REVISION RECORD
FOR THE STATE OF CALIFORNIA
SUPPLEMENT

CHANGE WITHOUT REGULATORY EFFECT SUPPLEMENT

SEE THE HISTORY NOTE FOR EFFECTIVE DATE

August 17, 2019

2019 Title 24, Part 5 California Plumbing Code

General Information:

1. This supplement provides building standards adopted as a change without regulatory effect, which was approved by the California Building Standards Commission on July 17, 2019 and filed with the Secretary of State on July 18, 2019 (see History Note Appendix for effective date).

2. This supplement provides new or replacement blue supplement pages with building standards approved by the California Building Standards Commission for a change without regulatory effect to be inserted in the 2019 California Plumbing Code (Part 5, Title 24, California Code of Regulations). Existing Part 5 pages should be replaced by pages provided in this supplement. 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.

4. Not all code text on the enclosed blue supplement pages is a new building standard. New, amended, or repealed building standards are identified by margin symbols. An explanation of margin symbols is provided in the front of the code.

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 You may wish to retain the superseded material with this revision record so that the prior wording of any section can be easily ascertained.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

Remove Existing Pages	Insert Blue-Colored Pages
xli – xlii	xli – xlii
33 – 36	33 – 36
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CALIFORNIA PLUMBING CODE – MATRIX ADOPTION TABLE
CHAPTER 15 - ALTERNATE WATER SOURCES FOR NONPOTABLE APPLICATIONS

(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								
Adopt Entire Chapter	X									X		X	X	X									
Adopt Entire Chapter as amended (amended sections listed below)				X	X																		
Adopt only those sections that are listed below		X																	X				
Chapter/Section																							
1501.0																			X				
1501.1	X	X		X															X				
1501.1.1				X															X				
1501.2 & Exceptions	X	X		X															X				
1501.3 & *Exception*	X	X		X															X				
1501.4																			X				
Table 1501.5	X	X		†																			
1501.5 & Exception	X	X		X															X				
1501.5.1	X	X		X															X				
1501.6	X	X		X															X				
1501.7	X	X		X															X				
1501.8																			X				
1501.9		X		X	X	X													X				
1501.9.*1*		X		X	X	X													X				
1501.9.*2*		X		X	X														X				
1501.10																			X				
1502.0																			X				
1502.1		X		X															X				
1502.1 Exception																			X				
1502.3		X		X																			
1502.3.2		X		X																			
1502.3.3		X		X																			
1502.3.4	†			†	†																		
1502.4 Exception																			X				
1502.5 - 1502.6																			X				
1503.0		X																					
1503.1 - *1503.1.3*		X		X																			
1503.2 - 1503.2.3		X		X																			
1503.3 & Exceptions		X		X															X				
1503.4 Exception		X		X																			
Table 1503.4		X		X																			
1503.5 Exception		X		X																			
1503.6		X		X																			
1503.7 Exceptions 2 & 3		X		X																			
1503.8 Exception		X		X																			
1503.8.1				X																			

CALIFORNIA PLUMBING CODE – MATRIX ADOPTION TABLE

CHAPTER 15 - ALTERNATE WATER SOURCES FOR NONPOTABLE APPLICATIONS (continued)

(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								
Adopt Entire Chapter	X									X		X	X	X									
Adopt Entire Chapter as amended (amended sections listed below)				X	X																		
Adopt only those sections that are listed below		X																	X				
Chapter/Section																							
1503.8.2.1		X																					
1503.8.2.2		X																					
1503.8.2.3		X																					
1503.8.3				X																			
1503.9		X		X																			
1503.9.1				X																			
1503.9.3		X		X																			
1503.9.4		X		X																			
1504.3 *Exceptions 1 & 2*		X		X																			
1504.4 Note				X																			
Table 1504.2		X		X																			
1504.5 - 1504.5.3		X		X																			
Table 1504.5.3		X		X																			
1504.8		X		X																			
1504.9				X																			
1504.9.1		X		X																			
1504.11				X																			
1505.0 - 1505.15	†	†		†						†		†	†	†					X				
1506.0		X		X																			
1506.1		X		X																			
1506.2		X		X																			
1506.3		X		X																			
1506.4 & Exceptions		X		X															X				
1506.5		X																					
1506.6		X		X																			
1506.7		X		X																			
1506.8		X		X																			
1506.9 - *1506.9.6*		X		X																			
1506.11		X		X	X																		
1506.12		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 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. 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 an 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 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 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* premises 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.*

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.*

Exception: [DWR] *Recycled water supply systems that are within or a part of a building shall comply with Section 1505.15.*

***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].* An operation and maintenance manual for gray water and on-site treated *nonpotable* water systems required to have a permit in accordance with Section 1501.3 *and Section 1506.2* 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* 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*.

(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.

[DWR] *An operation and maintenance manual for recycled water supply systems required to have a permit in accordance with Section 1501.3 and Section 1505.2 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 on operating and maintaining the system.

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

(4) Applicable testing, inspection, and maintenance frequencies in accordance with Section 1501.5 or Section 1503.15 as applicable.

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

(6) 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. ***[BSC-CG & HCD 1]*** *Water quality requirements for on-site treated nonpotable graywater shall comply with Section 1506.9.2.* ***[DWR]*** *Recycled water shall comply with the water quality requirements of Section 1505.14.*

Exception: Water treatment is not required for gray water used *in a disposal field or* for subsurface *or subsoil* irrigation.

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 1505.12.*

***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 reclaimed (recycled) water and 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 ½ of an inch (12.7 mm) letters of a highly visible color on a contrasting background. The location of the sign(s) shall be such that the sign(s) are visible to users. The location of the sign(s) shall be approved by the Authority Having Jurisdiction and 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 reclaimed (recycled) water and 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.

*_____*Shall indicate RECLAIMED (RECYCLED) WATER or ON-SITE TREATED WATER, accordingly.

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 1505.13.*

›› **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 inspection and test shall be performed on both the potable and alternate water source systems. 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*.

›› **1502.3.1 Visual System Inspection.** Before 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) Meter locations of the alternate water source and potable water lines shall be checked to verify that no modifications were made and that no cross-connections are visible.

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

(3) Valves shall be checked to ensure that the valve lock seals are still in place and intact. Valve control door signs shall be checked to verify that no signs have been removed.

›› **1502.3.2 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 alternate water source system shall be shut down, depressurized, and drained.

(2) The potable water system shall remain pressurized for a minimum period specified by the Authority Having Jurisdiction while the alternate water source system is empty. The minimum period the alternate water source 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 the alternate water source distribution systems, but in no case shall that period be less than 1 hour.

(3) The drain on the alternate water source system shall be checked for flow during the test and fixtures, potable and alternate water source, shall be tested and inspected for flow. Flow from an alternate water source system outlet indicates a cross-connection. No flow from a potable water outlet shall indicate that it is connected to the alternate water source system.

(4) The potable water system shall then be depressurized and drained.

(5) The alternate water source system shall then be activated and pressurized. *When an alternate water source is not available for the initial test, a temporary connection to a potable water supply shall be required. At the conclusion of the test, the temporary connection to the potable water supply shall be disconnected.*

(6) The alternate water source system shall remain pressurized for a minimum period 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.

(7) Fixtures, potable, and alternate water source shall be tested and inspected for flow. Flow from a potable water system outlet indicates a cross-connection. No flow from an alternate water source outlet will indicate that it is connected to the potable water system.

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

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

1502.3.3 Discovery of Cross-Connection. If a ‹‹ cross-connection is discovered, the following procedure shall be activated immediately:

(1) Notify the Authority Having Jurisdiction of the cross connection.

(*2*) The alternate water source piping to the building *and its premises* shall be shutdown at the meter, and the alternate water source riser shall be drained.

(*3*) Potable water piping to the building *and its premises* shall be shutdown at the meter.

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

(5) The building *and its premises* shall be retested in accordance with Section 1502.3.1 and Section 1502.3.2.

(*6*) The potable water system shall be chlorinated with 50 parts-per-million (ppm) chlorine for 24 hours.

(*7*) 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.

1502.3.4 Annual Inspection. An annual inspection of the alternate *gray* water source system, following the procedures listed in Section 1502.3.1 shall be required. Annual cross-connection testing, following the procedures listed in Section 1502.3.2 shall be required by the Authority Having Jurisdiction, unless site conditions do not require it. In no event shall the test occur less than once in 4 years. Alternate testing requirements shall be permitted by the Authority Having Jurisdiction. ‹‹

1502.4 Separation Requirements. Underground alternate water source service piping other than gray water shall be separated from the building sewer in accordance with this code. 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 comply with 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.

Exception: [DWR] *Recycled water supply systems that are within or a part of a building shall comply with Section 1505.11.*

1502.5 Abandonment. Alternate water source systems that are no longer in use or fail to be maintained in accordance with Section 1501.5 shall be abandoned. Abandonment shall comply with Section 1502.5.1 and Section 1502.5.2.

1502.5.1 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.

1502.5.2 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.

1502.6 Sizing. Unless otherwise provided for in this chapter, alternate water source piping shall be sized in accordance with Chapter 6 for sizing potable water piping.

1503.0 Gray Water Systems *[BSC-CG].* *Gray water systems shall be verified in accordance with the California Green Building Standards Code (CALGreen), Chapter 5, Division 5.3.*

1503.1 General. The provisions of this section shall apply to the construction, alteration, and repair of gray water systems. *A city, county, or city and county or other local government may adopt, after a public hearing and enactment of an ordinance or resolution, building standards that are more restrictive than the gray water building standards adopted in this code. For additional information, see Health and Safety Code Section 18941.7.*

(A) All gray water systems shall be designed with a diverter valve to allow the user to direct the flow to the building sewer and either the irrigation field or disposal field, whichever is used. The means of changing the direction flow of the gray water shall be clearly labeled and readily accessible to the user.

(B) Water used to wash diapers or similarly soiled or infectious garments or other prohibited contents shall be diverted by the user to the building sewer.

(C) Gray water shall not be used in spray irrigation, allowed to pond or runoff and shall not be discharged directly into or reach any storm sewer system or any surface body of water.

(D) Human contact with gray water or the soil irrigated by gray water shall be minimized and avoided, except as required to maintain the gray water system. The discharge point of any gray water subsoil irrigation or subsurface irrigation field shall be covered by at least two (2) inches (51 mm) of mulch, rock, or soil, or a solid shield to minimize the possibility of human contact.

(E) Gray water may be released above the ground surface provided at least two (2) inches (51 mm) of mulch, rock, or soil, or a solid shield covers the release point. Other methods which provide equivalent separation are also acceptable.

(F) Gray water shall not contain hazardous chemicals derived from activities such as cleaning car parts, washing greasy or oily rags, or disposing of waste solutions.

*(1) **[HCD 1]** The prohibition in Subsection (F) includes, but is not limited to, home photo labs or other similar hobbyist or home occupational activities.*

*(2) **[BSC]** Photo labs or similar activities.*

(G) Exemption from construction permit requirements of this code shall not be deemed to grant authorization for any gray water system to be installed in a manner that violates other provisions of this code or any other laws or ordinances of the Enforcing Agency.

(H) An operation and maintenance manual shall be provided to the owner. Directions shall indicate that the manual is to remain with the building throughout the life of the system and upon change of ownership or occupancy.

(I) A gray water system shall not be connected to any potable water system without an air gap, reduced-pressure principle backflow preventer, or other physical device which prevents backflow and shall not cause ponding or runoff of gray water.

1503.1.1 [HCD 1] Clothes Washer System. *A clothes washer system in compliance with all of the following is exempt from the construction permit specified in Section 1.8.4.1 and may be installed or altered without a construction permit:*

(1) If required, notification has been provided to the enforcing agency regarding the proposed location and installation of a gray water irrigation or disposal system.

(2) The design shall allow the user to direct the flow to the irrigation or disposal field or the building sewer. The direction control of the gray water shall be clearly labeled and readily accessible to the user.

(3) The installation, change, alteration, or repair of the system does not include a potable water connection or a pump and does not affect other building, plumbing, electrical, or mechanical components including structural features, egress, fire-life safety, sanitation, potable water supply piping, or accessibility.

Note: *The pump in a clothes washer shall not be considered part of the gray water system.*

(4) The gray water shall be contained on the site where it is generated.

(5) Gray water shall be directed to and contained within an irrigation or disposal field.

(6) Ponding or runoff is prohibited and shall be considered a nuisance.

(7) Gray water may be released above the ground surface provided at least two (2) inches (51 mm) of mulch, rock, or soil, or a solid shield covers the release point. Other methods which provide equivalent separation are also acceptable.

(8) Gray water systems shall be designed to minimize contact with humans and domestic pets.

(9) Water used to wash diapers or similarly soiled or infectious garments shall not be used and shall be diverted to the building sewer.

(10) Gray water shall not contain hazardous chemicals derived from activities such as cleaning car parts, washing greasy or oily rags, or disposing of waste solutions from home photo labs or similar hobbyist or home occupational activities.

(11) Exemption from construction permit requirements of this code shall not be deemed to grant authorization for any gray water system to be installed in a manner that violates other provisions of this code or any other laws or ordinances of the enforcing agency.

(12) An operation and maintenance manual shall be provided to the owner. Directions shall indicate that the manual is to remain with the building throughout the life of the system and upon change of ownership or occupancy.

(13) Gray water discharge from a clothes washer system through a standpipe shall be properly trapped in accordance with Section 1005.0.

1503.1.2 Simple System. *Simple systems exceed a clothes washer system and shall comply with the following:*

(1) The discharge capacity of a gray water system shall be determined by Section 1503.8. Simple systems have a discharge capacity of 250 gallons (947 L) per day or less.

(2) Simple systems shall require a construction permit, unless exempted from a construction permit by the Enforcing Agency. The Enforcing Agency shall consult with the water purveyor for any public water system (as defined in Health and Safety Code Section 116275) providing drinking water to the dwelling or non-residential structure before allowing an exemption from a construction permit.

(3) The design of simple systems shall meet generally accepted gray water system design criteria.

1503.1.3 Complex System. *Any gray water system that is not a clothes washer system or simple system shall comply with the following:*

(1) The discharge capacity of a gray water system shall be determined by Section 1503.8. Complex systems have a discharge capacity over 250 gallons (947 L) per day.

(2) Complex systems shall require a construction permit, unless exempted from a construction permit by the Enforcing Agency. The Enforcing Agency shall consult with the water purveyor for any public water system (as defined in Health and Safety Code, Section 116275) providing drinking water to the dwelling or non-residential structure before allowing an exemption from a construction permit.

1503.2 System Requirements. Gray water shall be permitted to be diverted away from a sewer or private sewage disposal system, and discharge to a subsurface irrigation or subsoil irrigation system*, or disposal field*. The gray water shall be permitted to discharge to a mulch basin for *residential occupancies*. Gray water shall not be used to irrigate root crops or food crops intended for human consumption that comes in contact with soil.

1503.2.1 Surge Capacity. Gray water systems shall be designed to have the capacity to accommodate peak flow rates and distribute the total amount of estimated gray water on a daily basis to a subsurface irrigation field, subsoil irrigation field*, disposal field*, or mulch basin without surfacing, ponding, or runoff. A surge tank is required for systems that are unable to accommodate peak flow rates and distribute the total amount of gray water by gravity drainage. The water discharge for gray water systems shall be determined in accordance with Section 1503.8.1 or Section 1503.8.2.

Exception: *It is not the intent of this section to require that all gray water must be handled by an irrigation field or disposal field. It is acceptable for excess gray water to be diverted to the building sewer through a diverter valve or overflow drain as permitted in this chapter.*

1503.2.2 Diversion. The gray water system shall connect to the sanitary drainage system downstream of fixture traps and vent connections through an approved diverter valve. The diverter valve shall be installed in *a readily* accessible location and clearly indicate the direction of flow.

Exception: [HCD 1] *A clothes washer system in compliance with Section 1503.1.1.*

1503.2.3 Backwater Valves. Gray water drains subject to backflow shall be provided with a backwater valve *at the point of connection to the building sewer system,* so located as to be accessible for inspection and maintenance.

1503.3 Connections to Potable and Reclaimed (Recycled) Water Systems. Gray water systems shall have no direct connection to a potable water supply, on-site treated nonpotable water supply, or reclaimed (recycled) water *supply* systems.

Exceptions:

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

(2) A potable water supply may be connected temporarily for initial testing of the untreated graywater system as required in Section 1502.3.2.

1503.4 Location. No gray water system or part thereof shall be located on a lot other than the lot that is the site of the building or structure that discharges the gray water, nor shall a gray water system or part thereof be located at a point having less than the minimum distances indicated in Table 1503.4.

Exception: *When there exists a lawfully recorded perpetual and exclusive covenant to an easement appurtenant and right-of-way between adjoining land-owners of two or more contiguous lots to discharge gray water from one lot to an adjoining lot.*

1503.5 Plot Plan Submission. No permit for a gray water system shall be issued until a plot plan with data satisfactory to the Authority Having Jurisdiction has been submitted and approved.

Exception: [HCD 1] *A construction permit shall not be required for a clothes washer system in compliance with Section 1503.1.1.*

1503.6 Prohibited Location. Where there is insufficient lot area or inappropriate soil conditions for adequate absorption, no gray water system shall be permitted.

1503.7 Drawings and Specifications. The Authority Having Jurisdiction *may* require the following information to be included with or in the plot plan before a permit is issued for a gray water system, or at a time during the construction thereof:

(1) Plot plan drawn to scale and completely dimensioned, showing lot lines and structures, direction and approximate slope of surface, location of present or proposed retaining walls, drainage channels, water supply lines, wells, paved areas and structures on the plot, number of bedrooms and plumbing fixtures in each structure, location of private sewage disposal system and expansion area or building sewer connecting to the public sewer, and location of the proposed gray water system.

(2) Details of construction necessary to ensure compliance with the requirements of this chapter, together with a full description of the complete installation, including installation methods, construction, and materials.

(3) Details for holding tanks shall include dimensions, structural calculations, bracings, and such other pertinent data as required.

(4) A log of soil formations and groundwater level as determined by test holes dug in proximity to proposed irrigation *and/or disposal* area, together with a statement of water absorption characteristics of the soil at the proposed site as determined by approved percolation tests.

Exceptions:

(1) The Authority Having Jurisdiction shall permit the use of Table 1504.2 instead of percolation tests.

TABLE 1503.4[7]
LOCATION OF GRAY WATER SYSTEM

MINIMUM HORIZONTAL DISTANCE IN CLEAR REQUIRED FROM	SURGE TANK (feet)	SUBSURFACE AND SUBSOIL IRRIGATION FIELD AND MULCH *BASIN* (feet)	*DISPOSAL FIELD*
Building structures[1]	5[2, 3, 9]	2[3, 8]	*5*
Property line adjoining private property	5	5[8]	*5*
Water supply wells[4]	50	100	*100*
Streams and lakes[4]	50	*100*[5, 10]	*100*[5]
Sewage pits or cesspools	5	5	*5*
Sewage disposal field[10]	5	4[6]	*4*[6]
Septic tank	0	5	*5*
On-site domestic water service line	5	*0*	*0*
Pressurized public water main[7]	10	10[7]	*10*[7]

For SI units: 1 foot = 304.8 mm

Notes:

[1] *Building structures do not include* porches and steps, whether covered or uncovered, breezeways, roofed carports, *roofed porte cocheres,* roofed patios, carports, covered walks, covered driveways, and similar structures or appurtenances.

[2] The distance shall be permitted to be reduced to 0 feet for aboveground tanks where first approved by the Authority Having Jurisdiction.

[3] *Underground tanks shall not be located within a 45 degree angle from the bottom of the foundation, or they shall be designed to address the surcharge imposed by the structure. The distance may be reduced to six (6) inches (153 mm) for aboveground tanks when first approved by the Enforcing Agency.*

[4] Where special hazards are involved, the distance required shall be increased as directed by the Authority Having Jurisdiction.

[5] These minimum clear horizontal distances shall apply between the irrigation or disposal field and the ocean mean higher high tide line.

[6] Add 2 feet (610 mm) for each additional foot of depth more than 1 foot (305 mm) below the bottom of the drain line.

[7] For parallel construction or crossings, approval by the Authority Having Jurisdiction shall be required.

[8] The distance shall be permitted to be reduced to 1½ feet (457 mm) for drip and mulch basin irrigation systems.

[9] The distance shall be permitted to be reduced to 0 feet for surge tanks of 75 gallons (284 L) or less.

[10] *The minimum horizontal distance may be reduced to 50 feet (15 240 mm) for irrigation or disposal fields utilizing gray water which has been filtered prior to entering the distribution piping.*

(2) The Enforcing Agency may waive the requirement for identification of groundwater level and/or soil absorption qualities based on knowledge of local conditions.

(3) The absence of groundwater in a test hole three (3) vertical feet (915 mm) below the deepest irrigation or disposal point shall be sufficient to satisfy this section unless seasonal high groundwater levels have been documented to rise to within this area.

(5) Distance between the plot and surface waters such as lakes, ponds, rivers or streams, and the slope of the plot and the surface water, wherein close proximity.

›› **1503.8 Procedure for Estimating Gray Water Discharge.** Gray water systems shall be designed to distribute the total amount of estimated gray water on a daily basis. The water discharge for gray water systems shall be determined in accordance with Section 1503.8.1 or Section 1503.8.2.

Exception: *It is not the intent of this section to require that all gray water must be handled by an irrigation field or disposal field. It is acceptable for excess gray water to be diverted to the building sewer through a diverter valve or overflow drain as permitted in this chapter.*

›› **1503.8.1 *Residential Occupancies*.** The gray water discharge for *residential occupancies* shall be calculated by water use records, calculations of local daily per person interior water use, or the following procedure:

(1) The number of occupants of each dwelling unit shall be calculated as follows:

First Bedroom	2 occupants
Each additional bedroom	1 occupant

(2) The estimated gray water flows of each occupant shall be calculated as follows:

Showers, bathtubs, and lavatories	25 gallons (95 L) per day/occupant
Laundry	15 gallons (57 L) per day/occupant

(3) The total number of occupants shall be multiplied by the applicable estimated gray water discharge as provided above and the type of fixtures connected to the gray water system.

›› **1503.8.2 Commercial, Industrial, and Institutional Occupancies.** The *Authority Having Jurisdiction may utilize the* gray water discharge *procedures listed below,*, water use records or other documentation to estimate gray water discharge.

1503.8.2.1 Lavatories. *Daily discharge from lavatories may be determined by the following equation:*

(Equation 15.1)

Occupants X lavatory flow rate X 3

Where:

The number of occupants = square footage of the building divided by the occupant load factor from the California Plumbing Code Chapter 4, Table A.

Lavatory fixture flow rate, new construction = That from the California Green Building Standards (CALGreen) Code Section 5.303.2.3

Lavatory fixture flow rate, existing fixtures = Actual flow rate for existing fixtures

3 = Average number of uses per person per day

1503.8.2.2 Showers. *Daily gray water discharge from showers may be determined by the following equation:*

(Equation 15.2)

Number of daily uses X shower flow rate X 5 minutes

1503.8.2.3 Commercial Clothes Washers. *Daily gray water discharge from commercial clothes washers may be determined by the following equation:*

(Equation 15.3)

Cubic feet of capacity X Water Factor X 6

Where:

Water Factor = Gallons per cubic foot

6 = Average number of uses per day

Note: *Cubic feet of capacity and Water Factor are contained in product specifications or are available from the washer manufacturer.*

1503.8.3 Daily Discharge. *Gray water systems using tanks shall be designed to minimize the amount of time gray water is held in the tank and shall be sized to distribute the total amount of estimated gray water on a daily basis.*

Exception: *Approved on-site treated nonpotable gray water systems.*

1503.9 Gray Water System Components. Gray water system components shall comply with Section 1503.9.1 through Section *1503.9.4*.

[HCD 1] *Gray water system components shall comply with this chapter.*

1503.9.1 Surge Tanks. Where installed, surge tanks ‹‹ shall be in accordance with the following:

(1) Surge tanks shall be constructed of solid, durable materials not subject to excessive corrosion or decay and shall be watertight. *Aboveground surge tanks shall be protected from direct sunlight or shall be constructed of UV resistant materials including but not limited to heavily tinted or opaque plastic, fiberglass, lined metal, concrete and wood.* Surge tanks constructed of steel shall be approved by the Authority Having Jurisdiction, provided such tanks are in accordance with approved applicable standards.

(2) Each surge tank shall be vented in accordance with this code. The vent size shall be determined based on the total gray water fixture units as outlined in this code.

(3) Each surge tank shall have an access opening with lockable gasketed covers or approved equivalent to allow for inspection and cleaning.

(4) Each surge tank shall have its rated capacity permanently marked on the unit. Also, a sign stating GRAY WATER *SYSTEM, CAUTION* — UNSAFE WATER shall be permanently marked on the holding tank.

(5) Each surge tank shall have an overflow drain. The overflow drains shall have permanent connections to the building drain or building sewer, upstream of septic tanks. The overflow drain shall not be equipped with a shutoff valve.

(6) The overflow drain pipes shall not be less in size than the inlet pipe. Unions or equally effective fittings shall be provided for piping connected to the surge tank.

(7) Surge tank shall be structurally designed to withstand anticipated earth or other loads. Surge 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.

(8) Where a surge tank is installed underground, the system shall be designed so that the tank overflow will gravity drain to the existing sewer line or septic tank. The tank shall be protected against sewer line backflow by a backwater valve installed in accordance with this code.

(9) Surge tanks shall be installed on dry, level, well-compacted soil where underground or on a level 3 inch (76 mm) thick concrete slab *or other approved method* where aboveground.

(10) Surge tanks shall be anchored to prevent against overturning where installed aboveground. 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 forces of the tank.

(11) ***[HCD 1]*** *An overflow drain and backwater valve is not required on a clothes washer system.*

1503.9.2 Gray Water Pipe and Fitting Materials. Aboveground and underground building drainage and vent pipe and fittings for gray water systems shall comply with the requirements for aboveground and underground sanitary building drainage and vent pipe and fittings in this code. These materials shall extend not less than 2 feet (610 mm) outside the building.

1503.9.3 Animals and Insects. *Gray water tank openings shall be protected to prevent the entrance of insects, birds, or rodents into the tank and piping systems. 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.*

1503.9.4 Freeze Protection. *Tanks and piping installed in locations subject to freezing shall be provided with an approved means of freeze protection.*

1504.0 Subsurface Irrigation System Zones.

1504.1 General. Irrigation or disposal fields shall be permitted to have one or more valved zones. Each zone shall be of a size to receive the gray water anticipated in that zone.

1504.2 Required Area of Subsurface Irrigation Fields, Subsoil Irrigation Fields, and Mulch Basins. The minimum effective irrigation area of subsurface irrigation fields, subsoil irrigation fields, and mulch basins shall be determined by Table 1504.2 for the type of soil found in the excavation, based upon a calculation of estimated gray water discharge under Section 1503.8. For a subsoil irrigation field, the area shall be equal to the aggregate length of the perforated pipe sections within the valved zone multiplied by the width of the proposed subsoil irrigation field.

TABLE 1504.2
DESIGN OF SIX TYPICAL SOILS

TYPE OF SOIL	MINIMUM SQUARE FEET OF IRRIGATION/*LEACHING* AREA PER 100 GALLONS OF ESTIMATED GRAY WATER DISCHARGE PER DAY	MAXIMUM ABSORPTION CAPACITY IN GALLONS PER SQUARE FOOT OF IRRIGATION/ LEACHING AREA FOR A 24-HOUR PERIOD
Coarse sand or gravel	20	5.0
Fine sand	25	4.0
Sandy loam	40	2.5
Sandy clay	60	1.7
Clay with considerable sand or gravel	90	1.1
Clay with small amounts of sand or gravel	120	0.8

For SI units: 1 square foot = 0.0929 m^2, 1 gallon per day = 0.000043 L/s

1504.3 Determination of Maximum Absorption Capacity. The irrigation field and mulch basin size shall be based on the maximum absorption capacity of the soil and determined using Table 1504.2. For soils not listed in Table 1504.2, the maximum absorption capacity for the proposed site shall be determined by percolation tests or another method acceptable to the Authority Having Jurisdiction. A gray water system shall not be permitted, where the percolation test shows the absorption capacity of the soil is unable to accommodate the maximum discharge of the proposed gray water irrigation system.

Exceptions:

(1) The Enforcing Agency may waive the requirement for identification of groundwater level and/or soil absorption qualities based on knowledge of local conditions.

(2) Irrigation fields in compliance with Section 1504.5 which only utilize drip type emitters are exempt from percolation tests.

1504.4 Groundwater Level. No excavation for an irrigation field, disposal field, or mulch basin shall extend within 3 feet (914 mm) vertical of the highest known seasonal

groundwater level, nor to a depth where gray water contaminates the groundwater or surface water. The applicant shall supply evidence of groundwater depth to the satisfaction of the Authority Having Jurisdiction.

Note: *The absence of groundwater in a test hole three (3) vertical feet (915 mm) below the deepest irrigation or disposal point shall be sufficient to satisfy this section unless seasonal high groundwater levels have been documented to rise to within this area.*

→ ***1504.5 Irrigation, Disposal Field and Mulch Basin Construction.*** *Irrigation fields, disposal fields and mulch basins used in gray water systems shall comply with this section. Gray water systems may contain either an irrigation field or a disposal field or a combination of both. This section is not intended to prevent the use of other methods of gray water irrigation or disposal approved by the Enforcing Agency.*

[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.*

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TABLE 1504.5
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.

1504.5.1 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. For emitter ratings, refer to Irrigation Equipment Performance Report, Drip Emitters and Micro-Sprinklers, Center for Irrigation Technology, California State University, 5730 N. Chestnut Avenue, Fresno, California 93740-0018.

(3) Each irrigation zone shall be designed to include no less than the number of emitters specified in Table 1504.5, 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.*

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 1505.15 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 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.*

***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, apartments, barracks, dormitories, jails, prisons, reformatories, and other structures as determined by the State Water Resources Control Board.*

1505.2 Permit. It shall be unlawful for a person to construct, install, alter, or cause to be constructed, installed, or altered a reclaimed (recycled) water *supply* system within a building or on *its* premises without first obtaining a permit to do such work from the Authority Having Jurisdiction.

Prior to commencing the issuance of permits for recycled water supply systems pursuant to state requirements relating to recycled water, a city, county, city and county or other local agency shall seek consultation with the State Water Resources Control Board, local public health department and local recycled water purveyor to ensure that state and local public health concerns are addressed in local standards or ordinances, or in issuing permits.

1505.2.1 Plumbing Plan Submission. No permit for a reclaimed (recycled) water *supply* system shall be issued until complete plumbing plans, with data satisfactory to the Authority Having Jurisdiction, have been submitted and approved.

1505.3 System Changes. No changes or connections shall be made to either the reclaimed (recycled) water *supply* system or the potable water system within site containing a reclaimed (recycled) water *supply* system without approval by the Authority Having Jurisdiction.

1505.4 Connections to Potable or Reclaimed (Recycled) Water *Supply* Systems. Recycled water *supply* systems shall have no *direct* connection to a potable water supply or alternate water source system.

Exceptions:

(1) Potable water is permitted to be used as makeup water for a reclaimed (recycled) water storage tank provided the *potable* water supply inlet is protected by an air gap or reduced-pressure principle backflow preventer in accordance with this code.

(2) A potable water supply may be connected temporarily for initial testing of the recycled water supply system as provided in Section 1505.13.2.2. Prior to temporarily connecting the potable line to the recycled water supply system for initial testing purposes, the potable line must have a reduced-pressure principle backflow preventer installed.

(3) Reclaimed (recycled) water is permitted to be used as makeup water for an alternate water source system provided the recycled water supply system is protected by an air gap in accordance with this code.

1505.5 Initial Cross-Connection Test. A cross-connection test is required in accordance with Section *1505.13.2.2*. Before the building is occupied or the system is activated, the installer shall perform *an* initial cross-connection test in the presence of the Authority Having Jurisdiction *or* other authorities having jurisdiction. The test shall be ruled successful by the Authority Having Jurisdiction before final approval is granted.

1505.6 Recycled Water *Supply* System Materials. Recycled water supply system materials shall comply with the requirements of this code for potable water supply systems unless otherwise provided for in this section.

1505.7 Recycled Water *Supply* System Color and Marking Information. *All mechanical equipment, including control valves, appurtenant to recycled water supply systems shall be painted purple or composed of purple material matching Pantone color No. 512, 522C or equivalent. Recycled water supply systems* shall *be identified and permanently marked with clearly visible black uppercase lettering on purple background. The identification may be accomplished by labeling metallic and non-metallic piping using purple-colored (Pantone color No. 512) adhesive Mylar PVC tape affixed along the entire length of the pipe, or using non-metallic pipe manufactured with purple (Pantone color No. 512, 522C, or equivalent) integral to the material. For either material, the tape or pipe shall be installed so the wording is clearly visible and shall be field or factory marked as follows:*

"CAUTION: NONPOTABLE RECYCLED WATER, DO NOT DRINK".

1505.8 Valves. Valves, except fixture supply control valves, shall be equipped with a locking feature.

1505.8.1 Valve Seals. *The master reclaimed (recycled) water shut-off valve and/or the reclaimed (recycled) water meter curb cock and each valve within a wall shall be sealed after the recycled water supply system has been approved and placed into operation. These seals shall be either crimped lead wire seal or plastic break away seal which, if broken after system approval, shall be deemed conclusive evidence that the recycled water supply system has been accessed. The seals shall be purple, numbered, and contain the words "RECYCLED WATER", and shall be supplied by the recycled water purveyor, or by other arrangements acceptable to the Authority Having Jurisdiction.*

1505.8.2 Valve and Appurtenance Access Door Signs. *Each reclaimed (recycled) water valve within a wall shall have its access door into the wall equipped with a warning sign approximately 6 inches by 6 inches (152 mm x 152 mm) with wording in approximately 3/8 inch (9.5 mm) letters on a purple background. The wording text and format of the sign shall be substantially the same as that specified in Section 1505.12.3. The signs shall be attached inside the access door frame and shall hang in the center of the access door frame. This sign requirement shall be applicable to any and all access doors, hatches, etc., leading to reclaimed (recycled) water piping and appurtenances.*

1505.9 Hose Bibbs. Hose bibbs shall not be allowed on reclaimed (recycled) water piping systems. *Only quick couplers* that differs from those installed on the potable water system *shall be used on the recycled water piping system in areas subject to public access*. *Quick couplers* supplying reclaimed (recycled) water shall be marked with the words: "CAUTION: NONPOTABLE *RECYCLED* WATER, DO NOT DRINK," and *one of* the symbol*s* in Figure 1505.9.

Exception: *In accordance with Health and Safety Code Section 8117 and Section 8118, hose bibbs are approved for use in cemeteries supplied with reclaimed (recycled) water. A hose bibb in an area subject to access by the general public shall be equipped with a sign marked "CAUTION: NONPOTABLE RECYCLED WATER, DO NOT DRINK," and one of the symbols in Figure 1505.9.*

FIGURE 1505.9

1505.10 Required Appurtenances. The recycled water *supply* system and the potable water system within the building *and the premises* shall be provided with the required appurtenances (e.g., valves, air/vacuum relief valves, etc.) to allow for *testing* as required for a cross-connection test in accordance with Section *1505.13.2*.

1505.11 *Pipe Separation in Trenches.* Reclaimed (recycled) water pipes shall be permitted to be run or laid in the same trench as potable water pipes with 12 inches (305 mm) minimum vertical and horizontal separation where both pipe materials are approved for use within a building. Where piping materials do not meet this requirement, the minimum horizontal separation shall be increased to *48* inches (*1220* mm). The potable water piping shall be installed at an elevation above the reclaimed (recycled) water piping. Reclaimed (recycled) water pipes laid in the same trench or crossing building sewer or drainage piping shall be installed in accordance with *Section 609.0 and Section 720.0 of this code for water pipes*.

1505.12 *Signage.* Signs in rooms and water closet tanks in buildings using reclaimed (recycled) water shall be in accordance with Section *1505.12.1, Section 1505.12.2, and Section 1505.12.3. Signs on access doors to valves and appurtenances shall be in accordance with Section 1505.8.2*.

1505.12.1 Commercial, Industrial, Institutional, and Residential Restroom Signs. *A sign shall be installed in each restroom of commercial, industrial, and institutional occupancies, and in residential common use areas using reclaimed (recycled) water for water closets, urinals, or both. Each sign shall contain letters of a highly visible color on a contrasting background with a character height as specified in the California Building Code (California Code of Regulations, Title 24, Part 2), Section 1143A.5 and Section 11B-703.5. The location of the sign(s) shall be such that the sign(s) are visible to users and shall be approved by the Authority Having Jurisdiction. The sign(s) shall contain the following text:*

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

1505.12.2 Tank-Type Toilet Signs. *Where tank-type toilets (water closets) are flushed with recycled water, a permanent sign (such as plastic or stainless steel) shall be installed inside the tank to warn that the water within the tank is not a suitable emergency drinking water supply. The sign shall be labeled: "CAUTION: NONPOTABLE RECYCLED WATER – DO NOT DRINK."*

1505.12.3 Equipment Room Signs. *Each room containing reclaimed (recycled) water equipment shall have a sign posted in a location that is visible to anyone working on or near reclaimed (recycled) water equipment with the following wording in 1 inch (25.4 mm) letters on a purple background:*

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

1505.13 Inspection and Testing. Recycled water *supply* systems shall be inspected and tested in accordance with Section *1505.13.1 and Section 1505.13.2. The reclaimed (recycled) water purveyor or other designated appointee may substitute for the Authority Having Jurisdiction for the purpose of inspections and tests pursuant to this section*.

1505.13.1 Supply System Inspection and Test. *Recycled water supply systems shall be inspected and tested in accordance with this code for testing of potable water piping.*

1505.13.2 Cross-Connection Inspection and Testing. *An initial visual inspection and cross-connection test shall be performed on both the potable and recycled water supply systems before the initial operation of the recycled water supply system. During an initial or subsequent cross-connection test, the potable water system and recycled water supply system shall be isolated from each other and independently inspected and tested to ensure there is no cross-connection in accordance with Section 1505.13.2.2. Initial or subsequent inspections or tests shall be performed in accordance with Section 1505.13.2.1 through Section 1505.13.2.4.*

(1) Written reports of cross-connection inspections and testing shall be performed as provided in California Code of Regulations, Title 22, Section 60316.

(2) A cross-connection test pursuant to Section 1505.13.2.2 shall be performed on the premises of a recycled water supply system when there is material reason to believe that the potable water system or recycled water supply system separation from another water supply has been compromised. A

material reason to believe that the system has been compromised may be based on, but is not limited to, evidence gathered (a) during a visual inspection performed pursuant to Section 1505.13.2.1, (b) as a result of an inspection performed following complaints of water quality or flow conditions consistent with a compromised system, or (c) during a visual inspection that indicates that the recycled water supply system has been modified.

1505.13.2.1 Visual System Inspection. *A visual dual system inspection shall be conducted by the Authority Having Jurisdiction and other authorities having jurisdiction to verify that no modifications were made, and that no cross-connections are visible as follows:*

(1) Meter locations of the reclaimed (recycled) water source and potable water lines shall be checked.

(2) All pumps and equipment, equipment room signs, and exposed piping in equipment room shall be checked.

(3) All valves shall be checked to ensure that the valve lock seals are still in place and intact. Valve control door signs shall be checked to verify that no signs have been removed.

1505.13.2.2 Cross-Connection Test. *A cross-connection test shall be performed pursuant to Section 1505.13.2. The test shall be conducted 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 recycled water supply system shall be shut down, depressurized, and drained.

(2) The potable water system shall remain pressurized for a minimum period of time specified by the Authority Having Jurisdiction while the recycled water supply system is empty. The minimum period the recycled water supply 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 the recycled water supply systems, but in no case shall that period be less than 1 hour.

(3) All fixtures, potable and reclaimed (recycled) water source, shall be tested and inspected for flow. Flow from a recycled water supply system outlet indicates a cross-connection. No flow from a potable water outlet shall indicate that it is connected to the recycled water supply system.

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

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

(6) The recycled water supply system shall then be activated and pressurized. For the initial test, a temporary connection to a potable water supply shall be required to test the recycled water supply system plumbing. At the conclusion of the test, the temporary connection to the potable water supply shall be disconnected.

(7) The recycled water supply 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) All fixtures, potable and reclaimed (recycled) water, shall be tested and inspected for flow. Flow from a potable water system outlet indicates a cross-connection. No flow from a recycled water supply system outlet will 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 test.

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

Where shutting off the water is not practical for residential, institutional, or industrial buildings, the Authority Having Jurisdiction may authorize testing procedures other than those described above.

1505.13.2.3 Discovery of Cross-Connection. *In the event that a cross-connection is discovered, the following procedure shall be activated immediately:*

(1) Notify the Authority Having Jurisdiction of the cross-connection.

(2) The reclaimed (recycled) water piping to the building and its premises shall be shut down at the meter, and the reclaimed (recycled) water riser shall be drained.

(3) Potable water piping to the building and its premises shall be shut down at the meter.

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

(5) The building and its premises shall be retested in accordance with Section 1505.13.2.1 and Section 1505.13.2.2.

(6) The potable water system shall be chlorinated with 50 parts-per-million (ppm) chlorine for 24 hours.

(7) 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.

1505.13.2.4 Periodic Inspection. *Periodic visual inspections of recycled water supply systems shall be required by the recycled water supplier or designee following the procedures in Section 1505.13.2.1. Pursuant to California Code of Regulations, Title 22, Section 60316, annual visual inspections shall be required for recycled water supply systems that are within or a part of a building.*

1505.14 Minimum Water Quality Requirements for Reclaimed (Recycled) Water. *The minimum water quality for reclaimed (recycled) water shall meet the applicable water quality requirements of California Code of Regulations, Title 22, Division 4, Chapter 3 (commencing with Section 60301) for disinfected tertiary recycled water and the applicable reclaimed (recycled) water use. The reclaimed (recycled) water supplier shall supply water in accordance with permits issued by the State Water Resources Control Board or Regional Water Quality Control Board.*

1505.15 Maintenance and Inspection. *Recycled water supply systems and components shall be inspected and maintained in accordance with the manufacturer's recommendations and/or as required by the Authority Having Jurisdiction. The frequency of testing, inspection, and maintenance shall be in accordance with Table 1505.15. The required inspection and maintenance shall be the responsibility of the property owner, unless otherwise required by the Authority Having Jurisdiction.*

1506.0 On-Site Treated Nonpotable *Gray* Water Systems.

1506.1 General. The provisions of this section shall apply to the installation, construction, alteration, and repair of on-site treated nonpotable *gray* water systems intended to supply uses such as water closets, urinals, trap primers for floor drains and floor sinks, above and belowground irrigation, and other uses approved by the Authority Having Jurisdiction.

Other approved nonpotable water sources including swimming pool backwash operations, air conditioner condensate, rainwater, cooling tower blow-down water, foundation drainage, steam system condensate, fluid cooler discharge water, food steamer discharge water, combination oven discharge water, industrial process water, and fire pump test water may be permitted to be collected for re-use by gray water systems, as approved for the intended application.

1506.2 Plumbing Plan Submission. No permit for an on-site treated nonpotable *gray* water system shall be issued until complete plumbing plans, with data satisfactory to the Authority Having Jurisdiction, have been submitted and approved. ***[BSC-CG, HCD 1]*** *Prior to commencing the issuance of permits for indoor gray water systems pursuant to state requirements relating to graywater, a city, county, city and county or other local agency shall seek consultation with the local public health department to ensure that local public health concerns are addressed in local standards or ordinances, or in issuing permits. See California Water Code Section 14877.3.*

1506.3 System Changes. No changes or connections shall be made to either the on-site treated nonpotable *gray* water system or the potable water system within a site containing an on-site treated nonpotable *gray* water system without approval by the Authority Having Jurisdiction.

1506.4 Connections to Potable or Reclaimed (Recycled) Water Systems. On-site treated nonpotable *gray* water systems shall have no *direct* connection to a potable water supply or reclaimed (recycled) water *supply* system.

Exceptions:

(1) Potable or reclaimed (recycled) water is permitted to be used as makeup water for a non-pressurized storage tank provided the makeup water supply *inlet* is protected by an air gap in accordance with this code.

(2) A potable water supply may be connected temporarily for initial testing of the on-site treated nonpotable gray water system as provided in Section 1502.3.2.

1506.5 Initial Cross-Connection Test. A cross-connection test is required in accordance with Section 1502.3. 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.

1506.6 On-Site Treated Nonpotable *Gray* Water System Materials. On-site treated nonpotable *gray* water supply, and distribution system materials shall comply with the requirements of this code for potable water supply and distribution systems unless otherwise provided for in this section.

TABLE 1505.15
MINIMUM RECLAIMED (RECYCLED) WATER SOURCE TESTING, INSPECTION, AND MAINTENANCE FREQUENCY

DESCRIPTION	*MINIMUM FREQUENCY**
Inspect and clean filters and screens, and replace (where necessary).	*Every 3 months.*
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.*

****Note:*** *Frequency is as described in this table, or more frequently as required by manufacturer's instructions and/or the Authority Having Jurisdiction.*

›› **1506.7 On-Site Treated Nonpotable *Gray* Water Devices and Systems.** Devices or equipment used to treat on-site treated nonpotable *gray* water 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) or approved for the intended application. Devices or equipment used to treat on-site treated nonpotable *gray* water for use in the water closet and urinal flushing, surface irrigation, and similar applications shall comply with NSF 350 or approved by the Authority Having Jurisdiction.

›› **1506.8 On-Site Treated Nonpotable *Gray* Water System Color and Marking Information.** On-site treated *nonpotable gray* water systems shall have a colored background and marking information in accordance with Section 601.3 of this code.

›› **1506.9 Design and Installation.** The design and installation of on-site treated nonpotable *gray water* systems shall be in accordance with Section 1506.9.1 through Section *1506.9.6*.

›› **1506.9.1 Listing Terms and Installation Instructions.** On-site treated nonpotable *gray* water systems shall be installed in accordance with the terms of its listing and the manufacturer's installation instructions.

›› **1506.9.2 Minimum Water Quality *[BSC-CG, HCD 1].*** On-site treated nonpotable *gray* water supplied to toilets or urinals or for other uses in which it is sprayed or exposed shall be disinfected. Acceptable disinfection methods shall include chlorination, ultraviolet sterilization, ozone, or other methods as approved by the Authority Having Jurisdiction. The minimum water quality for on-site treated nonpotable *gray* water systems shall meet the applicable water quality requirements for the intended applications as determined by the public health Authority Having Jurisdiction. *In the absence of local water quality requirements for on-site treated nonpotable gray water, the requirements of NSF 350 shall apply.*

›› **1506.9.3 Deactivation and Drainage.** The on-site treated nonpotable *gray* water system and the potable water system within the building shall be provided with the required appurtenances (e.g., valves, air/vacuum relief valves, etc.) to allow for deactivation or drainage as required for a cross-connection test in accordance with Section 1502.3.

›› **1506.9.4 Near Underground Potable Water Pipe.** On-site treated nonpotable *gray* 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 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 on-site treated nonpotable *gray* water piping.

›› **1506.9.5 Required Filters.** A filter permitting the passage of particulates no larger than 100 microns (100 μm) shall be provided for on-site treated nonpotable *gray* water supplied to water closets, urinals, trap primers, and drip irrigation system.

1506.9.6 Disinfection. *Where the intended use of onsite treated nonpotable gray water requires disinfection and/or other treatment, on-site treated nonpotable gray water shall be disinfected as needed to ensure the required water quality is obtained 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.*

1506.10 Valves. Valves, except fixture supply control valves, shall be equipped with a locking feature. ‹‹

1506.11 Signs. Signs in buildings using on-site treated nonpotable *gray* water shall comply with Section*s* 1501.9, 1501.9.1*, and 1501.9.2, and applicable requirements of the California Building Code.* ‹‹

1506.12 Inspection and Testing. On-site treated nonpotable *gray* water systems shall be inspected and tested in accordance with Section 1502.1 *and/or as required by the Authority Having Jurisdiction.* ‹‹