City of Santa Barbara

Public Works Department

www.SantaBarbaraCA.gov

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Main Office
630 Garden Street
P.O. Box 1990
Santa Barbara, CA
93102-1990

Administration
Tel: 805.564.5377
Fax: 805.897.2613

Engineering
Tel: 805.564.5363
Fax: 805.564.5467

Facilities
Tel: 805.564.5415
Fax: 805.897.2577

Street Maintenance
Tel: 805.564.5413
Fax: 805.897.1991

Transportation
Tel: 805.564.5385
Fax: 805.564.5467

Water Resources
Tel: 805.564.5387
Fax: 805.897.2613

California Building Standards Commission
Attention: Mia Marvelli, Executive Director
2525 Natomas Park Drive, Suite 130
Sacramento CA 95833

SUBJECT: Comments on Proposed Changes to the 2019 California Plumbing Code

Dear Ms. Marvelli:

The California Plumbing Code is a major driver in water efficiency statewide. Due to the plumbing code and stakeholder involvement, homes and buildings are being built and retrofitted with increasingly efficient fixtures and using best practices to ensure our built environment uses our natural resources in a sustainable manner.

The City of Santa Barbara has been a leader in water conservation, and we invested considerable staff time and resources in the monumental plumbing code changes in 2009 that lowered barriers to graywater system installation and use. We have seen the beneficial impacts of these changes spread statewide as water providers, permitting agencies, landscape professionals, stormwater agencies, non-profit organizations, and the public continue to collaborate and innovate to reduce potable water use by using alternate water sources.

Attached, please find the City Water Resources Division's comments on the proposed changes to the 2019 California Plumbing Code. The comments are summarized as follows:

- Add promotion of water efficiency, alternate supply, and reuse to the purpose and intent statements.
- Preserve portions of the graywater sections originally created in 2009.
- Remove provisions in the rainwater catchment sections that prevent common best practices.
- Update the water fixture units table to reflect current fixture flow rates.

Thank you for considering our comments and the comments of other stakeholders statewide who wish to promote the use of alternate water sources for non-potable

applications. Should you have any questions, I can be reached at MWood@SantaBarbaraCA.gov or (805) 897-2672.

Sincerely,

Madeline Wood
Water Conservation Supervisor

MW/js

Attachments

City of Santa Barbara Comments on Proposed Changes to 2019 CPC-Triennial_ET-45 day

Structure

For each proposed revision to the 2019 CPC-Triennial_ET-45day,

- Code text is indented in brown
- Our suggested deletions are in ~~strikeout~~
- Our suggested additions are underlined in red
- Text which is proposed by HCD for deletion which we think should be kept is double underlined. In some cases, this text may be from 2009 Ch. 16a.
- Each change is followed by the rationale for the change.

1.81 CPC Purpose

1.8.1 Purpose. The purpose of this code is to establish minimum requirements necessary to protect the health, safety, and general welfare of the occupants and the public by: a) governing the erection, construction, reconstruction, enlargement, conversion, alteration, repair, moving, removal, demolition, sanitation, ventilation and maintenance or use of plumbing equipment or systems, and b) promoting efficiency in the use of water and water-related energy, promoting alternate water source and water reuse.

Rationale: For conformance with high level State policy goals. The plumbing code is already serving this purpose and is doing more so every revision.

Ch. 15 Intent

1501.0 General. The provisions of this chapter are intended to:
1. Conserve potable water by facilitating greater reuse of laundry, shower, lavatory and similar sources of discharge, and by the use of alternate water sources such as rainwater and stormwater.
2. Reduce the number of non-compliant gray water and rainwater 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 gray water.~~
4. Relieve stress on water supply through alternate water sources such as rainwater, and water supply and septic/ sewer systems by reuse of greywater for irrigation.
5. 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.O (E).

Rationale: Keep the intent proposed for deletion. This language was a key product of the collaborative stakeholder code development process in 2009. Graywater is a fast evolving field,

and the code will always be a bit behind the technology. This intent statement provides Administrative Authorities guidance when faced with situations not anticipated by the code. Finally, this helps provide institutional memory for those revising the CPC and model code in the future, to focus and direct efforts. Updated in light of inclusion of rainwater in this section

1501.2 System Design

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.

(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 or un-treated nonpotable water system for single family dwellings having a maximum discharge capacity of 250 gal/d (0.011 L/s).

(3) Irrigation design plans for alternate water systems do not need to meet the requirements of the California Code of Regulations, Title 23, Division 2, Chapter 2.7, Model Water Efficient Landscape Ordinance if the alternate water source system replaces existing potable irrigation use and the aggregate landscape area remains unchanged or reduced.

Rationale: Model this section after the rainwater section in the current Express Terms 1601.2 “a person registered or licensed to perform plumbing design work or who demonstrates competency to design the rainwater catchment system…” There is currently no licensing for graywater installers. The City of Santa Barbara and numerous other water providers have invested heavily in professional and homeowner trainings to install clothes-washer only and simple graywater systems. It has been our experience that professionals that have other licenses and certifications are almost universally less experienced/knowledgeable with greywater than dedicated, unlicensed greywater installers.

The exception to the Model Water Efficient Landscape Ordinance (MWELO) should be considered in cases where an existing potable irrigation landscape is converting to a non-potable

system such as graywater or recycled water. These projects should be incentivized by reducing the barriers to convert from potable irrigation. Creating landscape and irrigation plans that conform to the MWELO when there is no significant change in the landscape plant palette is an unnecessary burden and barrier to what should be a simple project.

1502.3.2 (Formerly 1501.11.2.2) Cross-Connection Test

> Exception: A cross-connection test is not required for gravity-flow systems without a pump, or clothes washer systems where the only pressure is from the washer pump.

Rationale: Gravity flow systems pose negligible risk of cross-connection.

1503.2 (Formerly 1502.2) System Requirements.

> 1503.2 (Formerly 1502.2) 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, mulch basin, or disposal field. ~~The gray water shall be permitted to discharge to a mulch basin for single family and multi-family dwellings 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.

Rationale: Using a mulch basin is considered a best practice by graywater installers. The basin full of wood chips is highly effective at preventing ponding or runoff, and for providing surge capacity. There is no reason that this best practice should be restricted residential properties.

1503.2.2 Diversion

> 1503.2.2 (Formerly 1502.2.2) Diversion. The gray water system shall connect to the sanitary drainage system downstream of fixture traps and vent connections through an approved gray water diverter valve. The gray water diverter valve shall be installed in a ~~readily~~ accessible location and clearly indicate the direction of flow. Exception: diverter valve(s) are not required for systems with gravity overflow from surge tank to sewer.

Rationale: The physics of gravity flow are non-negotiable, and particularly in retrofit systems it is not feasible to place three-way valves in “readily” accessible locations and have proper flow. A diverter valve is not needed in a system with a graywater surge tank that overflows by gravity to the sewer, and all systems with a tank must overflow by gravity to the septic/ sewer.

1503.3 Connections

1503.3 (Formerly 1502.3) 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*, or 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.
(3) Connections protected by an air gap or reduced-pressure principle assembly.

Rationale: Either a reduced-pressure principle assembly or an air gap protects the fresh water supply and are accepted best practices.

Laundry, Simple, Complex, Graywater System Definitions

Laundry only greywater system—system with laundry water only, which does not require alternation of supply or drainage plumbing, or an electrical connection. This is equivalent to a Tier 1 system.
Tier 2 system—system with a discharge capacity of under 250 gallons per day
Tier 3 system —system with a discharge capacity of over 250 gallons per day

Calculation of gray water system discharge capacity is per 1503.8.1

Rationale: Flow is a legitimate metric for health risk and appropriate level of regulatory oversight, but it does not equate with “simple” and “complex” in common usage. The current terminology results in constant confusion and need to clarify which meaning is intended. Systems that are both “simple” as the term is generally understood, and low flow are almost all laundry-only systems, which is a category clearly described as it is at present: “Clothes Washer System.”

1503.8.1 (Formerly 1502.8) Procedure for Estimating Gray Water Discharge.

1503.8.1 (Formerly 1502.8.1) ***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:

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

Showers, bathtubs ~~and lavatories~~	~~25~~ **13** gallons (~~95~~ 49 L) per day/occupant
Lavatories	11 gallons (42 L) per day/occupant
Laundry	~~15~~ **10** gallons (~~57~~ 38 L) per day/occupant

Rationale: Update the estimated gallons per day based on the 2016 Residential End Use of Water study. The numbers of 25 gpcd for showers/baths/lav are outdated and reflective of flow rates from the 1999 Residential End Use of Water Study (REUS). This code should be updated to reflect the new REUS study released in 2016. The study found that per capita indoor use has gone down overall.
New numbers are:

Clothes Washer- 9.6 gpcd
Shower: 11.1 gpcd
Bath 1.5 gpcd
Faucets (this includes all sinks, which is not representative of graywater sink flow rates limited to the bathroom) 11.1 gpcd

View the study here: http://www.waterrf.org/PublicReportLibrary/4309A.pdf. In a disposal system, excess capacity has no downside other than higher cost and environmental impact. In an *irrigation* system, unrealistically high estimated flow has these issues and also results in insufficient water to plants, defeating the whole purpose of the system. The greywater-using public relies on the code for accurate guidance for expectations about real greywater generation.

We recommend separating sinks apart from showers/bathtubs because many systems don't include the sink and there is currently no way to reduce the sizing to accommodate this. Also, if someone wanted to permit just a lavatory sink, they should have an estimate that does not include showers/baths. Note: The number from the REUS for sinks includes lavatory and kitchen sinks, so is overly high, but since there is no reputable study showing just lavatory sinks it would be better to separate lavatory sinks from showers/baths even with an overly high estimate than do nothing.

1506.3 (Formerly 1504.3) System Changes.

1506.3 (Formerly 1504.3) 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, except as noted elsewhere herein.

Rationale: Internal consistency, this appears to contradict other exceptions noted elsewhere.

1601.7 (Formerly 1601.6) Minimum Water Quality Requirements.

1601.7 (Formerly 1601.6) Minimum Water Quality Requirements. The minimum water quality for rainwater catchment systems shall comply with the applicable water quality requirements for the intended application as determined by Authority Having Jurisdiction. Water quality for nonpotable rainwater catchment systems, shall comply

with Section 1602.9.6. In the absence of water quality requirements for harvested rainwater, Table 1602.9.6 shall apply.

Exceptions:
~~(1) Water treatment is not required for rainwater catchment systems used for aboveground irrigation with a maximum storage capacity of 5000 gallons (1363 L).~~
(2) Water treatment is not required for rainwater catchment systems used for surface, subsurface or drip irrigation.

Rationale: Exception 2 allows untreated rainwater for surface (=aboveground) irrigation without limitation to storage quantity, which is logical, consistent with best practice, and also contradicts the preceding exception.

1602.4 Rainwater connections

1602.4 Connections to Potable or Reclaimed (Recycled) Water Systems. Rainwater catchment systems shall have no direct unprotected connection to a potable water supply or alternate water source system. Potable or reclaimed (recycled) water is permitted to be used as makeup water for a rainwater catchment system provided the potable or reclaimed (recycled) water supply connection is protected by an air gap or reduced-pressure principle backflow preventer in accordance with this code.

Rationale: For clarity.

1602.9.4 (Formerly 1602.9.3.1) Other Surfaces.

1602.9.4 (Formerly 1602.9.3.1) Other Surfaces. Natural precipitation collected from surface water runoff, vehicular parking surfaces, or manmade surfaces at or below grade shall be in accordance with the *water quality* requirements for on-site treated nonpotable *gray* water systems in Section 1506.0.
Exception*: Collected rainwater or storm water used exclusively for ~~subsurface~~ landscape irrigation.*

Rationale: The natural and optimal course of this water in most instances is from other surfaces to irrigation. The requirement for subsurface irrigation implies a tremendous increase in treatment required, cost, and consequent lower utilization of this vital resource. This section potentially conflicts with most best practices for stormwater infiltration.

TABLE 1602.9.6 (Formerly 1602.9.4) MINIMUM WATER QUALITY

Surface, subsurface ~~and drip~~ irrigation	None required; may be advisable depending on hardware used.	N/A
Drip irrigation	Debris excluder or other approved means in accordance with Section 1603.14, and 100 microns *(100 µm)* in accordance with Section 1603.15 for drip irrigation.	N/A
Urinal and water closet flushing, clothes washing, and trap priming	Debris excluder or other approved means in accordance with Section 1603.14, and 100 microns *(100 µm)* in accordance with Section 1603.15, or to manufacturer's specifications.	N/A ~~Escherichia coli: < 100 CFU/100 mL, and Turbidity: < 10 NTU~~

Rationale:

1) **Irrigation** The simplest, most reliable systems simply route rainwater to surface or sub-mulch irrigation. Excellent filtration and treatment are provided by the mulch and soil; even filtration can be counterproductive by adding cost, maintenance, and quickly clogging.
2) **Flushing, clothes washing.** Any treatment beyond mechanical filtration is illogical, unnecessary and would effectively eliminate the possibility of this best practice at a residential scale. Testing and compliance verification are impractical. Furthermore, humans and animals are already in contact with this water in unfiltered form when outdoors in the rain. Kids play in rain directly from downspouts, and where it runs over lawns, walkways, down driveways, to gutters etc., more so than they play with water in toilets and washing machines. Pathogens are reduced by mechanical filtration and storage under proper conditions.

Table A 103.1 System Sizing

California Plumbing Code Table A 103.1
HCD proposes to adopt Appendix A from the 2018 Uniform Plumbing Code into the 2019 California Plumbing Code without amendments:
APPENDIX A
RECOMMENDED RULES FOR SIZING THE WATER SUPPLY SYSTEM
Appendix note: The provisions contained in this appendix are not mandatory unless specifically adopted by a state agency, or referenced in the adopting ordinance.

Table A 103.1

1) *Update table A 103.1 to conform with the current California Green Building Code and CPC fixture flows and corresponding fixture units.*
2) *Add footnote: Local jurisdictions may add or adjust to this table in a manner consistent with encouraging water efficiency in local development.*
3) *Add missing fixtures: R/O system, whole house R/O system, water softener, drip irrigation.*

Rationale: For consistency with the California Green Building Code. Table A103.1 assumes flows from fixtures that are too high to be legal for sale in California today. Drip irrigation is not accounted for in the current table but is required for most projects with MWELO. Reverse osmosis systems and water softeners can be considerable water use fixtures in both residential and commercial settings.