CALIFORNIA PLUMBING CODE – MATRIX ADOPTION TABLE
CHAPTER 16*A* - NON-POTABLE WATER REUSE SYSTEMS

Adopting Agency	BSC	SFM	HCD			DSA			OSHPD				CSA	DPH	AGR	DWR	CA
			1	2	1/AC	AC	SS	SS/CC	1	2	3	4					
Adopt Entire Chapter																	
Adopt Entire Chapter as amended (amended sections listed below)																	
Adopt only those sections that are listed below			X													X	
Chapter/Section																	
Part I			X														
Part II																X	

CHAPTER 16*A*
NON-POTABLE WATER REUSE SYSTEMS

Part I *[HCD 1]*

Intent

This part is applicable to occupancies under the authority of the Department of Housing and Community Development as specified in Section 1.8.2.1.1 and is intended to:

1. *Conserve water by facilitating greater reuse of laundry, shower, lavatory, and similar sources of discharge for irrigation and/or indoor use.*
2. *Reduce the number of non-compliant graywater systems by making legal compliance easily achievable.*
3. *Provide guidance for avoiding potentially unhealthful conditions.*
4. *Provide an alternative way to relieve stress on a private sewage disposal system by diverting the graywater.*

1601*A*.0 Graywater Systems – General.

(A) Except as otherwise provided for in this chapter, the provisions of this code shall be applicable to graywater installation. *The provisions of this part shall apply to the construction, alteration, discharge, use, and repair of graywater systems. The graywater system shall not be connected to any potable water system without an air gap or other physical device which prevents backflow and shall not cause the ponding or runoff of graywater. A city, county, or city and county or other local government may, after a public hearing and enactment of an ordinance or resolution, further restrict or prohibit the use of graywater systems. For additional information, see Health and Safety Code Section 18941.7.*

(B) *The type of system shall be determined by the location, discharge capacity, soil type, and ground water level. The system shall be designed to handle graywater discharged from the building and may include tank(s) and other appurtenances necessary to ensure proper function of the system.*

***Note:** It is not the intent of this section to require that all graywater must be handled by an irrigation field or disposal field. It is acceptable for excess graywater to be diverted to the building sewer through the overflow required pursuant to Section 1609A.0(E)*

(C) No graywater system or part thereof shall be located on any lot other than the lot that is the site of the building or structure that discharges the graywater, nor shall any graywater system or part thereof be located at any point having less than the minimum distances indicated in Table 16*A*-1.

***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 graywater from one lot to an adjoining lot.*

(D) No *construction* permit for any graywater system shall be issued until a plot plan with appropriate data satisfactory to the *Enforcing Agency* has been submitted and approved. When there is insufficient lot area or inappropriate soil conditions *to prevent the ponding or runoff* of the graywater, as determined by the *Enforcing Agency*, no graywater system shall be *allowed*.

***Exception:** A construction permit shall not be required for a clothes washer system which does not require cutting of the existing plumbing piping provided it is in compliance with Section 1603A.1.1.*

***(E)** All graywater systems shall be designed to allow the user to direct the flow to either the irrigation or disposal field or the building sewer. The means of changing the direction of the graywater shall be clearly labeled and readily accessible to the user.*

***(F)** 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.*

***(G)** Graywater 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.*

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

***(I)** Graywater shall not be used to irrigate root crops or edible parts of food crops that touch the soil.*

1602*A*.0 Definitions.

***Clothes Washer System.** A graywater system utilizing only a single domestic clothes washing machine in a one- or two-family dwelling.*

***Complex System.** Graywater systems that discharge over 250 gallons (947 L) per day.*

***Disposal Field.** An intended destination for graywater including but not limited to a mulch basin or receiving landscape feature, graywater leach field, or other approved method of disposal.*

***Graywater.** Pursuant to Health and Safety Code Section 17922.12, "graywater" means untreated wastewater that has not been contaminated by any toilet discharge, has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes. "Graywater" includes but is not limited to wastewater from*

bathtubs, showers, bathroom washbasins, clothes washing machines, and laundry tubs, but does not include wastewater from kitchen sinks or dishwashers.

Graywater System. *A system designed to collect graywater and transport it out of the structure for distribution in an Irrigation or Disposal Field. A graywater system may include tanks, valves, filters, pumps or other appurtenances along with piping and receiving landscape.*

Irrigation Field. *An intended destination for graywater in the receiving landscape including but not limited to a drip irrigation system, mulch basin, or other approved method of dispersal for irrigation purposes.*

Mulch. *Organic waste material including but not limited to leaves, prunings, straw, pulled weeds, and wood chips. Mulch shall be permeable enough to allow rapid infiltration of graywater.*

Mulch Basin. *A type of irrigation or disposal field filled with mulch or other approved permeable material of sufficient depth, length, and width to prevent ponding or runoff. A mulch basin may include a basin around a tree, a trough along a row of plants, or other shapes necessary for irrigation or disposal.*

Receiving Landscape. *Includes features such as soil, basins, swales, mulch, and plants.*

Simple System. *A graywater system serving a one- or two-family dwelling with a discharge of 250 gallons (947 L) per day or less. Simple systems exceed a clothes washer system.*

Treated Graywater. *Non-potable water collected and treated on-site suitable for direct beneficial use.*

1603*A*.0 Permit.

A written construction permit shall be obtained from the Enforcing Agency prior to the erection, construction, reconstruction, installation, relocation, or alteration of any graywater system that requires a permit.

Exception: *A construction permit shall not be required for a clothes washer system which does not require cutting of the existing plumbing piping provided it is in compliance with Section 1603A.1.1.*

1603A.1 System Requirements.

1603A.1.1 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 graywater irrigation or disposal system.*

   Note: *A city, county, or city and county or other local government may, after a public hearing and enactment of an ordinance or resolution, further restrict or prohibit the use of graywater systems. For additional information, see Health and Safety Code Section 18941.7.*

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 graywater 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 graywater system.*
4. *The graywater shall be contained on the site where it is generated.*
5. *Graywater 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. *Graywater 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. *Graywater 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. *Graywater 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 graywater 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. Directions shall indicate the manual is to remain with the building throughout the life of the system and indicate that upon change of ownership or occupancy, the new owner or tenant shall be notified the structure contains a graywater system.*

1603A.1.2 Simple System. *Simple systems exceed a clothes washer system and shall comply with the following:*

1. *The discharge capacity of a graywater system shall be determined by Section 1606A.0. 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 any public water system (as defined in Health and Safety Code, Section 116275) providing drinking water to the dwelling before allowing an exemption from a construction permit.*

3. *The design of simple systems shall be acceptable to the Enforcing Agency and shall meet generally accepted graywater system design criteria.*

1603A.1.3 Complex System. *Any graywater system that is not a clothes washer system or simple system shall comply with the following:*

1. *The discharge capacity of a graywater system shall be determined by Section 1606A.0. 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 any public water system (as defined in Health and Safety Code, Section 116275) providing drinking water to the dwelling before allowing an exemption from a construction permit.*
3. *A complex system shall be designed by a person who can demonstrate competence to the satisfaction of the Enforcing Agency.*

TABLE 1603A.1.4
CONSTRUCTION PERMIT REQUIREMENTS

TYPE OF SYSTEM	PERMIT REQUIREMENTS
Clothes Washer System	*No construction permit required if conditions in Section 1603A.1.1 are met.*
Simple System	*Permit and plans required unless exempted by Enforcing Agency.*
Complex System	*Permit and plans required unless exempted by Enforcing Agency.*
Treated Graywater	*Permit and plans required unless exempted by Enforcing Agency.*

1604*A*.0 Drawings and Specifications.

Graywater systems for which a construction permit is required may be subject to submittal of plans and details of the proposed graywater system necessary to ensure compliance with the requirements of this chapter. Identification of the groundwater level and soil absorption qualities at the site shall be included in the plans or provided to the Enforcing Agency.

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

1604A.1 Groundwater Depth. *Verification of ground water levels which exceed three (3) vertical feet (915 mm) from the deepest irrigation or disposal point of the proposed graywater system shall not be required.*

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.*

1605*A*.0 Inspection and Testing.

(A) Inspection. *A graywater system for which a construction permit is required shall be subject to inspection by the Enforcing Agency and such construction or work shall remain accessible and exposed for inspection purposes until approved.*

At the time of final inspection, an operation and maintenance manual shall be provided. Directions shall indicate the manual is to remain with the building throughout the life of the system and upon change of ownership, the new owner shall be notified the structure contains a graywater system.

(B) Testing.

(1) *Tanks* shall be filled with water to the overflow line prior to and during inspection. Seams and joints shall be left exposed, and the tank shall remain watertight.

(2) A flow test shall be performed through the system to the point of graywater irrigation *or* disposal. Lines and components shall be watertight.

1606*A*.0 Procedure for Estimating Graywater Discharge.

(A) Single Family Dwellings and Multi-Family Dwellings. The graywater discharge for single family and multi-family dwellings shall be calculated by *estimates of graywater use based on* 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 graywater flows of each occupant shall be calculated as follows:

Showers, bathtubs and wash basins	25 GPD (95 LPD)/occupant
Laundry	15 GPD (57 LPD)/occupant

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

(B) Daily Discharge. Graywater systems *using tanks* shall be designed to *minimize the amount of time graywater is held in the tank and shall be sized to* distribute the total amount of estimated graywater on a daily basis.

Exception: *Treated graywater systems when approved by the Enforcing Agency.*

1607*A*.0 Required Area of Irrigation *or* Disposal Fields.

Irrigation or disposal fields may have one or more valved zones. Each zone must be of adequate size to receive the graywater anticipated in that zone. No irrigation or disposal field shall extend within three (3) vertical feet (915 mm) of the highest known seasonal groundwater, or to a depth where graywater contaminates the groundwater, ocean water or surface water. The applicant shall supply evidence of groundwater depth to the satisfaction of the Enforcing Agency.

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.*

1608*A*.0 Determination of Maximum Absorption Capacity.

(A) Wherever practicable, irrigation *or* disposal field size shall be computed from Table 16*A*-2.

(B) In order to determine the absorption quantities of questionable soils other than those listed in Table 16*A*-2, the proposed site shall be permitted to be subjected to percolation tests acceptable to the *Enforcing Agency*.

Exception: *Irrigation fields in compliance with Section 1611A.2, which only utilize drip type emitters.*

(C) When a percolation test is required, no graywater system shall be permitted if the test shows the absorption capacity of the soil is *unable to accommodate the intended discharge of the proposed graywater system.*

Exception: *The Enforcing Agency may waive the requirement for percolation tests based on knowledge of local conditions or accept other testing methods.*

1609*A*.0 Tank Construction.

(A) *When system design includes a tank, specifications for the tank* shall be submitted to the *Enforcing Agency* for approval. Such plans shall show all dimensions and other pertinent data.

(B) *Tanks* shall be constructed of solid, durable materials not subject to excessive corrosion or decay and shall be watertight.

(C) Each tank shall be vented as required by Chapter 9 of this code, shall *be sealed against vermin and mosquitoes, and have an* access opening to allow for inspection and cleaning.

(D) Each tank shall have its rated capacity permanently marked on the unit. In addition, a sign stating "GRAYWATER IRRIGATION SYSTEM, *CAUTION* — UNSAFE WATER" shall be permanently marked on the holding tank.

(E) Each tank shall have an overflow drain. The overflow drain shall have *a* permanent connection to the building drain or building sewer, upstream of septic tanks, if any. The overflow drain shall not be equipped with a shutoff valve.

(F) The overflow *drain* shall be not less in size than the inlet pipe. The vent size shall be determined based on the total graywater fixture units as outlined in Table 7-5 of this code. Unions or equally effective fittings shall be provided for all piping connected to the holding tank.

(G) Each tank shall be structurally designed to withstand all anticipated earth or other loads. *Tank* covers shall be capable of supporting an earth load of not less than three-hundred (300) pounds per square foot (1,464.7 kg/m^2) when the tank is *used* for underground installation.

(H) *The overflow* system must 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.

(I) *An overflow drain and backwater valve is not required on a clothes washer system.*

1610*A*.0 Graywater Systems.

Graywater systems shall comply with Sections 1610*A*.1 through 1610*A*.3.

1610*A*.1 Pipe Materials. Graywater pipe, valves, and fittings shall conform to the requirements of Sections 604.0, 605.0, and 606.0.

1610A.2 Identification. *Graywater distribution piping upstream of any connection to an irrigation or disposal field or a distribution valve shall be identified with the words "CAUTION: NON-POTABLE WATER, DO NOT DRINK." Marking shall be at intervals not to exceed five (5) feet (1,524 mm).*

1610*A*.3 Valves. All valves shall be accessible. A backwater valve installed pursuant to this code shall be provided on all tank drain connections to the sanitary drain or sewer piping.

1611*A*.0 Irrigation, Disposal Field, *and Mulch Basin* Construction.

Irrigation fields, disposal fields, and mulch basins used in graywater systems shall comply with this section. Graywater 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 graywater irrigation or disposal approved by the Enforcing Agency.

1611A.1 Mulch Basin. *A mulch basin may be used as an irrigation or disposal field. Mulch basins shall be sized in accordance with Table 16A-2 and of sufficient depth, length, and width to prevent ponding or runoff during the graywater 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.*

1611A.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 graywater irrigation field:*

(1) Filters used in graywater 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 graywater.

(2) Emitters shall be designed to resist root intrusion and shall be of a design recommended by the manufacturer for the

intended graywater 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 16A-3, or through a procedure designated by the Enforcing Agency. Minimum spacing between emitters is in any direction shall be sufficient to prevent ponding 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 graywater 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 properly solvent-cemented, inspected, and 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 20 psi (138 kPa) shall be installed downstream from the pump and before any emission device.

(7) Each irrigation zone shall include a flush valve/antisiphon valve to prevent back siphonage of water and soil.

1611A.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 graywater 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 graywater into the trench area. Material, construction, and perforation shall be in compliance with the appropriate absorption fields 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-quarters of an (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 as follows (see chart *below*):

	MINIMUM	MAXIMUM
Number of drain lines per valved zone[1]	1	—
Length of each perforated line[1]	—	100 ft. (30,840 mm)
Bottom width of trench[1]	12 in. (305 mm)	*24 in. (610 mm)*
Spacing of lines, center to center[1]	4 ft. (1219 mm)	—
Depth of earth cover of lines	*2 in. (51 mm)*	—
Depth of filter material cover of lines	2 in. (51 mm)	—
Depth of filter material beneath lines[1]	3 in. (76 mm)	—
Grade of perforated lines	level	*3 in./100 ft.* (2 mm/m)

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

(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 watertight joints and installed on natural or unfilled ground.

1612*A*.0 Special Provisions.

(A) Other collection and distribution systems shall be permitted by the local *Enforcing Agency*, as allowed by Section *1.8.7* of this code.

(B) Nothing contained in this chapter shall be construed to prevent *a city, county, or city and county or other local government from, after a public hearing and enactment of an ordinance or resolution, further restricting or prohibiting the use of graywater systems. For additional information, see Health and Safety Code Section 18941.7.*

(C) Graywater stub-out plumbing may be allowed for future connection prior to the installation of irrigation lines and landscaping. Stub-out shall be permanently marked "GRAYWATER STUB-OUT, CAUTION --- UNSAFE WATER".

1612A.1 Indoor Use of Treated Graywater. *Graywater shall not be allowed for indoor use, such as flushing toilets and urinals, unless treated by an on-site water treatment system approved by the Enforcing Agency. For the purposes of this section, graywater treated by an on-site water treatment system shall be considered "Treated Graywater". Treated graywater and treated graywater systems shall comply with the*

provisions of this code except as otherwise provided in this chapter and all of the following:

(1) The treated graywater shall have a separate tank sized to minimize the length of time it is retained.

(2) A maintenance and operation manual for the treatment system shall be kept at the location of the system.

(3) Treated graywater intended for use indoors shall meet the California Department of Public Health statewide uniform criteria for disinfected tertiary recycled water as provided in California Code of Regulations, Title 22 Section 60301.230.

(4) The treated graywater system shall be installed, inspected, and tested as specified for recycled water systems in Sections 1618A.0 and 1620A.0.

TABLE 16*A*-1
LOCATION OF GRAYWATER SYSTEM

MINIMUM HORIZONTAL DISTANCE REQUIRED FROM	*TANK*	*IRRIGATION FIELD*	DISPOSAL FIELD
	feet/mm	feet/mm	*feet/mm*
Building structures[1]	5 (1,524 mm)[2]	2 (610 mm)	*5 (1,524 mm)*
Property line adjoining private property	5 (1,524 mm)	*1.5 feet (458 mm)*	*5 (1,524 mm)*
Water supply wells[3]	50 (15,240 mm)	100 (30,480 mm)	*100 (30,480 mm)*
Streams and lakes[3]	50 (15,240 mm)	*100 (30,480 mm)[4,5]*	*100 (30,480 mm)[4]*
Sewage pits or cesspools	5 (1,524 mm)	5 (1,524 mm)	*5 (1,524 mm)*
Sewage disposal field	5 (1,524 mm)	4 (1,219 mm)[6]	*4 (1,219 mm)[6]*
Septic tank	0 (0)	5 (1,524 mm)	*5 (1,524 mm)*
On-site domestic water service line	5 (1,524 mm)	*0 (0 mm)*	*0 (0 mm)*
Pressurized public water main	10 (3,048 mm)	10 (3,048 mm)[7]	*10 (3,048 mm)[7]*

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

[2] *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.*

[3] Where special hazards are involved, the distance required shall be increased as directed by the *Enforcing Agency.*

[4] These minimum clear horizontal distances shall also apply between the irrigation *or* disposal field and the ocean mean higher hightide line.

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

[6] Plus two (2) feet (610 mm) for each additional foot of depth in excess of one (1) foot (305 mm) below the bottom of the drain line.

[7] For parallel construction *or* crossings, approval by the *Enforcing Agency* shall be required.

TABLE 16*A*-2
DESIGN CRITERIA OF SIX TYPICAL SOILS

TYPE OF SOIL	*SQUARE FEET*	*GALLONS*	*SQUARE METERS*	*LITERS*
	Minimum square feet of irrigation/leaching area per 100 gallons of estimated graywater discharge per day	Maximum absorption capacity in gallons per square foot of irrigation/leaching area for a 24-hour period	Minimum square meters of irrigation/leaching area per liter of estimated graywater discharge per day	*Maximum absorption capacity in liters per square meter of irrigation/leaching area for a 24-hour period*
Coarse sand or gravel	20	5.0	0.005	203.7
Fine sand	25	4.0	0.006	162.9
Sandy loam	40	2.5	0.010	101.8
Sandy clay	60	1.7	0.015	69.2
Clay with considerable sand or gravel	90	1.1	0.022	44.8
Clay with small amounts of sand or gravel	120	0.8	0.030	32.6

TABLE 16A-3
SUBSURFACE DRIP DESIGN CRITERIA OF SIX TYPICAL SOILS

TYPE OF SOIL	*MAXIMUM EMITTER DISCHARGE (gal/day)*	*MINIMUM NUMBER OF EMITTERS PER GPD OF GRAYWATER PRODUCTION*
1. Sand	*1.8*	*0.6*
2. Sandy loam	*1.4*	*0.7*
3. Loam	*1.2*	*0.9*
4. Clay loam	*0.9*	*1.1*
5. Silty clay	*0.6*	*1.6*
6. Clay	*0.5*	*2.0*

Use the daily graywater flow calculated in Section 1606A.0 to determine the number of emitters per line.

Part II *[DWR]*

1613*A*.0 *Recycled* Water Systems – General.

(A) The provisions of Part II of this chapter shall apply to the installation, construction, alteration, and repair of *recycled* water systems intended to supply water closets, urinals, trap primers for floor drains, floor sinks *and other allowed uses. The recycled water system shall not have any connections to the potable water system except via an air gap approved by the Authority Having Jurisdiction or via a temporary connection to the potable system for initial testing of the recycled water system piping.*

(B) No permit for any *recycled* water system shall be issued until complete plumbing plans, with appropriate data satisfactory to the Authority Having Jurisdiction, have been submitted and approved. No changes or connections shall be made to either the *recycled* water system or the potable water system within any site containing a *recycled* water system without approval by the Authority Having Jurisdiction. *See Section 1620A.0 for further details.*

(C) Before the building is occupied, 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 before final approval is granted.

(D) A *recycled* water system shall be designed by a person registered or licensed to perform plumbing design work.

1614*A*.0 Definitions.

***Recycled* Water.** Non-potable water *that* meets *California Department of Public Health statewide uniform criteria for disinfected tertiary recycled water. Recycled water is also known as reclaimed water.*

1615*A*.0 Permit.

It shall be unlawful for any person to construct, install, alter, or cause to be constructed, installed, or altered any *recycled* water system within a building or on a premises without first obtaining a permit to do such work from the Authority Having Jurisdiction*. Section 13553 of the Water Code specifies structures where indoor use of recycled water is allowed. 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 Department of Public Health.*

1616*A*.0 Drawings and Specifications.

(A) *Drawings and specifications for recycled water systems shall be in accordance with the requirements identified in Chapter 1, General Code Provisions, of the California Plumbing Code.*

(B) *The drawings and specifications shall provide sufficient detail to determine compliance with the requirements of this chapter and the California Plumbing Code.*

1617*A*.0 Pipe Material/Pipe Identification.

Recycled water *pipe* shall comply with Sections 1617*A*.1 and 1617*A*.2.

1617*A*.1 Pipe Materials. *Recycled* water pipe, valves, and fittings shall conform to the requirements of Sections 604.0, 605.0, and 606.0.

1617*A*.2 Color and Information. *Recycled* water systems shall have a purple background with black uppercase lettering with the words "CAUTION: *RECYCLED* WATER, DO NOT DRINK."

All recycled water pipe shall be permanently marked to identify that it contains recycled water. This may be accomplished by labeling piping using purple-colored (Pantone color #512) adhesive Mylar PVC tape along the entire length of the pipe or using non-metallic pipe manufactured with purple integral to the material. For either material, the identification system shall be installed so the wording above is clearly visible.

1618*A*.0 Installation.

(A) *The recycled water piping system shall not include any hose bibbs. Only quick couplers that differ from those used on the potable water system shall be used on the recycled water piping system.*

(B) The *recycled* water system and the potable water system within the building shall be provided with the required appurtenances (valves, air/vacuum relief valves, etc.) to allow for *testing* as required for cross connection test in Section 1620*A*.0.

(C) *Recycled* water pipes laid in the same trench or crossing building sewer or drainage piping shall be installed in compliance with Sections 609.0 and 720.0 of this code. *Recycled* water pipes shall be protected similar to potable water pipes.

1619*A*.0 Signs.

(A) Commercial, Industrial, and Institutional Room Entrance Signs. All rooms in commercial, industrial, and institutional occupancies using *recycled* water for water closets and/or urinals shall be identified with signs. Each sign shall contain one-half (½) 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) shall be visible to all users. The signs shall contain the following text:

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

(B) *Equipment* Room Signs. Each room containing *recycled* water equipment shall have a sign posted with the following wording in one (1) inch (25.4 mm) letters on a purple background:

CAUTION
***RECYCLED* 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 *recycled* water equipment.

(C) 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 water supply. The sign shall be labeled:*

***RECYCLED* WATER – DO NOT DRINK**

(D) Valve Access Door Signs. Each *recycled* water valve within a wall shall have its access door into the wall equipped with a warning sign approximately six (6) inches by six (6) inches (152 mm x 152 mm) with wording in one-half (½) inch (12.7 mm) letters on a purple background. The size, shape, and format of the sign shall be substantially the same as that specified in subsection (B) above. 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 *recycled* water piping and appurtenances.

(E) Valve Seals. *The master recycled water shut-off valve and/or the recycled water meter curb cock and each valve within a wall shall be sealed after the recycled water system* has been approved and placed into operation. These seals shall be either crimped lead wire or plastic break away seal which, if broken after system approval, shall be deemed conclusive evidence that the *recycled* water 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.

1620*A*.0 Inspection and Testing.

(A) *Recycled* water piping shall be inspected and tested as outlined in this code for testing of potable water piping.

(B) *The recycled water system shall be inspected and tested in accordance to the following: (a) an initial cross-connection test before the initial operation of the recycled water system; (b) an annual visual system inspection; (c) a cross-connection test as required pursuant to Section 60316(a), Title 22, California Code of Regulations; (d) a cross-connection test when there is material reason to believe that the potable water and/or recycled water system separation has been compromised; and (e) a cross-connection test following remediation of a discovered cross-connection. 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 1620A.0, or (b) as a result of an inspection performed following complaints of water quality or flow conditions consistent with a compromised system.*

An initial Cross-Connection Test and subsequent Annual Visual System Inspection shall be performed as follows:

(1) ***Annual* Visual System Inspection.** *A visual* system inspection shall be conducted *annually* by the Authority Having Jurisdiction *or* other authorities having jurisdiction.

(i) Meter locations of the *recycled* water and potable water lines shall be checked to verify that no modifications were made, and that no cross-connections are visible.

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

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

(iv) If the visual inspection indicates that the recycled water plumbing has been modified, a Cross-Connection Test is required.

(2) Cross-Connection Test. The *applicant shall perform the Cross-Connection Test as required pursuant to the first paragraph in Section 1620A.0(B).*

The test shall be conducted in the presence of the Authority Having Jurisdiction *or* other authorities having jurisdiction to determine whether a cross-connection occurred.

Alternate inspection and testing requirements may be allowed by the Authority Having Jurisdiction for residential, institutional, or industrial buildings where shutting off the water is not practical. The recycled water purveyor or other designated appointee may substitute for the Authority Having Jurisdiction in the above mentioned inspection and tests.

(i) The potable water system shall be activated and pressurized. The *recycled* water system shall be shut down and completely *depressurized*.

(ii) The potable water system shall remain pressurized *while the recycled water system is depressurized*. The minimum period the *recycled* 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 *recycled* water distribution systems.

(iii) *All* fixtures, potable and *recycled*, shall be tested and inspected for flow. Flow from any *recycled* water system outlet shall indicate a cross-connection. No flow from a potable water outlet would indicate that it may be connected to the *recycled* water system.

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

(v) The potable water system shall then be completely *depressurized*.

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

(vii) The *recycled* water system shall remain pressurized while the potable water system is *depressurized*. The minimum period the potable water system is to remain depressurized shall be determined on a case-by-case basis.

(viii) *All* fixtures, potable and *recycled*, shall be tested and inspected for flow. Flow from any potable water system outlet shall indicate a cross-connection. No flow from a *recycled* water outlet would indicate that it is connected to the potable water system.

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

(x) If there is no flow detected in any of the fixtures that would have indicated a cross-connection, the potable water system shall be repressurized.

(3) Cross-Connection Discovered. In the event that a cross-connection is discovered, the following procedure shall be activated immediately:

(i) *Recycled* water piping to the building shall be shut down at the meter, and the *recycled* water riser shall be drained.

(ii) Potable water piping to the building shall be shut down at the meter.

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

(iv) The building shall be retested following procedures listed in Sections 1620*A*.0 (B)(1) and (B)(2) above.

(v) The potable water system shall be chlorinated with fifty (50) ppm chlorine for twenty-four (24) hours.

(vi) The potable water system shall be flushed after twenty-four (24) hours, and a standard bacteriological test shall be performed. If test results are acceptable, the potable water system shall be permitted to be recharged.

Alternate testing requirements *may be allowed* by the Authority Having Jurisdiction.

1621*A*.0 Sizing.

Recycled water piping shall be sized as outlined in this code for sizing potable water piping.