

Appendix L

The highlighted code sections below were requested to be included in the 2023 Uniform Plumbing Code amendments.

City staff are not in support of adding these amendments, these sections pertain to water heater requirements for the purpose of establishing means of conserving water and energy. Energy conservation requirements for water heating already exist in the energy code in sections and subsections of C404 & R403.5 duplication and amending both codes would only add additional confusion and increase our amendments when our goal is to return to model code as much as possible for the purpose of consistency and is preferred by the majority of stakeholders. For over a number of years Austin Water has established a comprehensive plan for water conservation and will continue to do so, Appendix L is not a part of the plan at this time, this appendix is intended to encourage sustainable practices and not creating requirements.

Water Heater Requirements

L 101.1 Applicability. The purpose of this appendix is to provide a comprehensive set of technically sound provisions that encourage sustainable practices and works towards enhancing the design and construction of plumbing systems that result in a positive long-term environmental impact. This appendix is not intended to circumvent the health, safety, and general welfare requirements of this code.

L 501.0 Water Heating Design, Equipment, and Installation.

L 501.1 Scope. The provisions of this section shall establish the means of conserving potable and non-potable water and energy associated with the generation and use of hot water in a building. This includes provisions for the hot water distribution system, which is the portion of the potable water distribution system between a water heating device and the plumbing fixtures, including dedicated return piping and appurtenances to the water heating device in a recirculation system.

L 503.0 Service Hot Water – Other Than Low-Rise Residential Buildings.

L 503.1 General. The service hot water, other than single family houses, multifamily structures of three stories or fewer above grade, and modular houses shall comply with this section.

L 503.1.1 New Buildings. Service water-heating systems and equipment shall comply with the requirements of this section as described in Section L 503.2. [ASHRAE 90.1:7.1.1.1]

L 503.3.1 Load Calculations. Service water-heating system design loads for the purpose of sizing systems and equipment shall be determined in accordance with manufacturer's published sizing guidelines or generally accepted engineering standards and handbooks acceptable to the adopting authority (e.g., ASHRAE Handbook – HVAC Applications). [ASHRAE 90.1:7.4.1]

L 503.3.5 Service Water Heating System Controls.

Service water heating system controls shall comply with Section L 503.3.5(1) and Section L 503.3.5(2).

(1) Temperature controls shall be provided that allow for storage temperature adjustment from 120°F(49°C) or lower to a maximum temperature compatible with the intended use.

Exception: Where the manufacturer's installation instructions specify a higher minimum thermostat setting to minimize condensation and resulting corrosion. [ASHRAE 90.1:7.4.4.1]

(2) Temperature controlling means shall be provided to limit the maximum temperature of water delivered from lavatory faucets in public facility restrooms to 110°F (43°C). [ASHRAE 90.1:7.4.4.3]

Hard Water

L 101.0 General. **2024 UPC Appendix L**

L 101.1 Applicability. The purpose of this appendix is to provide a comprehensive set of technically sound provisions that encourage sustainable practices and works towards enhancing the design and construction of plumbing systems that result in a positive long-term environmental impact. This appendix is not intended to circumvent the health, safety, and general welfare requirements of this code.

L 505.0 Hard Water.

L 505.1 Softening and Treatment. Where water has a hardness equal to or exceeding 10 gr/gal (171 mg/L) measured as total calcium carbonate equivalents, the water supply line to water heating equipment and the circuit of boilers shall be softened or treated to prevent accumulation of limescale and consequent reduction in energy efficiency.

L 410.2 Water Softener Limitations. In residential buildings, where the supplied potable water hardness is equal to or less than 8 grains per gallon (gr/gal) (137 mg/L) measured as total calcium carbonate equivalents, water softening equipment that discharges water into the wastewater system during the service cycle shall not be allowed, except as required for medical purposes.

Pro's

- A. The code section is targeting the accumulation of limestone in the plumbing system for the purpose of maintaining a good clean functioning plumbing system.

Con's

- B. It speaks about softening or treating which means you could install:
 - Water softener: means a softener with a timer would be sufficient when it's the least water conservative.
 - RO system: water conservation could become an issue and cost prohibited for a whole house system.
 - Deionized system:
 - chemical treatment: this would require specialized equipment which would not be cost effective and require some kind of cross-connection protection.

- C. To require a water softener, we would need water testing.
- D. Requiring water softener equipment would seem to be an additional cost.

2021 International Green Construction Code (IgCC)

The IGCC is targeting the water softener equipment as well as the downstream plumbing system.

601.1 (6.1) Scope.

This section specifies requirements for *potable water* and *nonpotable water* use efficiency, both for the *site* and for the building, and water monitoring.

601.2 (6.2) Compliance.

All provisions of [Chapter 6](#) are mandatory provisions.

601.3.6 (6.3.6) Water softeners.

Water softeners shall comply with [Sections 601.3.6.1](#) (6.3.6.1) through [601.3.6.4](#) (6.3.6.4).

601.3.6.1 (6.3.6.1) Demand-initiated regeneration.

Water softeners shall be equipped with demand-initiated regeneration control systems. Timer-based control systems shall be prohibited.

601.3.6.2 (6.3.6.2) Water consumption.

During regeneration, water softeners shall have a maximum water consumption of 4 gal (15.1 L) per 1000 gr (17.1 g/L) of hardness removed, as measured in accordance with [NSF 44](#).

601.3.6.3 (6.3.6.3) Waste connections.

Waste water from water softener regeneration shall not discharge to *reclaimed water* collection systems and shall discharge in accordance with the [International Plumbing Code](#).

601.3.6.4 (6.3.6.4) Efficiency and listing.

Water softeners that regenerate in place, that are connected to the water system they serve by piping not exceeding 1¹/₄ in. (31.8 mm) in diameter, or that have a volume of 3 ft³ (0.085 m³) or more of cation exchange media shall have a rated salt efficiency of not less than 4000 gr of total hardness exchange per pound of salt (571 g of total hardness exchange per kilogram of salt), based on sodium chloride equivalency, and shall be *listed* and *labeled* in accordance with [NSF 44](#). All other water softeners shall have a rated salt efficiency of not less than 3500 gr of total hardness exchange per pound of salt (500 g of total hardness exchange per kilogram of salt), based on sodium chloride equivalency.

601.3.7 (6.3.7) Reverse osmosis water treatment systems.

Reverse osmosis systems shall be equipped with an *automatic* shutoff valve that prevents the production of reject water when there is no demand for treated water. Point-of-use reverse osmosis treatment systems for drinking water shall be *listed* and *labeled* in accordance with [NSF 58](#).