 Supply System Inspection and Test. Alternate water source systems shall be inspected and tested in accordance with this code for testing of potable water piping.

1502.3 Cross-Connection Inspection and Testing. An initial *visual* inspection and *initial cross-connection* test shall be performed on both the potable and alternate water source systems *before the initial operation of the alternate water source system. During an initial or subsequent cross-connection test, the* potable and alternate water source system shall be isolated from each other and independently inspected and tested to ensure there is no cross-connection in accordance with Section 1502.3.1 through Section *1502.3.3*.

[BSC-CG] *Irrigation design shall be verified in accordance with the California Green Building Standards Code (CALGreen), Chapter 5, Division 5.3.*

[HCD 1] *Irrigation design shall be verified in accordance with the California Green Building Standards Code (CALGreen), Chapter 4, Division 4.3.*

1504.5.1 Mulch Basin. *A mulch basin may be used as an irrigation or disposal field. Mulch basins shall be sized in accordance with Table 1504.2 and of sufficient depth, length and width to prevent ponding or runoff during the gray water surge of a clothes washer, bathtub or shower. Mulch must be replenished as required due to decomposition of organic matter. Mulch basins will require periodic maintenance, reshaping or removal of dirt to maintain surge capacity and to accommodate plant growth and prevent ponding or runoff.*

1504.5.2 Irrigation Field. *The provisions of this section are not intended to prevent the use of any appropriate material, appliance, installation, device, design or method of construction. If an alternate design is not available, the following provisions may be used as guidance in the design of a gray water irrigation field:*

(1) Filters used in gray water irrigation systems shall be as specified by the manufacturer's installation instructions for the design flow rate and intended use. The filter backwash and flush discharge shall be contained and disposed of into the building sewer system, septic tank or, with approval of the Enforcing Agency, a separate mini-leachfield sized to accept all the backwash and flush discharge water. Filter backwash water and flush water shall not be used for any purpose. Sanitary procedures shall be followed when handling filter backwash and flush discharge or gray water.

(2) Emitters shall be designed to resist root intrusion and shall be of a design recommended by the manufacturer for the intended gray water flow and use.

(3) Each irrigation zone shall be designed to include no less than the number of emitters specified in Table 1504.5.5, or through a procedure designated by the Enforcing Agency. Minimum spacing between emitters in any direction shall be sufficient to prevent surfacing or runoff.

(4) The system design shall provide user controls, such as valves, switches, timers and other controllers, as appropriate, to rotate the distribution of gray water between irrigation zones.

(5) All drip irrigation supply lines shall be polyethylene tubing or PVC Class 200 pipe or better and Schedule 40 fittings. All joints shall be pressure tested at 40 psi (276 kPa), and shown to be drip tight for five minutes, before burial. All supply piping shall be covered to a minimum depth of two (2) inches (51 mm) of mulch or soil. Drip feeder lines can be poly or flexible PVC tubing and shall be covered to a minimum depth of two (2) inches (51 mm) of mulch or soil.

(6) Where pressure at the discharge side of the pump exceeds 20 psi (138 kPa), a pressure-reducing valve able to maintain downstream pressure no greater than the maximum operating pressure of the installed tubing, emitters, or other components shall be installed downstream from the pump and before any emission device.

(7) When an irrigation system utilizes a pump, and discharges water at a point higher than the pump, a backwater valve shall be installed downstream of the pump to prevent back siphonage of water and soil.

1504.5.3 Disposal Field. *The provisions of this section are not intended to prevent the use of any appropriate material, appliance, installation, device, design or method of construction. If an alternate design is not available, the following provisions may be used as guidance in the design of a gray water disposal field:*

(A) Disposal systems shall be not less than three (3) inches (80 mm) in cross sectional dimension and shall be constructed of perforated high-density polyethylene pipe, perforated ABS pipe, perforated PVC pipe, leaching chambers or other approved materials, provided that sufficient openings are available for distribution of the gray water into the trench area. Material, construction, and perforation shall be in compliance with the appropriate absorption field's drainage standards and shall be approved by the Enforcing Agency.

(B) Filter material, clean stone, gravel, slag, or similar filter material acceptable to the Enforcing Agency, varying in size from three-quarter (¾) inch (19.1 mm) to two and one-half (2½) inches (64 mm) shall be placed in the trench to the depth and grade required by this section. The perforated section shall be laid on the filter material in an approved manner. The perforated section shall then be covered with filter material to the minimum depth required by this section. The filter material shall then be covered with untreated building paper, straw, or similar porous material to prevent closure of voids with earth backfill. No earth backfill shall be placed over the filter material cover until after inspection and acceptance.

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

(C) Disposal fields shall be constructed in accordance with Table 1504.5.3.

(D) When necessary on sloping ground to prevent excessive line slopes, disposal lines shall be stepped or installed on the contour lines of the slope. The lines between each horizontal leaching section shall be made with approved water-tight joints and installed on natural or unfilled ground.

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.*

TABLE 1504.5.5
SUBSURFACE IRRIGATION DESIGN CRITERIA FOR SIX TYPICAL SOILS

TYPE OF SOIL	MAXIMUM EMITTER DISCHARGE (gallons per day)	MINIMUM NUMBER OF EMITTERS PER GALLON OF ESTIMATED GRAY WATER DISCHARGE PER DAY* (gallons per day)
Sand	1.8	0.6
Sandy loam	1.4	0.7
Loam	1.2	0.9
Clay loam	0.9	1.1
Silty clay	0.6	1.6
Clay	0.5	2.0

For SI units: 1 gallon per day = 0.000043 L/s

* The estimated gray water discharge per day shall be determined in accordance with Section 1503.8 of this code.

1504.6 Reserved.

1504.7 Reserved.

1504.8 Gray Water System Color and Marking Information. Pressurized gray water distribution systems shall be identified as containing nonpotable water in accordance with Section 601.3 of this code. *Marking shall be at intervals not to exceed 5 feet (1524 mm). Gray water distribution piping upstream of any connection to an irrigation or disposal field or a distribution valve shall be identified with the words "CAUTION: NONPOTABLE GRAY WATER, DO NOT DRINK."*

1504.9 Other Collection and Distribution Systems. Other collection and distribution systems shall be approved as allowed by Section 301.3 of this code.

1504.9.1 Future Connections. *Gray water stub-out plumbing may be allowed for future connection prior to the installation of irrigation lines and landscaping. Stub-out shall be permanently marked "CAUTION: NONPOTABLE GRAY WATER, DO NOT DRINK."*

1504.10 Testing. Building drains and vents for gray water systems shall be tested in accordance with this code. Surge tanks shall be filled with water to the overflow line prior to and during the inspection. Seams and joints shall be left exposed, and the tank shall remain watertight. A flow test shall be performed through the system to the point of gray water discharge. Lines and components shall be watertight up to the point of the irrigation perforated and drip lines.

1504.11 Maintenance. Gray water systems and components shall be maintained in accordance with *Section* 1501.5.

1505.0 Recycled Water *Supply* Systems *in Buildings*.

1505.1 General. The provisions of *Section 1505.0 through Section 1505.16* shall apply to *safely plumb buildings with both potable and recycled water supply systems. Unless otherwise specified in this code, the general provisions applying to alternate water systems pursuant to Section 1501.0 through Section 1501.10 and Section 1502.4 through Section 1502.6 shall apply to recycled water supply systems. The provisions in this section encompass* the installation, construction, alteration, and repair of recycled water *supply* systems *that are within or a part of a building, including a landscape irrigation system that connects to plumbing that is within or a part of a building, and receive reclaimed (recycled) water provided by a water/wastewater utility. When dealing with recycled water supply systems, the Authority Having Jurisdiction and Enforcing Agency may include the recycled water purveyor or potable water purveyor in accordance with their respective statutory authority and responsibility as provided on their respective permits for supplying water. Plumbing systems using reclaimed (recycled) water that do not enter the interior of a building plumbed with potable water are not encompassed by this section. All reclaimed (recycled) water use, covered and not covered by this code, is subject to applicable provisions of the State Water Resources Control Board's Cross-Connection Control Policy Handbook and the California Code of Regulations: Title 22 and Title 23.*

1505.1.1 Allowed Uses. *Allowed* uses *shall include* water closets, urinals, trap primers for floor drains and floor sinks, aboveground and subsurface irrigation, industrial or commercial cooling or air conditioning and other uses *as generally allowed in the California Code of Regulations, Title 22, Division 4, Chapter 3 and specifically allowed in the permit for the facility producing or supplying the reclaimed (recycled) water issued by the State Water Resources Control Board or Regional Water Quality Control Board.*

1505.1.2 Structures Allowed for Toilet and Urinal Flushing. *In accordance with Water Code Section 13553, reclaimed (recycled) water shall be allowed for toilet and urinal flushing in certain structures. These structures include commercial, retail, and office buildings, theaters, auditoriums, condominium projects, schools, hotels, apart-*

CALIFORNIA PLUMBING CODE – MATRIX ADOPTION TABLE
CHAPTER 16 - NONPOTABLE RAINWATER CATCHMENT SYSTEMS

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the code user. See Chapter 1 for state agency authority and building applications.)

Adopting Agency	BSC	BSC-CG	SFM	HCD			DSA			OSHPD							BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
				1	2	1-AC	AC	SS	SS/CC	1	1R	2	3	4	5	6								
Adopt Entire Chapter																								
Adopt Entire Chapter as amended (amended sections listed below)	**X**			**X**	**X**																			
Adopt only those sections that are listed below																								
Chapter/Section																								
1601.2	**X**			**X**																				
1601.3 & Exceptions 1 & 2	**X**			**X**	**X**																			
1601.5				**X**	**X**																			
Table 1601.5				†	†																			
1601.6	**X**			**X**																				
1601.7	**X**			**X**																				
1602.4 *& Exceptions*	**X**			**X**																**X**				
1602.7	**X**																							
1603.3	**X**			**X**																				
1603.3.1 & *Exception*	**X**			**X**																				
1603.4	**X**			**X**																				
1603.4.1	**X**			**X**																				
Table 1603.4	**X**			**X**																				
1603.7	**X**			**X**																				
1603.8	**X**			**X**																				
1603.9	**X**			**X**																				
1603.10 *A & B*	**X**			**X**																				
1603.12	**X**			**X**																				
1603.20	**X**			**X**																				
1604.1 - 1604.3	**X**			**X**																				
1605.3	**X**			**X**																				
1605.3.2	**X**			**X**																				
1605.3.3	**X**			**X**																				

This state agency does not adopt sections identified with the following symbol: †
The Office of the State Fire Marshal's adoption of this chapter or individual sections is applicable to structures regulated by other state agencies pursuant to Section 1.11.0.

CHAPTER 16
NONPOTABLE RAINWATER CATCHMENT SYSTEMS

1601.0 General.

1601.1 Applicability. The provisions of this chapter shall apply to the installation, construction, alteration, and repair of nonpotable rainwater catchment systems.

1601.1.1 Allowable Use of Alternate Water. Where approved or required by the Authority Having Jurisdiction, rainwater shall be permitted to be used instead of potable water for the applications identified in this chapter.

1601.2 System Design. Rainwater catchment systems shall be designed in accordance with this chapter by a *person* registered *or licensed to perform plumbing design work or who demonstrates competency to design the rainwater catchment system as required by the Authority Having Jurisdiction*. Components, piping, and fittings used in a rainwater catchment system shall be listed.

[HCD 1] *Irrigation design plans shall meet the requirements of the California Code of Regulations, Title 23, Division 2, Chapter 2.7, Model Water Efficient Landscape Ordinance.*

Exceptions:

(1) A person registered or licensed to perform plumbing design work is not required to design rainwater catchment systems used for irrigation with a maximum storage capacity of 360 gallons (1363 L).

(2) A person registered or licensed to perform plumbing design work is not required to design rainwater catchment systems for single family dwellings where outlets, piping, and system components are located on the exterior of the building.

1601.3 Permit. It shall be unlawful for a person to construct, install, alter, or cause to be constructed, installed, or altered a *nonpotable* rainwater catchment system in a building or on a premise without first obtaining a permit to do such work from the Authority Having Jurisdiction.

Exceptions:

(1) A permit is not required for exterior rainwater catchment systems used for outdoor non-spray irrigation with a maximum storage capacity of 5000 gallons (18 927 L) where the tank is supported directly upon grade and the ratio of height to diameter or width does not exceed 2 to 1 and it does not require electrical power or a makeup water supply connection.

(2) ***[HCD 1 & HCD 2]*** *A permit is not required for exterior rainwater catchment systems used for spray irrigation with a maximum storage capacity of 360 gallons (1363 L).*

1601.4 Component Identification. System components shall be properly identified as to the manufacturer.

1601.5 Maintenance and Inspection. Rainwater catchment systems and components shall be inspected and maintained in accordance with *the manufacturer's recommendations and/or as required by the enforcing agency*.

TABLE 1601.5
MINIMUM ALTERNATE WATER SOURCE TESTING, INSPECTION, AND MAINTENANCE FREQUENCY

DESCRIPTION	MINIMUM FREQUENCY
Inspect and clean filters and screens, and replace (where necessary).	Every 3 months
Inspect and verify that disinfection, filters, and water quality treatment devices and systems are operational and maintaining minimum water quality requirements as determined by the Authority Having Jurisdiction.	In accordance with manufacturer's instructions and the Authority Having Jurisdiction.
Inspect and clear debris from rainwater gutters, downspouts, and roof washers.	Every 6 months
Inspect and clear debris from the roof or another aboveground rainwater collection surfaces.	Every 6 months
Remove tree branches and vegetation overhanging a roof or other aboveground rainwater collection surfaces.	As needed
Inspect pumps and verify operation.	After initial installation and every 12 months thereafter
Inspect valves and verify operation.	After initial installation and every 12 months thereafter
Inspect pressure tanks and verify operation.	After initial installation and every 12 months thereafter
Clear debris from and inspect storage tanks, locking devices, and verify operation.	After initial installation and every 12 months thereafter
Inspect caution labels and marking.	After initial installation and every 12 months thereafter
Cross-connection inspection and test.*	After initial installation and every 12 months thereafter
Test water quality of rainwater catchment systems required by Section 1603.4 to maintain a minimum water quality.	Every 12 months. After system renovation or repair.

* The cross-connection test shall be performed in the presence of the Authority Having Jurisdiction in accordance with the requirements of this chapter.

1601.5.1 **Maintenance Responsibility.** The required maintenance and inspection of rainwater catchment systems shall be the responsibility of the property owner unless otherwise required by the Authority Having Jurisdiction.

1601.6 Operation and Maintenance Manual. An operation and maintenance manual for rainwater catchment systems required to have a permit in accordance with Section 1601.3, shall be supplied to the building owner by the system designer *or installer*. The operating and maintenance manual shall include the following:

(1) *Diagram(s)* of the entire system and the location of system components.

(2) Instructions for operating and maintaining the system.

(3) *Instructions* on maintaining the required water quality as *for rainwater catchment systems*.

(4) Details *startup, shutdown, and* deactivating the system for maintenance, repair, or other purposes.

(5) Applicable testing, inspection, and maintenance frequencies in accordance with *Section* 1601.5.

(6) A method of contacting the *installer and/or* manufacturer(s).

(7) Directions to the owner or occupant that the manual shall remain with the building throughout the life cycle of the structure.

1601.7 Minimum Water Quality Requirements. The minimum water quality for rainwater catchment systems shall comply with the applicable water quality requirements for the intended application as determined by the Authority Having Jurisdiction. Water quality for nonpotable rainwater catchment systems shall comply with Section 1603.4. *In the absence of water quality requirements for harvested rainwater, Table 1603.4 shall apply.*

Exceptions:

(1) Water treatment is not required for rainwater catchment systems used for aboveground irrigation with a maximum storage capacity of 360 gallons (1363 L).

(2) Water treatment is not required for rainwater catchment systems used for *surface,* subsurface or drip irrigation.

1601.8 Material Compatibility. Rainwater catchment systems shall be constructed of materials that are compatible with the type of pipe and fitting materials, water treatment, and water conditions in the system.

1601.9 System Controls. Controls for pumps, valves, and other devices that contain mercury that come in contact with rainwater supply shall not be permitted.

1601.10 Separation Requirements. Underground rainwater catchment service piping shall be separated from the building sewer in accordance with Section 609.2. Treated nonpotable water pipes shall be permitted to be run or laid in the same trench as potable water pipes with a 12 inch (305 mm) minimum vertical and horizontal separation where both pipe materials are approved for use within a building. Where horizontal piping materials do not meet this requirement, the minimum separation shall be increased to 60 inches (1524 mm). The potable water piping shall be installed at an elevation above the treated nonpotable water piping.

1601.11 Abandonment. Rainwater catchment systems that are no longer in use, or fail to be maintained in accordance with Section 1601.5, shall be abandoned. Abandonment shall comply with Section 1601.11.1 and Section 1601.11.2.

1601.11.1 General. An abandoned system or part thereof covered under the scope of this chapter shall be disconnected from remaining systems, drained, plugged, and capped in an approved manner.

1601.11.2 Underground Tank. An underground water storage tank that has been abandoned or otherwise discontinued from use in a system covered under the scope of this chapter shall be completely drained and filled with earth, sand, gravel, concrete, or other approved material or removed in a manner satisfactory to the Authority Having Jurisdiction.

1601.12 Sizing. Unless otherwise provided for in this chapter, rainwater catchment piping shall be sized in accordance with Chapter 6 for sizing potable water piping.

1602.0 Nonpotable Rainwater Catchment Systems.

1602.1 General. The installation, construction, alteration, and repair of rainwater catchments systems intended to supply uses such as water closets, urinals, trap primers for floor drains and floor sinks, irrigation, industrial processes, water features, cooling tower makeup and other uses shall be approved by the Authority Having Jurisdiction. Rainwater catchment systems for collecting precipitation from rooftops shall comply with ARCSA/ASPE/ANSI 63.

1602.2 Plumbing Plan Submission. No permit for a rainwater catchment system shall be issued until complete plumbing plans, with data satisfactory to the Authority Having Jurisdiction, have been submitted and approved.

1602.3 System Changes. No changes or connections shall be made to either the rainwater catchment system or the potable water system within a site containing a rainwater catchment system requiring a permit without approval by the Authority Having Jurisdiction.

1602.4 Connections to Potable or Reclaimed (Recycled) Water Systems. Rainwater catchment systems shall have no direct connection to a potable water supply or alternate water source system.

Exceptions:

(1) Potable *water, on-site treated nonpotable gray water,* or reclaimed (recycled) water is permitted to be used as makeup water for a rainwater catchment system provided the connection is protected by an air gap in accordance with this code.

(2) A potable water supply may be connected temporarily for the initial cross-connection test of the rainwater catchment system as required in Section 1605.3.2.

1602.5 Initial Cross-Connection Test. Where a portion of a rainwater catchment system is installed within a building, a cross-connection test is required in accordance with Section 1605.3. Before the building is occupied or the system is activated, the installer shall perform the initial cross-connection test in the presence of the Authority Having Jurisdiction and other authorities having jurisdiction. The test shall be ruled successful by the Authority Having Jurisdiction before final approval is granted.

1602.6 Sizing. The design and size of rainwater drains, gutters, conductors, and leaders shall comply with Chapter 11 of this code.

1602.7 Rainwater Catchment System Materials. Rainwater catchment system materials shall comply with Section 1602.7.1 through Section *1602.7.3*.

1602.7.1 Water Supply and Distribution Materials. Rainwater catchment water supply and distribution materials shall comply with the requirements of this code for potable water supply and distribution systems unless otherwise provided for in this section.

1602.7.2 Rainwater Catchment System Drainage Materials. Materials used in rainwater catchment drainage systems, including gutters, downspouts, conductors, and leaders shall be in accordance with the requirements of this code for storm drainage.

1602.7.3 Storage Tanks. Rainwater storage tanks shall comply with Section 1603.5.

1602.8 Rainwater Catchment System Color and Marking Information. Rainwater catchment systems shall have a colored background in accordance with Section 601.3. Rainwater catchment systems shall be marked, in lettering in accordance with Section 601.3.3, with the words: "CAUTION: NONPOTABLE RAINWATER, DO NOT DRINK."

1602.9 Deactivation and Drainage for Cross-Connection Test. The rainwater catchment system and the potable water system within the building shall be provided with the required appurtenances (e.g., valves, air or vacuum relief valves, etc.) to allow for deactivation or drainage as required for a cross-connection test in accordance with Section 1605.3.

1603.0 Design and Installation.

1603.1 Rainwater Catchment Systems. The design and installation of nonpotable rainwater catchment systems shall be in accordance with Section 1603.2 through Section 1603.20.

1603.2 Outside Hose Bibbs. Outside hose bibbs shall be allowed on rainwater piping systems. Hose bibbs supplying rainwater shall be marked with the words: "CAUTION: NONPOTABLE RAINWATER, DO NOT DRINK" and in Figure 1603.2.

FIGURE 1603.2

1603.3 Rainwater Catchment Collection Surfaces. Rainwater shall be collected from roof surfaces or other *impervious* manmade, aboveground collection surfaces.

1603.3.1 Other Surfaces. Natural precipitation collected from surface water runoff, vehicular parking surfaces, or manmade surfaces at or below grade shall be in accordance with the *water quality* requirements for onsite treated nonpotable *gray* water systems in Section 1506.0.

Exception: *Collected rainwater or storm water used exclusively for subsurface landscape irrigation.*

1603.3.2 Prohibited Discharges. Overflows and bleed-off pipes from roof-mounted equipment and appliances shall not discharge onto roof surfaces that are intended to collect rainwater without prior approval from the Authority Having Jurisdiction.

1603.4 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 1603.4, IAPMO IGC 324 or NSF/ANSI 350.

Exception: ***[BSC]*** No treatment is required for rainwater used for subsurface or nonsprinkled surface irrigation where the maximum storage volume is less than *5000 gallons (18 927 L) where the tank is supported directly upon grade and the ratio of height to diameter or width does not exceed 2 to 1*.

1603.4.1 Disinfection. *Where the initial quality of the collected rainwater requires disinfection or other treatment or both, the collected rainwater shall be treated as necessary to ensure the required water quality is delivered at the point of use. Where chlorine is used for disinfection or treatment, water shall be tested for residual chlorine in accordance with ASTM D1253. The levels of residual chlorine shall not exceed the levels allowed for the intended use in accordance with the requirements of the local enforcing agency.*

1603.5 Rainwater Storage Tanks. Rainwater storage tanks shall comply with IAPMO/ANSI Z1002 and be installed in accordance with Section 1603.6 through Section 1603.12.

1603.6 Location. Rainwater storage tanks shall be permitted to be installed above or below grade.

1603.7 Above Grade. Above grade, storage tanks shall be of an opaque material, approved for aboveground use in direct sunlight or shall be shielded from direct sunlight. Tanks shall be installed in an accessible location to allow for inspection and cleaning. The tank shall be installed on a foundation or platform that is constructed to accommodate loads in accordance with the *California Building Code*.

Exception: *Tanks may be installed directly on grade in accordance with Section 1601.3.*

1603.8 Below Grade. Rainwater storage tanks installed below grade shall be structurally designed to withstand antic-

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TABLE 1603.4
MINIMUM WATER QUALITY

APPLICATION	MINIMUM TREATMENT	MINIMUM WATER QUALITY
Car washing	Debris excluder or other approved means in accordance with Section 1603.17, and 100 microns *(100 µm)* in accordance with Section 1603.18 for drip irrigation.	N/A
Surface, Subsurface and drip irrigation	Debris excluder or other approved means in accordance with Section 1603.17, and 100 microns *(100 µm)* in accordance with Section 1603.18 for drip irrigation.	N/A
Spray irrigation where the maximum storage volume is less than 360 gallons *(1363 L)*	Debris excluder or other approved means in accordance with Section 1603.17, and disinfection in accordance with Section 1603.15.	N/A
Spray irrigation where the maximum storage volume is equal to or more than 360 gallons *(1363 L)*	Debris excluder or other approved means in accordance with Section 1603.17.	Escherichia coli: < 100 CFU/100 mL, and Turbidity: < 10 NTU
Urinal and water closet flushing, clothes washing, and trap priming	Debris excluder or other approved means in accordance with Section 1603.17, and 100 microns *(100 µm)* in accordance with Section 1603.18.	Escherichia coli: < 100 CFU/100 mL, and Turbidity: < 10 NTU
Ornamental fountains and other water features	Debris excluder or other approved means in accordance with Section 1603.17.	Escherichia coli: < 100 CFU/100 mL, and Turbidity: < 10 NTU
Cooling tower make-up water	Debris excluder or other approved means in accordance with Section 1603.17, and 100 microns *(100 µm)* in accordance with Section 1603.18.	Escherichia coli: < 100 CFU/100 mL, and Turbidity: < 10 NTU

For SI units: 1 micron = 1 µm, 1 gallon = 3.785 L

ipated earth or other loads. Holding tank covers shall be capable of supporting an earth load of not less than 300 pounds per square foot (lb/ft^2) (1465 kg/m^2) where the tank is designed for underground installation. Below grade rainwater tanks installed underground shall be provided with manholes. *Below grade storage tanks, located outside of the building, shall be provided with either a manhole not less than 24 inches (610 mm) square or a manhole with an inside diameter of not less than 24 inches (610 mm). Service ports in manhole covers shall be not less than 8 inches (203 mm) in diameter.* The manhole opening shall be located not less than 4 inches (102 mm) above the surrounding grade. The surrounding grade shall be sloped away from the manhole. Underground tanks shall be ballasted, anchored, or otherwise secured, to prevent the tank from floating out of the ground where empty. The combined weight of the tank and hold down system shall meet or exceed the buoyancy force of the tank.

1603.9 Drainage and Overflow. Rainwater storage tanks shall be provided with a means of draining and cleaning. The overflow drain shall not be equipped with a shutoff valve. The overflow outlet shall discharge in accordance with this code for storm drainage systems. Where discharging to the storm drainage system, the overflow drain *and tank drain* shall be protected from backflow of the storm drainage system by a backwater valve or other approved method. *Backwater valves shall be installed so that access is provided to the working parts for service and repair.* ‹‹

1603.9.1 Overflow Outlet Size. The overflow outlet shall be sized to accommodate the flow of the rainwater entering the tank and not less than the aggregate cross-sectional area of inflow pipes. ‹‹

1603.10 Opening and Access Protection. Rainwater tank openings shall be protected to prevent the entrance of insects, birds, or rodents into the tank *and piping systems*. ‹‹

Rainwater tank access openings exceeding 12 inches (305 mm) in diameter shall be secured to prevent tampering and unintended entry by either a lockable device or other approved method.

(A) Animals and Insects. *Screens installed on vent pipes, inlets, and overflow pipes shall have an aperture of not greater than 1/16 of an inch (1.6 mm) and shall be close fitting.*

(B) Human Access. *A minimum of one access opening shall be provided to allow inspection and cleaning. Rainwater tank manholes and access openings shall be secured by either a lockable device or other approved method to prevent unauthorized access.*

1603.11 Marking. Rainwater tanks shall be permanently marked with the capacity and the language: "NONPOTABLE RAINWATER." Where openings are provided to allow a person to enter the tank, the opening shall be marked with the following language: "DANGER-CONFINED SPACE." ‹‹

1603.12 Storage Tank Venting. Where venting using drainage or overflow piping is not provided or is considered insufficient, a vent shall be installed on each tank. The vent shall extend from the top of the tank and terminate not less than 6 inches (152 mm) above grade and shall be *provided with a vent sized in accordance with this code, and based on the size of the influent pipe*. The vent terminal shall be directed downward and covered with a 1/16 of an inch (*1.6* mm) mesh screen to prevent the entry of vermin and insects. *Tank vent pipes shall not be connected to the sanitary drainage system vent.* ‹‹

1603.13 Pumps. Pumps serving rainwater catchment systems shall be listed. Pumps 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 rainwater 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 in accordance with this code.

1603.14 Roof Drains. Primary and secondary roof drains, conductors, leaders, and gutters shall be designed and installed in accordance with this code.

1603.15 Water Quality Devices and Equipment. Devices and equipment used to treat rainwater to maintain the minimum water quality requirements determined by the Authority Having Jurisdiction shall be listed or labeled (third-party certified) by a listing agency (accredited conformity assessment body) and approved for the intended application.

1603.16 Freeze Protection. Tanks and piping installed in locations subject to freezing shall be provided with an approved means of freeze protection.

1603.17 Debris Removal. The rainwater catchment conveyance system shall be equipped with a debris excluder or other approved means to prevent the accumulation of leaves, needles, other debris and sediment from entering the storage tank. Devices or methods used to remove debris or sediment shall be accessible and sized and installed in accordance with manufacturer's installation instructions.

1603.18 Required Filters. A filter permitting the passage of particulates not larger than 100 microns (100 µm) shall be provided for rainwater supplied to water closets, urinals, trap primers, and drip irrigation system*s*.

1603.19 Roof Gutters. Gutters shall maintain a minimum slope and be sized in accordance with Section 1103.3.

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.

1604.0 Signs.

1604.1 General. Signs in buildings using rainwater shall be in accordance with Section 1604.2 and Section 1604.3*, and applicable requirements of the California Building Code*.

1604.2 Commercial, Industrial, Institutional *and Residential* Restroom Signs. A sign shall be installed in restrooms in commercial, industrial, and institutional occupancies*, and in residential common use areas* using nonpotable rainwater for water closets, urinals, or both. *Signs shall comply with all applicable requirements of the California Building Code.* Each sign shall contain the following text:

TO CONSERVE WATER, THIS BUILDING USES RAINWATER TO FLUSH TOILETS AND URINALS.

1604.3 Equipment Room Signs. Each equipment room containing nonpotable rainwater equipment shall have a sign posted with the following wording in 1 inch (25.4 mm) letters:

CAUTION NONPOTABLE WATER, DO NOT DRINK. DO NOT CONNECT TO DRINKING WATER SYSTEM. NOTICE: CONTACT BUILDING MANAGEMENT BEFORE PERFORMING ANY WORK ON THIS WATER SYSTEM.

This sign shall be posted in a location that is visible to anyone working on or near rainwater equipment.

1605.0 Inspection and Testing.

1605.1 General. Rainwater catchment systems shall be inspected and tested in accordance with Section 1605.2 and Section 1605.3.

1605.2 Supply System Inspection and Test. Rainwater catchment systems shall be inspected and tested in accordance with the applicable provisions of this code for testing of potable water and storm drainage systems. Storage tanks shall be filled with water to the overflow opening for a period of 24 hours, and during the inspection, or by other means as approved by the Authority Having Jurisdiction. Seams and joints shall be exposed during the inspection and checked for watertightness.

1605.3 Cross-Connection Inspection and Testing. An initial *visual* inspection and *an initial cross-connection* test shall be performed on both the potable and rainwater catchment water systems *before the initial operation of the rainwater catchment system. During an initial or subsequent cross-connection test, the* potable and rainwater catchment water systems shall be isolated from each other and independently inspected and tested to ensure there is no cross-connection *in accordance with Section 1602.5. Initial or subsequent inspections or tests shall be performed* in accordance with Section 1605.3.1 through Section *1605.3.3*.

1605.3.1 Visual System Inspection. Prior to commencing the cross-connection testing, a dual system inspection shall be conducted by the Authority Having Jurisdiction and other authorities having jurisdiction as follows:

(1) Pumps, equipment, equipment room signs, and exposed piping in an equipment room shall be checked.

1605.3.2 Cross-Connection Test. *A cross-connection test shall be performed* in the presence of the Authority Having Jurisdiction *or* other authorities having jurisdiction to determine whether a cross-connection has occurred as follows:

(1) The potable water system shall be activated and pressurized. The rainwater catchment water system shall be shut down and completely drained.

(2) The potable water system shall remain pressurized for a minimum period of time specified by the Authority Having Jurisdiction while the rainwater catchment water system is empty. The minimum period the rainwater catchment water system is to remain depressurized shall be determined on a case-by-case basis, taking into account the size and complexity of the potable and rainwater catchment water distribution systems, but in no case shall that period be less than 1 hour.

(3) Fixtures, potable, and rainwater shall be tested and inspected for flow. Flow from a rainwater catchment water system outlet shall indicate a cross-connection. No flow from a potable water outlet shall indicate that it is connected to the rainwater system.

(4) The drain on the rainwater catchment water system shall be checked for flow during the test and at the end of the period.

(5) The potable water system shall then be completely drained.

(6) The rainwater catchment water system shall then be activated and pressurized. *When rainwater is not available for the initial cross-connection test, a temporary connection to a potable water supply shall be required. At the conclusion of the initial cross-connection test, the temporary connection to the potable water supply shall be disconnected.*

(7) The rainwater catchment water system shall remain pressurized for a minimum period of time specified by the Authority Having Jurisdiction while the potable water system is empty. The minimum period the potable water system is to remain depressurized shall be determined on a case-by-case basis, but in no case shall that period be less than 1 hour.

(8) Fixtures, potable and rainwater catchment, shall be tested and inspected for flow. Flow from a potable water system outlet shall indicate a cross-connection. No flow from a rainwater catchment water outlet shall indicate that it is connected to the potable water system.

(9) The drain on the potable water system shall be checked for flow during the test and at the end of the period.

(10) Where there is no flow detected in the fixtures which would indicate a cross-connection, the potable water system shall be repressurized.

1605.3.3 Discovery of Cross-Connection. In the event that a cross-connection is discovered, the following procedure shall be activated immediately:

(1) Rainwater catchment piping to the building shall be shutdown at the *supply source(s)*, and the rainwater riser shall be drained.

(2) Potable water piping to the building shall be shutdown at the meter.

(3) The cross-connection shall be uncovered and disconnected.

(4) The building shall be retested following procedures listed in Section 1605.3.1 and Section 1605.3.2.

(5) The potable water system shall be chlorinated with 50 ppm chlorine for 24 hours.

(6) The potable water system shall be flushed after 24 hours, and a standard bacteriological test shall be performed. Where test results are acceptable, the potable water system shall be permitted to be recharged.

HISTORY NOTE APPENDIX

2025 CALIFORNIA PLUMBING CODE
CALIFORNIA CODE OF REGULATIONS, TITLE 24, PART 5

HISTORY:

For prior code history, see the History Note Appendix to the California Plumbing Code, 2022 Triennial Edition, effective January 1, 2023.

1. *(BSC 02/24, DSA-SS 02/24, DSA-SS 01/24 CWoRE, DWR 01/24, HCD 03/24, OSHPD 02/24, SFM 02/24) Adoption by reference the 2024 Uniform Plumbing Code with necessary amendments to become the 2025 California Plumbing Code, and repeal of the 2021 edition of the Uniform Plumbing Code. Effective on January 1, 2026.*
2. *Erratum to correct editorial errors in the Preface and miscellaneous corrections throughout Chapters 2, 3, 4, 15, and 16, effective January 1, 2026.*