ASA Plumbing Fixture and Appliance Code Committee - UPC TC Meeting Notes from May 3 thru 7, 2021 Hearings

ASA TOOK POSITIONS ON PROPOSALS HIGHLIGHTED THIS COLOR

UNIFORM PLUMBING CODE				
Item #	**Section(s)**	**Summary of Proposed Revision**	**UPC TC Position**	**Comments**
009	Definitions	Revised "dead leg" definition to place a min. length of 1.5 times the pipe diameter. Also, see item 34	Reject	**ASA Position:** Oppose: Does not provide enough length to terminate and add an end cap; ASPE Design Handbook (2 feet ormore with a cap); no technical substantiation provided **UPC Committee Discussion:** Should not have specific requirements in a definition; also noted the issues raised in the ASA position.
011	Definitions	**Diverter Valve, Gray Water ~~Diverter Valve~~.** A valve that directs gray water to the sanitary drainage system or a subsurface irrigation system. **Diverter Valve, On Site Treated Nonpotable Water.** A key component in the collection system to control inflow and overflow in collection tanks intended for on-site treatment and direct beneficial use. **Diverter Valve. Rainwater.** A key component in commercial rainwater catchment systems to control high inflow and overflow volumes in rainwater storage tanks.	Accept as Modified	**ASA Position:** Neutral **UPC Committee Discussion:** Modification suggested to delete "but not limited to in definition of gray water. Also modified to remove the work "key" in definition of Diverter Valve. Rainwater
013	Definitions	Revise definition of "flood-level rim" to include "… or fixture …"	Accept	**ASA Position:** Opposed: Not necessary since a "plumbing fixture" is included in receptor definition and requirements for "plumbing fixture are clearly delineated in the code. **UPC Committee Discussion:** Sone members supported ASA position and also leads to confusion when plumbing fixture is added to the definition. Motion to accept passed 16 yes to 8 no

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Item #	**Section(s)**	**Summary of Proposed Revision**	**UPC TC Position**	**Comments**
017	Definitions	**Joint, ~~Press-Connect~~ Elastomeric.** A ~~permanent mechanical~~ removable or non-removable joint incorporating an elastomeric seal or an elastomeric seal and corrosion resistant grip ring. ~~The joint is made with a pressing tool and jaw or ring that complies with the manufacturer's installation instructions.~~	Reject	**ASA Position:** Oppose: Current definition is consistent with other industry consensus standards. **UPC Committee Discussion:** General agreement with the position of ASA. Also, suggested to proponent they might want to submit a definition for the product they would like recognized. It was noted that "press connect" is actually defined in Section 6. It was suggested to modify proposal to deleted Press Connect definition and have a new definition for Elastomeric Joint and have Press Connect definition refer to the new Elastomeric Joint definition. Motion to modify was defeated.
018	Definitions	**Listed (Third Party Certified).** Equipment or materials included in a list published by a listing agency (accredited conformity assessment body) that maintains periodic inspection of current production of listed equipment or materials and whose listing states either that the equipment or material complies with approved standards or has been tested and found suitable for use in a specified manner. Terms used to identify listed equipment products or materials include "listed," "certified," or other terms as determined appropriate by the listing agency.	Reject	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to reject based on terms not being defined by "listing agency" but rather terms being defined by the code.
021	Definitions	**Public Use Occupancy.** Commercial buildings that include, but are not limited to office buildings, retail stores, restaurants, industrial, multi-family housing, hotels, motel, arenas, stadiums, and other structures not used for one and two family dwellings.	Reject	**ASA Position:** Neutral **UPC Committee Discussion:** Concern that issues are already defined in the UPC and Private Use already defines what is Public
026	Definitions	**Valve, Balancing**. A valve that regulates and controls the return of hot water to the water heater in a recirculating potable or nonpotable hot water piping system to ensure that specified hot water temperatures are delivered to all point-of-use fixtures within specified time frames and volumes. These include the following:	Accepted as Modified	**ASA Position:** Oppose: No use of the term "thermostatic flow regulating valve in the UPC; Appears only use of the term in is Appendix L so term should be

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		(1) Flow Balancing Valve with Memory Stop. Includes globe valve, needle valve, or venturi valve design with ports for reading temperature and pressure, knob adjustment with graduated set-point markings, and lockable memory setting. (2) Preset Automatic Flow Control Valve. A fixed orifice valve regulates flow by using a spring mechanism to maintain a specified flow over a variety of pressures. These function with replaceable flow cartridges, each having a different flow rate orifice assembly and with different pressure differentials. (3) Thermostatic Flow Regulating Valve. Mechanical thermostatically controlled valves that automatically self-adjust return water flow to maintain specified temperatures in the hot water circuits.		defined in the Appendix to avoid use of the term balancing valve used in other sections of the code. The terms "Pressure-Balancing Valve" and "Combination Thermoplastic/Pressure Balancing Valve" are currently defined in the UPC. **UPC Committee Discussion** Motion to amend, strike hot and potable and non-potable in first sentence. And Deleted everything from "These include the following: …." Motion to modify was accepted. Modifications address ASA Position.
028	Definitions	Adds a definition for "water station"	Approve	**ASA Position:** **Modify proposal to add "… where food is consumed indoors…".** **UPC Committee Discussion** A proposal made to modify to add "places where food is consumed indoors" Trying to differentiate between water bottle fillers and drinking fountains which are already defined. This modification was not accepted. Motion to approve passed with 12 yes and 10 no
030	Section 3. General Regulations	**301.3 Alternate Materials and Methods of Construction Equivalency.** Unless specifically prohibited, ~~N~~nothing in this code is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this code. ……	Approved	**ASA Position:** Neutral **UPC Committee Discussion** No notes taken.
034	Section 309.6	Adds the revised definition of "dead leg" with the min. length of 1.5 times the diameter into 309.6. Dead Legs.	Rejected	**ASA Position:** Oppose: Does not provide enough length to terminate and add an end cap; ASPE Design Handbook (2 feet ormore with a cap); no technical substantiation provided

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Item #	**Section(s)**	**Summary of Proposed Revision**	**UPC TC Position**	**Comments**
				UPC Committee Discussion: Supported ASA positions
035	Section 310.	**310.0 Prohibited Fittings and Practices.** **310.1 Fittings.** No double hub fitting, single or double tee branch, single or double tapped tee branch, side inlet quarter bend, running thread, band, or saddle shall be used as a drainage fitting ~~except that b sanitary tapped tee shall be permitted to be used on a vertical line as a fixture connection.~~	Approve	**ASA Position:** Neutral **UPC Committee Discussion:** No discussion, vote was unanimous by consent
046	Section 402.6	Revises second paragraph of 402.6 Flanged Fixture Connections to read, "Wall-mounted water closet fixtures shall be securely bolted to the structure with an approved carrier fitting.	Reject	**ASA Position:** Oppose: the carrier fitting is what is attached to the structure; the section references appropriate industry standards for carriers. **UPC Committee Discussion:** See item 048
047	Section 402.6	Add ASME A112.4.3 as a requirement for elastomeric gasket flange to the fixture connector.	Reject	**UPC Committee Discussion:** Over restrictive and appears to be proprietary.
048	Section 402.6	Revises the last sentence of Section 402.6 Flanged Fixture Connections to read, "The bottom of the flange shall be set on ~~an approved firm base~~ the top of the finished floor."	Approve as Modified	**ASA Position:** Neutral **UPC Committee Discussion:** Committee members noted that the flange should be installed at the top of the finished floor. Motion to accept as modified by adding to the second paragraph, "Wall-mounted water closet fixtures shall be securely bolted to an approved carrier fitting. The approved carrier fitting shall be securely bolted to the structure. Motion to accept as modified accepted by consent.

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Item #	**Section(s)**	**Summary of Proposed Revision**	**UPC TC Position**	**Comments**
049	Section 402.6.1 and 402.6.3	Revises 402.6.1 Closet Rings (Closet Flanges) fourth, fifth and sixth paragraphs as follows: ~~Closet bends or stubs shall be cut off to present a smooth surface even with the top of the closet ring before the rough inspection is called.~~ Where the closet ring is installed on the closet bend or riser, the finished joint shall be present a smooth surface flush with the top of the closet ring. Closet rings (closet flanges) shall be adequately designed with the bottom of the ring or flange positioned on the finished floor and secured to support fixtures connected thereto. Offset closet rings (closet flanges) shall be free of ledges and corners that would obstruct flow shall be permitted for floor discharge water closets. Revise 402..3 Securing Floor-Mounted, Back-Outlet Water Closet Bowls, last two sentence to read: The closet flange shall be firmly secured ~~to a firm base~~. ~~Where floor-mounted, back-outlet water closets are used, the soil pipe shall be not less than 3 inches (80 mm) in diameter.~~ Offset, eccentric reducing closet flanges shall not be ~~used~~ permitted with these fixtures.	Reject	**ASA Position:** Oppose. No value being added. **UPC Committee Discussion:** Move to reject 49, 50 and 51 and accept 52. Item 49 does not add additional value. Also, not sure what the phrase, "floor discharge water closet" means. Motion to reject passed based on consent approval.
050	Section 402.6.1	Section 402.6.1 Closet Rings (Closet Flanges), third paragraph is being revised: Closet rings (closet flanges) shall be joined as approved for the specific material in accordance with Section 705.0 ~~burned or soldered to lead bends or stubs, shall be caulked to cast-iron soil pipe, shall be solvent cemented to ABS and PVC, and shall be screwed or fastened in an approved manner to other materials~~.	Reject	**ASA Position:** Oppose. Conflicts with A117.1 which allow water temperatures to be 120 deg max for bathtubs and showers; would limit temperature at kitchen sink. **UPC Committee Discussion:** Move to reject 49, 50 and 51 while accepting 52. Motion to reject by unanimous consent.
051	Section 402.6.1	The following is being added to the end of Section 402.6.1 Closet Rings (Closet Flanges)	Reject	**ASA Position:** Neutral

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		Offset, eccentric, or reducing floor mounted closet flanges that create a ledge or otherwise constrict the full opening g of the water closet shall not be used.		**UPC Committee Discussion:** Move to reject 49, 50 and 51 while accepting 52.
052	Section 402.6.3	The following changes are being proposed for the end of Section 402.6.3 Securing Floor-Mounted, Back-Outlet Water Closet Bowls: Offset, eccentric, or reducing closet flanges shall not be permitted with these fixtures. ~~Where floor-mounted, back-outlet water closets are used, the soil 3 inches (80 mm) in diameter. Offset, eccentric, or reducing closet flanges shall not be used.~~	Accept	**ASA Position:** Neutral **UPC Committee Discussion:** Move to reject 49, 50 and 51 while accepting 52.
053	Section 403.0	Proposal adds the following new item to section 403.0 Accessible Plumbing Facilities **403.4 Temperature Limits at Accessible Plumbing Fixtures.** The maximum water temperature discharging from any accessible plumbing fixture shall be limited to a maximum of 110 F (43 C) by one of the methods prescribed in Section 408.3.2	Reject	**ASA Position:** Oppose. Conflicts with A117.1; 403.3 already requires pipes to be insulated; proposal would limit in certain applications kitchen sink faucet temp to 110 F. **UPC Committee Discussion:** Move to reject item 53 since it is an ADA issue, reject 60 due to requirement is based on temperature limiting not monitoring. Accept item 59
054	Section 404.0	Item 404.2 Overflows is being revised as follows: Where a fixture is provided with an overflow, the overflow shall comply with Section 404.2.1 and Section 404.2.2. **404.2.1 Sinks and Bathtubs.** t~~T~~he waste shall be so arranged that the standing water in the fixture shall not rise in the overflow where the stopper is closed or remain in the overflow where the fixture is empty. The overflow pipe from a fixture shall be connected to the house or inlet side of the fixture trap. ~~, except that overflow on flush tanks shall be permitted to discharge into the water closets or urinals served by them, but i~~t shall be unlawful to connect such overflows with any other part of the drainage system.	Approved as Modified	**ASA Position:** Oppose due to existing text starting with "It shall be unlawful to connect …." **UPC Committee Discussion:** Proposed modification to delete last sentence of existing text and the addition of lavatory in the title. Modification addresses ASAs position.

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Item #	**Section(s)**	**Summary of Proposed Revision**	**UPC TC Position**	**Comments**
		402.2.2 **Closets and Urinals.** Overflows on flush tanks shall be permitted to discharge into the water closets or urinals served by them.		
055	Section 407.0	IAPMO IGC 156, *Wash Fountains and Lavatory Systems with or without Water Closets* is being added to Section 407.0 Lavatories, item 407.1 Application.	Reject	**ASA Position:** Oppose. As written would require all group wash fixtures to comply with IGC 156. **UPC Committee Discussion:** Motion to reject since it would require every product to comply when there are other standards already addressed. In addition, 401.2 is a general section and is over restrictive to put a standard in that section.
056	Section 407.0	Add the following new section: **407.7 Soap Dispenser.** Each public lavatory shall have an accompanying soap dispenser.	Reject	**ASA Position:** Modify to: A public lavatory shall have access to a soap dispenser. **UPC Committee Discussion:** Concern that it is too restrictive and belongs in the Building Code. A modification was recommended to change to: "Soap Dispenser: soap dispensers shall be provided for public lavatories." Motion to reject passed with a vote of 17 yes to 6 no
057	Section 408.0	**408.0 Showers.** **408.2 Water Consumption.** Showerheads shall have a maximum flow rate of not more than 2.5 gpm at 80 psi (9.5 L/m at 552 kPa). Body sprays shall have a flow rate for the shower enclosure of not more than 2.5 gpm at 80 psi (9.5 L/m at 552 kPa).	Approve as Modified	**ASA Position:** Oppose. Applying the 2.5 gpm to "total per shower enclosure", instead of individual body sprays, is not consistent with industry standards.

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		204.0 - B - **Body Spray.** A shower device for spraying water onto a bather from other than the overhead position.		In addition, although the term "body spray" is now defined in DOE regulation, the definition is provided to clarify that "body sprays" are not covered in DOE energy and water efficiency requirements. **UPC Committee Discussion:** Motion to modify is to delete "for the shower enclosure" to show the 2.5 gpm is related to each body spray.
058	Section 408.0	Add IAPMO PS 106, *Tileable Shower Receptors and Shower Kits* to 408.0 Showers		Did not get results on this proposal.
059	Section 408.3.2	Delete following from item 408.3.2 Temperature Limiting, for individual shower and tub-shower combination control valves: ~~(3) A limiting device conforming to either ASS 1070/ASME A112.1070/CSA B125.70 or CSA B125.3.~~ ~~(4) A water heater conforming to ASSE 1084.~~ ~~(5) A temperature actuated flow reduction device conforming to ASSE 1062~~	Approve	**ASA Position:** Support proposal **UPC Committee Discussion:** Move to reject item 53 since it is an ADA issue, reject 60 due to requirement is based on temperature limiting not monitoring. Accept item 59 approved based on consent approval.
060	Section 408.3.2	Add following to the end of 408.3.2 Temperature Limiting: (6) Remote temperature monitoring, control and alert when lack line of sight. Temperature shall be permitted to be monitored remotely via a sensor and App to alert if mixed water exceeds 120°F (49°C) at the outlet. Temperature can also be adjusted via remote means.	Reject	**ASA Position:** Neutral **UPC Committee Discussion:** Move to reject item 53 since it is an ADA issue, reject 60 due to requirement is based on temperature limiting not monitoring. Accept item 59. Motion to reject approved by consent. Public comment from Watts indicated a modification to delete monitoring might be acceptable to the Committee.

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Item #	**Section(s)**	**Summary of Proposed Revision**	**UPC TC Position**	**Comments**
061	Section 408.3	Add new item referencing ASSE 1066-1997 *Individual Pressure Balancing In-Line Valves for Individual Fixture Fittings.*	Reject	**ASA Position:** Support proposal **UPC Committee Discussion:** Motion to reject because code already addresses in another section of the code.
062	Section 408	Add new item 408.3.4 **408.3.4 Temperature-Actuated, Flow-Reduction Devices for Individual Fixture Fittings.** Temperature-actuated, flow-reduction devices, where installed for individual fixture fittings, shall comply with ASSE 1062. A temperature- actuated, flow-reduction device shall be an approved method for limiting the water temperature to not more than 120°F (49°C) at the outlet of a faucet or fixture fitting. Such devices shall not be used alone as a substitute for the balanced- pressure, thermostatic or combination shower valves requirements or as a substitute for bathtub or whirlpool tub water-temperature-limiting valves requirements.	Approve as Modified	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to modify by deleting second sentence. Modification based on the requirement already being addressed in other part of the standard. Motion failed Motion to accept as submitted did not pass. Motion to reject did not pass with a vote of 2 yes to 22 no Motion to accepts as modified (delete second sentence) was made again and passed by consent.
063	Section 408.4	Item 408.4 Waste Outlet is revised as follows: **408.4 Waste Outlet.** Showers shall have a waste outlet and fixture tailpiece not less than 2 inches (50 mm) in diameter. Fixture tailpieces shall be constructed from the materials specified in Section 701.2 for drainage piping. ~~Strainers serving shower drains shall have a waterway at least equivalent to the area of the tailpiece.~~	Reject	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to reject based on installers belief it is important to have the requirements in the code and not have to go to a reference standard.

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Item #	**Section(s)**	**Summary of Proposed Revision**	**UPC TC Position**	**Comments**
				Motion to reject passed with a vote of 19 yes to 5 no
064	Section 408.5	Revise third sentence of 408.5 Finished Curb or Threshold: … Each such receptor shall be provided with an integral nailing flange either integral or field installed in accordance with the manufacturer's installation instructions. ~~to be located were the receptor meets the vertical surface of the finished interior of the shower compartment.~~	Approve as Modified	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to modify by deleting ""an integral" before "nailing flange"
065	Section 408.6	Revise 408.6 Shower Compartments as follows: **408.6 Shower Compartments.** Shower compartments~~, regardless of shape,~~ shall have a ~~mini um~~ finished interior ~~of~~ in accordance with the following: (1) Not less than 1024 square inches (0.6606 m^2). ~~and shall also be capable of encompassing~~ (2) Be of sufficient dimension to accommodate a 30 inch (762 mm) circle.	Approve as Modified	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to approve as modify by striking new text in (2) and put back the deleted text, "and shall also be capable of encompassing" Passed based on consent approval.
066	Section 408.7	Add following to the end of section 408.7 Lining for Showers and Receptors: Unless the shower receptor is poured on the ground as part of a slab, an approved shower liner shall be provided in accordance with the requirements of this section.	Reject	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to reject. Motion passed by consent approval.
067	Section 408.7.5	Revised 408.7.5 Tests for Shower Receptors revised: **408.7.5 Tests for Shower Receptors.** Shower receptors shall be tested for watertightness by filling with water to the ~~level of the rough threshold~~ a depth of not less than 2 inches (51 mm) for not less than 15 minutes. Where no threshold is present, a 2 inch (51 mm) barrier shall be temporarily constructed for testing. The test plug shall be so placed that both upper and under sides of the subpan shall be subjected to the test at the point where it is clamped to the drain.	Accepted	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to accept (note the word "the" was editorially removed". Approved by consent.

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Item #	**Section(s)**	**Summary of Proposed Revision**	**UPC TC Position**	**Comments**
068	Section 408.9	Revise 408.9 Location of Valves and Heads: **408.9 Location of Valves and Heads.** Control valves and showerheads shall be located on ~~the~~ a sidewall of the shower compartment~~s or otherwise~~ and arranged so that the showerhead does not discharge directly at the entrance ~~to~~ into the shower compartment ~~so that~~ and the bather can adjust the valve(s) before stepping into the shower spray. **Exception:** Shower valve(s) or shower head(s) can be placed in an alternate location when approved by the Authority Having Jurisdiction.	Reject	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to reject passed with a vote of 15 yes to 8 no
069	Section 409.4	Add following to section 409.4 Limitation of Hot Water Temperature in Bathtubs and Whirlpool Bathtubs: (3) Remote temperature monitoring, control and alert when lack line of sight. Temperature shall be permitted to be monitored remotely via a sensor and App to alert if mixed water exceeds 120F (49°C) at the outlet. Temperature can also be adjusted via remote means.	Reject	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to reject due to not being enforceable. Motion approved based on consent.
070	Section 409	**409.6.1 Suction Fittings.** Suction fittings on whirlpool bathtubs shall comply with ASME A112.19.7/CSA B45.10. (renumber remaining sections)	Approve	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to accept.
071	Section 411.0	Add item 411.2 under 411.0 Water Closets requiring water closet hydraulic performance comply with ASME A112.19.2/CSA B45/1	Reject	**ASA Position:** Oppose. Hydraulic performance already covered in referenced ASME/CSA and IAPMO standards. **UPC Committee Discussion:** Move to reject due to existing standards already addresses the issues.
072	Section 411.2.1	Revise sections of 411.0 Water Closets: **411.2.1 Dual Flush Water Closets.** Dual flush water closets shall comply with ASME A112.19.14 or IAPMO PS 50. The effective flush volume for dual flush	Reject	**ASA Position:** Oppose. ASME and IAPMO standards do not appear to be equivalent. ASME A112.19.10 has never been accepted by the industry.

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		water closets shall be defined as the composite, average flush volume of two reduced flushes and one full flush. **411.2.2 Dual Flush Valves.** Dual flush water closet valves shall comply with IAPMO PS 50 or ASME A112.19.10.		**UPC Committee Discussion:** Motion to reject approved by consent.
073	Section 411.3	Revise 411.3 Water Closets: **411.3 Water Closet Seats.** Water closet seats shall be properly sized for the water closet bowl type, and shall be of smooth, non-absorbent material. Seats, for public or employee use, shall be of the elongated type and either of the open front type or have an automatic seat cover dispenser. Plastic seats shall comply with IAPMO Z124.5. Seats that are integral to the water closet shall be of the same material as the fixture.	Reject	**ASA Position:** Oppose. Proposal would prohibit plastic toilet seats and no technical data provided to support proposed change. **UPC Committee Discussion:** Motion to reject due to not enforceable and you do not need a permit to change a water closet seat. Would prohibit a plastic seat from being installed on a ceramic toilet. Motion to reject was by consent.
074	Section 411.3	**411.3 Water Closet Seats.** Water closet seats shall be properly sized for the water closet bowl type, and shall be of smooth, non-absorbent material. Seats, for public use, shall be of the elongated type and either of the open front type or have an automatic seat cover dispenser. Plastic seats with or without covers shall comply with IAPMO Z124.5.	Reject	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to reject since standards already address covers. Motion to reject by consent.
075	Section 412.1	**412.1 Application.** Urinals shall comply with ASME A112.19.2/CSA B45.1, ASME A112.19.19, or CSA B45.5/IAPMO Z124. Urinals shall have an average water consumption not to exceed 1 gallon (3.8 Lpf) of water per flush. The hydraulic performance for urinals using water for flushing shall be in accordance with ASME A112.19.2/CSA B45.1 or CSA B45.5/IAPMO Z124.	Reject	**ASA Position:** Oppose. Hydraulic performance already covered in standards currently referenced. **UPC Committee Discussion:** Move to reject due to existing standards already addresses the issues.

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076	Section 412.1	Delete second sentence of 412.1.1 **412.1.1 Nonwater Urinals.** Nonwater urinals shall have a liquid barrier sealant to maintain a trap seal. ~~Nonwater urinals shall permit the uninhibited flow of waste through the urinal to the sanitary drainage system.~~ Nonwater urinals shall be cleaned and maintained in accordance with the manufacturer's instructions after installation.	Reject	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to reject due to the flow is needed in case of a backup. Motion passed by consent.
077	Section 412.1	Revise first sentence of 412.1.1 and definition: **412.1.1 Nonwater Urinals.** Nonwater urinals shall have a liquid barrier sealant or a membrane valve to maintain a trap seal. Nonwater urinals shall permit the uninhibited flow of waste through the urinal to the sanitary drainage system. **Trap.** A fitting or device so designed and constructed as to provide, where properly vented, a liquid seal or a membrane valve that will prevent the back passage of air without materially affecting the flow of sewage or wastewater through it.	Reject	**ASA Position:** Neutral **UPC Committee Discussion:** No standard for a membrane valve and a valve does not provide equivalent of a liquid seal. Motion passed by consent.
083	Section 415.0	**415.0 Drinking Fountains.** 415.1 **Application.** Drinking fountains shall be self-closing and comply with ASME A112.19.1/CSA B45.2, ASME A112.19.2/CSA B45.1, or ASME A112.19.3/CSA B45.4. Drinking fountains and bottle filling stations shall also comply with NSF 61. Permanently installed electric water coolers and bottle filling stations shall also comply with UL 399. 415.2 **Drinking Fountain Alternatives.** Where food is consumed indoors, water stations shall be permitted to be substituted for drinking fountains. Bottle filling stations shall be permitted to be substituted for drinking fountains ~~up to 50 percent of the requirements for drinking fountains~~. Drinking fountains shall not be required for an occupant load of 30 or less.	Reject	**ASA Position:** Support **UPC Committee Discussion:** Motion to modify be putting deleted text back in. Concern that not everyone has a bottle available. Motion passed with 23 yes to 1 no
084	Section 416	Add following under 416.0 Emergency Eyewash and Shower Equipment **416.3 Remote Temperature Monitoring.** Control and alert when lack line of sight. Temperature may be monitored remotely via a sensor and App to alert if mixed water	Reject	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to reject. Motion passed by consent.

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		exceeds 85F (29.4 C) at the outlet. Temperature can also be adjusted via remote means.		
085	Section 417 and 603	Proposal moves the following items in Section 417 to Section 603.0 Cross-Connection Control: 417.2 Deck Mounted Bath/Shower Valves 417.3 Handheld Showers 417.4 Faucets and Fixture Fittings with Hose Connected Outlets	Reject	**ASA Position:** Oppose. Not all requirements being moved pertain to backflow protection; and section 603.5.19 already covers backflow protection. **UPC Committee Discussion:** Motion to reject approved by consent.
086	Section 417	Revise first sentence of 417.5 Separate Controls for Hot and Cold Water **417.5 Separate Controls for Hot and Cold Water.** Where two separate handles control the hot and cold water, the handles shall be marked in such a manner to indicate to the user that the left-hand control of the faucet where facing the fixture fitting outlet shall control the hot water.	Reject	**ASA Position:** Oppose **UPC Committee Discussion:** Motion to reject. Motion passed based on consent.
087	Section 417	**417.0 Faucets and Fixture Fittings.** ~~**417.6 Low-Pressure Water Dispenser.** Beverage faucets shall comply with ASME A112.18.1/CSA B125.1. Low- pressure water dispensers that dispense electrically heated water have a reservoir vented to the atmosphere shall comply with ASSE 1023. Electric devices that heat water shall comply with UL 499.~~ **417.6 Water Dispensers.** All potable water dispensers directly connected to the plumbing system shall comply with one of the following: **a.** Beverage faucets shall comply with ASME A112.18.1/CSA B125.1. **b.** Dispensers that supply electrically heated or cooled water shall comply with ASSE 1023. (3) Electric devices that heat water shall comply with UL 499. (4) Dispensers that include water treatment shall comply with ASSE 1023 and Section 611.0 based on the type of water treatment technology.	Reject	**ASA Position:** Request the deletion of "one of the following". **UPC Committee Discussion:** Motion to reject. The proposal should be revised to delete "one of the following" and clarify that water dispensers from carbonated beverages and hand gun dispensers are not covered by the new requirements. Motion passed by consent.
088	Section 417	**417.7 Head Shampoo Sink Faucets.** Head shampoo sink faucets shall be supplied with hot water that is limited to not more than 120°F (49°C). Each faucet shall	Reject	**ASA Position:** Neutral

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Item #	**Section(s)**	**Summary of Proposed Revision**	**UPC TC Position**	**Comments**
		have integral check valves to prevent crossover flow between the hot and cold water supply connections. The means for regulating the maximum temperature shall be in accordance with one of the following: (1) A limiting device conforming to ASSE 1070/ASME A112.1070/CSA B125.70. (2) A water heater conforming to ASSE 1084. (3) A temperature-actuated, flow-reduction device conforming to ASSE 1062.		**UPC Committee Discussion:** Motion to reject. It would require the sourcing of hot water. Note sure why a 1082 compliance would not be acceptable. Motion rejected by consent.
089	Section 417	**417.0 Faucets and Fixture Fittings.** **417.8 Footbaths and Pedicure Baths.** The water supplied to specialty plumbing fixtures, such as pedicure chairs having an integral foot bathtub and footbaths, shall be limited to not more than 120ºF (49ºC) by a water- temperature-limiting device that conforms to ASSE 1070/ASME A112.1070/CSA B125.70 or by a water heater complying with ASSE 1084.	Reject.	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to reject based on implied requirement for hot water. Motion accepted by consent.
091	Section 420.3	Revises 420.3 Pre-Rinse Spray Valve to incorporate maximum flow rates as required in DOE regulations.	Approve	**ASA Position:** Support **UPC Committee Discussion:** Motion to accept approved based on consent.
092	Table 422.1	Add following footnotes to Table 422.1 Minimum Plumbing Facilities under the "Other" category 6 Service sinks shall not be required for non-residential occupancies with an occupant load of 15 or less. 7 For business and mercantile occupancies, one common service sink shall be permitted when accessible to all businesses and mercantile within 300 feet and within the same story.		Did not document decision
093	Section 422.2	Add following exception to 422.2 Separate Facilities: (4) Separate facilities shall not be required where rooms have fixtures designed for use by both sexes and the water closets are installed in privacy compartments. Urinals shall be located in an area that is visually separated from the remainder of the room or each urinal shall be installed in a privacy compartment.	Reject	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to reject passed based on 12 yes to 9 no

AMERICAN SUPPLY ASSOCIATION

ASA Plumbing Fixture and Appliance Code Committee - UPC TC Meeting Notes from May 3 thru 7, 2021 Hearings

UNIFORM PLUMBING CODE				
Item #	**Section(s)**	**Summary of Proposed Revision**	**UPC TC Position**	**Comments**
094	Section 422.2	Add new item under Section 422.0 Minimum Number of Required Fixtures **Multiple Occupancy Buildings.** Buildings having multiple types of occupancies, shall have separate toilet facilities for each occupancy with the minimum number of fixtures prescribed in Table 422.1. A common set of restrooms shall be permitted to be used to accommodate all of the building occupants when the following requirements are met: (1) Restrooms shall be accessible to the occupants at all times. (2) The maximum travel distance from the restrooms to any occupancy shall not exceed 300 feet (91 440 mm). (3) The total occupant load for the building shall be determined by adding the individual occupant loads together. The minimum number of fixtures for the common restrooms shall be calculated at 50 percent female and 50 percent male based on the total occupant load and by using the occupancy requiring the greatest number of fixtures per occupant load in accordance with Table 422.1.	Reject	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to reject. No technical justification for 300 ft. and a bit confusing. Motion passed by consent.
095	Section 422.4	Add new item under Section 422.4 Toilet Facilities Serving Employees and Customers **422.4.2 Factory, Industrial and Storage.** The location and maximum distances of travel to required public and employee facilities in factory, industrial and storage occupancies shall be permitted to exceed that required by Section 422.4, provided that the location and maximum distance of travel are approved.	Reject	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to reject and not enforceable with no clear requirements. Motion passed by consent.
130		**603.5.17 Potable Water Outlets and Valves.** Potable water outlets, freeze-proof yard hydrants, combination stop-and- waste valves, freeze resistant drinking fountains or other fixtures that incorporate a stop and waste feature that drains into the ground shall not be installed underground. **Exception:** Drinking fountain freeze resistant sanitary shall be permitted to be installed underground. **206.0 -D-** **Drinking Fountain Freeze Resistant.** An outdoor point of use valve used for potable water systems that uses a stop and waste below the frost line to protect against	Reject	**ASA Position:** Oppose. Term sanitary is not defined and proposal may be proprietary. **UPC Committee Discussion:** Motion to reject. The term sanitary may conflict with the way it is used in the code. There should be a separation between the potable and nonpotable requirements. Motion passed by consent.

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Item #	**Section(s)**	**Summary of Proposed Revision**	**UPC TC Position**	**Comments**
		freezing. The device is normally installed in a vertical position extending from below the frost line to above grade. **Drinking Fountain Freeze Resistant Sanitary.** An outdoor point of use valve used for potable water systems that drains back into an internal reservoir below the frost line to protect against freezing The device is normally installed in a vertical position extending from below the frost line to above grade.		
131		**603.5.17 Potable Water Outlets and Valves.** Potable water outlets, freeze-proof non-sanitary yard hydrants, combination stop-and-waste valves, or other fixtures that incorporate a stop and waste feature that drains into the ground shall not be installed underground. **Exception:** Freeze-resistant sanitary yard hydrants that meet the requirements of ASSE 1057 shall be permitted to be installed underground. **227.0 -Y-** **Yard Hydrant.** A point-of-use valve used for nonpotable water systems that is protected against freezing by draining residual water onto the soil (which can be a source of cross-contamination). The device is normally installed in a vertical position extending from below the frost line to above grade. **Yard Hydrant, Sanitary.** A point-of-use valve used for potable water systems that drains back into an internal reservoir below the frost line to protect against freezing. The device incorporates a backflow prevention device with hose connection outlet for potable water application. The device is normally installed in a vertical position extending from below the frost line to above grade.	Reject	**ASA Position:** Oppose. A "sanitary hydrant" does not require components that would lend it to being sanitary. May be proprietary. **UPC Committee Discussion:** Motion to reject. The term sanitary may conflict with the way it is used in the code. There should be a separation between the potable and nonpotable requirements. Moition passed by consent.
137	Table 604.1	Add IAPMO IGC 353 - Branch Connectors to Table 604.1 – Materials for Building Supply and Water Distribution Piping and Fittings in the material row for stainless steel. Also add IAPMO document to Table 1701.1 – Referenced Standards	Reject	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to reject based on it not being applicable building water supply.
138	Table 604.1	Add ASTM F3347 – Metal Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-Linked PEX Tubing and SDR9 P-RT Tubing and ASTM F3348 – Standard Specification for Plastic Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 PEX Tubing and SDR9 PE_RT Tubing to Table 604.1	Reject	**ASA Position:** **Neutral** **UPC Committee Discussion:**

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Item #	**Section(s)**	**Summary of Proposed Revision**	**UPC TC Position**	**Comments**
		– Materials for Building Supply and Water Distribution Piping and Fittings and to Table 1701.1 – Referenced Standards.		Concern raised about the table showing both Building Supply and Water Distribution is checked and ASTM F3347 is not scoped for both. It was noted that there are other standards already in the table just for Water Distribution. Motion to reject passed with a vote of 13 yes, 6 no and 3 abstentions.
139	Section 604.2	Revise Exception section of 604.2 Lead Content: **Exceptions:** (1) Pipes, pipe fittings, plumbing fittings, or fixtures ~~or backflow preventers~~ used for nonpotable services such as manufacturing, industrial processing, irrigation, outdoor watering, or any other uses where the water is not used for human consumption.	Reject	**ASA Position:** Oppose. **UPC Committee Discussion:** Motion to reject based on it not being consistent with Federal Regulations. Motion passed with a vote of 21 yes to 2 no
140	Section 604.5 and 12	**604.0 Materials.** ~~**604.5 Flexible Connectors.** Flexible water connectors shall be installed in readily accessible locations, and where under continuous pressure shall comply with ASME A112.18.6/CSA B125.6. Flexible water connectors with an excess flow shutoff device shall comply with CSA B125.5/IAPMO Z600.~~ **604.12 Flexible ~~Corrugated~~ Connectors.** Flexible ~~corrugated connectors of copper, copper alloy, or stainless steel~~ water connectors shall be installed in readily accessible locations and shall comply with ASME A112.18.6/CSA B125.6. Flexible water connectors with an excess flow shutoff device shall comply with CSA B125.5/IAPMO Z600. Such connectors shall be limited to the following connector lengths: **c.** Fixture Connectors – 30 inches (762 mm) **d.** Washing Machine Connectors – 72 inches (1829 mm) **e.** Dishwasher and Icemaker Connectors – 120 inches (3048 mm) (4) Other Connections – 48 inches (1220 mm)	Reject	**ASA Position:** Oppose **UPC Committee Discussion:** Motion to reject based on attempting to take requirements for corrugated connectors and apply to all connectors with a lack of technical justification and no background to support 48 in. Motion accepted based on consent approval.
143	Section 605	Place the following new sentence at the end of Section 605.1.3.3 Push Fittings:	Reject	**ASA Position:** Oppose

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Item #	**Section(s)**	**Summary of Proposed Revision**	**UPC TC Position**	**Comments**
		Fittings used in potable water systems intended to supply drinking water shall comply with NSF 61.		**UPC Committee Discussion:** Motion to reject based on the requirement already covered under 604.1 and is already covered in the product standard. Motion passed by consent.
152	Section 606	**606.1 General.** Valves up to and including 2 inches (50 mm) in size shall be copper alloy or other approved material. Sizes exceeding 2 inches (50 mm) shall be permitted to have cast iron or copper alloy bodies or other approved materials. Each gate or ball valve shall be a fullway or full-port type with working parts of the noncorrosive material. Valves carrying water used in potable water systems ~~intended to supply drinking water~~ shall comply ~~with the requirements of NSF 61 and~~ ASME A112.4.14, ASME B16.34, ASTM F1970, ASTM F2389, AWWA C500, AWWA C504, AWWA C507, IAPMO IGC 312, IAPMO Z1157, MSS SP-67, MSS SP-70, MSS SP-71, MSS SP-72, MSS SP-78, MSS SP-80, MSS SP-110, MSS SP-122, or NSF 359. Valves carrying water intended to supply drinking water shall also comply with NSF 61.	Reject	**ASA Position:** Neutral **UPC Committee Discussion:** Move to reject based on consent.
153	Section 606	**606.1 General.** Valves up to and including 2 inches (50 mm) in size shall be copper alloy or other approved material. Sizes exceeding 2 inches (50 mm) shall be permitted to have cast iron or copper alloy bodies. Each gate or ball valve shall be a fullway or full-port type with working parts of the noncorrosive material. Valves carrying water used in potable water systems ~~intended to supply drinking water~~ shall comply with the requirements of ~~NSF 61 and~~ ASME A112.4.14, ASME B16.34, ASTM F1970, ASTM F2389, AWWA C500, AWWA C504, AWWA C507, IAPMO Z1157, MSS SP-67, MSS SP-70, MSS SP-71, MSS SP-72, MSS SP-78, MSS SP-80, MSS SP-110, MSS SP-122, or NSF 359. Valves intended to supply drinking water shall also comply with the requirements of NSF 61.	Accept	**ASA Position:** Neutral **UPC Committee Discussion:** Move to accept based on consent.
155	Section 606	**606.9 Leak Detection Devices.** Where digital leak detection devices for water supply and distribution are installed, they shall comply with IAPMO ~~IGC 115 or IAPMO IGC 349~~ IAPMO Z1349.	Reject	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to reject based on the IAPMO standard is not limited to digital devices. Motion passed based on consent.

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Item #	**Section(s)**	**Summary of Proposed Revision**	**UPC TC Position**	**Comments**
156	Section 606 and 405	**606.9 Leak Detection Devices.** Where leak detection devices for water supply and distribution are shall comply with ~~IAPMO IGC 115 or IAPMO IGC 349~~ IAPMO Z1349. **L 405.0 Leak Detection and Control.** **L 405.1 General.** Where installed, leak detection and control devices shall comply with ~~IAPMO IGC 115 or IAPMO IGC 349~~ IAPMO Z1349. Leak detection and control devices help protect property from water damage and also conserve water by shutting off the flow when leaks are detected.	Accept	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to accept passed based on consent.
165	Table 610.3	Add following footnote to Table 603.3 – Water Supply Fixture Units and Minimum Fixture Branch Pipe Sized. Footnote would apply to following: • Bathtub or Combination Bath Shower • Bidet • Dishwasher (domestic) • Lavatory • Sink (bar; kitchen, domestic with or without dishwasher; laundry; service or mop basin; washup, each set up faucets • Shower, per head • Water Closet, 1.6 GPF Gravity Tank • Water Closet, 1.6 GPF Flushometer Tank [9] Nominal tubing size 3/8 shall be permitted to be used where hydraulic calculations support the use of this size.	Reject	**ASA Position:** Support **UPC Committee Discussion:** Motion to accept failed based on a vote of 6 yes to 18 no. Motion to reject was approved by consent. Concern was noted related to adequate filling and time related to a reduction in size.
166	Table 610.3	Update following appliance name in Table 610.3 – Water Supply Fixture Units and Minimum Fixture Branch Pipe Sizes: Nonwater Urinal with Drain Cleansing Action	Accept	**ASA Position:** Support **UPC Committee Discussion:** Motion to accept as submitted passed based on consent.
167	Section 701	**701.2 Drainage Piping.** Materials for drainage piping shall be in accordance with one of the referenced standards n Table 701.2 except that:	Reject	**ASA Position:**

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Item #	**Section(s)**	**Summary of Proposed Revision**	**UPC TC Position**	**Comments**
		(7) Flexible trap assemblies meeting the IAPMO IGC 361 listing are permissible for all applications in Table 702.1 where the trap is directly accessible. **701.3.3 Type.** Fittings used for drainage shall be of the drainage type, have a smooth interior water-way except for Section 701.2 (7) applications, and be constructed to allow 1/4 inch per foot (20.8 mm/m) grade. **701.8 Disinfection.** Drainage pipe between a water fixture and trap should be disinfected as necessary using Centers for Disease Control guidelines to help prevent the spread of infectious diseases that can live in these areas. Drain applications in clinical settings shall use a trap system that allows for regular disinfection.		Oppose. Flexible trap would be in violation of 1004.2. Disinfection not applicable to all classes of occupancies. **UPC Committee Discussion:** Motion to reject due to lack of smooth waterway in the fitting and additional requirements may be best suited in hospital setting. Rejected by consent approval.
175	Definitions and DFUs	Add definition: **Bathroom Group.** Any combination of fixtures, not to exceed one water closet, two lavatories, either one bathtub or one combination bath/shower, and one shower, and may include a bidet and an emergency floor drain. **Half Group.** A group of fixtures located together for use by a single occupant consisting of a water closet and lavatory. Proposal adds specific Drainage Fixture Unit Values for various types of "half group" bathroom groups.	Reject	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to reject passed based on 12 yes, to 11 no and 1 abstention.
177	705.6.2	Add following to 705.6.2 Solvent Cement Joints. "Two-step joining methods shall be in accordance with ASTM D2855."	Reject	**ASA Position:** Support **UPC Committee Discussion:** Motion to reject as noted in previous proposals under Chapter 6. Passed by consent approval.
180	Section 706	**706.0 Changes in Direction or Drainage Flow.** **706.2 Horizontal to Vertical.** Horizontal drainage lines, connecting with a vertical stack, shall enter through 45 degree (0.79 rad) wye branches, 60 degree (1.05 rad) wye	Reject	**ASA Position:** Neutral **UPC Committee Discussion:**

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Item #	**Section(s)**	**Summary of Proposed Revision**	**UPC TC Position**	**Comments**
		branches, combination wye and one-eighth bend branches, double fixture fittings, sanitary tee or sanitary tapped tee branches, or …….		Motion to reject since the fitting is only designed for back to back systems.
181	Section 707.4	(4) An approved type of two-way cleanout fitting or field made double wye (wye and 1/8 bend fitting) in a back to back configuration, installed	Reject	**ASA Position:** Neutral **UPC Committee Discussion:** Reject since a field installed combination fitting would be installed in reverse. Some noted that it is not an uncommon practice but the text is not written well. Motion passed by consent.
182	Section 707	**707.0 Cleanouts.** **707.4 Location.** Each horizontal drainage pipe shall be provided with a cleanout at its upper terminal, and each run of piping, that is more than 100 feet (30 480 mm) in total developed length, shall be provided with a cleanout for each 100 feet (30 480 mm), or fraction thereof, in length of such piping. An additional cleanout shall be provided in a drainage line for each aggregate horizontal change in direction exceeding 135 degrees (2.36 rad). A cleanout shall be installed above the fixture ~~connection fitting~~ flood rim serving each urinal or battery of toiltes regardless of the location of the urinal or battery of toilets in the building.	Reject	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to accept as submitted. Edit was made to change "toilets" to "water closets". Motion to accept failed with a vote of 12 yes to 13 no. Move to reject based on adding additional clean outs without justification. Motion to reject passed by consent.
183	Section 707.4.1	Add following new item under 707.4, Cleanouts – Location **707.4.1 Load Rated Cover.** Cleanout floor Covers and top rims meant to take loads shall be rated for the loading in accordance with ASME A112.36.2M.	Accept	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to accept as submitted. Motion passed based on consent.
184	Section 708	Revise following section under 708 – Grade of Horizontal Piping.	Reject	**ASA Position:** Neutral **UPC Committee Discussion:**

ASA Plumbing Fixture and Appliance Code Committee - UPC TC Meeting Notes from May 3 thru 7, 2021 Hearings

UNIFORM PLUMBING CODE				
Item #	**Section(s)**	**Summary of Proposed Revision**	**UPC TC Position**	**Comments**
		708.1 General. ~~Horizontal drainage~~ Building drain piping shall be run in practical alignment and a uniform slope of not less than ¼ inch per foot (20.8 mm/m) or 2 percent toward the point of disposal. ~~provided that, where~~ **Exception:** Where it is impractical due to the depth of the street sewer, ~~to the~~ structural features, or ~~to~~ the arrangement of a building or structure to obtain a slope of ¼ inch per foot (20.8 mm/m) or 2 percent, ~~such pipe or~~ building drain piping 4 inches (100 mm) or larger in diameter shall be permitted to have a slope of not less than 1/8 inch per foot (10.4 mm/m) or 1 percent, where first approved by the Authority Having Jurisdiction.		Motion to reject because it would only apply to building drains. Motion passed by consent.
185	Section 708	Revised following under 708 – Grade Horizontal Draining Piping, 708.1, General: … pipe or piping ~~4~~ 5 inches (~~100~~ 127 mm) or larger in diameter shall be permitted to have a slope of not less than 1/8 in per foot or 1 %, where approved by the Authority Having Jurisdiction. Revise Table 703.2, Maximum Unit Loading and Maximum Length of Drainage and Vent Piping to delete footnote 5 for 4 in horizontal drainage piping and revise footnote 4 to state "Not to exceed ~~five~~ six water closets or five six-unit traps.	Accept as Modified	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to modify to remove deletion of the 4" and note will remain. The addition of footnote 5 to the 4" horizontal pipe will be removed. The only change left is to footnote 4 allowing for "six". Motion to accept as modified passed 17 yes to 5 no. Some concern was raised about lack of justification of the six urinals on a 3" line.
197	Section 718	**718.0 Grade, Support, and Protection of Building Sewers.** **718.1 Slope.** Building sewers shall be run in practical alignment and at a uniform slope of not less than ¼ inch per foot (20.8 mm/m) toward the point of disposal. **Exception:** Where approved by the Authority Having Jurisdiction and where it is impractical, due to the depth of the street sewer, ~~or to~~ the structural features or the arrangement of a building or structure, to obtain a slope of ¼ inch per foot (20.8 mm/m), ~~such pipe or~~ piping 4 inches (100 mm) through 6 inches (150 mm) shall be permitted to have a slope of not less than 1/8 inch per foot (10.4 mm/m) and ~~such~~ piping 8 inches (200 mm) and larger shall be permitted to have a slope of not less than 1/16 inch per foot (5.2 mm/m). The maximum and minimum fixture unit loading shall be in accordance with Table 717.1.	Accept	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to accept passed based on consent.

UNIFORM PLUMBING CODE				
Item #	**Section(s)**	**Summary of Proposed Revision**	**UPC TC Position**	**Comments**
227	Table 1002.2	Revise footnote 2 for Table 1002.2 Horizontal Lengths of Trap Arms (Except Water Closets and Similar Fixtures) [2] The developed length between the trap of a water closet or similar fixture (measured from the ~~top~~ face of the closet flange to the inner edge of the vent) and its vent shall not exceed 6 feet (1829 mm).	Approve	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to accept. Motion passed based on consent approval.
228	Table 1002.2	Add footnote 3 for Table 1002.2 Horizontal Lengths of Trap Arms (Except Water Closets and Similar Fixtures) [3] Horizontally wet vented bathtubs, showers and similar fixtures shall be limited to a maximum of 6 feet (1830 mm) for 1-1/2 inch (40 mm) fixture drains and 8 feet (2440 mm) for 2 inch (50 mm) fixture drains, maintaining ¼ inch per foot slope (20 mm/m).	Reject	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to reject. The motion passed with a vote of 14 yes to 9 no.
229	Section 1003	**1003.0 Traps – Described** **1003.1 General Requirements.** Each trap, except for traps within an interceptor or similar device shall be self-cleaning. Traps for bathtubs, showers, lavatories, sinks, laundry tubs, floor drains, urinals, drinking fountains, dental units, and similar fixtures shall be of standard design, weight and shall be of ABS, cast-~~brass~~ copper alloy, cast-iron, lead, PP, PVC, or other approved material. An exposed and readily accessible drawn-copper alloy tubing trap, not less than 17 B & S Gauge (0.045 inch) (1.143 mm), shall be permitted to be used on fixtures discharging domestic sewage. ~~**Exception:** Drawn-copper alloy tubing traps shall not be used for urinals.~~ Each trap shall have the manufacturer's name stamped legibly in the metal of the trap, and each tubing trap shall have the gauge of the tubing in addition to the manufacturer's name. A trap shall have a smooth and uniform interior waterway. **Exception:** Drawn-copper alloy tubing traps shall not be used for urinals.	Reject	**ASA Position:** Opposed. Movement of the objection into the body goes beyond drawn-copper alloy. **UPC Committee Discussion:** Motion to reject. Motion passed based on consent approval.
230	Section 1003	**1003.0 Traps – Described** **1003.1 General Requirements.** Each trap, except for traps within an interceptor or similar device, shall be self-cleaning. Traps shall have a smooth and uniform interior waterway. Traps for bathtubs, showers, lavatories, sinks, laundry tubs, floor drains, urinals, drinking fountains, dental units, and similar fixtures shall be of standard design, weight and shall be of ABS, cast-brass, cast-iron, lead, PP, PVC, or other approved material.	Reject	**ASA Position:** Opposed. Movement of the objection into the body goes beyond drawn-copper alloy. **UPC Committee Discussion:** Motion to reject. Motion passed based on consent approval.

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Item #	**Section(s)**	**Summary of Proposed Revision**	**UPC TC Position**	**Comments**
		An exposed and readily accessible drawn-copper alloy tubing trap, not less than 17 B & S Gauge (0.045 inch) (1.143 mm), shall be permitted to be used on fixtures discharging domestic sewage. Each trap shall have the manufacturer's name and gauge or schedule legibly stamped on the trap. **Exception:** Drawn-copper alloy tubing traps shall not be used for urinals. ~~Each trap shall have the manufacturer's name stamped legibly in the metal of the trap, and each tubing trap shall have the gauge of the tubing in addition to the manufacturer's name. A trap shall have a smooth and uniform interior waterway.~~		
255	Section 1500	Significant revisions to Sections under Section 1500 related to gray water systems.	Reject	**ASA Position:** Neutral **UPC Committee Decision:** Motion to reject based on unenforceable language and setting requirements while not requiring a permit. Motion passed based on a consent vote.
256	Chapters 15 and 16	**CHAPTER 15 - ALTERNATE WATER SOURCES FOR NONPOTABLE APPLICATIONS** **1501.7 Minimum Water Quality Requirements.** The minimum water quality for alternate water source systems shall meet the applicable water quality requirements for the intended application as determined by the Authority Having Jurisdiction. In the absence of water quality requirements, for on-site treated nonpotable systems, the water quality requirements of EPA/600/R-12/618-2012, IAPMO IGC 324 or NSF 350 shall apply. ~~The EPA/625/R-04/108 contains recommended water reuse guidelines to assist regulatory agencies to develop, revise, or expand alternate water source water quality standards.~~ **CHAPTER 16 - NONPOTABLE RAINWATER CATCHMENT SYSTEMS** **1603.5 Minimum Water Quality.** The minimum water quality for harvested rainwater shall meet the applicable water quality requirements for the intended applications as determined by the Authority Having Jurisdiction. In the absence of	Approve as Modified	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to modify that removes EPA guideline as a requirement and leave as a guideline. NSF expressed concern about including IAPMO IGC 324. Motion to modify (leaving IAPMO reference in) passed with a vote of 18 yes, 1 no and 3 abstentions

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Item #	**Section(s)**	**Summary of Proposed Revision**	**UPC TC Position**	**Comments**
		water quality requirements determined by the Authority Having Jurisdiction, the minimum treatment and water quality shall be in accordance with Table 1603.5, EPA/600/R-12/618-2012, IAPMO IGC 324 or NSF 350. **Exception:** No treatment is required for rainwater used for subsurface or nonsprinkled surface irrigation where the maximum storage volume is less than 360 gallons (1363 L). ~~**1603.5.1 Treatment.** If the quality of the tested water cannot consistently be maintained at the minimum levels specified in Table 1603.5 then the system shall be equipped with an appropriate treatment device meeting applicable NSF standards referenced in Chapter 17.~~		
260	Section 1505	**1505.0 Reclaimed (Recycled) Water Systems.** **1505.5 Water Pressure.** Reclaimed (recycled) water systems supplying water to water closets, urinals, and trap primers shall be capable of delivering not less than 15 pounds-force per square inch (psi) (103 kPa) residual pressure at the highest and most remote outlet served. Where the water pressure in the reclaimed water supply system within the building exceeds 80 psi (552 kPa), a press re reducing valve reducing the pressure to 80 psi (552 kPa) or less to water outlets in the building shall be installed.	Accept	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to accept passed based on consent approval. (Note: see comments under 262)
261	Section 1506	**1506.0 On-Site Treated Nonpotable Water Systems.** **1506.1 General.** The provisions of this section shall ap alteration, and repair of onsite treated nonpotable water systems intended to supply uses such as water closets, urinals, trap primers for floor drains and floor sinks, above and belowground irrigation, industrial or commercial cooling or air conditioning, and other uses approved by the Authority Having Jurisdiction. Nonpotable water sources that shall be permitted for collection for re-use in on-site treated nonpotable water systems, include rainwater, air conditioner condensate, cooling tower blow-down water, fire pump test water, foundation drainage, swimming pool backwash, steam system condensate, fluid cooler discharge water, ice maker discharge water, food steamer discharge water, combination oven discharge water, industrial process water, and other sources approved by the Authority Having Jurisdiction.	Reject	**ASA Position:** Neutral **UPC Committee Discussion:** Motion to reject since the "laundry list" may not be all inclusive.

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Item #	**Section(s)**	**Summary of Proposed Revision**	**UPC TC Position**	**Comments**
262	Section 1506	**1506.0 On-Site Treated Nonpotable Water Systems.** **1506.5 Water Pressure.** On-site treated non-potable water systems supplying water to water closets, urinals, and trap primers shall be capable of delivering not less than 15 pounds-force per square inch (psi) (103 kPa) residual pressure at the highest and most remote outlet served. Where the water pressure in the on-site treated non-potable water supply system within the building exceeds 80 psi (552 kPa), a pressure reducing valve reducing the pressure to 80 psi (552 kPa) or less to water outlets in the building shall be installed.	Accept	**ASA Position:** Neutral **UPC Committee Discussion:** Concerns raised related to other sections of the code already addressing. Motion to accept passed based on consent approval
264	Chapter 15	Adds new section 1507.0 Onsite Blackwater Treatment Systems.	Reject	**ASA Position** Neutral **UPC Committee Discussion** Motion to reject passed based on understanding the proposal would be better suited for an Appendix.
265	Chapter 15	Adds new section 1508.0 Onsite Stormwater Treatment Systems	Reject	**ASA Position** Neutral **UPC Committee Discussion** Motion to reject passed based on understanding the proposal would be better suited for an Appendix.
287	Appendix L	Adds new Section L404.0 Non-Sewered Sanitation Systems in Appendix L, Sustainable Practices.	Reject	**ASA Position** Neutral **UPC Committee Discussion** Motion to reject based on the acceptance of item 306. Motion accepted based on consent approval.

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Item #	**Section(s)**	**Summary of Proposed Revision**	**UPC TC Position**	**Comments**
288	Appendix L	Significant revisions to sections L402 Water-Conserving Plumbing Fixtures and Fittings and L404 Occupancy Specific Water Efficiency Requirements and other Sections of Appendix L.	Reject	**ASA Position** Neutral **UPC Committee Discussion** Motion to reject. No test requirement for "zero leakage"; 406.6.3.1 markings is overly restrictive and marking requirements are already covered in the product standards; exception Table 407 for pools/spas overly restrictive. Motion to reject passed with a vote of 13 yes to 8 no
292	Appendix L	Revise footnote 1 to Table L402.1 Maximum Fixture and Fixture Fittings Flow Rates 1 Shall be listed to EPA WatersSense Specification for Showerheads. For multiple showerheads serving one shower compartment see Section L 402.6.1.	Approve	**ASA Position** Neutral **UPC Committee Discussion** Approve
293	Appendix L	Revise footnote 2 to Table L 402.1 Maximum Fixture and Fixture Fittings Flow Rates 2 Shall be listed to EPA WaterSense Specification for Tank-Type Toilet or Specification for Flushometer-Valve Water Closets.	Approve	**ASA Position** Neutral **UPC Committee Discussion** Approve
294	Appendix L	Add footnote 5 to Table L 402.1 Maximum Fixture and Fixture Fittings Flow Rates related to "lavatory faucets residential" 5 Shall be listed to EPA WaterSense High-Efficiency Lavatory Faucet Specification.	Approve	**ASA Position** Neutral **UPC Committee Discussion** Approve
295	Appendix L	**L 402.8 Commercial Pre-Rinse Spray Valves.** The flow rate for a pre-rinse spray valve installed in a commercial kitchen to remove food waste from cookware and dishes before cleaning shall not be more than ~~1.28 gpm (4.8 L/m) at 60 psi (414 kPa)~~ the maximum flow rate, as specified in Table L 402.8. Where pre-rinse spray valves with maximum flow rates of 1.0 gpm (3.8 L/m) or less are installed, the static pressure shall be not less than 30 psi (207 kPa). Commercial kitchen pre-rinse spray valves shall be equipped with integral automatic shutoff. ~~Pre-rinse spray valves shall be listed to the EPA WaterSense Commercial Pre-rinse Spray Valve Specification.~~	Approve	**ASA Position** Neutral **UPC Committee Discussion** Motion to accept; It was pointed out the proposal brings text in line with existing Federal Law. Motion approved based on a consent vote.

UNIFORM PLUMBING CODE

Item #	Section(s)	Summary of Proposed Revision	UPC TC Position	Comments
		TABLE L 402.8 **COMMERCIAL PRE-RINSE SPRAY VALVE MAXIMUM FLOW RATE** **PRODUCT CLASS BY SPRAY FORCE** / **MAXIMUM FLOW RATE (GPM)** Product Class 1 (</= 5.0 ounces-force) — 1.00 Product Class 2 (> 5.0 ounces-force and </= 8.0 ounces-force) — 1.20 Product Class 3 (> 8.0 ounces-force) — 1.28 For SI units: 1 gallon per minute = 3.785 L/min, 1 ounce-force = 0.0625 pound-force		
296	Appendix L	**L 402.0 Water-Conserving Plumbing Fixtures and Fittings.** **L 402.8 Bath and Shower Flow-Reduction Devices.** Bath and shower flow-reduction devices shall comply with IAPMO IGC 244.	Approve	**ASA Position** Neutral **UPC Discussion** Motion to accept approved based on consent.
300	Appendix L	Add reference to ASSE 1086 to L410.3 POU Reverse Osmosis Water Treatment Systems.	Approve	**ASA Position** Neutral **UPC Discussion** Motion to accept approved by consent vote.
305	Appendix N	Significant revisions throughout Appendix N Impact of Water Temperature on the Potential for Scalding and Legionella Growth.	Approve	**ASA Position** Neutral **UPC Discussion** Motion to accept. Concern with the moving from the current table to the graphic

UNIFORM PLUMBING CODE				
Item #	**Section(s)**	**Summary of Proposed Revision**	**UPC TC Position**	**Comments**
				representation and some concern with technical correctness. Motion approved by consent.
306	Appendix O	New Appendix specifically covering Non-Sewered Sanitation Systems	Approved as Modified	**ASA Position** Neutral **UPC Discussion** Motion to approve as modified to remove the "exception statement". Motion accepted based on consent approval.
308 - 319	Appendix Q	Proposals provide guidance on the safe operation, closure and reopening of building water systems	Reject	**ASA Position** Neutral **UPC Discussion** Motion to reject all items based on the fact that some content is currently going through a peer review process and it will be coming back in public comment. Motion approved by consent approval.
320 - 23	Appendix Q	New Appendix covering nonpotable water systems	Reject	**ASA Position** Neutral **UPC Discussion** Motion to reject all items based on the fact that some content is currently going through a peer review process and it will be coming back in public comment. Motion approved by consent approval.
324	Appendix R	New Appendix on Tiny Houses	Approve as Modified	**ASA Position** Neutral

UNIFORM PLUMBING CODE				
Item #	**Section(s)**	**Summary of Proposed Revision**	**UPC TC Position**	**Comments**
				UPC Discussion Motion to approve as modified based on a significant amount of modification. Motion was withdrawn and new motion to reject accepted by consent.
325	Appendix S	New Appendix for Composting Toilet and Urine Diversion Systems	Reject	**ASA Position** Neutral **UPC Discussion** Motion to reject based on insufficient justification for adding to UPC as an Appendix and should remain in WeStand.

2021

UPC® TECHNICAL COMMITTEE MEETING MONOGRAPH

VIRTUAL MEETING | **MAY 3 – 7, 2021**

Proposals

Item #: 009

UPC 2024 Section: 206.0

SUBMITTER: Bruce A Pfeiffer
Retired - City of Topeka

RECOMMENDATION:
Revise text

206.0 - D -

Dead Leg. Section of potable water pipe which contains water that has no flow or does not circulate. Pipe lengths equal to, or greater than 1.5 times the diameter of the pipe constitutes a dead leg.

SUBSTANTIATION:
Defining the length of a dead leg will eliminate interpretation issues between the installer and AHJ.

Proposals

Item #: 011

UPC 2024 Section: 206.0, 209.0

SUBMITTER: Garry Sato
Greensmart Sustainable Concepts

RECOMMENDATION:
Revise text

206.0 - D -

Diverter Valve, **Gray Water** ~~**Diverter Valve**~~**.** A valve that directs gray water to the sanitary drainage system or a subsurface irrigation system.
Diverter Valve, On Site Treated Nonpotable Water. A key component in the collection system to control inflow and overflow in collection tanks intended for on-site treatment and direct beneficial use.
Diverter Valve, Rainwater. A key component in commercial rainwater catchment systems to control high inflow and overflow volumes in rainwater storage tanks.

209.0 - G -

Gray Water. Untreated wastewater that has not come into contact with toilet waste, kitchen sink waste, dishwasher waste or similarly contaminated sources. Gray water includes, but not limited to, wastewater from bathtubs, showers, lavatories, clothes washers, and laundry tubs. Also known as grey water, graywater, and greywater.

SUBSTANTIATION:
The intent is to define new items that fill an unmet need and to clarify their specific uses that previously did not exist in the industry with regards to water sustainability. There are now existing regulations that require certain sustainable water practices that were not mentioned in previous code editions that require greater conformity and definition.

Proposals

Item #: 013

UPC 2024 Section: 208.0

SUBMITTER: Phillip H Ribbs
PHR Consultants

RECOMMENDATION:
Revise text

208.0 - F -
Flood-Level Rim. The top edge of a receptor or fixture from which water overflows.

(below shown for reference only)

Receptor. An approved plumbing fixture or device of such material, shape, and capacity as to adequately receive the discharge from indirect waste pipes, so constructed and located as to be readily cleaned.

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

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

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

Critical Level. The critical level (C-L or C/L) marking on a backflow prevention device or vacuum breaker is a point conforming to approved standards and established by the testing laboratory (usually stamped on the device by the manufacturer) that determines the minimum elevation above the flood-level rim of the fixture or receptor served at which the device may be installed. Where a backflow prevention device does not bear a critical level marking, the bottom of the vacuum breaker, combination valve, or the bottom of such approved device shall constitute the critical level.

SUBSTANTIATION:
As currently written, the term “flood-level rims” is limited to “receptors” which seems like an oversight in the language. The term “flood-level rim” applies to water closets, urinals and other fixtures that are not considered a receptor. The simple addition of “or fixture” will clarify the intended use for flood-level rims and not just limit it to a receptor.

Proposals

Item #: 017

UPC 2024 Section: 212.0

SUBMITTER: Donald (DJ) Berger
Self

RECOMMENDATION:
Revise text

212.0 - J -

Joint, ~~Press-Connect~~ Elastomeric. A ~~permanent mechanical~~ removable or non-removable joint incorporating an elastomeric seal or an elastomeric seal and corrosion resistant grip ring. ~~The joint is made with a pressing tool and jaw or ring that complies with the manufacturer's installation instructions.~~

SUBSTANTIATION:
The word "Press-Connect" describes one type of technology using elastomeric materials for the joint seal. By revising the definition with the word "Elastomeric." This definition may be expanded to include similar joining technologies employing an elastomeric material for its seal. E.g., push-fit, grooved (Victaulic), bolted (Dresser), compression repair couplings, etc.

The words "permanent mechanical" are inconsistent with other "permanent" and "mechanical" joint definitions within this section of the code. By revising the definition with the removal of the phrase "The joint is made with a pressing tool and jaw or ring that complies with the manufacturer's installation instructions," the definition would be inclusive of similar joining technologies employing elastomeric materials. This revision would provide additional consistency within the code as the 2021 UPC has specific sections that provide information on how joints are to be made.

Proposals

Item #: 018

UPC 2024 Section: 214.0

SUBMITTER: John Taecker
UL LLC

RECOMMENDATION:
Revise text

214.0 – L –

Listed (Third Party Certified). Equipment or materials included in a list published by a listing agency (accredited conformity assessment body) that maintains periodic inspection of current production of listed equipment or materials and whose listing states either that the equipment or material complies with approved standards or has been tested and found suitable for use in a specified manner. Terms used to identify listed equipment, products, or materials include "listed," "certified," or other terms as determined appropriate by the listing agency.

SUBSTANTIATION:
The proposed revision to the definition for "Listed" recognizes that listing organizations may use other terms to identify "listed" equipment, products, or materials. An example of other terms used that meet the definition of "listed" include "certified." The term "certified" is a more globally recognized term used by listing organizations compared to the term "listed."

Proposals

Item #: 021

UPC 2024 Section: 218.0

SUBMITTER: Bruce A Pfeiffer
Retired - City of Topeka

RECOMMENDATION:
Add new text

218.0 – P –

Public Use Occupancy. Commercial buildings that include, but are not limited to office buildings, retail stores, restaurants, industrial, multi-family housing, hotels, motels, arenas, stadiums, and other structures not used for one and two family dwellings.

SUBSTANTIATION:
There is no definition for the term "public use occupancy" in the Code. That term is used in Section 710.9 and Section 1101.14 of the 2021 UPC to require multiple pumps for sanitary and storm water wastes. Defining the term "public use occupancy" gives the user a clearer understanding of when two pumps would be needed.

Proposals

Item #: 026

UPC 2024 Section: 224.0

SUBMITTER: Chris Sweeny
Specification Sales

RECOMMENDATION:
Add new text

224.0 – V –

Valve, Balancing. A valve that regulates and controls the return of hot water to the water heater in a recirculating potable or nonpotable hot water piping system to ensure that specified hot water temperatures are delivered to all point-of-use fixtures within specified time frames or volumes. These include the following:
(1) Flow Balancing Valve with Memory Stop. Includes globe valve, needle valve, or venturi valve design with ports for reading temperature and pressure, knob adjustment with graduated set-point markings, and lockable memory setting.
(2) Preset Automatic Flow Control Valve. A fixed orifice valve regulates flow by using a spring mechanism to maintain a specified flow over a variety of pressures. These function with replaceable flow cartridges, each having a different flow rate orifice assembly and with different pressure differentials.
(3) Thermostatic Flow Regulating Valve. Mechanical thermostatically controlled valves that automatically self-adjust return water flow to maintain specified temperatures in the hot water circuits.

SUBSTANTIATION:
What exactly is a domestic hot water (DHW) balancing valve? Despite code enhancements and increased emphasis around domestic hot water design, a critical component of any DHW recirculation system has gone largely unaddressed. Due to the lack of a definition of a balancing valve, any valve that regulates flow can theoretically be used in a DHW recirculation system, including a ball valve. The addition of a clear definition of what a balancing valve is will allow plumbing designers to require a balancing valve designed and intended for use in DHW recirculation systems.

Proposals

Item #: 028

UPC 2024 Section: 225.0

SUBMITTER: Bob Adler
Self

RECOMMENDATION:
Add new text

225.0 – W –

Water Station. A designated location intended to provide access to drinking water through a device or appliance.

SUBSTANTIATION:
The term “water station” is used in the code and not currently defined. This definition will assist the end user to the intent of the term and how it will apply to the section and note of the UPC.

Proposals

Item #: 030

UPC 2024 Section: 301.3

SUBMITTER: Phillip H Ribbs
PHR Consultants

RECOMMENDATION:
Revise text

301.0 General.

301.3 Alternate Materials and Methods of Construction Equivalency. Unless specifically prohibited, ~~N~~nothing in this code is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this code. Technical documentation shall be submitted to the Authority Having Jurisdiction to demonstrate equivalency prior to installation. The Authority Having Jurisdiction shall have the authority to approve or disapprove the system, method, or device for the intended purpose.

However, the exercise of this discretionary approval by the Authority Having Jurisdiction shall have no effect beyond the jurisdictional boundaries of said Authority Having Jurisdiction. An alternate material or method of construction so approved shall not be considered as in accordance with the requirements, intent, or both of this code for a purpose other than that granted by the Authority Having Jurisdiction where the submitted data does not prove equivalency.

SUBSTANTIATION:
Section 301.3 grants authority to AHJ's to approve materials or products at their discretion. However, Section 301.3 places an obligation on the AHJ to approve only those alternate materials or products which comply "with the intent of this code," which are "at least the equivalent of that prescribed in this code," and are not specifically prohibited elsewhere in the code.

Proposals

Item #: 034

UPC 2024 Section: 309.6

SUBMITTER: Bruce A Pfeiffer
Retired - City of Topeka

RECOMMENDATION:
Revise text

309.0 Workmanship.

309.6 Dead Legs. Dead legs shall have a method of flushing. The maximum length of a dead leg shall be not more than 1.5 times the diameter of the branch pipe.

(below is shown for reference only)

209.0 – G –

Dead Leg. A section of potable water pipe which contains water that has no flow or does not circulate.

SUBSTANTIATION:
These new guidelines are recommended by industry experts for Legionella and bacteria control in potable water systems. Currently there are no restrictions in the Code on the length of pipe for a dead leg.

Proposals

Item #: 035

UPC 2024 Section: 310.1

SUBMITTER: Bruce A Pfeiffer
Retired - City of Topeka

RECOMMENDATION:
Revise text

310.0 Prohibited Fittings and Practices.

310.1 Fittings. No double hub fitting, single or double tee branch, single or double tapped tee branch, side inlet quarter bend, running thread, band, or saddle shall be used as a drainage fitting~~., except that a double hub sanitary tapped tee shall be permitted to be used on a vertical line as a fixture connection.~~

SUBSTANTIATION:
According to representatives of the Cast Iron Soil Pipe Institute (CISPI), the double hub sanitary tapped tee has not been made for 75 years. The reference to this fitting needs to be removed from the Code.

Proposals

Item #: 046

UPC 2024 Section: 402.6

SUBMITTER: Bob Adler
Self

RECOMMENDATION:
Revise text

402.0 Installation.

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

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

SUBSTANTIATION:
It might go without saying but the carrier needs to be secured to the structure. The added text will ensure that the flange is secured to the structure as directed by the manufacturer.

Proposals

Item #: 047

UPC 2024 Section: 402.6, Table 1701.1, Table 1701.2

SUBMITTER: Karan Kapila
Self

RECOMMENDATION:
Revise text

402.0 Installation.

402.6 Flanged Fixture Connections. Fixture connections between drainage pipes and water closets, floor outlet service sinks and urinals shall be made using an approved copper alloy, hard lead, ABS, PVC, or iron flanges caulked, soldered, solvent cemented; rubber compression gaskets; or screwed to the drainage pipe. ~~The connection shall be bolted with an approved gasket, washer, or setting compound between the fixture and the connection.~~ The waste connection shall be joined with an approved elastomeric gasket, flange to fixture connector complying with ASME A112.4.3 or an approved setting compound. The bottom of the flange shall be set on an approved firm base.

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

TABLE 1701.1
REFERENCED STANDARDS

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTION
ASME A112.4.3-1999(R2019)	Plastic Fittings for Connecting Water Closets to the Sanitary Drainage System	Fittings	402.6

(portions of table not shown remain unchanged)

Note: ASME A112.4.3 meets the requirements for a mandatory referenced standard in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

TABLE 1701.2
STANDARDS, PUBLICATIONS, PRACTICES, AND GUIDES

DOCUMENT NUMBER	DOCUMENT TITLE	APPLICATION
~~ASME A112.4.3-1999(R2015)~~	~~Plastic Fittings for Connecting Water Closets to the Sanitary Drainage System~~	~~Fittings~~

(portions of table not shown remain unchanged)

SUBSTANTIATION:
This change will add the appropriate standard for plastic water closet fittings for connecting a water closet to the sanitary drainage system. These connections are a safety issue, and the addition of this standard will add clarity and direction for the end user.

Proposals

Item #: 048

UPC 2024 Section: 402.6

SUBMITTER: Bruce A Pfeiffer
Retired - City of Topeka

RECOMMENDATION:
Revise text

402.0 Installation.

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

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

SUBSTANTIATION:
This Code section allows a water closet flange to be set on the subfloor (approved firm base) which would require the use of multiple closet wax rings to create a water tight seal between the fixture and flange. The installation instructions by manufacturers is to install the flange so the bottom of the flange rests on the finished floor. This installation requires only a single bowl wax to create a water tight seal.

Proposals

Item #: 049

UPC 2024 Section: 402.6.1, 402.6.3

SUBMITTER: Bob Adler
Self

RECOMMENDATION:
Revise text

402.0 Installation.

402.6.1 Closet Rings (Closet Flanges). Closet rings (closet flanges) for water closets or similar fixtures shall be of an approved type and shall be copper alloy, copper, hard lead, cast-iron, galvanized malleable iron, ABS, PVC, or other approved materials. ~~Each such~~ The closet ring (closet flange) shall be approximately 7 inches (178 mm) in diameter and, where installed, shall, together with the soil pipe, present a 1 1/2 inch (38 mm) wide flange or face to receive the fixture gasket or closet seal.

Caulked-on closet rings (closet flanges) shall be not less than 1/4 of an inch (6.4 mm) thick and not less than 2 inches (51 mm) in overall depth.

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

~~Closet bends or stubs shall be cut-off to present a smooth surface even with the top of the closet ring before the rough inspection is called.~~ Where the closet ring is installed on the closet bend or riser, the finished joint shall be present a smooth surface flush with the top of the closet ring.

Closet rings (closet flanges) shall be adequately designed with the bottom of the ring or flange positioned on the finished floor and secured to support fixtures connected thereto.

Offset closet rings (closet flanges) shall be free of ledges and corners that would obstruct flow shall be permitted for floor discharge water closets.

402.6.3 Securing Floor-Mounted, Back-Outlet Water Closet Bowls. Floor-mounted, back-outlet water closet bowls shall be set level with an angle of 90 degrees (1.57 rad) between the floor and wall at the centerline of the fixture outlet. The floor and wall shall have a flat mounting surface not less than 5 inches (127 mm) to the right and left of the fixture outlet centerline. The fixture shall be secured to the wall outlet flange or drainage connection and the floor by corrosion resistant screws or bolts. The closet flange shall be firmly secured ~~to a firm base~~. ~~Where floor-mounted, back-outlet water closets are used, the soil pipe shall be not less than 3 inches (80 mm) in diameter.~~ Offset, eccentric, or reducing closet flanges shall not be ~~used~~ permitted with these fixtures.

SUBSTANTIATION:
For Section 402.6.1:
(Paragraph 4) Since closet flanges (closet flange) are unlikely to be installed, for dozens of reasons, before the rough inspection is called, that language should be eliminated. It is likely unenforceable because rarely has a finished floor level been established.
(Paragraph 5) The question has been asked thousands of time as to where the closet flange sets in relation to the floor. Here it is answered… it is designed to sit on and be securely attached to the “finished floor.” One of the reasons for the problem in paragraph 2.
(Last paragraph) This is an often asked question which needs a direct answer in the text of the code. The last paragraph of Section 402.6.3 is sometimes mistakenly used to prevent ANY offset closet ring.

For Section 402.6.3, the proposed language will make the language concise and clarify the intent of the section. Pipe size is not needed, it is clearly addressed in Tables 702.1 and 703.2.

Proposals

Item #: 050

UPC 2024 Section: 402.6.1

SUBMITTER: Shane Peters
City of Santa Monica

RECOMMENDATION:
Revise text

402.0 Installation.

402.6 Flanged Fixture Connections. (portions of text not shown remains unchanged)

402.6.1 Closet Rings (Closet Flanges). Closet rings (closet flanges) for water closets or similar fixtures shall be of an approved type and shall be copper alloy, copper, hard lead, cast-iron, galvanized malleable iron, ABS, PVC, or other approved materials. Each such closet ring (closet flange) shall be approximately 7 inches (178 mm) in diameter and, where installed, shall, together with the soil pipe, present a 1 1/2 inch (38 mm) wide flange or face to receive the fixture gasket or closet seal.

Caulked-on closet rings (closet flanges) shall be not less than 1/4 of an inch (6.4 mm) thick and not less than 2 inches (51 mm) in overall depth.

Closet rings (closet flanges) shall be joined as approved for the specific material in accordance with Section 705.0 ~~burned or soldered to lead bends or stubs, shall be caulked to cast-iron soil pipe, shall be solvent cemented to ABS and PVC, and shall be screwed or fastened in an approved manner to other materials~~.

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

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

(below shown for reference only)
705.0 Joints and Connections.

SUBSTANTIATION:
Cleans up the language by eliminating all the ways the closet ring or flange shall be joined to the riser and just references Section 705.0 (Joints and Connections).

Proposals

Item #: 051

UPC 2024 Section: 402.6.1

SUBMITTER: Bruce A Pfeiffer
Retired - City of Topeka

RECOMMENDATION:
Revise text

402.0 Installation.

402.6 Flanged Fixture Connections. (remaining text unchanged)
402.6.1 Closet Rings (Closet Flanges). Closet rings (closet flanges) for water closets or similar fixtures shall be of an approved type and shall be copper alloy, copper, hard lead, cast-iron, galvanized malleable iron, ABS, PVC, or other approved materials. Each such closet ring (closet flange) shall be approximately 7 inches (178 mm) in diameter and, where installed, shall, together with the soil pipe, present a 11/2 inch (38 mm) wide flange or face to receive the fixture gasket or closet seal.

Caulked-on closet rings (closet flanges) shall be not less than 1/4 of an inch (6.4 mm) thick and not less than 2 inches (51 mm) in overall depth.

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

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

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

Offset, eccentric, or reducing floor mounted closet flanges that create a ledge or otherwise constrict the full opening of the water closet shall not be used.

SUBSTANTIATION:
Currently the Code only addresses the use of offset, eccentric or reducing closet flanges for floor-mounted back-outlet water closets (see Section 402.6.3). Flanges for all water closets that constrict the full opening of a water closet into the sanitary waste piping create an obstruction in flow and are not compliant with the Code per Section 310.5. The proposed language reinforces the requirement that closet flanges that causes a restriction in flow, regardless of if they are floor or wall mounted, are not Code compliant.

Proposals

Item #: 052

UPC 2024 Section: 402.6.3

SUBMITTER: Shane Peters
City of Santa Monica

RECOMMENDATION:
Revise text

402.0 Installation.

402.6 Flanged Fixture Connections. (remaining text unchanged)

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

~~Where floor-mounted, back-outlet water closets are used, the soil pipe shall be not less than 3 inches (80 mm) in diameter. Offset, eccentric, or reducing closet flanges shall not be used.~~

SUBSTANTIATION:
This change is an attempt to be clear and direct. Pipe size is not needed, as it is clearly stated in Table 702.1 and Table 703.2. The last sentence is moved up and modified to clarify that such offset, eccentric, or reducing closet flanges should not be permitted with the fixtures mentioned in Section 402.6.3.

Proposals

Item #: 053

UPC 2024 Section: 403.4

SUBMITTER: Ronald L George
Plumb-Tech Design & Consulting Services LLC

RECOMMENDATION:
Add new text

403.0 Accessible Plumbing Facilities.

403.4 Temperature Limits at Accessible Plumbing Fixtures. The maximum water temperature discharging from any accessible plumbing fixture shall be limited to a maximum of 110°F (43°C) by one of the methods prescribed in Section 408.3.2.

(below shown for reference only)

408.3 Individual Shower and Tub-Shower Combination Control Valves. (remaining text unchanged)

408.3.2 Temperature Limiting. The maximum water temperature discharging from an individual showerhead shall be limited to 120°F (49°C) by one of the following methods:
(1) A shower or tub/shower combination valve conforming to ASSE 1016/ASME A112.1016/CSA B125.16 where either:
(a) The valve is field-adjusted to the required maximum temperature, or
(b) The handle position, stop, or temperature limiting control is set in accordance with the manufacturer's instructions to the required maximum temperature.
(2) For gang showers supplied by a single water supply pipe, a mixing valve that conforms to ASSE 1069 that is field-adjusted to the required maximum temperature.
(3) A limiting device conforming to either ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3.
(4) A water heater conforming to ASSE 1084.
(5) A temperature actuated flow reduction device conforming to ASSE 1062.

SUBSTANTIATION:
Persons using accessible fixtures do not always have feeling or sensation in their body and may be scalded inadvertently because many disabled people using accessible fixtures cannot feel temperature in their extremities. Burn Studies by Dr. Moritz & Dr. Henriques at Harvard medical college showed that, at a temperature of 110°F, it took hours to develop a serious scald burn.

Proposals

Item #: 054

UPC 2024 Section: 404.2 – 404.2.2

SUBMITTER: David Mann
CA State Pipe Trades Council

RECOMMENDATION:
Revise text

404.0 Waste Fittings and Overflows.

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

404.2.1 Sinks and Bathtubs. ~~t~~The waste shall be so arranged that the standing water in the fixture shall not rise in the overflow where the stopper is closed or remain in the overflow where the fixture is empty. The overflow pipe from a fixture shall be connected to the house or inlet side of the fixture trap., ~~except that overflow on flush tanks shall be permitted to discharge into the water closets or urinals served by them, but i~~It shall be unlawful to connect such overflows with any other part of the drainage system.

404.2.2 Water Closets and Urinals. Overflows on flush tanks shall be permitted to discharge into the water closets or urinals served by them.

SUBSTANTIATION:
This section is mixing overflows between sinks, water closets, urinals, and bathtubs all within the same section. However, there are different types of overflows for these sets of fixtures. The language separates the types of overflows and relocates the appropriate provision for each. This will clean up the language and add clarity to the intent.

Proposals

Item #: 055

UPC 2024 Section: 407.1, Table 1701.1

SUBMITTER: Bruce A Pfeiffer
Retired - City of Topeka

RECOMMENDATION:
Revise text

407.0 Lavatories.
407.1 Application. Lavatories shall comply with ASME A112.19.1/CSA B45.2, ASME A112.19.2/CSA B45.1, ASME A112.19.3/CSA B45.4, ASME A112.19.12, CSA B45.5/IAPMO Z124, CSA B45.8/IAPMO Z403, CSA B45.11/IAPMO Z401 or CSA B45.12/IAPMO Z402. Group wash fixtures shall comply with the requirements of Section 401.2 and IAPMO IGC 156. Every 20 inches (508 mm) of rim space of a group wash fixture shall be considered as one lavatory for determining the number of lavatories required in accordance with Table 422.1. Lavatory assemblies with automatic soap dispensers, faucets, or hand dryers shall comply with IAPMO IGC 127.

TABLE 1701.1
REFERENCED STANDARDS

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTION
IAPMO IGC 156-2021	Wash Fountains and Lavatory Systems with or without Water Closets	Miscellaneous	407.1

(portions of table not shown remain unchanged)

Note: IAPMO IGC 156 meets the requirements for a mandatory referenced standard in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

SUBSTANTIATION:
The IAPMO IGC 156 standard covers multi faucet assemblies which are a multi-user hand washing plumbing fixture with a single water supply or single drain. This type of technology is commonly installed in public buildings such as hospitals, penal facilities, schools, factories, or places of assembly. This standard will assist the consumer and end user in verifying that such fixture assemblies are compliant with an industry standard.

Proposals

Item #: 056

UPC 2024 Section: 407.7

SUBMITTER: Julius Ballanco, P.E. (JB Engineering and Code Consulting, P.C.; Bradley Corp); Jim Kendzel (ASA)

RECOMMENDATION:
Add new text

407.0 Lavatories.

407.7 Soap Dispenser. Each public lavatory shall have an accompanying soap dispenser.

SUBSTANTIATION:
The COVID-19 pandemic has identified the importance of washing one's hand with soap. It is interesting that the code does not require soap dispensers for public lavatories. However, most engineers and architects specify soap dispensers. Plumbing contractors install soap dispensers when located in a countertop lavatory. This is an important health issue that the Plumbing Code must address.

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Proposals

Item #: 057

UPC 2024 Section: 204.0, 408.2

SUBMITTER: Julius Ballanco, P.E.
JB Engineering and Code Consulting, P.C.
Rep. Self

RECOMMENDATION:
Revise text

408.0 Showers.

408.2 Water Consumption. Showerheads shall have a maximum flow rate of not more than 2.5 gpm at 80 psi (9.5 L/m at 552 kPa). Body sprays shall have a flow rate for the shower enclosure of not more than 2.5 gpm at 80 psi (9.5 L/m at 552 kPa).

204.0 - B -

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

SUBSTANTIATION:
The U.S. Department of Energy added a definition of body spray to Federal Law regarding water conservation. The new definition excludes body sprays from the water conservation requirements for showerheads. This change will add the definition of body spray to Chapter 2. The definition is consistent with the DOE definition. The second part of the change is to add water conservation requirements for body sprays to the shower section. The water conservation requirements are the same as the water conservation requirements for showerheads. Body sprays discharging 2.5 gpm of water provide an adequate amount of water for cleansing while showering. This has been proven with the years of experience taking showers with showerheads discharging 2.5 gpm.

Proposals

Item #: 058

UPC 2024 Section: 408.2, Table 1701.1, Table 1701.2

SUBMITTER: Bruce A Pfeiffer
Retired - City of Topeka

RECOMMENDATION:
Add new text

408.0 Showers.

408.1 Application. Manufactured shower receptors and shower bases shall comply with ASME A112.19.1/CSA B45.2, ASME A112.19.2/CSA B45.1, ASME A112.19.3/CSAB45.4, CSA B45.12/IAPMO Z402, or CSA B45.5/IAPMO Z124. Prefabricated shower enclosures shall comply with IAPMO IGC 154.
408.2 Tileable Shower Receptors. Tileable shower receptors shall comply with CSA B45.5/IAPMO Z124. Field installed tileable and pre-tiled shower kits shall comply with IAPMO PS 106.

(renumber remaining sections)

TABLE 1701.1
REFERENCED STANDARDS

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTION
IAPMO PS 106-2015e[1]	Tileable Shower Receptors and Shower Kits	Fixtures	408.2

(portions of table not shown remain unchanged)

Note: CSA B45.5/IAPMO Z124 and IAPMO PS 106 meet the requirements for mandatory referenced standards in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

TABLE 1701.2
STANDARDS, PUBLICATIONS, PRACTICES, AND GUIDES

DOCUMENT NUMBER	DOCUMENT TITLE	APPLICATION
~~IAPMO PS 106-2015e[1]~~	~~Tileable Shower Receptors and Shower Kits~~	~~Fixtures~~

(portions of table not shown remain unchanged)

SUBSTANTIATION:
This standard specifies requirements for materials, manufacture, physical characteristics, performance testing, and markings for prefabricated, tileable shower receptors; and tileable and pre-tiled shower kits that are field installed, which are not currently covered in the UPC.

Proposals

Item #: 059

UPC 2024 Section: 408.3.2

SUBMITTER: Jason M Shank
ASSE International

RECOMMENDATION:
Revise text

408.0 Showers.

408.3 Individual Shower and Tub-Shower Combination Control Valves. (remaining text unchanged)

408.3.2 Temperature Limiting. The maximum water temperature discharging from an individual showerhead shall be limited to 120°F (49°C) by one of the following methods:
(1) A shower or tub/shower combination valve conforming to ASSE 1016/ASME A112.1016/CSA B125.16 where either:
(a) The valve is field-adjusted to the required maximum temperature, or
(b) The handle position, stop, or temperature limiting control is set in accordance with the manufacturer's instructions to the required maximum temperature.
(2) For gang showers supplied by a single water supply pipe, a mixing valve that conforms to ASSE 1069 that is field-adjusted to the required maximum temperature.
~~(3) A limiting device conforming to either ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3.~~
~~(4) A water heater conforming to ASSE 1084.~~
~~(5) A temperature actuated flow reduction device conforming to ASSE 1062~~

SUBSTANTIATION:
ASSE 1070, ASSE 1084 and ASSE 1062 are not designed for this application of individual showers.

Proposals

Item #: 060

UPC 2024 Section: 408.3.2

SUBMITTER: Bruce Fathers
Watts Water Technologies

RECOMMENDATION:
Revise text

408.0 Showers.

408.3 Individual Shower and Tub-Shower Combination Control Valves. Showers and tub-shower combinations shall be provided with individual control valves of the pressure balance, thermostatic, or combination pressure balance/thermostatic mixing valve type that provide scald and thermal shock protection for the rated flow rate of the installed showerhead. These valves shall be installed at the point of use and comply with ASSE 1016/ASME A112.1016/CSA B125.16 or ASME A112.18.1/CSA B125.1.
408.3.1 Gang Showers. Where gang showers are supplied with a single temperature-controlled water supply pipe, it shall be controlled by a mixing valve that complies with ASSE 1069.
408.3.2 Temperature Limiting. The maximum water temperature discharging from an individual showerhead shall be limited to 120°F (49°C) by one of the following methods:
(1) A shower or tub/shower combination valve conforming to ASSE 1016/ASME A112.1016/CSA B125.16 where either:
(a) The valve is field-adjusted to the required maximum temperature, or
(b) The handle position, stop, or temperature limiting control is set in accordance with the manufacturer's instructions to the required maximum temperature.
(2) For gang showers supplied by a single water supply pipe, a mixing valve that conforms to ASSE 1069 that is field-adjusted to the required maximum temperature.
(3) A limiting device conforming to either ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3.
(4) A water heater conforming to ASSE 1084.
(5) A temperature actuated flow reduction device conforming to ASSE 1062.
(6) Remote temperature monitoring, control and alert when lack line of sight. Temperature shall be permitted to be monitored remotely via a sensor and App to alert if mixed water exceeds 120°F (49°C) at the outlet. Temperature can also be adjusted via remote means.

SUBSTANTIATION:
The addition of this language adds public safety. The provision provides visibility to shower temperatures in a commercial facility mitigating scalding and Legionella risk, and allowing facility staff to respond quickly to over- and under-temperature performance.

Proposals

Item #: 061

UPC 2024 Section: 408.3.3, Table 1701.1, Table 1701.2

SUBMITTER: Jason M Shank
ASSE International

RECOMMENDATION:
Add new text

408.0 Showers.

408.3 Individual Shower and Tub-Shower Combination Control Valves. (remaining text unchanged)

408.3.3 Individual Pressure Balancing In-Line Valves for Individual Fixture Fittings. Where individual pressure balancing in-line valves for individual fixture fittings are installed, such valves shall comply with ASSE 1066. Such valves shall be installed in an accessible location. The valves shall not be utilized alone as a substitute for the balanced pressure, thermostatic or combination shower valves requirements.

TABLE 1701.1
REFERENCED STANDARDS

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTION
ASSE 1066-1997	Individual Pressure Balancing In-Line Valves for Individual Fixture Fittings	Valves	408.3.3

Note: ASSE 1066 meets the requirements for a mandatory referenced standard in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

(portions of table not shown remains unchanged)

TABLE 1701.2
STANDARDS, PUBLICATIONS, PRACTICES, AND GUIDES

DOCUMENT NUMBER	DOCUMENT TITLE	APPLICATION
~~ASSE 1066-1997~~	~~Individual Pressure Balancing In-Line Valves for Individual Fixture Fittings~~	~~Valves~~

(portions of table not shown remains unchanged)

SUBSTANTIATION:
This standard applies to automatic pressure balancing in-line valves which are used to equalize incoming hot and cold water line pressures for the purpose of minimizing mixed water temperature variations due to pressure fluctuations when used in conjunction with a mixing valve or two handle valve set. They are not designed to limit the maximum outlet temperature at the point-of-use. These devices are intended for use in individual plumbing fixtures fittings such as shower heads, bath utility faucets, and sink and lavatory faucets.

Proposals

Item #: 062

UPC 2024 Section: 408.3.4

SUBMITTER: Jason M Shank
ASSE International

RECOMMENDATION:
Add new text

408.0 Showers.

408.3 Individual Shower and Tub-Shower Combination Control Valves. (remaining text unchanged)

408.3.4 Temperature-Actuated, Flow-Reduction Devices for Individual Fixture Fittings. Temperature-actuated, flow-reduction devices, where installed for individual fixture fittings, shall comply with ASSE 1062. A temperature-actuated, flow-reduction device shall be an approved method for limiting the water temperature to not more than 120°F (49°C) at the outlet of a faucet or fixture fitting. Such devices shall not be used alone as a substitute for the balanced-pressure, thermostatic or combination shower valves requirements or as a substitute for bathtub or whirlpool tub water-temperature-limiting valves requirements.

Note: ASSE 1062 meets the requirements for a mandatory referenced standard in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

SUBSTANTIATION:
This standard applies to temperature actuated, flow reduction (TAFR) valves for individual supply fittings (herein referred to as the “device”) that react to high temperature water. These valves are intended for use in-line with, or integrated into, individual plumbing supply fittings such as shower heads, bath and utility faucets, and sink and lavatory faucets. When intended for use by people with disabilities, TAFR valves covered by this standard shall also comply with ICC Standard A117.1. The use of TAFR valves does not replace the requirements for valves compliant to ASSE 1016 / ASME A112.1016 / CSA B125.16, ASSE 1069, or ASSE 1070 / ASME A112.1070 / CSA B125.70, as outlined in the model codes.

Proposals

Item #: 063

UPC 2024 Section: 408.4

SUBMITTER: Kevin Ernst
OS&B

RECOMMENDATION:
Revise text

408.0 Showers.

408.4 Waste Outlet. Showers shall have a waste outlet and fixture tailpiece not less than 2 inches (50 mm) in diameter. Fixture tailpieces shall be constructed from the materials specified in Section 701.2 for drainage piping. ~~Strainers serving shower drains shall have a waterway at least equivalent to the area of the tailpiece.~~

(below shown for reference only)

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

SUBSTANTIATION:
Current wording is design restrictive. The shower drain must comply to the requirements of ASME A112.18.2/CSA B125.2 - 2020 as per Section 404.1. Within this standard there is a flow performance test in Sections 5.8.1 - 5.8.2. As long as the shower drain is certified to the standard and meets the required flow rate, there isn't a need to be prescriptive with the grate sizing.

Proposals

Item #: 064

UPC 2024 Section: 408.5

SUBMITTER: David Mann
CA State Pipe Trades Council

RECOMMENDATION:
Revise text

408.0 Showers.

408.5 Finished Curb or Threshold. Where a shower receptor has a finished dam, curb, or threshold, it shall be not less than 1 inch (25.4 mm) lower than the sides and back of such receptor. In no case, shall a dam or threshold be less than 2 inches (51 mm) or exceeding 9 inches (229 mm) in depth where measured from the top of the dam or threshold to the top of the drain. Each such receptor shall be provided with an integral nailing flange either integral or field installed in accordance with the manufacturer's installation instructions. ~~to be located where the receptor meets the vertical surface of the finished interior of the shower compartment.~~ The flange shall be watertight and extend vertically not less than 1 inch (25.4 mm) above the top of the sides of the receptor. The finished floor of the receptor shall slope uniformly from the sides towards the drain not less than 1/8 inch per foot (10.4 mm/m), nor more than 1/2 inch per foot (41.6 mm/m). Thresholds shall be of sufficient width to accommodate a minimum 22 inch (559 mm) door. Shower doors shall open so as to maintain not less than a 22 inch (559 mm) unobstructed opening for egress. Where there is a shower without a threshold, the floor space within the same room shall be considered a wet location and shall comply with the requirements of the building, residential, and electrical codes.

Exceptions:
(1) Showers in accordance with Section 403.2.
(2) A cast-iron shower receptor flange shall be not less than 0.3 of an inch (7.62 mm) in height.
(3) For flanges not used as a means of securing, the sealing flange shall be not less than 0.3 of an inch (7.62 mm) in height.

SUBSTANTIATION:
The shower receptor must be installed with the nailing flange at rough wall. If the flange were at the finished interior the receptor would not be watertight. The 2021 UPC Section 408.1 requires manufactured shower receptors and shower bases to comply with ASME A112.19.1/CSA B45.2, ASME A112.19.2/CSA B45.1, ASME A112.19.3/CSAB45.4, CSA B45.12/IAPMO Z402, or CSA B45.5/IAPMO Z124. All these standards give three options for the flanges:
(a) integral with the bathtub or shower base;
(b) added to an island tub or shower base in the factory; or
(c) field installed using a flange kit.

For this reason, Section 408.5 should be updated to allow for integral or field installed nailing flanges.

Proposals

Item #: 065

UPC 2024 Section: 408.6

SUBMITTER: Shane Peters
City of Santa Monica

RECOMMENDATION:
Revise text

408.0 Showers.

408.6 Shower Compartments. Shower compartments~~, regardless of shape,~~ shall have a ~~minimum~~ finished interior ~~of~~ in accordance with the following:

(1) Not less than 1024 square inches (0.6606 m^2)~~. and shall also be capable of encompassing~~
(2) Be of sufficient dimension to accommodate a 30 inch (762 mm) circle.

The minimum required area and dimensions shall be measured at a height equal to the top of the threshold and a point tangent to its centerline. The area and dimensions shall be maintained to a point of not less than 70 inches (1778 mm) above the shower drain outlet with no protrusions other than the fixture valve or valves, showerheads, soap dishes, shelves, and safety grab bars, or rails. Fold-down seats in accessible shower stalls shall be permitted to protrude into the 30 inch (762 mm) circle.

Exceptions:
(1) Showers that are designed to be in accordance with ICC A117.1.
(2) The minimum required area and dimension shall not apply for a shower receptor having overall dimensions of not less than 30 inches (762 mm) in width and 60 inches (1524 mm) in length.

SUBSTANTIATION:
This change is intended to simplify the requirements for the area required for a shower compartment. Putting the requirements into a list format is preferable to the language in a paragraph form and is easier to comprehend. Additionally, an additional metric dimension is being added to simplify the dimension.

Proposals

Item #: 066

UPC 2024 Section: 408.7

SUBMITTER: Cathy Tran
MN DEPT OF LABOR & INDUSTRY

RECOMMENDATION:
Revise text

408.0 Showers.

408.7 Lining for Showers and Receptors. Shower receptors built on-site shall be watertight and shall be constructed from approved-type dense, nonabsorbent, and noncorrosive materials. Each such receptor shall be adequately reinforced, shall be provided with an approved flanged floor drain designed to make a watertight joint on the floor, and shall have smooth, impervious, and durable surfaces. Unless the shower receptor is poured on the ground as part of a slab, an approved shower liner shall be provided in accordance with the requirements of this section.

Shower receptors shall have the subfloor and rough side of walls to a height of not less than 3 inches (76 mm) above the top of the finished dam or threshold shall be first lined with sheet plastic, lead, or copper, or shall be lined with other durable and watertight materials. Showers that are provided with a built in place, permanent seat or seating area that is located within the shower enclosure, shall be first lined with sheet plastic, lead, copper, or shall be lined with other durable and watertight materials that extend not less than 3 inches (76 mm) above horizontal surfaces of the seat or the seating area.

Lining materials shall be pitched 1/4 inch per foot (20.8 mm/m) to weep holes in the subdrain of a smooth and solidly formed subbase. Such lining materials shall extend upward on the rough jambs of the shower opening to a point not less than 3 inches (76 mm) above the horizontal surfaces of the seat or the seating area, the top of the finished dam or threshold and shall extend outward over the top of the permanent seat, permanent seating area, or rough threshold and be turned over and fastened on the outside face of both the permanent seat, permanent seating area, or rough threshold and the jambs.

Nonmetallic shower subpans or linings shall be permitted to be built up on the job site of not less than three layers of standard grade 15 pound (6.8 kg) asphalt impregnated roofing felt. The bottom layer shall be fitted to the formed subbase and each succeeding layer thoroughly hot-mopped to that below. Corners shall be carefully fitted and shall be made strong and watertight by folding or lapping, and each corner shall be reinforced with suitable webbing hot-mopped in place.

Folds, laps, and reinforcing webbing shall extend not less than 4 inches (102 mm) in all directions from the corner, and webbing shall be of approved type and mesh, producing a tensile strength of not less than 50 pounds per square foot (lb/ft^2) (244 kg/m^2) in either direction. Nonmetallic shower subpans or linings shall be permitted to consist of multilayers of other approved equivalent materials suitably reinforced and carefully fitted in place on the job site as elsewhere required in this section.

Linings shall be properly recessed and fastened to the approved backing so as not to occupy the space required for the wall covering, and shall not be nailed or perforated at a point that is less than 1 inch (25.4 mm) above the finished dam or threshold. An approved type subdrain shall be installed with a shower subpan or lining. Each such subdrain shall be of the type that sets flush with the subbase and shall be equipped with a clamping ring or other device to make a tight connection between the lining and the drain. The subdrain shall have weep holes into the waste line. The weep holes located in the subdrain clamping ring shall be protected from clogging.

SUBSTANTIATION:
The proposed added language clarifies that an exception for onsite built shower receptors that are poured and built directly on the ground, adequately reinforced, and watertight do not required shower liners as prescribed in the first two sentences of the paragraph. The proposed change is consistent with the intent of the current language of this section (408.7) but adds clarity to avoid continued confusion, for a more consistent code enforcement of this provision. An acceptable shower receptor that qualifies is one that is poured-in-place receptor construction, complete with integral threshold, sides and back directly supported by the underlying ground, and impervious watertight receptor as prescribed. The existing language of this section requires sides and back of the receptor pour must extend at least three inches above the finished threshold before wall covering.

Proposals

Item #: 067

UPC 2024 Section: 408.7.5

SUBMITTER: David Mann
CA State Pipe Trades Council

RECOMMENDATION:
Revise text

408.0 Showers.

408.7.5 Tests for Shower Receptors. Shower receptors shall be tested for watertightness by filling with water to the ~~level of the rough threshold~~ a depth of not less than 2 inches (51 mm) for not less than 15 minutes. Where no threshold is present, a 2 inch (51 mm) barrier shall be temporarily constructed for testing. The test plug shall be so placed that both upper and under sides of the subpan shall be subjected to the test at the point where it is clamped to the drain.

SUBSTANTIATION:
The existing language does not have guidance for water depth or time requirement for testing the shower beds. The proposed depths are standard in the industry and will assist the end user install a watertight shower receptor.

Proposals

Item #: 068

UPC 2024 Section: 408.9

SUBMITTER: Steven Hart
Public Health-Seattle & King County

RECOMMENDATION:
Revise text

408.9 Location of Valves and Heads. Control valves and showerheads shall be located on ~~the~~ a sidewall of the shower compartment~~s or otherwise~~ and arranged so that the showerhead does not discharge directly at the entrance ~~to~~ into the shower compartment ~~so that~~ and the bather can adjust the valve(s) before stepping into the shower spray.
Exception: Shower valve(s) or shower head(s) can be placed in an alternate location when approved by the Authority Having Jurisdiction.

SUBSTANTIATION:
There may be occasions when the shower valve may need to be installed opposite of the shower door entrance (rear wall) due to no access at side walls. There may be instances where the valves may need to be outside of the shower compartment for safety reasons to prevent thermal shock rather than arranged at the rear wall of the shower compartment. This is a concern for elderly, children, or persons with disabilities who would not expect thermal shock.

Proposals

Item #: 069

UPC 2024 Section: 409.4

SUBMITTER: Bruce Fathers
Watts Water Technologies

RECOMMENDATION:
Revise text

409.0 Bathtubs and Whirlpool Bathtubs.

409.4 Limitation of Hot Water Temperature in Bathtubs and Whirlpool Bathtubs. The maximum hot water temperature discharging from the bathtub and whirlpool bathtub filler shall be limited to 120°F (49°C). The maximum temperature shall be regulated by one of the following means:
(1) A limiting device conforming to either ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3.
(2) A water heater conforming to ASSE 1084.
(3) Remote temperature monitoring, control and alert when lack line of sight. Temperature shall be permitted to be monitored remotely via a sensor and App to alert if mixed water exceeds 120°F (49°C) at the outlet. Temperature can also be adjusted via remote means.

SUBSTANTIATION:
The addition of this language adds public safety. The provision provides visibility to whirlpool temperatures in a commercial/institutional facility mitigating scalding and Legionella risk and allowing facility staff to respond quickly to over- and under-temperature performance via App alerts.

Proposals

Item #: 070

UPC 2024 Section: 409.6.1

SUBMITTER: Karan Kapila
Self

RECOMMENDATION:
Revise text

409.0 Bathtubs and Whirlpool Bathtubs.

409.6 Installation and Access. Bathtubs and whirlpool bathtubs shall be installed in accordance with the manufacturer's installation instructions. Access openings shall be of a size and opening to permit the removal and replacement of the circulation pump.

Whirlpool pump access located in the crawl space shall be located not more than 20 feet (6096 mm) from an access door, trap door, or crawl hole.

The circulation pump shall be located above the crown weir of the trap. The pump and the circulation piping shall be self-draining to minimize water retention.

409.6.1 Suction Fittings. Suction fittings on whirlpool bathtubs shall comply with ASME A112.19.7/CSA B45.10.
(renumber remaining sections)

SUBSTANTIATION:
Whirlpool suction fitting are too important to be lost in a paragraph. This change relocates the suction fitting into it's own section as it has nothing to do with access or installation.

Proposals

Item #: 071

UPC 2024 Section: 411.2

SUBMITTER: Karan Kapila
Self

RECOMMENDATION:
Revise text

411.0 Water Closets.

411.1 Application. Water closets shall comply with ASME A112.19.2/CSA B45.1, ASME A112.19.3/CSA B45.4, or CSA B45.5/IAPMO Z124. Water closet bowls for public use shall be of the elongated type. In nurseries, schools, and other similar places where plumbing fixtures are provided for the use of children less than 6 years of age, water closets shall be of a size and height suitable for children's use.

411.2 Hydraulic Performance. Water closet hydraulic performance shall be in accordance with ASME A112.19.2/CSA B45.1.

(renumber remaining sections)

Note: ASME A112.19.2/CSA B45.1 meets the requirements for a mandatory reference standards in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

SUBSTANTIATION:
The maximum water closet flushing volume requirements and acceptable testing variations are specified in ASME/ANSI A112.19.6 for hydraulic performance.

Proposals

Item #: 072

UPC 2024 Section: 411.2.1, 411.2.2. Table 1701.1, Table 1701.2

SUBMITTER: Bruce A Pfeiffer
Retired - City of Topeka

RECOMMENDATION:
Revise text

411.0 Water Closets.

411.2 Water Consumption. (remaining text unchanged)
411.2.1 Dual Flush Water Closets. Dual flush water closets shall comply with ASME A112.19.14 or IAPMO PS 50. The effective flush volume for dual flush water closets shall be defined as the composite, average flush volume of two reduced flushes and one full flush.
411.2.2 Dual Flush Valves. Dual flush water closet valves shall comply with IAPMO PS 50 or ASME A112.19.10.

(renumber remaining sections)

TABLE 1701.1
REFERENCED STANDARDS

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTION
ASME A112.19.10-2017	Retrofit Dual Flush Devices for Water Closets	Fixtures	411.2.2
IAPMO PS 50-2019	Flush Valves with Dual Flush Device for Water Closets or Water Closet Tanks with Integral Flush Valves with a Dual Flush Device	Fixtures	411.2.1, 411.2.2

(portions of table not shown remains unchanged)

Note: ASME A112.19.10 and IAPMO PS 50 meet the requirements for mandatory referenced standards in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

TABLE 1701.2
STANDARDS, PUBLICATIONS, PRACTICES, AND GUIDES

DOCUMENT NUMBER	DOCUMENT TITLE	APPLICATION
~~ASME A112.19.10-2017~~	~~Retrofit Dual Flush Devices for Water Closets~~	~~Fixtures~~
~~IAPMO PS 50-2010~~	~~Flush Valves with Dual Flush Device for Water Closets or Water Closet Tank with an Integral Flush Valves with a Dual Flush Device~~	~~Fixtures~~

(portions of table not shown remains unchanged)

SUBSTANTIATION:
The current language is only covering water closets with integrated dual flush valves. However, there are dual flush valves that are either separate flush valves or as part of a complete water closet assembly. The proposed change will clarify the appropriate standard required for either.

Proposals

Item #: 073

UPC 2024 Section: 411.3

SUBMITTER: Karan Kapila
Self

RECOMMENDATION:
Revise text

411.0 Water Closets.

411.3 Water Closet Seats. Water closet seats shall be properly sized for the water closet bowl type, and shall be of smooth, non-absorbent material. Seats, for public or employee use, shall be of the elongated type and either of the open front type or have an automatic seat cover dispenser. Plastic seats shall comply with IAPMO Z124.5. Seats that are integral to the water closet shall be of the same material as the fixture.

SUBSTANTIATION:
The proposed language will prevent different materials to be utilized as water closet seats. This will prevent unsanitary conditions where bacteria can grow and collect in seams and glue if two or more materials are used. Furthermore, the addition of employees clarifies the intent of place of work or public workspace as meeting the same intent as the public.

Proposals

Item #: 074

UPC 2024 Section: 411.3

SUBMITTER: Bruce A Pfeiffer
Retired - City of Topeka

RECOMMENDATION:
Revise text

411.0 Water Closets.

411.3 Water Closet Seats. Water closet seats shall be properly sized for the water closet bowl type, and shall be of smooth, non-absorbent material. Seats, for public use, shall be of the elongated type and either of the open front type or have an automatic seat cover dispenser. Plastic seats with or without covers shall comply with IAPMO Z124.5.

SUBSTANTIATION:
The proposed change is to concede with the reference standard as it addresses toilet seat covers as part of the standard and therefore, it is needed for clarity.

Proposals

Item #: 075

UPC 2024 Section: 412.1

SUBMITTER: Karan Kapila
Self

RECOMMENDATION:
Revise text

412.0 Urinals.

412.1 Application. Urinals shall comply with ASME A112.19.2/CSA B45.1, ASME A112.19.19, or CSA B45.5/IAPMO Z124. Urinals shall have an average water consumption not to exceed 1 gallon (3.8 Lpf) of water per flush. The hydraulic performance for urinals using water for flushing shall be in accordance with ASME A112.19.2/CSA B45.1 or CSA B45.5/IAPMO Z124.

Note: ASME A112.19.2/CSA B45.1 and CSA B45.5/IAPMO Z124 meet the requirements for mandatory referenced standards in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

SUBSTANTIATION:
The maximum water volume supplied water-urinal should meet the requirements and acceptable testing variations that are specified in ASME/ANSI A112.19.2/CSA B45.1 and CSA B45.5/IAPMO Z124 for hydraulic performance.

Proposals

Item #: 076

UPC 2024 Section: 412.1.1

SUBMITTER: Bruce A Pfeiffer
Retired - City of Topeka

RECOMMENDATION:
Revise text

412.0 Urinals.

412.1 Application. (remaining text unchanged)

412.1.1 Nonwater Urinals. Nonwater urinals shall have a liquid barrier sealant to maintain a trap seal. ~~Nonwater urinals shall permit the uninhibited flow of waste through the urinal to the sanitary drainage system.~~ Nonwater urinals shall be cleaned and maintained in accordance with the manufacturer's instructions after installation. Where nonwater urinals are installed, not less than one water supplied fixture rated at not less than 1 water supply fixture unit (WSFU) shall be installed upstream on the same drain line to facilitate drain line flow and rinsing. Where nonwater urinals are installed, they shall have a water distribution line rough-in to each individual urinal location to allow for the installation of an approved backflow prevention device in the event of a retrofit.

SUBSTANTIATION:
Many of the new non-water type urinals include integral mechanical devices in their cartridges for the purpose of odor control. The urinals and cartridges must be tested and must meet applicable standards, including tests for adequate flow through the devices. They do not however meet the requirements of the Code because they may cause a small reduction in flow. Removing this sentence would allow manufacturers the ability to explore the use of designs that could possibly reduce or eliminate the odors associated with these products. These odor control devices are not intended to take the place of the required liquid barrier seal and one is still required on all non-water urinals as prescribed by Code.

Proposals

Item #: 077

UPC 2024 Section: 222.0, 412.1.1

SUBMITTER: Fredi Heimberg
STEADYFREDY LLC
Rep. URIMAT Schweiz AG

RECOMMENDATION:
Revise text

412.0 Urinals.

412.1.1 Nonwater Urinals. Nonwater urinals shall have a liquid barrier sealant or a membrane valve to maintain a trap seal. Nonwater urinals shall permit the uninhibited flow of waste through the urinal to the sanitary drainage system. Nonwater urinals shall be cleaned and maintained in accordance with the manufacturer's instructions after installation. Where nonwater urinals are installed, not less than one water supplied fixture rated at not less than 1 water supply fixture unit (WSFU) shall be installed upstream on the same drain line to facilitate drain line flow and rinsing. Where nonwater urinals are installed, they shall have a water distribution line rough-in to each individual urinal location to allow for the installation of an approved backflow prevention device in the event of a retrofit.

222.0 – T –
Trap. A fitting or device so designed and constructed as to provide, where properly vented, a liquid seal or a membrane valve that will prevent the back passage of air without materially affecting the flow of sewage or wastewater through it.

SUBSTANTIATION:
Technical substantiation / reason statement for including membrane valves/traps for waterless urinals in the new standard:

Membrane valves (traps) in waterless urinal applications were introduced more than 15 years ago and they have proven their quality & effectiveness since then in worldwide applications. Traps operating according to the principle described below are used by the majority of companies in the urinal market segment such as Geberit, Sloan/Falcon Water Technologies, Franke, Keramag, Ideal Standard, Duravit, Kuhfuss, Sphinx, Culu, Whiffaway, URIMAT and others. In Europa, Asia, South America and Australia they are widely used in waterless urinals. Today the majority of the worldwide waterless urinal market operates on membrane-/trap- technology.

The membrane valves/traps are designed as one-way valves. The membrane traps can be made of waterproof materials such as Rubber, Silicon or even plastic (LDPE) and these materials make the membrane trap hold the lips close. When used, the valve opens in only one direction. It allows liquid (urine) to flow through and immediately closes shut afterward. It prevents the stink by not letting the odor from the drainage pass back into the urinal. Just like the liquid sealant, the membrane valve also needs to be replaced after a few thousand uses. Therefore, the performance of such membrane valves is very good compared to the technology of a liquid barrier.

Another advantage of membrane valves in waterless urinals is the fact, that no barrier liquid is needed or has to be renewed. Due to that chemicals which can cause health and safety issues can be completely avoided on these products. In addition membranes are more reliable in terms of service and maintenance. They offer more security when "flushing the urinal", because there is no liquid barrier to break.

The similar rubber membrane technology is used for floor drains to prevent odor problems when water-siphons become dry. These products are also well-established in the American market, for instance Green Drain.

The European guideline (https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32013D0641&from=DE) makes no difference for the trap technology, the trap as such (with liquid barrier or with a membrane valve) has to fulfill the different test procedures.

Proposals

Item #: 083

UPC 2024 Section: 415.1, 415.2

SUBMITTER: Donald L. Strickland, FASPE, CPD, GPD
TK1SC

RECOMMENDATION:
Revise text

415.0 Drinking Fountains.
415.1 Application. Drinking fountains shall be self-closing and comply with ASME A112.19.1/CSA B45.2, ASME A112.19.2/CSA B45.1, or ASME A112.19.3/CSA B45.4. Drinking fountains and bottle filling stations shall also comply with NSF 61. Permanently installed electric water coolers and bottle filling stations shall also comply with UL 399.
415.2 Drinking Fountain Alternatives. Where food is consumed indoors, water stations shall be permitted to be substituted for drinking fountains. Bottle filling stations shall be permitted to be substituted for drinking fountains ~~up to 50 percent of the requirements for drinking fountains~~. Drinking fountains shall not be required for an occupant load of 30 or less.

SUBSTANTIATION:
The text is addressing a concern with health and safety. As written, the language is overly restrictive to allow only 50 percent of drinking fountains to be substituted with bottle filling stations. There are jurisdictions that find drinking fountains unsanitary as many persons use it and there are no means of sanitizing drinking fountains. Additionally, if bottle filling stations are accepted as an equal to drinking fountains, then bottle filling stations should comply to the same requirements.

Proposals

Item #: 084

UPC 2024 Section: 416.3

SUBMITTER: Bruce Fathers
Watts Water Technologies

RECOMMENDATION:
Add new text

416.0 Emergency Eyewash and Shower Equipment.

416.2 Water Supply. Emergency eyewash and shower equipment shall not be limited in the water supply flow rates. Where hot and cold water is supplied to an emergency shower or eyewash station, the temperature of the water supply shall be controlled by a temperature actuated mixing valve complying with ASSE 1071. Where water is supplied directly to an emergency shower or eyewash station from a water heater, the water heater shall comply with ASSE 1085. The flow rate, discharge pattern, and temperature of flushing fluids shall be provided in accordance with ISEA Z358.1.
416.3 Remote Temperature Monitoring. Control and alert when lack line of sight. Temperature may be monitored remotely via a sensor and App to alert if mixed water exceeds 85°F (29.4°C) at the outlet. Temperature can also be adjusted via remote means.

(renumber remaining sections)

SUBSTANTIATION:
The addition of this language adds Public Safety. The provision provides remote visibility to eye wash, face wash, drench showers and combination unit outlet temperature mitigating scalding risk to eyes, face and body, and allowing facility staff to respond quickly to over temperature conditions and bypass mode via App alerts.

Proposals

Item #: 085

UPC 2024 Section: 417.2 – 417.4, 603.5

SUBMITTER: Bruce A Pfeiffer
Retired - City of Topeka

RECOMMENDATION:
Revise text

603.0 Cross-Connection Control.

603.5 Specific Requirements. Specific requirements for backflow prevention shall comply with Section 603.5.1 through Section ~~603.5.21~~ 603.5.24.

~~417.2~~ 603.5.19 **Deck Mounted Bath/Shower Valves.** Deck mounted bath/shower transfer valves with integral backflow protection shall comply with ASME A112.18.1/CSA B125.1. This shall include handheld showers, and other bathing appliances mounted on the deck of bathtubs or other bathing appliances that incorporate a hose or pull out feature.
~~417.3~~ 603.5.20 **Handheld Showers.** Handheld showers shall comply with ASME A112.18.1/CSA B125.1. Handheld showers with integral backflow protection shall comply with ASME A112.18.1/CSA B125.1 or shall have a backflow prevention device that complies with ASME A112.18.3 or ASSE 1014.
~~417.4~~ 603.5.21 **Faucets and Fixture Fittings with Hose Connected Outlets.** Faucets and fixture fittings with pull out spout shall comply with ASME A112.18.1/CSA B125.1. Faucets and fixture fittings with pull out spouts with integral backflow protection shall comply with ASME A112.18.1/CSA B125.1 or shall have a backflow preventer device that complies with ASME A112.18.3.
~~603.5.19~~ 603.5.22 **Plumbing Fixture Fittings.** (remaining text unchanged)
~~603.5.20~~ 603.5.23 **Swimming Pools, Spas, and Hot Tubs.** (remaining text unchanged)
~~603.5.21~~ 603.5.24 **Chemical Dispensers.** (remaining text unchanged)

SUBSTANTIATION:
Section 417.2, Section 417.3 and Section 417.4 deal specifically with backflow protection for deck mounted bath/shower valves, handheld showers and faucets, and fixture fittings with hose connected outlets. Requirements for backflow protection of fixtures and appliances are found in Chapter 6 making it the logical chapter to relocate these sections.

Proposals

Item #: 086

UPC 2024 Section: 417.5

SUBMITTER: Bruce A Pfeiffer
Retired - City of Topeka

RECOMMENDATION:
Revise text

417.0 Faucets and Fixture Fittings.

417.5 Separate Controls for Hot and Cold Water. Where two separate handles control the hot and cold water, the handles shall be marked in such a manner to indicate to the user that the left-hand control of the faucet where facing the fixture fitting outlet shall control the hot water. Faucets and diverters shall be connected to the water distribution system so that hot water corresponds to the left side of the fixture fitting.

Single-handle mixing valves installed in showers and tub-shower combinations shall have the flow of hot water corresponding to the markings on the fixture fitting.

SUBSTANTIATION:
While the Code states that the left-hand control of the faucet is to control the hot water supply, it does not require markings on the faucet to indicate to the user which handle regulates the hot and cold water supply. This additional language will require those markings.

Proposals

Item #: 087

UPC 2024 Section: 417.6

SUBMITTER: Jason M Shank
ASSE International

RECOMMENDATION:
Revise text

417.0 Faucets and Fixture Fittings.

~~**417.6 Low-Pressure Water Dispenser.** Beverage faucets shall comply with ASME A112.18.1/CSA B125.1. Low-pressure water dispensers that dispense electrically heated water have a reservoir vented to the atmosphere shall comply with ASSE 1023. Electric devices that heat water shall comply with UL 499.~~

417.6 Water Dispensers. All potable water dispensers directly connected to the plumbing system shall comply with one of the following:
(1) Beverage faucets shall comply with ASME A112.18.1/CSA B125.1.
(2) Dispensers that supply electrically heated or cooled water shall comply with ASSE 1023.
(3) Electric devices that heat water shall comply with UL 499.
(4) Dispensers that include water treatment shall comply with ASSE 1023 and Section 611.0 based on the type of water treatment technology.

(below shown for reference only)

611.0 Drinking Water Treatment Units.

Note: ASME A112.18.1/CSA B125.1, ASSE 1023, and UL 499 meet the requirements for mandatory referenced standards in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

SUBSTANTIATION:
ASSE 1023 has been updated with a change of the scope of the standard. This proposed change reflects these changes. Other referenced standards with in this section have remained but listed in an easier to read order.

Proposals

Item #: 088

UPC 2024 Section: 417.7

SUBMITTER: Jason M Shank
ASSE International

RECOMMENDATION:
Add new text

417.0 Faucets and Fixture Fittings.

417.7 Head Shampoo Sink Faucets. Head shampoo sink faucets shall be supplied with hot water that is limited to not more than 120°F (49°C). Each faucet shall have integral check valves to prevent crossover flow between the hot and cold water supply connections. The means for regulating the maximum temperature shall be in accordance with one of the following:
(1) A limiting device conforming to ASSE 1070/ASME A112.1070/CSA B125.70.
(2) A water heater conforming to ASSE 1084.
(3) A temperature-actuated, flow-reduction device conforming to ASSE 1062.

Note: ASSE 1070/ASME A112.1070/CSA B125.70, ASSE 1062, and ASSE 1084 meet the requirements for mandatory referenced standards in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

SUBSTANTIATION:
Currently the UPC does not address these types of faucet usage. These provisions will address the proper standards required for the health and safety of the public.

Proposals

Item #: 089

UPC 2024 Section: 417.8

SUBMITTER: Jason M Shank
ASSE International

RECOMMENDATION:
Add new text

417.0 Faucets and Fixture Fittings.

417.8 Footbaths and Pedicure Baths. The water supplied to specialty plumbing fixtures, such as pedicure chairs having an integral foot bathtub and footbaths, shall be limited to not more than 120ºF (49ºC) by a water-temperature-limiting device that conforms to ASSE 1070/ASME A112.1070/CSA B125.70 or by a water heater complying with ASSE 1084.

Note: ASSE 1070/ASME A112.1070/CSA B125.70 and ASSE 1084 meet the requirements for mandatory referenced standards in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

SUBSTANTIATION:
Currently the UPC does not address these types of faucet usage. These provisions will address the proper standards required for the health and safety of the public.

Proposals

Item #: 091

UPC 2024 Section: 420.3, Table 420.3

SUBMITTER: Robert Pickering
Eastern Research Group, Inc.
Rep. EPA WaterSense

RECOMMENDATION:
Revise text

420.0 Sinks.

420.3 Pre-Rinse Spray Valve. Commercial food service pre-rinse spray valves shall have a maximum flow rate ~~of 1.6 gallons per minute (gpm) at 60 pounds-force per square inch (psi) (6.0 L/m at 414 kPa)~~ in accordance with Table 420.3 and shall be equipped with an integral automatic shutoff.

TABLE 420.3
COMMERCIAL PRE-RINSE SPRAY VALVE MAXIMUM FLOW RATE

PRODUCT CLASS BY SPRAY FORCE	MAXIMUM FLOW RATE, GPM
Product Class 1 (</= 5.0 ounces-force)	1.00
Product Class 2 (> 5.0 ounces-force and </= 8.0 ounces-force)	1.20
Product Class 3 (> 8.0 ounces-force)	1.28

For SI units: 1 gallon per minute = 3.785 L/min, 1 ounce-force = 0.0625 pound-force

SUBSTANTIATION:
Effective as of January 2019, the Department of Energy requires all pre-rinse spray valves to have a maximum flow rate of 1.28 gallons per minute (or less, depending on the product's spray force). See the energy conservation standards specified in the Code of Federal Regulations at 10 CFR 431.266 (https://www.law.cornell.edu/cfr/text/10/431.266).

Proposals

Item #: 092

UPC 2024 Section: Table 422.1

SUBMITTER: Arnie Rodio
Self

RECOMMENDATION:
Revise text

TABLE 422.1
MINIMUM PLUMBING FACILITIES[1]

LAVATORIES (FIXTURES PER PERSON)[5, 6]	BATHTUBS OR SHOWERS (FIXTURES PER PERSON)	DRINKING FOUNTAINS/ FACILITIES (FIXTURES PER PERSON)	OTHER[6,7]

(portions of table not shown remain unchanged)

Notes:
1 The figures shown are based upon one fixture being the minimum required for the number of persons indicated or any fraction thereof.
2 A restaurant is defined as a business that sells food to be consumed on the premises.
a. The number of occupants for a drive-in restaurant shall be considered as equal to the number of parking stalls.
b. Hand-washing facilities shall be available in the kitchen for employees.
3 The total number of required water closets for females shall be not less than the total number of required water closets and urinals for males.
4 For each urinal added in excess of the minimum required, one water closet shall be permitted to be deducted. The number of water closets shall not be reduced to less than two-thirds of the minimum requirement.
5 Metering or self-closing faucets shall be installed on lavatories intended to serve the transient public.
6 Service sinks shall not be required for non-residential occupancies with an occupant load of 15 or less.
7 For business and mercantile occupancies, one common service sink shall be permitted when accessible to all businesses and mercantile within 300 feet and within the same story.

SUBSTANTIATION:
Note 6 is being added to remove the conflict with the building code and UPC regarding required service sinks. Note 7 is being added for flexibility as the language will allow businesses and mercantile occupancies to share a common service sink within the same work/business area. Similarly, with common facilities from Section 422.4, the UPC requires access to be within 300 feet on the same floor, it makes sense for the distance to be limited to the same.

Proposals

Item #: 093

UPC 2024 Section: 422.2

SUBMITTER: Julius Ballanco, P.E.
JB Engineering and Code Consulting, P.C.
Rep. Self

RECOMMENDATION:
Revise text

422.0 Minimum Number of Required Fixtures.
422.2 Separate Facilities. Separate toilet facilities shall be provided for each sex.
Exceptions:
(1) Residential installations.
(2) In occupancies with a total occupant load of 10 or less, including customers and employees, one toilet facility, designed for use by no more than one person at a time, shall be permitted for use by both sexes.
(3) In business and mercantile occupancies with a total occupant load of 50 or less including customers and employees, one toilet facility, designed for use by no more than one person at a time, shall be permitted for use by both sexes.
(4) Separate facilities shall not be required where rooms have fixtures designed for use by both sexes and the water closets are installed in privacy compartments. Urinals shall be located in an area that is visually separated from the remainder of the room or each urinal shall be installed in a privacy compartment.

SUBSTANTIATION:
The Building Code added an allowance for all gender toilet rooms in the 2021 edition. This change provides a correlation with the Building Code. All gender toilet rooms have become common place in other countries. The water closets and urinals are located in privacy compartments while the lavatories are located in the open. There is no issue with waiting time since everyone has access to all the fixtures. All gender toilet rooms also avoid any discrimination regarding gender identity. This concept is gaining popularity in North America. Since the Building Code allows such a design, the Uniform Plumbing Code should have a similar requirement. Otherwise, the code are in conflict.

Proposals

Item #: 094

UPC 2024 Section: 422.2

SUBMITTER: Bruce A Pfeiffer
Retired - City of Topeka

RECOMMENDATION:
Add new text

422.0 Minimum Number of Required Fixtures.

422.2 Multiple Occupancy Buildings. Buildings having multiple types of occupancies, shall have separate toilet facilities for each occupancy with the minimum number of fixtures prescribed in Table 422.1. A common set of restrooms shall be permitted to be used to accommodate all of the building occupants when the following requirements are met:
(1) Restrooms shall be accessible to the occupants at all times.
(2) The maximum travel distance from the restrooms to any occupancy shall not exceed 300 feet (91 440 mm).
(3) The total occupant load for the building shall be determined by adding the individual occupant loads together. The minimum number of fixtures for the common restrooms shall be calculated at 50 percent female and 50 percent male based on the total occupant load and by using the occupancy requiring the greatest number of fixtures per occupant load in accordance with Table 422.1.

(renumber remaining sections)

SUBSTANTIATION:
The renovation of older buildings to accommodate multiple types of occupancies has prompted design professionals to request guidance on how to calculate the minimum fixtures required. This section will provide the guidelines for those types of occupancies.

Proposals

Item #: 095

UPC 2024 Section: 422.4.2

SUBMITTER: Andrew Klein
A S Klein Engineering, PLLC
Rep. Self Storage Association

RECOMMENDATION:
Add new text

422.0 Minimum Number of Required Fixtures.

422.4 Toilet Facilities Serving Employees and Customers. Each building or structure shall be provided with toilet facilities for employees and customers. Requirements for customers and employees shall be permitted to be met with a single set of restrooms accessible to both groups.

Required toilet facilities for employees and customers located in shopping malls or centers shall be permitted to be met by providing a centrally located toilet facility accessible to several stores. The maximum travel distance from entry to any store to the toilet facility shall not exceed 300 feet (91 440 mm).

Required toilet facilities for employees and customers in other than shopping malls or centers shall have a maximum travel distance not to exceed 500 feet (152 m).

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

422.4.2 Factory, Industrial and Storage. The location and maximum distances of travel to required public and employee facilities in factory, industrial and storage occupancies shall be permitted to exceed that required by Section 422.4, provided that the location and maximum distance of travel are approved.

SUBSTANTIATION:
This proposal provides the AHJ the authority to increase the travel distance to restrooms from 500 ft and the number of floors between restrooms from every other floor to something more appropriate in industrial and storage buildings. Because these types of occupancies have extremely low occupancy rates, it is not a cost-effective use of space or resources to require the same number of independent restrooms when they will rarely be utilized. The new section recognizes that even though there may be members of the public present in some of these types of occupancies, occupancy rates and dwell times are extremely low. This “exception allowance” is present in the I-Codes.

Proposals

Item #: 130

UPC 2024 Section: 206.0, 603.5.17

SUBMITTER: Herb Hoeptner
Hoeptner Perfected Products

RECOMMENDATION:
Revise text

603.0 Cross Connection Control.

603.5.17 Potable Water Outlets and Valves. Potable water outlets, freeze-proof yard hydrants, combination stop-and-waste valves, freeze resistant drinking fountains or other fixtures that incorporate a stop and waste feature that drains into the ground shall not be installed underground.
Exception: Drinking fountain freeze resistant sanitary shall be permitted to be installed underground.

206.0 -D-
Drinking Fountain Freeze Resistant. An outdoor point of use valve used for potable water systems that uses a stop and waste below the frost line to protect against freezing. The device is normally installed in a vertical position extending from below the frost line to above grade.
Drinking Fountain Freeze Resistant Sanitary. An outdoor point of use valve used for potable water systems that drains back into an internal reservoir below the frost line to protect against freezing The device is normally installed in a vertical position extending from below the frost line to above grade.

SUBSTANTIATION:
An outside frost free drinking fountain are most common at parks, sports complexes, hiking trails, bike trails, dog parks and anywhere the public will need drinking water. The latest trend is to include bottle fillers and dog waterers. To prevent them from freezing they incorporate a stop and waste vale to drain the system into the soil. Standard yard hydrants(weep hole hydrants) that drain into the ground to prevent freezing, and all stop and waste valves are prohibited from being buried underground. An outside frost free drinking fountain drains into the soil the same as a weep hole hydrant or stop and waste and is currently not addressed as such in the UPC code. One can argue whether or not someone can get cross contamination from a stop and waste claiming the use is for filling bucket, but one cannot argue that the only purpose for a drinking fountain is to drink from it. Therefore it is imperative that we guarantee the quality of the water coming from a drinking fountain.

Definitions: There is no current definition of Drinking Fountain Freeze Resistant or the subcategory, Drinking Fountain Freeze Resistant Sanitary. These are generally accepted definitions.

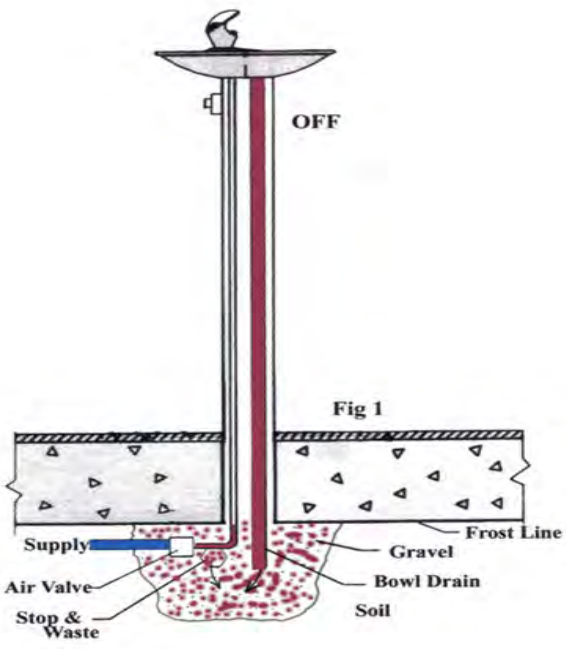
Section 603.5.17 currently does not include outside frost free drinking fountains that use a stop and waste to protect from freezing. To prevent this text from being misinterpreted to read that all frost free drinking fountains including Sanitary frost free drinking fountains cannot be installed underground an exception needs to be added. Sanitary drinking fountains have been specifically designed to be installed below the frost line and supply potable drinking water.

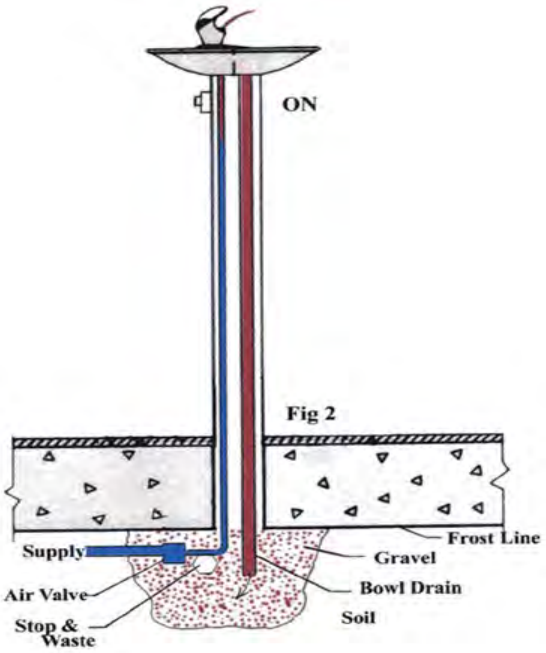
Currently there are three manufacturers that manufacture a Sanitary Drinking Fountain that does not drain into the soil to prevent freezing. For more information on Drinking fountains please see attached

Is your outside drinking fountain safe for drinking?
If you use or install outside drinking fountains or yard hydrants you might want to concern yourself with the

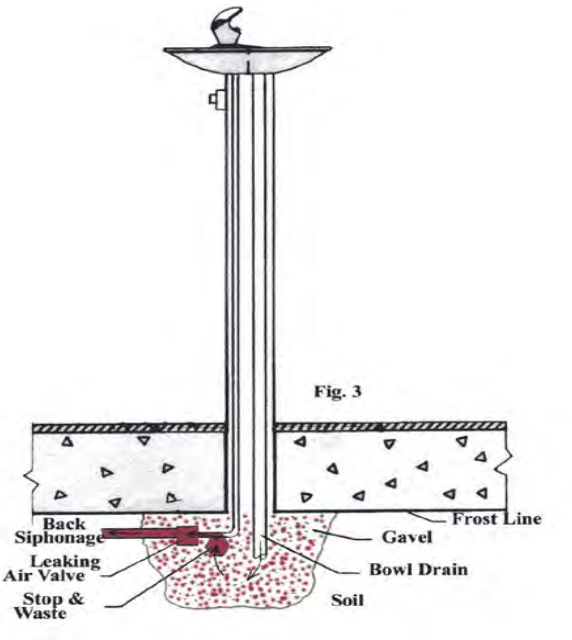
inevitable possibility that your potable water can become contaminated with harmful bacteria located in the soil. Sure you hire the best contractors and you assume that you meet all the state and local requirements, but sometimes that is not enough. Some code authorities adopt codes but don't necessarily enforce them, leaving you liable for any problems that develop. Some code authorities are slow to adopt the most current standards available, thus newly adopt an old standard after you have completed your project again leaving you liable. In this litigious society, sometimes you need to do more to ensure you do not become entangled in the litigation process.

How contaminated ground water can enter your potable water supply:
Typical outside drinking fountains and yard hydrants prevent freeze-ups by draining out of a "weep hole" deep in the ground. They generally consist of a bubbler, or in the case of a yard hydrant, a head for attaching a hose, a riser pipe, and a shutoff valve deep below the frost level. The term "weep hole" is derived from the fact that, when the weep hole drinking fountain or yard hydrant is shut off, a hole in the side of the valve opens to drain all the water from the riser into the soil below the frost line. These are sometimes referred to as Stop & Waste valves. A typical problem for these "weep hole" devices is that, when the ground water level fluctuates, especially during the summer months, or the device is used repeatedly so drain water does not have a chance to percolate into the ground, the ground water level will rise above the weep hole filling the riser with soiled ground water that will be consumed by the public. Each time the device is shut off (Fig. 1) and the weep hole opens, ground water will migrate into the drinking fountain or yard hydrant. Each time the drinking fountain or hydrant is turned on (Fig. 2), that contaminated migrated water enters the potable water supply system and exits the bubbler. That first drink of water can be nothing but soiled, most likely contaminated water.





A secondary, and more serious, problem occurs when the rubber seal in the shutoff valve or air valve deteriorates over time and begins to leak. When the valve on the kitchen sink leaks it is very noticeable as it will drip incessantly forcing you to replace the rubber seal. Unfortunately when your drinking fountain or yard hydrant leaks, it usually leaks out the weep hole deep in the ground undetected. From the surface no one is aware the device is leaking. When a back siphonage condition occurs (Fig.3), that leak out will become a leak in, sucking contaminated muddy water into the supply line. If the hydrant is located in a horse arena or cow barn, animal by-products will leach into the potable water supply.



In the first scenario the end user can consume contaminated water. In the second scenario, it is far more serious because the entire water supply can become contaminated which the public consumes. This means that possible contamination from one drinking fountain or yard hydrant, in one area, could cross contaminate the public in other areas or other commercial or private dwellings. Anyone connected to that water supply potentially can become contaminated.
Lately, due to the deaths associated with e-coli outbreaks and other pathogens that have contaminated our water supplies, there has been great concern regarding cross contamination between the soil, which carries animal by-products, fertilizers and other waste, and the water supply.

The liability toward each state became such a concern that many states created their own drinking fountain and yard hydrant requirements. Initially, states implemented requirements to isolate weep hole devices from the potable water supply. These requirements included installing a testable RPP backflow preventer upstream of the hydrant and then tagging the hydrant “danger unsafe water”. This solved two major concerns. First, it protected the potable water supply from siphoning contaminated water into the public water system, and secondly, it attempted to notify the public not to use the hydrant for any potable source. Naturally the obvious downside to this approach was that drinking fountains and yard hydrants had to be used as a potable source. Drinking fountains are only used for drinking, and yard hydrants are used for RV parks and campgrounds. A secondary down side is the cost associated with the purchase and installation of a testable RPP backflow preventer, the difficulty in finding a location for the backflow preventer to keep it from freezing and the added cost in annual inspection and testing of the backflow preventer.

Innovative manufacturers soon developed a new breed of drinking fountains and yard hydrants to solve the problems associated with the new requirements imposed on weep hole devices. These new devices are called Sanitary Drinking Fountains (Fig. 4) and Sanitary Yard Hydrants.

These Sanitary devices work much the same way as a Weep Hole device in that when they are shut off the water in the riser drains down and out a hole located below the frost line to prevent freezing. However, instead of draining out a hole and into the soil, the Sanitary Hydrant, or Sanitary Drinking Fountain (Fig. 4), drains into a sealed tank. When the hydrant is turned on again the water in the tank is expelled leaving the tank empty to repeat the cycle when the device is again shut off. Because the Sanitary drinking fountain and yard hydrant drain into a tank there is no cross contamination with the soil. Because the soil is not required for drainage the drinking fountain or yard hydrant can be placed in any soil condition, even clay.

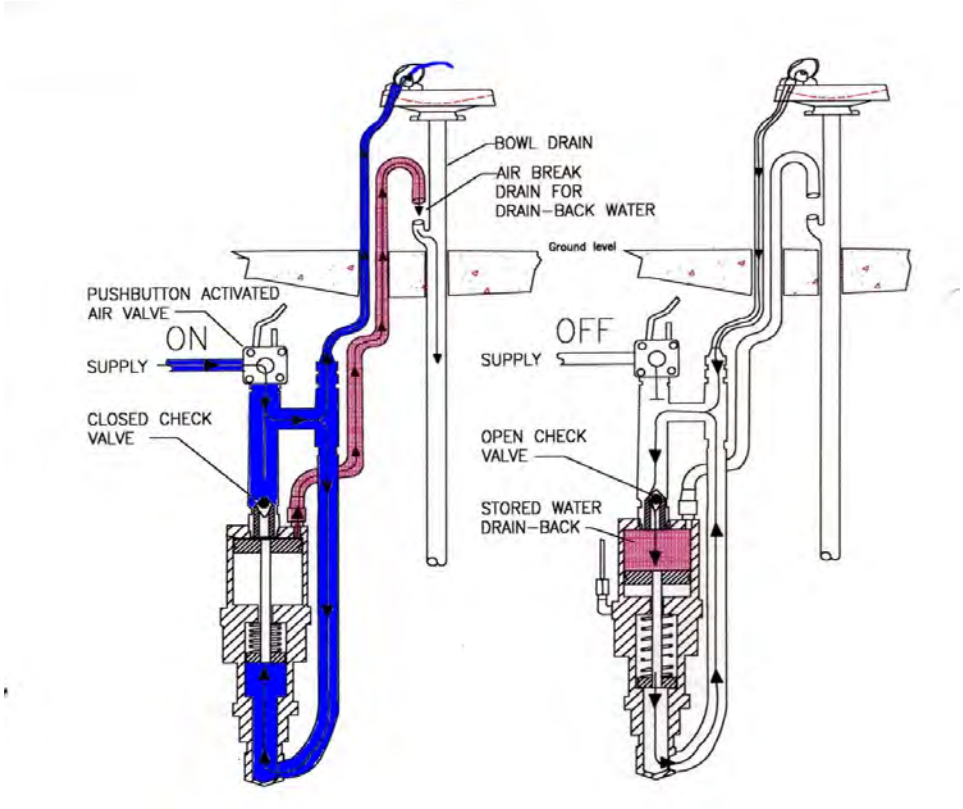


Fig .4

With the advent of the Sanitary Drinking Fountain and Sanitary Yard Hydrant, states were able to meet the needs and safety requirements of the public. The problem for the state or local code officials was the cost, manpower and liability in having to develop their own approval process and testing each manufacturer's device for approval. In turn, the varying requirements by each state made it difficult for manufacturers to make one product for all states.

ASSE (American Society of Sanitary Engineers) realized the need to develop a national standard to help states avoid this liability and give manufacturers the ability to meet one set of requirements. After six years of debate and research by code officials, manufacturers, engineers, consultants, and the public, ASSE Sanitary Yard Hydrant Standard 1057 was completed. This standard requires that the hydrant not drain directly into the ground and it must have a back flow preventer if a hose is capable of attachment. It stipulates required pressure and flow capabilities and ensures proper freeze protection.

Its obvious that over the past few years the sanitary issue for drinking fountains and yard hydrants has become an important issue for public safety, and although the 1057 Sanitary Yard Hydrant Standard has not yet specifically addressed drinking fountains, it is important to realize ones potential risk of cross contamination and possible liability when installing or specifying drinking fountains and yard hydrants. For yard hydrants, make sure they have been tested by an approved test lab and listed by a third party certifier to the ASSE 1057 standard. For drinking fountains make sure they are Sanitary drinking fountains where the freeze protection draining does not drain directly into the ground.

Proposals

Item #: 131

UPC 2024 Section: 227.0, 603.5.17

SUBMITTER: Herb Hoeptner
Hoeptner Perfected Products

RECOMMENDATION:
Revise text

603.0 Cross Connection Control.

603.5.17 Potable Water Outlets and Valves. Potable water outlets, freeze-proof non-sanitary yard hydrants, combination stop-and-waste valves, or other fixtures that incorporate a stop and waste feature that drains into the ground shall not be installed underground.
Exception: Freeze-resistant sanitary yard hydrants that meet the requirements of ASSE 1057 shall be permitted to be installed underground.

227.0 -Y-
Yard Hydrant. A point-of-use valve used for nonpotable water systems that is protected against freezing by draining residual water onto the soil (which can be a source of cross-contamination). The device is normally installed in a vertical position extending from below the frost line to above grade.

Yard Hydrant, Sanitary. A point-of-use valve used for potable water systems that drains back into an internal reservoir below the frost line to protect against freezing. The device incorporates a backflow prevention device with hose connection outlet for potable water application. The device is normally installed in a vertical position extending from below the frost line to above grade.

Note: ASSE 1057 meets the requirements for a mandatory referenced standard in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

SUBSTANTIATION:
Standard yard hydrants (weep hole hydrants) that drain into the ground to prevent freezing, are normally used for irrigation but are typically attached to a potable water supply. It has been determined that weep hole yard hydrants can cross contaminate to the potable water supply lines, contaminating homes and buildings upstream of the hydrant. Those same hydrants are also being used for potable water supply for campsites, Recreational Vehicles (RV) and trailer parks, creating more cross contamination problems for the end user's potable water. Please see additional information

An ASSE 1057 Sanitary Yard Hydrant approved device protects the water supply from cross contamination with the soil. These devices do not behave as a weep hole hydrant (such as a stop and waste device) as they do not have an opening into the soil to drain the excess water from the device. Devices capture water in an internal reservoir below the frost line to prevent cross contamination from the soil. They could be buried in a septic tank and still deliver clean potable water as they are totally isolated from the surrounding soil conditions. This is why they have been deemed Sanitary.

The purpose of this proposed change is to clarify the definition and installation of freeze resistant sanitary yard hydrants which is currently not addressed in the UPC code

Definitions: There is no current definition of Yard Hydrant or the subcategory, Sanitary Yard Hydrant. These are generally accepted definitions.

Section 603.5.17 can currently be misinterpreted to read that all yard hydrants including Sanitary yard hydrants cannot be installed underground, when in fact the product is specifically designed to be installed below the frost line and supply potable water. Currently there are three manufacturers that are listed to ASSE 1057 Sanitary Yard Hydrant standard

In summary:
Most states have taken it upon themselves to require Sanitary Yard Hydrants to meet the ASSE 1057 Standard. Any engineer who is familiar with ASSE 1057 will make it a requirement, even if the state does not, because they are concerned for their own liability. The UPC code currently does not address Sanitary Yard Hydrants.
This verbiage, including the requirement to meet ASSE 1057, is currently used by most states. Any engineer who specifies a yard hydrant will always specify a 1057 approved device for their own liability. This Sanitary Yard Hydrant addition has been sorely neglected in the UPC codes.

Serious Cross Contamination In Yard Hydrants:
Due to the deaths associated with e-coli outbreaks and other pathogens that have contaminated our water supplies, there has been great concern regarding cross contamination between the potable water supply and the soil, which carries animal by-products, fertilizers and other hazardous materials.
Most of us are familiar with a standard “weep hole” Yard Hydrant as they have been around for years. Hundreds of thousands of them are sold each year. They are used in campgrounds, RV parks, ranches, farms, gardens and anywhere water is needed away from a building. However, most of us are unaware of the serious cross contamination potential associated with the weep hole at the base of the hydrant. The common weep hole yard hydrant consists of a head for attaching a hose, a riser pipe, and a shutoff valve deep below the frost level. The term “weep hole” is derived from the fact that, when the weep hole hydrant is shut off, a hole in the side of the valve opens up to drain all the water from the riser into the soil below the frost line, much like a Stop and Waste Valve. Some are placed in a backfill of gravel to aid in draining
Most states agencies recognize the cross contamination potential anytime a hose is connected to a hydrant. Hoses have the ability to be placed in high hazard environments, such as stock tanks, pesticide tanks or even lying on the ground in mud puddles. Back Siphonage will cause these hazardous materials to be sucked back into the water supply. Back siphonage can occur whenever a supply line is broken or drained for repair. In addition, yard hydrants create a back siphonage each and every time they are shut off, as the mere act of draining the riser, creates a siphon at the hose bib. Because of this, many states have required vacuum breakers to be attached to all hydrants where a hose could be attached. Naturally this prevents cross contamination during back siphonage should the hose be placed in a contaminated environment.

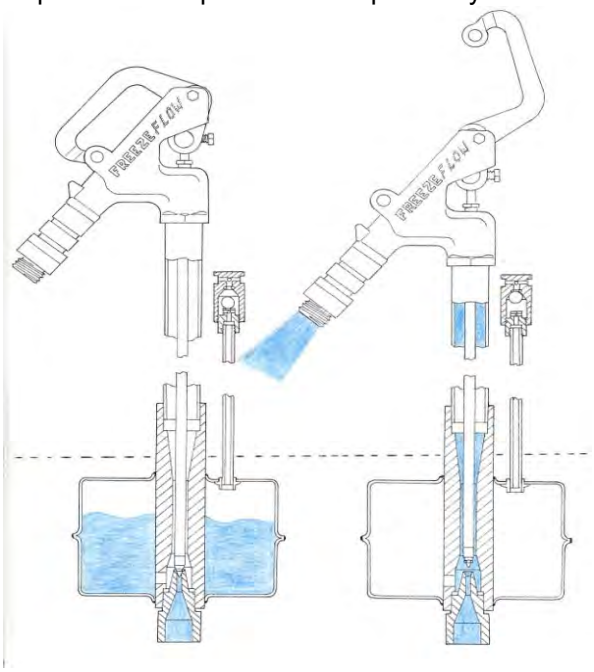
What many agencies are starting to realize is, that there still exists a severe cross contamination potential associated with the weep hole being in contact with the soil. Because these weep hole hydrants function much the same way as a Stop and Waste Valve, they suffer the same cross contamination issues. For example, if the stopper in a standard “weep hole” hydrant ever leaks, it is undetectable at ground level as it is leaking out the weep hole deep into the ground. The hydrant weep hole drips continuously throughout the day and night, and from the surface no one is aware the hydrant is leaking.

When a back siphonage condition occurs, that leak out will become a leak in, sucking contaminated muddy water into the supply line. If the hydrant is located in a horse or cow barn, animal by-products will leach into the potable water supply.
Even when the hydrant is working properly, in states where the ground water level fluctuates, this problem is

exacerbated by the fact that when the water table rises above the weep hole, like when it rains, the backfill of gravel gets full of water. Any water higher that the weep hole will migrate contaminated water into the riser. Now every time one turns on the hydrant they will get a slug of contaminated water entering the potable water of an RV or camper. Each time the hydrant is shut off and the weep hole opens, permitting contaminated water to migrate into the hydrant. Each time the hydrant is turned on, that contaminated water enters the potable water supply system. Outside drinking fountains operate the same way. Each time the fountain is turned on, the first drink of water is nothing but soiled, possibly contaminated, water.

The liability toward each state became such a concern that many states created their own yard hydrant requirements. Initially, states implemented requirements to isolate weep hole hydrants from the potable water supply. These requirements included installing a testable RPP backflow preventer upstream of the hydrant and then tagging the hydrant “danger unsafe water”. This solved two major concerns. First, it protected the potable water supply from siphoning contaminated water into the public water system, and secondly, it attempted to notify the public not to use the hydrant for any potable source. The downside to this approach was the cost associated with the purchase and installation of a testable RPP backflow preventer, the difficulty in finding a location for the RPP device to keep it from freezing, the added cost in annual inspection and testing of the RPP device, and the fact that the weep hole yard hydrant is not fit for potable water. RV parks and campgrounds were especially hard hit, as they required potable water from their hydrants.

Manufacturers soon developed a new breed of yard hydrants to solve the problems associated with the new requirements imposed on weep hole hydrants. These new hydrants are called Sanitary Yard Hydrants.



A Sanitary Yard Hydrant works much the same way as a Weep Hole Hydrant in that when they are shut off, the water in the riser drains down and out a hole located below the frost line to prevent freezing. However, instead of draining out a hole and into the soil, the Sanitary Hydrant drains into a sealed tank. When the hydrant is turned on again, the water in the tank is expelled leaving the tank empty to repeat the cycle when the hydrant is again shut off. Because the sanitary hydrant drains into a tank there is no cross contamination with the soil. Because the soil is not required for drainage the hydrant can be placed in any soil condition, even clay. With the addition of a vacuum breaker at the hose connection, the Sanitary Yard Hydrant protects the potable water supply and public from cross contamination from the soil and from the hose.

The problem for the state and local code officials was the cost, manpower, and liability in having to develop their own approval process and testing each manufacturer’s device for approval. In turn, the varying requirements by each state made it difficult for manufacturers to make one product for all states.

ASSE realized the need to develop a national standard to help states avoid this liability and give manufacturers the ability to meet one set of requirements. After six years of debate and research by code officials, manufacturers, engineers, consultants, and the public, ASSE’s Sanitary Yard Hydrant Standard 1057 was completed. This standard requires that the yard hydrant not drain directly into the ground and that it must have a back flow preventer if a hose is capable of attachment. In addition, it stipulates minimum required pressure and flow capabilities and ensures

proper freeze protection and that all serviceable parts can be accomplished without the need to excavate. It also stipulates, the manufacturers must test their hydrants at an approved and regulated test lab.

This standard reduces the liability, manpower, and costs for the state agencies to ensure proper protection of the water supply and the public. At the same time it helps manufacturers to have a base line from which to develop and improve yard hydrants in general.

With the continued efforts by states for clean, safe, potable water and the high liability associated with cross contamination, greater concern must be given to the proper selection, installation and use of yard hydrants.

Proposals

Item #: 137

UPC 2024 Section: Table 604.1, Table 1701.1

SUBMITTER: Mark Fasel
Viega LLC

RECOMMENDATION:
Revise text

TABLE 604.1
MATERIALS FOR BUILDING SUPPLY AND WATER DISTRIBUTION PIPING AND FITTINGS

MATERIAL	BUILDING SUPPLY PIPE AND FITTINGS	WATER DISTRIBUTION PIPE AND FITTINGS	REFERENCED STANDARD(S) PIPE	REFERENCED STANDARD(S) FITTINGS
Stainless Steel	X	X	ASTM A269, ASTM A312, ASTM A554, ASTM A778	ASTM F3226, IAPMO IGC 353, IAPMO PS 117

(portions of table not shown remains unchanged)

TABLE 1701.1
REFERENCED STANDARDS

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTION
IAPMO IGC 353-2019e1	Branch Connectors	Connectors	Table 604.1

(portions of table not shown remains unchanged)

Note: IAPMO IGC 353 meets the requirements for a mandatory referenced standard in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

SUBSTANTIATION:
The IAPMO IGC 353 Branch Connectors standard was developed for branch connectors NPS 1 1/2" - 6 inches.

Branch connectors are defined within the standard as a permanent fitting or connection that allows a NPT threaded branch connection to be added to existing piping.

Branch connectors covered by IAPMO IGC 353 shall include:
(a) Saddle like permanent connection mechanically fixed in place to the host pipe; and
(b) leak tight seal realized through the compression of a sealing element between the outer surface of the pipe and body or flange of the branch connector.
Note: One method of mechanically fixing the branch connection is via a swaging action which secures the fitting by mechanically deforming a flange of metal attached to the branch connector so that it matches the contour of the inside surface of a host pipe as indicated in Section 1.1.2 of IAPMO IGC 353.

Section 4.2.1 of the standard requires that materials and components of a branch connector intended to convey or dispense water for human consumption through drinking or cooking shall comply with the applicable requirements of NSF/61 and the applicable low-lead requirements.

The addition of this standard to the Materials for building supply and water distribution piping and fittings table provides a consensus developed standard branch connector fittings can be listed to for use in potable water applications with stainless steel pipe.

Proposals

Item #: 138

UPC 2024 Section: Table 604.1, Table 1701.1

SUBMITTER: Michael Cudahy
PPFA

RECOMMENDATION:
Revise text

TABLE 604.1
MATERIALS FOR BUILDING SUPPLY AND WATER DISTRIBUTION PIPING AND FITTINGS

MATERIAL	BUILDING SUPPLY PIPE AND FITTINGS	WATER DISTRIBUTION PIPE AND FITTINGS	REFERENCED STANDARD(S) PIPE	REFERENCED STANDARD(S) FITTINGS
PE-RT	X	X	ASTM F2769, CSA B137.18	ASSE 1061, ASTM D3261, ASTM F1055, ASTM F1807, ASTM F2098, ASTM F2159, ASTM F2735, ASTM F2769, ASTM F3347, ASTM F3348, CSA B137.18
PEX	X	X	ASTM F876, CSA B137.5, AWWA C904[1]	ASSE 1061, ASTM F877, ASTM F1807, ASTM F1960, ASTM F2080, ASTM F2159, ASTM F2735, ASTM F3347, ASTM F3348, CSA B137.5

(portions of table not shown remains unchanged)

TABLE 1701.1
REFERENCED STANDARDS

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTION
ASTM F3347-2020a	Metal Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing	Fittings	Table 604.1
ASTM F3348-2020b	Plastic Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing	Fittings	Table 604.1

(portions of table not shown remains unchanged)

Note: ASTM F3347 and ASTM F3348 meet the requirements for mandatory referenced standards in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

SUBSTANTIATION:
Proposal adds ASTM F3347, Metal Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing and ASTM F3348, Standard Specification for Plastic Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing to the Piping System table.

Proposals

Item #: 139

UPC 2024 Section: 604.2

SUBMITTER: Cameron Rapoport
Watts Water Technologies

RECOMMENDATION:
Revise text

604.0 Materials.

604.2 Lead Content. The maximum allowable lead content in pipes, pipe fittings, plumbing fittings, and fixtures intended to convey or dispense water for human consumption shall be not more than a weighted average of 0.25 percent with respect to the wetted surfaces of pipes, pipe fittings, plumbing fittings, and fixtures. For solder and flux, the lead content shall be not more than 0.2 percent where used in piping systems that convey or dispense water for human consumption.
Exceptions:
(1) Pipes, pipe fittings, plumbing fittings~~,~~ or fixtures ~~or back-flow preventers~~ used for nonpotable services such as manufacturing, industrial processing, irrigation, outdoor watering, or any other uses where the water is not used for human consumption.

(2) Flush valves, fill valves, flushometer valves, tub fillers, shower valves, service saddles, or water distribution main gate valves that are 2 inches (50 mm) in diameter or larger.

SUBSTANTIATION:
Backflow preventers that are intended to convey water for use in non-potable services are in contact with potable water on the upstream side. Authorities Having Jurisdiction are increasingly requiring lead free backflow preventers in these applications (i.e. irrigation, fire) for this reason. This language would align with inspectors and increase water safety with respect to lead contact.

Proposals

Item #: 140

UPC 2024 Section: 604.5, 604.12

SUBMITTER: Shane Peters
City of Santa Monica

RECOMMENDATION:
Revise text

604.0 Materials.

~~**604.5 Flexible Connectors.** Flexible water connectors shall be installed in readily accessible locations, and where under continuous pressure shall comply with ASME A112.18.6/CSA B125.6. Flexible water connectors with an excess flow shutoff device shall comply with CSA B125.5/IAPMO Z600.~~

604.12 Flexible ~~Corrugated~~ Connectors. Flexible ~~corrugated connectors of copper, copper alloy, or stainless steel~~ water connectors shall be installed in readily accessible locations and shall comply with ASME A112.18.6/CSA B125.6. Flexible water connectors with an excess flow shutoff device shall comply with CSA B125.5/IAPMO Z600. Such connectors shall be limited to the following connector lengths:
(1) Fixture Connectors – 30 inches (762 mm)
(2) Washing Machine Connectors – 72 inches (1829 mm)
(3) Dishwasher and Icemaker Connectors – 120 inches (3048 mm)
(4) Other Connections – 48 inches (1220 mm)

SUBSTANTIATION:
The change deletes Section 604.5 and relocates the language to Section 604.12. The existing language of Section 604.12 was added in 2000 (see original proposal and reason statement in at the end of the substantiation) while the field of flexible water connectors was still developing. The term “corrugated” still used in the section title now seems archaic for the current application described.

Corrugated connectors (see images below) are distinctive in appearance, were a very small portion of the market (perhaps is even smaller now) and were primarily developed for larger diameter connections. Certainly not for the relatively small and flexible diameters that serve fixture connectors, dishwasher and icemaker connections. They are not well suited for close radius change of directions like the 180° change required for most clothes washer connections.

All the Flexible Corrugated Connectors are listed to ASME A112.18.6/CSA B125.6.

Explanation:
1. Removes the specific materials section included and opens it to any material meeting the standard.
2. Removes the dubious statement “where under continuous pressure shall comply with...” They should comply with the standard whether under pressure or not.
3 Water Heater Connectors are still in the following section

604.11 Flexible Corrugated Connectors. Flexible corrugated connectors of copper or stainless steel shall be limited to the following connector lengths:
Water Heater Connectors – twenty-four inches (609 mm)
Fixture Connectors – thirty inches (762 mm)
Washing Machine Connectors – seventy-two inches (1827 mm)
Dishwasher and Icemaker Connectors – one hundred twenty inches (3048 mm)

Proponent: P.J. Higgins & Associates, Inc.

Reason for Code Revision:
Working with the listees, the Plumbing Research Committee has recommended these requirements for corrugated flexible connectors. The intent of this change is to limit the length of flexible supplies to a reasonable length, which may be found in field installations, and to prevent the flexible supply from being used as a branch line.

Code Committee's Recommendation:
Adopt Item 72

Proposals

Item #: 143

UPC 2024 Section: 605.1.3.3

SUBMITTER: Tyler Leighton
Watts Water Technologies

RECOMMENDATION:
Revise text

605.0 Joints and Connections.

605.1.3 Mechanical Joints. (remaining text unchanged)

605.1.3.3 Push Fit Fittings. Removable and nonremovable push fit fittings for copper or copper alloy tubing or pipe that employ quick assembly push fit connectors shall comply with ASSE 1061. Push fit fittings for copper or copper alloy pipe or tubing shall have an approved elastomeric o-ring that forms the joint. Pipe or tubing shall be cut square, chamfered, and reamed to full inside diameter. The tubing shall be fully inserted into the fitting, and the tubing marked at the shoulder of the fitting. The fitting alignment shall be checked against the mark on the tubing to ensure the tubing is inserted into the fitting and gripping mechanism has engaged on the pipe. Fittings used in potable water systems intended to supply drinking water shall comply with NSF 61.

SUBSTANTIATION:
The purpose of requiring NSF 61 and NSF 372 is to ensure the health and safety of everyone using these fittings in potable water applications. The provisions are consistent with those found in Section 604.1.

Proposals

Item #: 152

UPC 2024 Section: 606.1, Table 1701.1

SUBMITTER: Garry Sato
Greensmart Sustainable Concepts

RECOMMENDATION:
Revise text

606.0 Valves.

606.1 General. Valves up to and including 2 inches (50 mm) in size shall be copper alloy or other approved material. Sizes exceeding 2 inches (50 mm) shall be permitted to have cast iron or copper alloy bodies or other approved materials. Each gate or ball valve shall be a fullway or full-port type with working parts of the noncorrosive material. Valves carrying water used in potable water systems ~~intended to supply drinking water~~ shall comply ~~with the requirements of NSF 61 and~~ ASME A112.4.14, ASME B16.34, ASTM F1970, ASTM F2389, AWWA C500, AWWA C504, AWWA C507, IAPMO IGC 312, IAPMO Z1157, MSS SP-67, MSS SP-70, MSS SP-71, MSS SP-72, MSS SP-78, MSS SP-80, MSS SP-110, MSS SP-122, or NSF 359. Valves carrying water intended to supply drinking water shall also comply with NSF 61.

TABLE 1701.1
REFERENCED STANDARDS

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTION
IAPMO IGC 312-2018a	Gate, Globe, Angle, and Check Valves	Valves	606.1

(portions of table not shown remain unchanged)

Note: IAPMO IGC 312 and NSF 61 meet the requirements for mandatory referenced standards in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

SUBSTANTIATION:
The proposed text cleans up the language by adding “or other approved materials” for sizes exceeding 2” as indicated in the first sentence. NSF 61 is moved after the valve standards as NSF 61 is an additional standard required for drinking water purposes. Furthermore, IAPMO IGC 312 is being added as it is an approved standard which covers ball, gate, and globe valves that are fullway/full-port type valves.

Proposals

Item #: 153

UPC 2024 Section: 606.1

SUBMITTER: David Mann
CA State Pipe Trades Council

RECOMMENDATION:
Revise text

606.0 Valves.
606.1 General. Valves up to and including 2 inches (50 mm) in size shall be copper alloy or other approved material. Sizes exceeding 2 inches (50 mm) shall be permitted to have cast iron or copper alloy bodies. Each gate or ball valve shall be a fullway or full-port type with working parts of the noncorrosive material. Valves carrying water used in potable water systems ~~intended to supply drinking water~~ shall comply with the requirements of ~~NSF 61 and~~ ASME A112.4.14, ASME B16.34, ASTM F1970, ASTM F2389, AWWA C500, AWWA C504, AWWA C507, IAPMO Z1157, MSS SP-67, MSS SP-70, MSS SP-71, MSS SP-72, MSS SP-78, MSS SP-80, MSS SP-110, MSS SP-122, or NSF 359. Valves intended to supply drinking water shall also comply with the requirements of NSF 61.

Note: NFPA 61 meets the requirements for a mandatory referenced standard in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

SUBSTANTIATION:
The revised text clarifies the intent of NSF 61 as only being required when the valves are used when the water is intended for drinking. All the other standards are required in potable water systems.

Proposals

Item #: 155

UPC 2024 Section: 606.9, Table 1701.1

SUBMITTER: Cameron Rapoport
Watts Water Technologies

RECOMMENDATION:
Revise text

606.0 Valves.

606.9 Leak Detection Devices. Where digital leak detection devices for water supply and distribution are installed, they shall comply with IAPMO ~~IGC 115 or IAPMO IGC 349~~ IAPMO Z1349.

TABLE 1701.1
REFERENCED STANDARDS

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTION
IAPMO Z1349-2021	Devices for Detection, Monitoring or Control of Plumbing Systems	Miscellaneous	606.9

(portions of table not shown remain unchanged)

Note: IAPMO Z1349 meets the requirements for a mandatory referenced standard in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

SUBSTANTIATION:
The IAPMO IGC 115 and the IAPMO IGC 349 standards have been incorporated into one standard (IAPMO Z1349) which now incorporates digital technology.

Proposals

Item #: 156

UPC 2024 Section: 606.9, L 405.1, Table 1701.1

SUBMITTER: Rich Houle
Reliance Worldwide Corporation

RECOMMENDATION:
Revise text

606.0 Valves.

606.9 Leak Detection Devices. Where leak detection devices for water supply and distribution are installed, they shall comply with ~~IAPMO IGC 115 or IAPMO IGC 349~~ IAPMO Z1349.

L 405.0 Leak Detection and Control.
L 405.1 General. Where installed, leak detection and control devices shall comply with ~~IAPMO IGC 115 or IAPMO IGC 349~~ IAPMO Z1349. Leak detection and control devices help protect property from water damage and also conserve water by shutting off the flow when leaks are detected.

TABLE 1701.1
REFERENCED STANDARDS

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTION
IAPMO Z1349-2021	Devices for Detection, Monitoring or Control of Plumbing Systems	Miscellaneous	606.9

(portions of table not shown remain unchanged)

Note: IAPMO Z1349 meets the requirements for a mandatory referenced standard in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

SUBSTANTIATION:
The standard IAPMO IGC 115 and IGC 349 have been updated and have gone through the ANSI process. Both IGC 115 and IGC 349 have been combined into one standard; ANSI/CAN/IAPMO Z1349.

Proposals

Item #: 165

UPC 2024 Section: Table 610.3

SUBMITTER: Lance MacNevin
Plastics Pipe Institute

RECOMMENDATION:
Revise text

TABLE 610.3
WATER SUPPLY FIXTURE UNITS (WSFU) AND MINIMUM FIXTURE BRANCH PIPE SIZES[3]

APPLIANCES, APPURTENANCES OR FIXTURES[2]	MINIMUM FIXTURE BRANCH PIPE SIZE[1,4] (inches)	PRIVATE	PUBLIC	ASSEMBLY[6]
Bathtub or Combination Bath/Shower (fill)[9]	1/2	4.0	4.0	—
3/4 inch Bathtub Fill Valve	3/4	10.0	10.0	—
Bidet[9]	1/2	1.0	—	—
Clothes Washer	1/2	4.0	4.0	—
Dental Unit, cuspidor	1/2	—	1.0	—
Dishwasher, domestic[9]	1/2	1.5	1.5	—
Drinking Fountain or Water Cooler	1/2	0.5	0.5	0.75
Hose Bibb	1/2	2.5	2.5	—
Hose Bibb, each additional8	1/2	1.0	1.0	—
Lavatory[9]	1/2	1.0	1.0	1.0
Lawn Sprinkler, each head[5]	—	1.0	1.0	—
Mobile Home, each (minimum)	—	12.0	—	—
Sinks	—	—	—	—
Bar[9]	1/2	1.0	2.0	—
Clinical Faucet	1/2	—	3.0	—
Clinical Flushometer Valve with or without faucet	1	—	8.0	—
Kitchen, domestic with or without dishwasher[9]	1/2	1.5	1.5	—
Laundry[9]	1/2	1.5	1.5	—
Service or Mop Basin[9]	1/2	1.5	3.0	—
Washup, each set of faucets[9]	1/2	—	2.0	—
Shower, per head[9]	1/2	2.0	2.0	—
Urinal, 1.0 GPF Flushometer	3/4	See Footnote[7]		—

Valve				
Urinal, greater than 1.0 GPF Flushometer Valve	3/4	See Footnote[7]		—
Urinal, flush tank	1/2	2.0	2.0	3.0
Urinal with Drain Cleansing Action	1/2	1.0	1.0	1.0
Wash Fountain, circular spray	3/4	—	4.0	—
Water Closet, 1.6 GPF Gravity Tank[9]	1/2	2.5	2.5	3.5
Water Closet, 1.6 GPF Flushometer Tank[9]	1/2	2.5	2.5	3.5
Water Closet, 1.6 GPF Flushometer Valve	1	See Footnote[7]		—
Water Closet, greater than 1.6 GPF Gravity Tank	1/2	3.0	5.5	7.0
Water Closet, greater than 1.6 GPF Flushometer Valve	1	See Footnote[7]		—

For SI units: 1 inch = 25 mm

Notes:

[1] Size of the cold branch pipe, or both the hot and cold branch pipes.

[2] Appliances, appurtenances, or fixtures not referenced in this table shall be permitted to be sized by reference to fixtures having a similar flow rate and frequency of use.

[3] The listed fixture unit values represent their load on the cold water building supply. The separate cold water and hot water fixture unit value for fixtures having both hot and cold water connections shall be permitted to be each taken as three-quarter of the listed total value of the fixture.

[4] The listed minimum supply branch pipe sizes for individual fixtures are the nominal (I.D.) pipe size.

[5] For fixtures or supply connections likely to impose continuous flow demands, determine the required flow in gallons per minute (gpm) (L/s), and add it separately to the demand in gpm (L/s) for the distribution system or portions thereof.

[6] Assembly [Public Use (See Table 422.1)].

[7] Where sizing flushometer systems, see Section 610.10.

[8] Reduced fixture unit loading for additional hose bibbs is to be used where sizing total building demand and for pipe sizing where more than one hose bibb is supplied by a segment of water distribution pipe. The fixture branch to each hose bibb shall be sized on the basis of 2.5 fixture units.

[9] Nominal tubing size 3/8 shall be permitted to be used where hydraulic calculations support the use of this size.

SUBSTANTIATION:

Many of the appliances, appurtenances or fixtures which are currently approved for use are subject to water conservation regulations which reduce their WSFU demand, and therefore their required supply pipe sizing. The twelve (12) specific Appliances, Appurtenances or Fixtures to which footnote 9 is proposed to be added meet this description.

Plumbing system designers should have the option to supply these appliances, appurtenances or fixtures with NTS 3/8 tubing, where supported by hydraulic calculations which demonstrate sufficient flow and pressure supply. This will assist with conservation of water, as 3/8 tubing has approximately half the volume of 1/2 tubing, so hot-water fixtures will require less flushing of water before hot water arrives. The addition of footnote 9 as proposed is independent of the tubing material.

Proposals

Item #: 166

UPC 2024 Section: Table 610.3

SUBMITTER: David Mann
CA State Pipe Trades Council

RECOMMENDATION:
Revise text

TABLE 610.3
WATER SUPPLY FIXTURE UNITS (WSFU) AND MINIMUM FIXTURE BRANCH PIPE SIZES[3]

APPLIANCES, APPURTENANCES OR FIXTURES[2]	MINIMUM FIXTURE BRANCH PIPE SIZE[1,4] (inches)	PRIVATE	PUBLIC	ASSEMBLY[6]
Nonwater Urinal with Drain Cleansing Action	½	1.0	1.0	1.0

(portions of table not shown remain unchanged)

SUBSTANTIATION:
Add “nonwater” to correlate with other sections of this type of urinals. The "Nonwater Urinal with Drain Cleansing Action" term is already in Table 701.2, the definition, and other sections of the UPC.

Proposals

Item #: 167

UPC 2024 Section: 701.2, 701.3.3, 701.8, Table 1701.1

SUBMITTER: Todd Grayson
Crushproof Tubing Co

RECOMMENDATION:
Revise text

701.0 General.

701.2 Drainage Piping. Materials for drainage piping shall be in accordance with one of the referenced standards in Table 701.2 except that:
(1) No galvanized wrought-iron or galvanized steel pipe shall be used underground and shall be kept not less than 6 inches (152 mm) aboveground.
(2) ABS and PVC DWV piping installations shall be installed in accordance with applicable standards referenced in Table 701.2 and Chapter 14 “Firestop Protection.” Except for individual single-family dwelling units, materials exposed within ducts or plenums shall have a flame-spread index of not more than 25 and a smoke-developed index of not more than 50, where tested in accordance with ASTM E84 or UL 723. Plastic piping installed in plenums shall be tested in accordance with all requirements of ASTM E84 or UL 723. Mounting methods, supports and sample sizes of materials for testing that are not specified in ASTM E84 or UL 723 shall be prohibited.
(3) No vitrified clay pipe or fittings shall be used aboveground or where pressurized by a pump or ejector. They shall be kept not less than 12 inches (305 mm) belowground.
(4) Copper or copper alloy tube for drainage and vent piping shall have a weight of not less than that of copper or copper alloy drainage tube type DWV.
(5) Stainless steel 304 pipe and fittings shall not be installed underground and shall be kept not less than 6 inches (152 mm) aboveground.
(6) Cast-iron soil pipe and fittings and the stainless steel couplings used to join these products shall be listed and tested in accordance with standards referenced in Table 701.2. Such pipe and fittings shall be marked with the country of origin, manufacturer’s name or registered trademark as defined in the product standards, the third party certifier’s mark, and the class of the pipe or fitting.
(7) Flexible trap assemblies meeting the IAPMO IGC 361 listing are permissible for all applications in Table 702.1 where the trap is directly accessible.

701.3.3 Type. Fittings used for drainage shall be of the drainage type, have a smooth interior water-way except for Section 701.2 (7) applications, and be constructed to allow 1/4 inch per foot (20.8 mm/m) grade.

701.8 Disinfection. Drainage pipe between a water fixture and trap should be disinfected as necessary using Centers for Disease Control guidelines to help prevent the spread of infectious diseases that can live in these areas. Drain applications in clinical settings shall use a trap system that allows for regular disinfection.

TABLE 1701.1
REFERENCED STANDARDS

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTION
IAPMO IGC 361-2019	Continuous Flexible Self-Plunging Waste Pipes	Piping	701.2

(portions of table not shown remain unchanged)

Note: IAPMO IGC 361 meets the requirements for a mandatory referenced standard in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

SUBSTANTIATION:
The viability of any material or design should be based on meeting the health, safety, and performance requirements for the application. In that respect, the current code is unnecessarily biased against flexible drain pipes in open/exposed applications where there is no risk of pervasive flooding/leaking/damage and access for repair or replacement is convenient. So if the material and design are doing the job as required by the Code and there's little risk, why inhibit the development of new products?

To that end, there are some health and performance issues with existing tailpipe and trap standards that are not being solved with hard pipe, so innovation is badly needed. The most significant example is the ability of viruses and bacteria to live (and in the case of bacteria, multiply) inside the tailpipe and trap when both are functioning as the current Code intends, and then migrate out via normal air exchanges into living space. The COVID-19 outbreak has made the dangers of airborne pathogens all that much more clear, and turning on the HVAC system in your home is like making your sink sneeze on you. Whereas a drain pipe made of soft material can be clamped off to allow for fast and easy disinfection because the entire system can be filled with a dilute bleach solution and allowed to soak, it is much harder for that kind of contact time with a rigid, open-ended system like plastic pipes create today.

Homeowners should be allowed to decide if and when they disinfect their drains, but clinical settings like hospitals would certainly benefit from a regular disinfection regimen, such as when they move a patient out of a room. In that respect, it may actually make sense for health care officials to mandate disinfection in clinical settings in the future. It would therefore be helpful to require new installations in clinical settings to allow for some method of easy and cost-effective disinfection. If we all recognize the dangers of sewer gases to disease spread, why are we ignoring those same pathogens coming up from the exposed pipe surfaces between the faucet and trap?

Other benefits include:
--Flexible pipes are able to be snaked without the risk of breaking the seal on a joint and can be bumped through normal use without the same leak potential.
--Some flexible systems could also meet ADA requirements because they wouldn't hurt knees/legs if someone in a wheelchair uses the sink.
--Regular clog/cleaning maintenance is easier with a flexible system.
--There can be fewer leak points.
--A soft polymer like rubber can create superior seals when compared to plastic-on-plastic.
--Softer materials could be freeze-proof for some outdoor or seasonal applications like public restrooms or campgrounds.
--Help to eliminate the use of hard plastic accordion pipes to solve out-of-alignment applications. This could take a known problem and replace it with a better performing product.

Proposals

Item #: 175

UPC 2024 Section: 204.0, Table 702.1

SUBMITTER: Julius Ballanco, P.E.
JB Engineering and Code Consulting, P.C.
Rep. Self

RECOMMENDATION:
Revise text

204.0 -B-

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

Half Group. A group of fixtures located together for use by a single occupant consisting of a water closet and lavatory.

702.0 Fixture Unit Equivalents.

702.1 Trap Size. The unit equivalent of plumbing fixtures shown in Table 702.1 shall be based on the size of the trap required, and the unit equivalent of fixtures and devices not shown in Table 702.1 shall be based on the size of trap or trap arm.

Maximum drainage fixture units for a fixture trap and trap arm loadings for sizes up to 4 inches (100 mm) shall be in accordance with Table 702.1(1).

TABLE 702.1
DRAINAGE FIXTURE UNIT VALUES (DFU)

PLUMBING APPLIANCES, APPURTENANCES, OR FIXTURES	MINIMUM SIZE TRAP AND TRAP ARM[7] (inches)	PRIVATE	PUBLIC	PUBLIC ASSEMBLY[8]
Bathroom Group (1.6 gpf or less water closet)	-	-	-	-
Half Group		3.5		
1 Bathroom Group		5		
1-1/2 Bathroom Groups		6		
2 Bathroom Groups		7		
2-1/2 Bathroom Groups		8		
3 Bathroom Groups		9		
Each Additional Half Groups		0.5		
Each Additional Bathroom Groups		1		
Bathroom Group (Greater than 1.6 gpf water closet)	-	-	-	-
Half Group		3.5		
1 Bathroom Group		6		
1-1/2 Bathroom Groups		8		
2 Bathroom Groups		10		
2-1/2 Bathroom Groups		11		
3 Bathroom Groups		12		
Each Additional Half Groups		0.5		
Each Additional Bathroom Groups		1		

(portions of table not shown remain unchanged)

For SI units: 1 inch = 25 mm

Notes:

1 Indirect waste receptors shall be sized based on the total drainage capacity of the fixtures that drain thereinto, in accordance with Table 702.2.

2 Provide a 2 inch (50 mm) minimum drain.

3 For refrigerators, coffee urns, water stations, and similar low demands.

4 For commercial sinks, dishwashers, and similar moderate or heavy demands.

5 Buildings having a clothes-washing area with clothes washers in a battery of three or more clothes washers shall be rated at 6 fixture units each for purposes of sizing common horizontal and vertical drainage piping.

6 Water closets shall be computed as 6 fixture units where determining septic tank sizes based on Appendix H of this code.

7 Trap sizes shall not be increased to the point where the fixture discharge is capable of being inadequate to maintain their self-scouring properties.

8 Assembly [Public Use (see Table 422.1)].

9 For a bathtub to shower retrofit, a 1-$^{1}/_{2}$ inch (40 mm) trap and trap arm shall be permitted with a maximum shower size of 36 inches (914 mm) in width and 60 inches (1524 mm) in length. See Section 408.5 and Section 408.6.

SUBSTANTIATION:

This change adds a new definition of bathroom group and half bath. These two definitions allow a new category of fixtures to be added to the drainage fixture unit table.

Tom Konen, P.E. did extensive research on the impact of flows in the overall drainage systems design using low flow fixtures. The proposed new table of fixture unit values was published in 1994.

Konen identified in his paper is that families are getting smaller and houses are getting bigger with more bathrooms. Using the queuing theory developed by Dr. Roy B. Hunter, Konen determined that the use of fixtures varies based on the number of fixture installed in a dwelling unit. A five bathroom home occupied by 3 people could not possibly have a peak demand whereby half of the fixture are used simultaneously. Konen's data identified the frequency of use. The data resulted in a revised fixture unit table for bathroom groups. This table has been included in the IAPMO National Standard Plumbing Code since the publication of Konen's paper. To date, I am unaware of the information being proposed to the UPC. This will add the accepted practice of lowering the fixture unit value for bathroom groups.

Proposals

Item #: 177

UPC 2024 Section: 705.6.2, Table 1701.1, Table 1701.2

SUBMITTER: Michael Cudahy
PPFA

RECOMMENDATION:
Revise text

705.0 Joints and Connections.

705.6 PVC and PVC Co-Extruded Plastic Pipe and Joining Methods.

705.6.2 Solvent Cement Joints. Solvent cement joints for PVC pipe and fittings shall be clean from dirt and moisture. Pipe shall be cut square and pipe shall be deburred. Where surfaces to be joined are cleaned and free of dirt, moisture, oil, and other foreign material, apply primer purple in color that complies with ASTM F656. Primer shall be applied to the surface of the pipe and fitting is softened. Solvent cement that comply with ASTM D2564 shall be applied to all joint surfaces. Joints shall be made while both the inside socket surface and outside surface of pipe are wet with solvent cement. Two-step joining methods shall be in accordance with ASTM D2855. Hold joint in place and undisturbed for 1 minute after assembly.

TABLE 1701.1
REFERENCED STANDARDS

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTION
ASTM D2855-2020	Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets	Joints	605.2.2, 605.3.1

(portions of table not shown remains unchanged)

Note: ASTM D2855 meets the requirements for a mandatory referenced standards in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

TABLE 1701.2
STANDARDS, PUBLICATIONS, PRACTICES, AND GUIDES

DOCUMENT NUMBER	DOCUMENT TITLE	APPLICATION
~~ASTM D2855-2015~~	~~Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets~~	~~Joints~~

(portions of table not shown remain unchanged)

SUBSTANTIATION:
The standard for two step solvent cement joining is ASTM D2855, "Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets."

Proposals

Item #: 178

UPC 2024 Section: 705.7 – 705.7.2, Table 1701.1

SUBMITTER: William E Chapin
Professional Code Consulting, LLC

RECOMMENDATION:
Add new text

705.0 Joints and Connections.

705.7 Polyolefin Pipe (DWV) and Joints. Joints between polyolefin plastic pipe and fittings shall be installed in accordance with the manufacturer's installation instructions and shall comply with Section 705.7.1 or Section 705.7.2.
705.7.1 Heat-fusion Joints. Heat-fusion joints for polyolefin pipe and tubing joints shall be installed with socket-type heat-fused polyolefin fittings or electrofusion polyolefin fittings. Joint surfaces shall be clean and free from moisture. The joint shall be undisturbed until cool. Joints shall be made in accordance with ASTM F3371.
705.7.2 Mechanical Joints. Mechanical joints shall be designed to provide a permanent seal and shall be of the mechanical or push-on joint type. The push-on join shall include an elastomeric gasket and shall provide a compressive force against the spigot and socket after assembly to provide a permanent seal. Joints shall be made in accordance with ASTM F3371.

(renumber remaining sections)

TABLE 1701.1
REFERENCED STANDARDS

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTION
ASTM F3371-2019	Polyolefin Pipe and Fittings for Drainage, Waste, and Vent Applications	Piping	705.7.1, 705.7.2

(portions of table not shown remains unchanged)

Note: ASTM F3371 meets the requirements for a mandatory referenced standard in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

SUBSTANTIATION:
ASTM F3371 was developed and published as it includes the same requirements as ASTM F1412 minus the chemical resistance testing. Also, note that other ASTM for DWV application do not include a chemical resistance test. Under the scope of ASTM F3371, two polyolefins materials are covered; polyethylene (PE) and polypropylene (PP).

Proposals

Item #: 180

UPC 2024 Section: 706.2

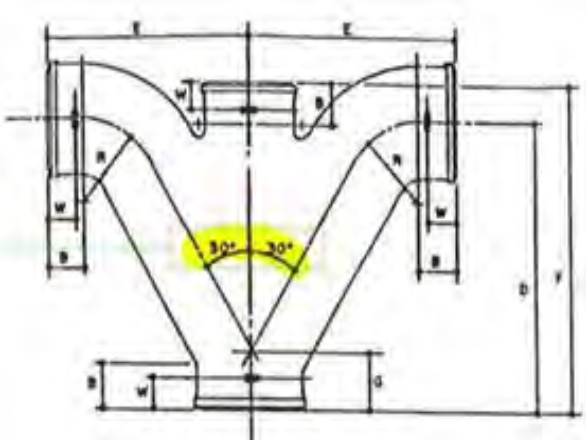
SUBMITTER: Shane Peters
City of Santa Monica

RECOMMENDATION:
Revise text

706.0 Changes in Direction of Drainage Flow.

706.2 Horizontal to Vertical. Horizontal drainage lines, connecting with a vertical stack, shall enter through 45 degree (0.79 rad) wye branches, 60 degree (1.05 rad) wye branches, combination wye and one-eighth bend branches, double fixture fittings, sanitary tee or sanitary tapped tee branches, or other approved fittings of equivalent sweep. No fitting having more than one inlet at the same level shall be used unless such fitting is constructed so that the discharge from one inlet cannot readily enter any other inlet. Double sanitary tees shall be permitted to be used where the barrel of the fitting is not less than two pipe sizes larger than the largest inlet, (pipe sizes recognized for this purpose are 2 inches, 2½ inches, 3 inches, 3½ inches, 4 inches, 4½ inches, 5 inches, 6 inches, etc.) (50 mm, 65 mm, 80 mm, 90 mm, 100 mm, 115 mm, 125 mm, 150 mm, etc.).

SUBSTANTIATION:
1. If a double fixture fitting can serve back to back or side by side fixture connections with no discharge from one trap arm to the other surely it is adequate to connect horizontal drain lines to a stack.
2. Double fixture fittings are a wye type fitting. Depending upon the material and manufacture the angle may be 45 to 60 degrees, complying with the requirements but not listed as an acceptable fitting
3. From UPC A & A Committee UPC 16-163:
Yes, a figure 5 fitting meets the requirements found in Section 706.2 for horizontal to vertical change in direction.
4. From UPC A&A Committee UPC 20-93:
Yes. Section 706.2 of the 2018 Uniform Plumbing Code (UPC), states "…No fitting having more than one inlet at the same level shall be used unless such fitting is constructed so that the discharge from one inlet cannot readily enter any other inlet". A figure five cast iron fitting, though designed for back-to-back fixture connections, is configured to prevent the discharge from one inlet from entering the adjacent inlet.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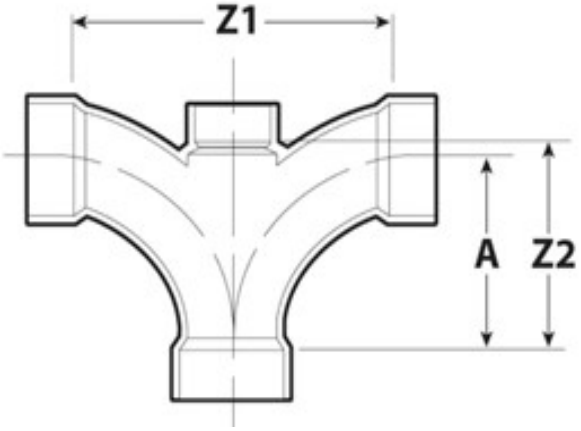
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Proposals

Item #: 181

UPC 2024 Section: 707.4

SUBMITTER: Shane Peters
City of Santa Monica

RECOMMENDATION:
Revise text

707.0 Cleanouts.

707.4 Location. Each horizontal drainage pipe shall be provided with a cleanout at its upper terminal, and each run of piping, that is more than 100 feet (30 480 mm) in total developed length, shall be provided with a cleanout for each 100 feet (30 480 mm), or fraction thereof, in length of such piping. An additional cleanout shall be provided in a drainage line for each aggregate horizontal change in direction exceeding 135 degrees (2.36 rad). A cleanout shall be installed above the fixture connection fitting, serving each urinal, regardless of the location of the urinal in the building.

Exceptions:

(1) Cleanouts shall be permitted to be omitted on a horizontal drain line less than 5 feet (1524 mm) in length unless such line is serving sinks or urinals.

(2) Cleanouts shall be permitted to be omitted on a horizontal drainage pipe installed on a slope of 72 degrees (1.26 rad) or less from the vertical angle (one-fifth bend).

(3) Excepting the building drain, its horizontal branches, kitchen sinks, and urinals, a cleanout shall not be required on a pipe or piping that is above the floor level of the lowest floor of the building.

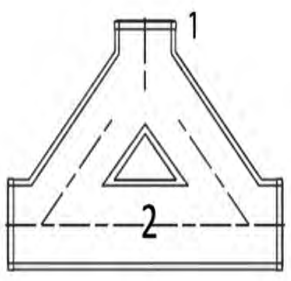
(4) An approved type of two-way cleanout fitting or field made double wye (wye and 1/8 bend fitting) in a back to back configuration, installed inside the building wall near the connection between the building drain and the building sewer or installed outside of a building at the lower end of a building drain and extended to grade, shall be permitted to be substituted for an upper terminal cleanout.

SUBSTANTIATION:

While many of us may not be fans of two cleanouts, they are permitted.

The question is which design offers the best experience for a snaking a drain?

The ‘approved type of two-way cleanout(1)’ has one opening and the deeper in the ground it is located the less control you have on which way the cable it is going to travel in the building sewer. In this pattern there is also a ‘dead’ spot(2) the snake is unable to clean.



The field made two-way cleanout has two openings and the direction of travel is assured. Most users (drain cleaners) believe the field made two-way cleanout is a superior design.

Many times the inspector will reject the installation of the field made two-way cleanout, (commenting it’s design allows better access) because it is not included in 707.4.

Proposals

Item #: 182

UPC 2024 Section: 707.4

SUBMITTER: Mark Woodwick
Woodwick Plumbing LLC

RECOMMENDATION:
Revise text

707.0 Cleanouts.

707.4 Location. Each horizontal drainage pipe shall be provided with a cleanout at its upper terminal, and each run of piping, that is more than 100 feet (30 480 mm) in total developed length, shall be provided with a cleanout for each 100 feet (30 480 mm), or fraction thereof, in length of such piping. An additional cleanout shall be provided in a drainage line for each aggregate horizontal change in direction exceeding 135 degrees (2.36 rad). A cleanout shall be installed above the fixture ~~connection fitting~~ flood rim, serving each urinal or battery of toilets, regardless of the location of the urinal or battery of toilets in the building.

Exceptions:

(1) Cleanouts shall be permitted to be omitted on a horizontal drain line less than 5 feet (1524 mm) in length unless such line is serving sinks or urinals.

(2) Cleanouts shall be permitted to be omitted on a horizontal drainage pipe installed on a slope of 72 degrees (1.26 rad) or less from the vertical angle (one-fifth bend).

(3) Excepting the building drain, its horizontal branches, kitchen sinks, and urinals, a cleanout shall not be required on a pipe or piping that is above the floor level of the lowest floor of the building.

(4) An approved type of two-way cleanout fitting, installed inside the building wall near the connection between the building drain and the building sewer or installed outside of a building at the lower end of a building drain and extended to grade, shall be permitted to be substituted for an upper terminal cleanout.

SUBSTANTIATION:

Imagine if you will, a battery of 6 toilets in a public restroom that are nearly overflowing due to a down stream blockage. Per the current code, the clean out by which to run the line with a drain machine is located only above the finished floor yet it is below the flood rim of all these toilets. The ensuing mess is and has been horrible.

Whereas, if the clean out is required by code to be above the flood rim of these fixtures, the sewage is not spilt all over the floor, but is contained and the blockage can be cleared more readily.

Please amend the clean out location requirement to be above the flood rim of any fixture served.

Proposals

Item #: 183

UPC 2024 Section: 707.4.1

SUBMITTER: David Mann
CA State Pipe Trades Council

RECOMMENDATION:
Add new text

707.0 Cleanouts.

707.4 Location. Each horizontal drainage pipe shall be provided with a cleanout at its upper terminal, and each run of piping, that is more than 100 feet (30 480 mm) in total developed length, shall be provided with a cleanout for each 100 feet (30 480 mm), or fraction thereof, in length of such piping. An additional cleanout shall be provided in a drainage line for each aggregate horizontal change in direction exceeding 135 degrees (2.36 rad). A cleanout shall be installed above the fixture connection fitting, serving each urinal, regardless of the location of the urinal in the building.

Exceptions:

(1) Cleanouts shall be permitted to be omitted on a horizontal drain line less than 5 feet (1524 mm) in length unless such line is serving sinks or urinals.

(2) Cleanouts shall be permitted to be omitted on a horizontal drainage pipe installed on a slope of 72 degrees (1.26 rad) or less from the vertical angle (one-fifth bend).

(3) Excepting the building drain, its horizontal branches, kitchen sinks, and urinals, a cleanout shall not be required on a pipe or piping that is above the floor level of the lowest floor of the building.

(4) An approved type of two-way cleanout fitting, installed inside the building wall near the connection between the building drain and the building sewer or installed outside of a building at the lower end of a building drain and extended to grade, shall be permitted to be substituted for an upper terminal cleanout.

707.4.1 Load Rated Cover. Cleanout floor Covers and top rims meant to take loads shall be rated for the loading in accordance with ASME A112.36.2M.

Note: ASME A112.36.2M meets the requirements for a mandatory referenced standard in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

SUBSTANTIATION:
The code book is currently silent on load bearing covers for floor cleanouts. This is a safety feature that should be included to guide the end users to make sound judgments on appropriate loading applications for these cleanout covers.

Proposals

Item #: 184

UPC 2024 Section: 708.1

SUBMITTER: Shane Peters
City of Santa Monica

RECOMMENDATION:
Revise text

708.0 Grade of Horizontal Drainage Piping.

708.1 General. ~~Horizontal drainage~~ Building drain piping shall be run in practical alignment and a uniform slope of not less than ¼ inch per foot (20.8 mm/m) or 2 percent toward the point of disposal. ~~provided that, where~~
Exception: Where it is impractical due to the depth of the street sewer, ~~to the~~ structural features, or ~~to~~ the arrangement of a building or structure to obtain a slope of ¼ inch per foot (20.8 mm/m) or 2 percent, ~~such pipe or~~ building drain piping 4 inches (100 mm) or larger in diameter shall be permitted to have a slope of not less than 1/8 inch per foot (10.4 mm/m) or 1 percent, where first approved by the Authority Having Jurisdiction.

SUBSTANTIATION:
Because building drain and building sewer requirements are both in the same chapter, identifying what is being referenced and spoken about will be helpful for the end user. Furthermore, the addition of a exception for the language stated in Section 708.1 is being added to separate the language where a 1/4 inch is not practical.

Proposals

Item #: 185

UPC 2024 Section: 708.1, Table 703.2

SUBMITTER: Arnie Rodio
Self

RECOMMENDATION:
Revise text

708.0 Grade of Horizontal Drainage Piping.
708.1 General. Horizontal drainage piping shall be run in practical alignment and a uniform slope of not less than ¼ inch per foot (20.8 mm/m) or 2 percent toward the point of disposal provided that, where it is impractical due to the depth of the street sewer, to the structural features, or to the arrangement of a building or structure to obtain a slope of ¼ inch per foot (20.8 mm/m) or 2 percent, such pipe or piping ~~4~~ 5 inches (~~100~~ 127 mm) or larger in diameter shall be permitted to have a slope of not less than $^1/_8$ inch per foot (10.4 mm/m) or 1 percent, where first approved by the Authority Having Jurisdiction.

TABLE 703.2
MAXIMUM UNIT LOADING AND MAXIMUM LENGTH OF DRAINAGE AND VENT PIPING

SIZE OF PIPE (inches)	1¼	1½	2	3	4	5	6	8	10	12
Maximum Units										
Drainage Piping[1]										
Vertical	1	2[2, 7]	16[3]	48[4]	256	600	1380	3600	5600	8400
Horizontal	1	1[7]	8[3]	35[4]	216[5]	428[5]	720[5]	2640[5]	4680[5]	8200[5]
Maximum Length										
Drainage Piping										
Vertical, (feet)	45	65	85	212	300	390	510	750	–	–
Horizontal (unlimited)										
Vent Piping										
Horizontal and Vertical[6]										
Maximum Units	1	8[3]	24	84	256	600	1380	3600	–	–
Maximum Lengths, (feet)	45	60	120	212	300	390	510	750		

For SI units: 1 inch = 25 mm, 1 foot = 304.8 mm

Notes:

[1] Excluding trap arm.

[2] Except for sinks, urinals, and dishwashers – exceeding 1 fixture unit.

[3] Except for six-unit traps or water closets.

[4] Not to exceed ~~five~~ six water closets or five six-unit traps.

[5] Based on ¼ inch per foot (20.8 mm/m) slope. For $^1/_8$ of an inch per foot (10.4 mm/m) slope, multiply horizontal fixture units by a factor of 0.8.

[6] The diameter of an individual vent shall be not less than 1¼ inches (32 mm) nor less than one-half the diameter of the drain to which it is connected. Fixture unit load values for drainage and vent piping shall be computed from Table 702.1 and Table 702.2. Not to exceed one-third of the total permitted length of a vent shall be permitted to be installed in a horizontal position. Where vents are increased one pipe size for their

entire length, the maximum length limitations specified in this table do not apply. This table is in accordance with the requirements of Section 901.3.

[7] Up to 8 public lavatories are permitted to be installed on a 1½ inch (40 mm) vertical branch or horizontal sanitary branch sloped at ¼ inch per foot (20.8 mm/m).

SUBSTANTIATION:
The 1/8 slope with the 0.8 factor of Note (5) in Table 703.2, should not be permitted for 4 inch pipe due to requirements of low flow water closets and other water conserving fixtures. The lack of volume of the low flow fixtures have less scouring and carrying rate. The two-percent slope verses a one-percent slope helps alleviate these issues.

Proposals

Item #: 197

UPC 2024 Section: 718.1

SUBMITTER: Shane Peters
City of Santa Monica

RECOMMENDATION:
Revise text

718.0 Grade, Support, and Protection of Building Sewers.

718.1 Slope. Building sewers shall be run in practical alignment and at a uniform slope of not less than ¼ inch per foot (20.8 mm/m) toward the point of disposal.
Exception: Where approved by the Authority Having Jurisdiction and where it is impractical, due to the depth of the street sewer, ~~or to~~ the structural features or the arrangement of a building or structure, to obtain a slope of ¼ inch per foot (20.8 mm/m), ~~such pipe or~~ piping 4 inches (100 mm) through 6 inches (150 mm) shall be permitted to have a slope of not less than 1/8 inch per foot (10.4 mm/m) and ~~such~~ piping 8 inches (200 mm) and larger shall be permitted to have a slope of not less than 1/16 inch per foot (5.2 mm/m). The maximum and minimum fixture unit loading shall be in accordance with Table 717.1.

SUBSTANTIATION:
While there is a reference to Table 717.1 in the previous section and the table is located between the 2 sections, adding a ‘reminder’ here for users is prudent.

Proposals

Item #: 227

UPC 2024 Section: Table 1002.2

SUBMITTER: Phillip H Ribbs
PHR Consultants

RECOMMENDATION:
Revise text

TABLE 1002.2
HORIZONTAL LENGTHS OF TRAP ARMS
(EXCEPT FOR WATER CLOSETS AND SIMILAR FIXTURES)[1, 2]

TRAP ARM PIPE DIAMETER (inches)	DISTANCE TRAP TO VENT MINIMUM (inches)	LENGTH MAXIMUM (inches)
1¼	2½	30
1½	3	42
2	4	60
3	6	72
4	8	120
Exceeding 4	2 x Diameter	120

For SI units: 1 inch = 25.4 mm

Notes:

[1] Maintain ¼ inch per foot slope (20.8 mm/m).

[2] The developed length between the trap of a water closet or similar fixture (measured from the ~~top~~ face of the closet flange to the inner edge of the vent) and its vent shall not exceed 6 feet (1829 mm).

SUBSTANTIATION:
Flanges are installed either flush with the floor or flush with the wall. This change is a clarification which will address the intent of footnote (2) as the measurement should always be taken from the face of the flange which is not necessarily the top.

TC Discussion:

Move to accept.

Proposals

Item #: 228

UPC 2024 Section: Table 1002.2

SUBMITTER: John Lansing
PAE Consulting Engineers
Rep. American Society of Plumbing Engineers

RECOMMENDATION:
Revise text

TABLE 1002.2
HORIZONTAL LENGTHS OF TRAP ARMS
(EXCEPT FOR WATER CLOSETS AND SIMILAR FIXTURES)[1, 2, 3]

TRAP ARM PIPE DIAMETER (inches)	DISTANCE TRAP TO VENT MINIMUM (inches)	LENGTH MAXIMUM (inches)
1¼	2½	30
1½	3	42
2	4	60
3	6	72
4	8	120
Exceeding 4	2 x Diameter	120

For SI units: 1 inch = 25.4 mm

Notes:

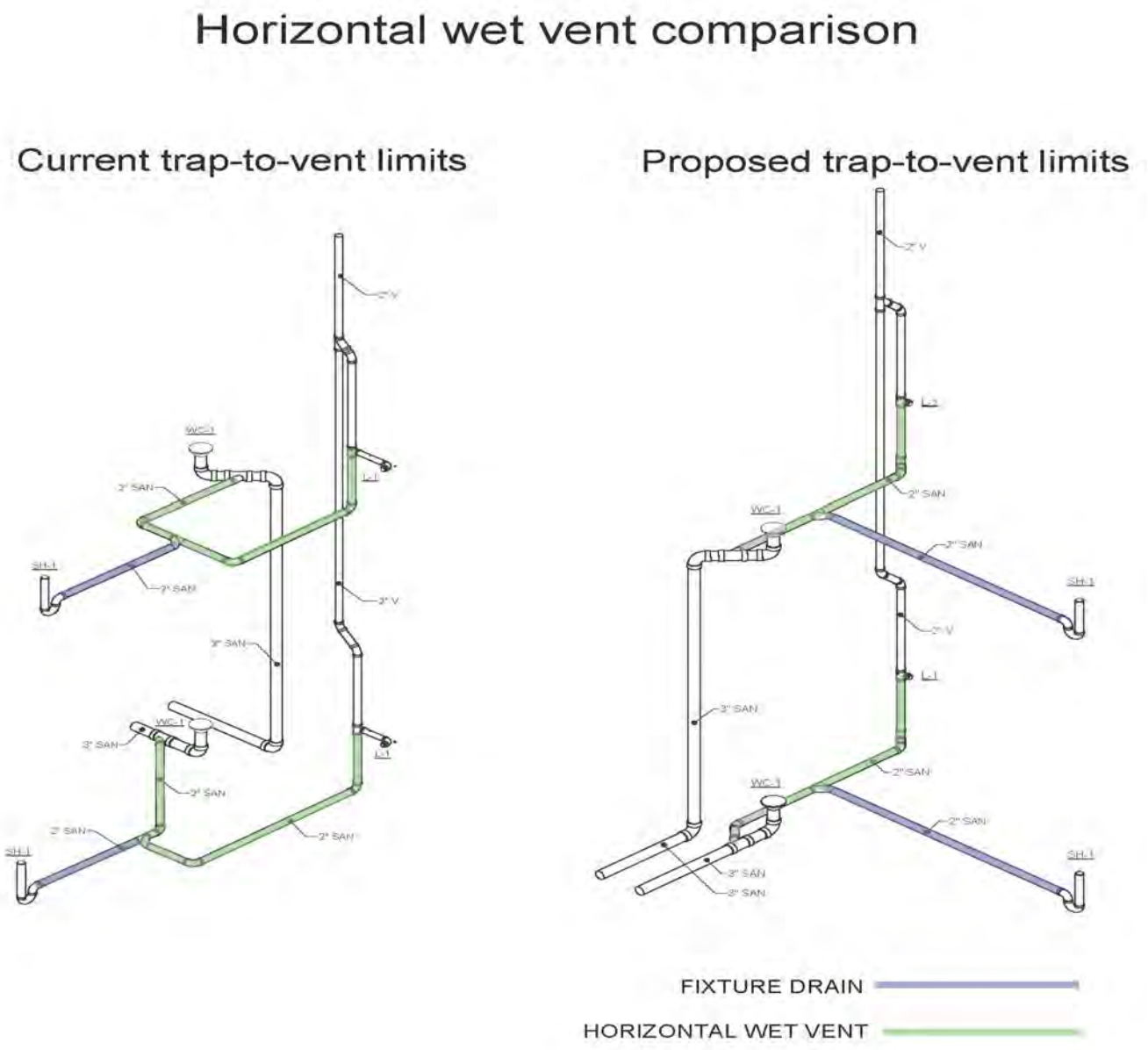
[1] Maintain 1/4 inch per foot slope (20.8 mm/m).

[2] The developed length between the trap of a water closet or similar fixture (measured from the top of the closet flange to the inner edge of the vent) and its vent shall not exceed 6 feet (1829 mm).

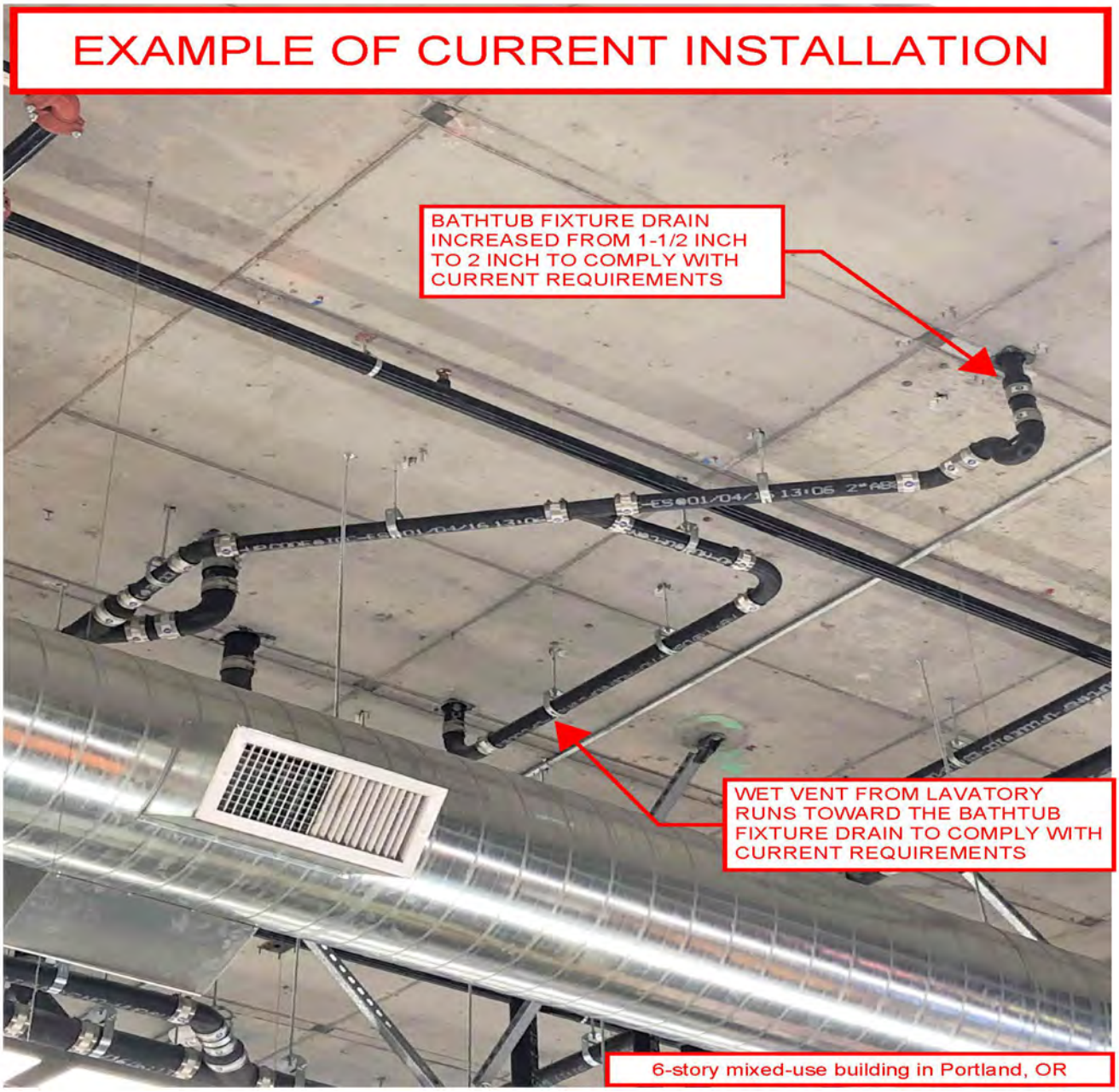
[3] Horizontally wet vented bathtubs, showers and similar fixtures shall be limited to a maximum of 6 feet (1830 mm) for 1-1/2 inch (40 mm) fixture drains and 8 feet (2440 mm) for 2 inch (50 mm) fixture drains, maintaining ¼ inch per foot slope (20 mm/m).

SUBSTANTIATION:
Since the introduction of horizontal wet venting in the 2009 Uniform Plumbing Code, many installations feature roundabout piping configurations in order to meet the maximum 3'-6" trap-to-vent distance from the bathtub, as required in Table 1002.2 for 1-1/2 inch fixture drains. We believe that the trap-to-vent requirement was mistakenly incorporated into the code language, given that the original conclusions from the National Bureau of Standards analysis and experimental testing on horizontal wet venting recommended greater allowances for trap arm lengths. The National Bureau of Standards, which originally helped produce many of the tables and recommendations in the UPC regarding sanitary drainage and vent systems, investigated horizontal wet vent systems to verify performance for the inclusion into plumbing codes. Their report, BMS 119 Wet Venting of Plumbing Fixtures, found that a 1-1/2 inch bathtub drain sloped at 1/4-inch per foot may have a length of 6'-0" between the horizontal wet vent (from the lavatory) and trap weir of the bathtub while maintaining within the required ±1 inch of water column pressure differential at the fixture trap to mitigate self-siphonage conditions. They also found that increasing the diameter of the fixture drain from the bathtub to 2 inches allowed a distance of 8'-0". Recognizing the rest of the conclusions from the original work of the NBS on wet venting will reduce unnecessary horizontal piping and increase drainline

performance while optimizing the use of drainage piping. The additional piping installed to meet current code requirements does not add value to the drainage system, consequently increasing the cost, materials, and complexity of the installation. The impact of extending the maximum bathtub/shower trap arm length is substantial for multi-family applications utilizing wet vent configurations, allowing bathrooms to more easily be served by one sanitary stack, particularly in wood-frame construction were horizontal runs are more challenging. An example schematic and installation photo is provided in the attached document as well as supporting data from BMS 119. We recommend including the revised values as a footnote under Table 1002.2.



EXAMPLE OF CURRENT INSTALLATION



The permissible values of the factor proposed above lead to the simple and obvious design criterion for a wet-vented bathtub drain—that the value of $S_3 l_3/d_1$, where d_1 is the diameter of the wet vent, shall not exceed unity. Figure 15 shows permissible lengths of tub drains, measured from

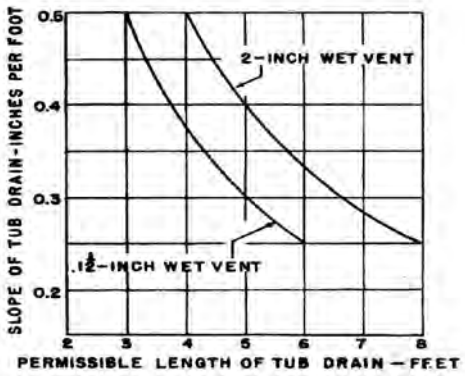


FIGURE 15. *Design data for wet-vented tub drains.*

the trap weir to the wet vent, for various slopes of the tub drain, computed from the criterion, $S_3 l_3/d_1 = 1$.

Proposals

Item #: 229

UPC 2024 Section: 1003.1

SUBMITTER: Pennie Feehan
Pennie L Feehan Consulting
Rep. Copper Development Association

RECOMMENDATION:
Revise text

1003.0 Traps – Described.
1003.1 General Requirements. Each trap, except for traps within an interceptor or similar device shall be self-cleaning. Traps for bathtubs, showers, lavatories, sinks, laundry tubs, floor drains, urinals, drinking fountains, dental units, and similar fixtures shall be of standard design, weight and shall be of ABS, cast-~~brass~~ copper alloy, cast-iron, lead, PP, PVC, or other approved material. An exposed and readily accessible drawn-copper alloy tubing trap, not less than 17 B & S Gauge (0.045 inch) (1.143 mm), shall be permitted to be used on fixtures discharging domestic sewage. ~~**Exception:** Drawn-copper alloy tubing traps shall not be used for urinals.~~ Each trap shall have the manufacturer's name stamped legibly in the metal of the trap, and each tubing trap shall have the gauge of the tubing in addition to the manufacturer's name. A trap shall have a smooth and uniform interior waterway.
Exception: Drawn-copper alloy tubing traps shall not be used for urinals.

SUBSTANTIATION:
This proposal removes the word brass and replaces with the correct terminology. The exception is lost in the middle of the paragraph and is for urinals only. The manufacturer's name stamped and smooth and uniform interior appears to be part of the exception.

Proposals

Item #: 230

UPC 2024 Section: 1003.1

SUBMITTER: Phillip H Ribbs
PHR Consultants

RECOMMENDATION:
Revise text

1003.0 Traps – Described.
1003.1 General Requirements. Each trap, except for traps within an interceptor or similar device, shall be self-cleaning. Traps shall have a smooth and uniform interior waterway. Traps for bathtubs, showers, lavatories, sinks, laundry tubs, floor drains, urinals, drinking fountains, dental units, and similar fixtures shall be of standard design, weight and shall be of ABS, cast-brass, cast-iron, lead, PP, PVC, or other approved material.

An exposed and readily accessible drawn-copper alloy tubing trap, not less than 17 B & S Gauge (0.045 inch) (1.143 mm), shall be permitted to be used on fixtures discharging domestic sewage.

Each trap shall have the manufacturer's name and gauge or schedule legibly stamped on the trap.

Exception: Drawn-copper alloy tubing traps shall not be used for urinals. ~~Each trap shall have the manufacturer's name stamped legibly in the metal of the trap, and each tubing trap shall have the gauge of the tubing in addition to the manufacturer's name. A trap shall have a smooth and uniform interior waterway.~~

SUBSTANTIATION:
Only the first sentence in the "exception" is a true exception. The relocated language are current provisions that are requirements and should not be exempt. The change moves the exception provisions to the body of the section.

Proposals

Item #: 255

UPC 2024 Section: 1501.3 - 1504.6.1

SUBMITTER: Jim Kendzel
American Supply Association
Rep. Chairman of the Alternate Water Sources Task Group

RECOMMENDATION:
Revise text

1501.3 Permit. 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 a premise without first obtaining a permit to do such work from the Authority Having Jurisdiction.
Exception: For single family dwellings a construction permit shall not be required for a clothes washer only system meeting the requirements of Section 1501.3.1. A written notification shall be provided to the Authority Having Jurisdiction in accordance with Section 1501.3.1.
1501.3.1 Clothes Washer System. A clothes washer system in compliance with all of the following is exempt from the construction permit specified in Section 1501.3 and shall be permitted to be installed or altered without a construction permit:
(1) Where 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. 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 shall be permitted to be released above the ground surface provided at least 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 Authority Having Jurisdiction.
(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 the plumbing code.

1501.6 Operation and Maintenance Manual. An operation and maintenance manual for gray water and on-site treated water systems required to have a permit in accordance with Section 1501.3 shall be supplied to the building owner by the system designer. The operation and maintenance manual shall include the following:
(1) Detailed diagram of the entire system and the location of system components.
(2) Instructions for operating and maintaining the system.
(3) Details on maintaining the required water quality for onsite nonpotable water systems.
(4) Details on deactivating the system for maintenance, repair, or other purposes.
(5) Applicable testing, inspection, and maintenance frequencies in accordance with Table 1501.5.
(6) A method of contacting the manufacturer(s).
(7) Directions to the owner or occupant that the manual shall remain with the building throughout the life of the structure.

1503.0 Gray Water Systems.
1503.1 General. The provisions of this section shall apply to the construction, alteration, and repair of gray water systems.
1503.2 Gray Water Collection Piping. New single-family dwellings shall have a separate waste piping system for all gray water fixtures in accordance with this code. The separate piping system shall be piped to outside the building and terminate into an approved gray water diverter valve in accordance with Section 1503.2.2 before connecting to the waste system from non-gray water fixtures.
Exception: Where ground conditions do not provide percolation or where prohibited by this code.
1503.2.1 Diverter. The diverter valve shall be connected and installed in the open position to the building sewer. The gray water diversion port shall remain capped off for future use until a gray water irrigation/reuse system is installed.
1503.2.2 Access. The diverter and sewer connection shall be readily accessible for connection, inspection, maintenance, and servicing.
1503.2.3 Regulatory. Gray water reuse and irrigation system components shall meet local, and state code and regulatory requirements.

(renumber remaining sections)

1503.2 System Requirements. Gray water shall be permitted to be diverted away from a sewer or private sewage disposal system of single family and multifamily dwellings, and discharge to a subsurface irrigation or subsoil irrigation system, or to a mulch basin, or disposal field. ~~The gray water shall be permitted to discharge to a mulch basin for single-family and multi-family dwellings.~~ 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, 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. Systems that produce more gray water than needed by the landscape shall discharge excess water into the sewer or private sewage disposal system.
1503.2.2 Diversion. The gray water system shall connect to the sanitary drainage system downstream of fixture traps and vent connections through a ~~gray water~~ diverter valve(s) approved by the Authority Having Jurisdiction. The ~~gray water~~ diverter valve shall ~~comply with IAPMO PS 59 and~~ be installed in an accessible location and clearly indicate the direction of flow.
Exception: A clothes washer system in compliance with Section 1501.3.1.

TABLE 1503.4
LOCATION OF GRAY WATER SYSTEM[7]

MINIMUM HORIZONTAL DISTANCE IN CLEAR REQUIRED FROM:	SURGE TANK (feet)	SUBSURFACE AND SUBSOIL IRRIGATION FIELD AND MULCH BED (feet)
Building structures[1]	52, 9	23, 8
Property line adjoining private property	5	58
Water supply wells[4]	50	100
Streams and lakes[4]	50	505
Sewage pits or cesspools	5	5
Sewage disposal field~~[10]~~	5	46
Septic tank	0	5
On-site domestic water service line	5	5
Pressurized public water main	10	10[7]

For SI units: 1 foot = 304.8 mm
Note: Where irrigation or disposal fields are installed in sloping ground, the minimum horizontal distance between any part of the distribution system and the ground surface shall be 15 feet (4572 mm).

1 Including porches and steps, whether covered or uncovered, breezeways, roofed carports, roofed patios, carports, covered walks, covered drive- ways, and similar structures or appurtenances.

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

3 Reference to a 45 degree (0.79 rad) angle from foundation.

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 also 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 in excess of 1 foot (305 mm) below the bottom of the drain line.

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

8 The distance shall be permitted to be reduced to 11/2 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. Where irrigation or disposal fields are installed in the sloping ground, the minimum horizontal distance between a part of the distribution system and the ground surface shall be 15 feet (4572 mm).~~

1503.8.1 Single Family Dwellings and Multi-Family Dwellings. The gray water discharge for single family and multi-family dwellings 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~~ 13 gallons (~~95~~ 50 L) per day/occupant
Lavatories	4 gallons (15 L) per day/occupant
Laundry	~~15~~ 10 gallons (~~57~~ 38 L) per day/occupant

(3) (remaining text unchanged)

1503.9.4 Subsurface Irrigation Field and Mulch Basin Supply Line Materials. Materials for gray water piping outside the building for non-pressure gravity systems shall be ABS, polyethylene, ~~or~~ PVC or other approved DWV pipe. Pressure systems shall be pressure rated polyethylene or PVC or other approved pressure rated pipe. Drip feeder lines shall be PVC or polyethylene tubing.

TABLE 1504.2
~~DESIGN OF SIX TYPICAL~~ SOIL~~S~~ ABSORPTION CAPACITY

~~TYPE OF SOIL~~	~~MINIMUM SQUARE FEET OF IRRIGATION 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 consider- able sand or gravel~~	~~90~~	~~1.1~~
~~Clay with small amounts of sand or gravel~~	~~120~~	~~0.8~~

SOIL CLASS AND TEXTURES	MAXIMUM ABSORPTION CAPACITY IN GALLONS PER SQUARE FOOT OF IRRIGATION/LEACHING AREA FOR A 24-HOUR PERIOD
Sandy Loam (Group A) (Textures: sand, loamy sand, sandy loam)	11.9
Loam (Group B) (Textures: loam, silt loam)	4.5
Sandy Clay Loam (Group C) (Textures: Sandy clay loam)	3.0
Clay Loam (Group D) (Textures: clay loam, silty clay loam, sandy clay, silty clay, clay)	0.9

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

1504.5.4 Emitter Size. Emitters shall be installed in accordance with the manufacturer's installation instructions. ~~Emitters shall have a flow path of not less than 1200 microns (μ) (1200 μm) and shall not have a coefficient of manufacturing variation (Cv) exceeding 7 percent. Irrigation system design shall be such that emitter flow variation shall not exceed 10 percent.~~

1504.5.7 Maximum Pressure. Where pressure at the discharge side of the pump exceeds 20 pounds-force per square inch (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 ~~not exceeding 20 psi (138 kPa)~~ shall be installed downstream from the pump and before an emission device.

1504.6 Mulch Basin Design and Construction. A mulch basin shall comply with Section 1504.6.1 through Section 1504.6.3~~4~~.

~~**1504.6.1 Single Family and Multi-Family Dwellings.** The gray water discharge to a mulch basin is limited to single family and multi-family dwellings.~~

(renumber remaining sections)

SUBSTANTIATION:
The proposed changes to Chapter 15 are updates to harmonize to the latest edition of the WeStand.
The updates include provisions for clothes washer only systems. Clothes washer only systems that do not alter the existing plumbing (and follow basic health and safety guidelines) are extremely low risk and should be allowed to be installed with no permit. California has had great success with many incentive programs across the state for the clothes washer graywater system due to its permit-exempt status.
For Section 1501.6(7), this addition should be added so the system owner knows they must pass on the Operation and Maintenance (O&M) manual to future owners.
For Section 1503.2, the installation of a total gray water system in a single family dwelling would save each dwelling considerable water, far more water than the low flow shower heads and conversion to ultra-low flow toilets save. These provisions give guidance to piping these gray water systems.
For Table 1504.2: The existing Table 1504.2 "Design of Six Typical Soils" does not appear to come from a referenced source and the names of the soils are not typical soils. If someone were to send their soil into a laboratory for testing, or perform an on-site test using standard soil texture identification methods (jar test or soil ribbon test) the soil names they would get would most likely not match this chart. We have not been able to find the original source for the information in this table. The information doesn't appear to come from septic design or irrigation system design: it appears the original creators of this table used some unknown infiltration rate and applied an unknown factor to come up with the provided coefficients for infiltration graywater into various types of soil. This new proposed table uses steady state infiltration rates from the Minnesota Stormwater Manual 2013. This manual compiled infiltration rates and recommendations based on a review of 30 guidance manuals and other stormwater references. Other agencies, like the San Francisco Public Utilities Commission, use the same table in their stormwater system sizing manuals. The table uses steady state infiltration rates and is based on the assumption that the soil is very deeply wetted below (or at field capacity), which builds in a safety factor into the numbers. (Graywater systems are typically shut off during the rainy season so the soil would not be at field capacity during irrigation time.) By adopting this new table, the UPC would be using a soil infiltration table that is aligned with actual, published references that are used by stormwater, civil engineers, and landscape professionals. The proposed table includes both hydrologic groups, which a person could look up the property's hydrologic group on a GIS map or NRCS map, as well as soil textures which an on-site soil test could verify. The proposed table is more conservative for clay soil types, and so would have less potential for overloading slower draining soils than the existing table. The proposed table has higher infiltration rates for sandy and loam soils, which are soils that are verified by studies (see references for Stormwater Manual) to infiltrate much much more water than the current table permits. To create the new table we converted the units provided in the referenced table from inches/hour to gallons/day as shown in the reference material. This is the source for the steady state infiltration rates: Minnesota Stormwater Manual 2013 -thirty guidance manuals and many other stormwater references were reviewed to compile recommended infiltration rates. All of these sources use the following studies as the basis for their recommended infiltration rates: (1) Rawls, Brakensiek and Saxton (1982); (2) Rawls, Gimenez and Grossman (1998); (3) Bouwer and Rice (1984); and (4) Urban Hydrology for Small Watersheds (NRCS). SWWD, 2005, provides field documented data that supports the proposed infiltration rates. (view reference list here https://stormwater.pca.state.mn.us/index.php?title=References) The Full Minnesota Stormwater Manual is available on-line here: https://stormwater.pca.state.mn.us/index.php?title=Main_Page

Proposals

Item #: 256

UPC 2024 Section: 1501.7, 1506.7, 1603.5, Table 1701.1, Table 1701.2

SUBMITTER: Steve Braband
BioSolutions, Incorporated

RECOMMENDATION:
Revise text

CHAPTER 15 - ALTERNATE WATER SOURCES FOR NONPOTABLE APPLICATIONS

1501.7 Minimum Water Quality Requirements. The minimum water quality for alternate water source systems shall meet the applicable water quality requirements for the intended application as determined by the Authority Having Jurisdiction. In the absence of water quality requirements, for on-site treated nonpotable systems, the water quality requirements of EPA/600/R-12/618-2012, IAPMO IGC 324 or NSF 350 shall apply. ~~The EPA/625/R-04/108 contains recommended water reuse guidelines to assist regulatory agencies to develop, revise, or expand alternate water source water quality standards.~~
Exception: Water treatment is not required for gray water used for subsurface irrigation.

1506.7 On-Site Treated Nonpotable Water Devices and Systems. Devices or equipment used to treat on-site treated nonpotable 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 water for use in the water closet and urinal flushing, surface irrigation, and similar applications shall comply with IAPMO IGC 324, NSF 350 or approved by the Authority Having Jurisdiction.

CHAPTER 16 - NONPOTABLE RAINWATER CATCHMENT SYSTEMS

1603.5 Minimum Water Quality. The minimum water quality for harvested rainwater shall meet the applicable water quality requirements for the intended applications as determined by the Authority Having Jurisdiction. In the absence of water quality requirements determined by the Authority Having Jurisdiction, the minimum treatment and water quality shall be in accordance with Table 1603.5, EPA/600/R-12/618-2012, IAPMO IGC 324 or NSF 350.
Exception: No treatment is required for rainwater used for subsurface or nonsprinkled surface irrigation where the maximum storage volume is less than 360 gallons (1363 L).

~~**1603.5.1 Treatment.** If the quality of the tested water cannot consistently be maintained at the minimum levels specified in Table 1603.5, then the system shall be equipped with an appropriate treatment device meeting applicable NSF standards referenced in Chapter 17.~~

TABLE 1701.1
REFERENCED STANDARDS

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTION
EPA/600/R-12/618-2012	Guidelines for Water Reuse	Miscellaneous	1501.7
IAPMO IGC 324-2019	Alternate Water Source Systems for MultiFamily, Residential, and Commercial Use	Water Quality	1501.7, 1506.7

(portions of table not shown remain unchanged)

Note: IAPMO IGC 324 meets the requirements for a mandatory referenced standard in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

Note: EPA/600/R-12/618-2012 does not meet the requirements for a mandatory reference standards in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

TABLE 1701.2
STANDARDS, PUBLICATIONS, PRACTICES, AND GUIDES

DOCUMENT NUMBER	DOCUMENT TITLE	APPLICATION
~~EPA/600/R-12/618-2012~~	~~Guidelines for Water Reuse~~	~~Miscellaneous~~

(portions of table not shown remain unchanged)

SUBSTANTIATION:
The 2019 edition of the IAPMO IGC 324 has been greatly improved. There was input from the San Francisco Department of Public Health (SFDPH) in developing this latest edition.

In addition to the below substantiation, please see support letter from LADWP for the Technical Committee review.

IAPMO IGC 324 covers residential, multi-family, and commercial use applications intended to process water from alternate water sources such as greywater, rainwater, stormwater air conditioning condensate, cooling tower makeup, vehicle wash and other non-potable reuse applications not specifically listed, for use in subsurface and/or surface irrigation and toilet/urinal flushing applications, and specifies requirements for materials, physical characteristics, performance testing, and markings. The standard also covers test plans and safety check (failure modes effects) that ensures the safety of the treated water.

Additionally, Section 1603.5.1 is being stricken as appropriate references are being proposed for inclusion in Section 1603.5. The proposed text in Section 1603.5 will provide guidance to the standards that apply to water treatment as options for harvested rainwater.

Supporting document(s) has been provided to the Technical Committee for review.

Proposals

Item #: 260

UPC 2024 Section: 1505.5

SUBMITTER: Bruce A Pfeiffer
Retired - City of Topeka

RECOMMENDATION:
Add new text

1505.0 Reclaimed (Recycled) Water Systems.

1505.5 Water Pressure. Reclaimed (recycled) water systems supplying water to water closets, urinals, and trap primers shall be capable of delivering not less than 15 pounds-force per square inch (psi) (103 kPa) residual pressure at the highest and most remote outlet served. Where the water pressure in the reclaimed water supply system within the building exceeds 80 psi (552 kPa), a pressure reducing valve reducing the pressure to 80 psi (552 kPa) or less to water outlets in the building shall be installed.

(renumber remaining sections)

SUBSTANTIATION:
The Code does not address a minimum or maximum water pressure in Chapter 15, Section 1505.0 for off-site treated reclaimed water. These systems are used to supply water to water closets and urinals, and in some cases exterior hose bibbs and should be required to meet the same requirements as those found in Chapter 6 for potable water systems.

Proposals

Item #: 261

UPC 2024 Section: 1506.1

SUBMITTER: Garry Sato
Greensmart Sustainable Concepts

RECOMMENDATION:
Revise text

1506.0 On-Site Treated Nonpotable Water Systems.
1506.1 General. The provisions of this section shall apply to the installation, construction, alteration, and repair of onsite treated nonpotable water systems intended to supply uses such as water closets, urinals, trap primers for floor drains and floor sinks, above and belowground irrigation, industrial or commercial cooling or air conditioning, and other uses approved by the Authority Having Jurisdiction.

Nonpotable water sources that shall be permitted for collection for re-use in on-site treated nonpotable water systems, include rainwater, air conditioner condensate, cooling tower blow-down water, fire pump test water, foundation drainage, swimming pool backwash, steam system condensate, fluid cooler discharge water, ice maker discharge water, food steamer discharge water, combination oven discharge water, industrial process water, and other sources approved by the Authority Having Jurisdiction.

SUBSTANTIATION:
The proposed revision will give updated clarity and uniformity, as there have been new codes and regulations put in place in various other regions specifically relating to sources and uses of "on-site treated nonpotable water" since the last publication.

Proposals

Item #: 262

UPC 2024 Section: 1506.5

SUBMITTER: Bruce A Pfeiffer
Retired - City of Topeka

RECOMMENDATION:
Add new text

1506.0 On-Site Treated Nonpotable Water Systems.

1506.5 Water Pressure. On-site treated non-potable water systems supplying water to water closets, urinals, and trap primers shall be capable of delivering not less than 15 pounds-force per square inch (psi) (103 kPa) residual pressure at the highest and most remote outlet served. Where the water pressure in the on-site treated non-potable water supply system within the building exceeds 80 psi (552 kPa), a pressure reducing valve reducing the pressure to 80 psi (552 kPa) or less to water outlets in the building shall be installed.

(renumber remaining sections)

SUBSTANTIATION:
The Code does not address a minimum or maximum water pressure in Chapter 15, Section 1506.0 for on-site treated non-poatble water systems. These systems are used to supply water to water closets and urinals and should be required to meet the same requirements as those found in Chapter 6 for potable water systems.

Proposals

Item #: 264

UPC 2024 Section: 1507.0, Table 1701.1

SUBMITTER: Jim Kendzel
American Supply Association
Rep. Chairman of the Alternate Water Sources Task Group

RECOMMENDATION:
Add new text

1507.0 Onsite Blackwater Treatment Systems.
1507.1 General. The provisions of this section shall apply to the water quality, monitoring, design, construction, alteration, repair, and operation requirements of onsite blackwater treatment systems for nonpotable reuse.
1507.2 Allowable Use of Blackwater. Where approved or required by the Authority Having Jurisdiction, blackwater shall be permitted to be used in lieu of potable water for uses such as, but not limited, to water closets, urinals, clothes washers, ornamental plant irrigation, and dust suppression.
1507.3 Design and Construction Requirements. Onsite blackwater treatment systems shall meet the design, construction, and performance requirements of Section 1507.3.1 or Section 1507.3.2.
1507.3.1 Listed Blackwater Treatment Systems. Onsite blackwater treatment systems shall be listed to NSF 350, installed according to the manufacturer's instructions, and commissioned in accordance with Section 1507.13.
1507.3.2 Alternative Design Systems. Where approved by the Authority Having Jurisdiction, onsite blackwater treatment systems for residential and commercial applications shall comply with the provisions of Section 1507.4 through Section 1507.15.
1507.4 Permit. It shall be unlawful for any person to construct, install, alter, or cause to be constructed, installed, or altered any blackwater treatment system in a building or on a premise without first obtaining a permit to do such work from the Authority Having Jurisdiction.
1507.5 Component Identification. System components shall be properly identified as to the manufacturer.
1507.6 Material Compatibility. Blackwater treatment 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.

TABLE 1507.7
LOG REDUCTION TARGETS FOR 10^{-4} INFECTIONS PER PERSON PER YEAR BENCHMARKS FOR BLACKWATER TREATMENT SYSTEMS

WATER USE SCENARIO	ENTERIC VIRUSES	PARASITIC PROTOZOA	ENTERIC BACTERIA
Ornamental plant irrigation*/dust suppression	8.0	7.0	6.0
Indoor Use	8.5	7.0	6.0

* Non-food

1507.7 Log Reduction Targets. Blackwater treatment systems shall be designed to meet the log reduction targets as set forth in Table 1507.7. To meet the log reduction targets in Table 1507.7, treatment processes used in blackwater systems shall comply with Section 1507.9 for validation or be operated according to conditions approved by the Authority Having Jurisdiction.
1507.8 Effluent Water Quality Parameters. Blackwater treatment systems shall be designed to meet the effluent water quality parameters for water closet and urinal fixture use listed in Table 1507.8.

TABLE 1507.8
EFFLUENT WATER QUALITY PARAMETERS FOR WATER CLOSET AND URINAL FIXTURE USE

	MINIMUM	MAXIMUM
Alkalinity mg/L	20	200
TDS mg/L	0	500
Turbidity NTU	0	5
pH	6.0	9.0
Odor	Non-Offensive	
Oily Film and Foam	Visual Non-detectable	
Free Chlorine Residual ppm	NA	4
Combined Chlorine ppm	NA	4
Chloramines mg/L	NA	4

1507.9 Validation. Where required by the Authority Having Jurisdiction, treatment processes shall be tested to verify the pathogen reduction performance. The treatment processes shall be validated through third-party component validation or field verification using the challenge testing. The results of the third-party component validation and/or challenge testing shall be summarized in a validation report prepared by a Registered Design Professional. The validation report shall document the treatment technology's log reduction performance, including information on the operating conditions and surrogate parameters.

1507.10 Health and Safety. Treated blackwater shall not create a nuisance or odor, nor threaten human health, or damage the quality of surface water or groundwater.

1507.11 Monitoring Requirements. Monitoring of blackwater treatment systems shall be based on the risk level in accordance with Table 1507.11(1). The parameters listed in Table 1507.11(2) shall be monitored by sensors placed in the effluent of the system and connected to a smart controller. The smart controller shall activate an alarm when the parameters in Table 1507.11(2) are outside the specifications and shall shut the system down when the alarm is not acknowledged after a period of 8 hours has elapsed. For Category 2, quarterly grab samples shall be taken out of the effluent and analyzed by an accredited lab. The sensors' accuracy and response shall be validated upon commissioning of the system by an independent third party.

TABLE 1507.11(1)
RISK LEVELS

RISK LEVEL	TREATED WATER USAGE*
1	Ornamental plant irrigation and dust suppression
2	Water closets, urinals, clothes washers

*See Section 1507.2 for other uses approved by the Authority Having Jurisdiction.

TABLE 1507.11(2)
MONITORING PARAMETERS

CATEGORY	PARAMETERS TO BE MONITORED	VALIDATION PROCEDURE
1	Turbidity ORP UV intensity (if used)	IGC 324 -Sensor validation procedure using 5.4.1.1 (a), (b), (c), and (d), as applicable
2	Turbidity ORP UV intensity (if used) pH Quarterly lab Sample for Total Coliform	

1507.12 Design and Installation. The design and installation of onsite blackwater treatment systems shall meet the requirements of Section 1507.12.1 through Section 1507.12.6.

1507.12.1 Connections to Potable or Reclaimed (Recycled) Water Systems. Blackwater treatment systems shall have no direct connection to any potable water supply or reclaimed (recycled) water source system. Potable water or reclaimed (recycled) water shall be permitted to be used as makeup water for a blackwater treatment system provided the potable or reclaimed (recycled) water supply connection is protected by an airgap.

1507.12.2 Bypass Connection. A bypass shall be provided for the input connection to the blackwater treatment

system. The bypass shall be a diverter valve normally open to the blackwater treatment system. The normally closed port of the diverter valve shall be connected directly to the plumbing drainage system in accordance with this code.
1507.12.3 Overflow Connection. Blackwater treatment overflow shall be connected directly to the plumbing drainage system. The overflow shall be provided with a backwater valve at the point of connection to the plumbing drainage system. The backwater valve shall be accessible for inspection and maintenance.
1507.12.4 Fail-Safe Mechanisms. Blackwater treatment systems shall be equipped with an automatic shutdown of the treatment process when a malfunction occurs.
1507.12.5 Flow Meter Totalizer. Buildings with blackwater treatment systems shall include a flow meter totalizer on the treated blackwater distribution system and a flow meter totalizer on the potable make-up water connection to the blackwater treatment system.
1507.12.6 Cross-Connection Inspection and Testing. A cross-connection test is required in accordance with Section 1502.0. 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. The test shall be ruled successful by the Authority Having Jurisdiction before final approval is granted.
1507.13 Commissioning. Onsite blackwater treatment systems shall be commissioned in accordance with the requirements of Section 1507.13.1 through Section 1507.13.4.
1507.13.1 Commissioning Requirements. Commissioning of blackwater treatment systems shall be included in the design and construction processes of the project. Commissioning shall be performed by a person who demonstrates competency in commissioning blackwater treatment systems as required by the Authority Having Jurisdiction.
1507.13.2 Commissioning Plan. The construction documents shall include the commissioning plan for the blackwater treatment system. The commissioning plan shall be approved by the Authority Having Jurisdiction prior to commissioning the blackwater treatment system. The commissioning plan shall include the following:
(1) General project information.
(2) Equipment to be tested, including the test methodology.
(3) Processes to be tested.
(4) Criteria or process for testing.
(5) Criteria for acceptance.
(6) Commissioning team contact information.
(7) Commissioning process activities, schedules, and responsibilities.
(8) Plans for the completion of functional performance testing, post construction documentation and training, and the commissioning report.
1507.13.3 Performance Testing. Performance tests shall verify that the installation and operation of the equipment of the blackwater treatment system is in accordance with the approved plans and specifications. The performance test report shall include the equipment tested, the testing methods utilized, and proof of proper calibration of the equipment.
1507.13.4 Commissioning Report. The commissioning report shall be submitted to the Authority Having Jurisdiction.
1507.14 Operation and Maintenance Manual. An operation and maintenance manual shall be provided in accordance with Section 1501.6 and shall also include the following:
(1) Instructions on operating and maintaining the system, including treatment process operations, instrumentation and alarms, and chemicals storage and handling.
(2) Site equipment inventory and maintenance notes.
(3) Equipment/system warranty documentation and information.
(4) As-built design drawings.
(5) Details on training requirements and qualifications of personnel responsible for operating the system.
(6) Maintenance schedule.
1507.15 Inspection. Field inspections shall take place during and after construction while the contractor is on-site to verify that the blackwater treatment system components have been properly supplied and installed according to the plans and specifications used for installation. Record drawings shall be maintained with changes to the approved plans by the contractor and available for periodic inspection as needed.

Chapter 2 Definitions
204.0 -B-
Blackwater. Waste water containing bodily or other biological wastes discharged from toilets and kitchen sink waste.

205.0 -C-
Challenge Test. The evaluation of a unit treatment process for pathogen log10 reduction performance using selected surrogate or indigenous constituents. This includes a detailed technology evaluation study conducted to challenge the treatment technology over a wide range of operational conditions.
Commissioning. The activities associated with bringing a new process into normal working condition.

208.0 -F-
Field Verification. Performance confirmation study conducted using challenge testing, including surrogate microorganisms and/or other non-biological surrogates, usually during startup and commissioning.

214.0 -L-

Log_{10} Reduction. The removal of a pathogen or surrogate in a unit process expressed in log_{10} units of the effluent concentration over the influent concentration (e.g., a 1-log reduction equates to 90% removal, 2-log reduction to 99% removal, 3-log reduction to 99.9% removal, and so on).

Log_{10} Reduction Target (LRT). The log_{10} reduction target for the specified pathogen group (e.g., viruses, bacteria, or protozoa) to achieve the identified level of risk to individuals (e.g., 10^{-4} infection per year).

221.0 -S-

Surrogate. A biological, chemical, or physical parameter used to verify pathogen reductions performances.

224.0 -V-

Validation Report. Report documenting the results of a challenge test conducted during field verification.

TABLE 1701.1
REFERENCED STANDARDS

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTION
IAPMO IGC 324-2019	Alternate Water Source Systems for Multi-Family, Residential, and Commercial Use	Miscellaneous	Table 1507.11(2)

(portions of table not shown remain unchanged)

Note: IAPMO IGC 324 meets the requirements for a mandatory referenced standard in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

SUBSTANTIATION:

The Alternate Water Task Group (AWTG) proposes comprehensive requirements related to the water quality, monitoring, design, construction, commissioning, alteration, repair, and operation requirements of blackwater and stormwater systems for non-potable water reuse. These requirements for a properly designed system, together with appropriate construction, operation, and maintenance, will help ensure blackwater and stormwater systems will be implemented safely and reliably.

The AWTG proposes to incorporate health risk-based water quality requirements for blackwater and stormwater systems. The risk-based water quality approach was developed through recent research by the National Water Research Institute (NWRI) and the Water Research Foundation (WRF), culminating in the report Risk-Based Framework for the Development of Public Health Guidance for Decentralized Non-Potable Water Systems. Utilizing similar methodology as is employed in potable reuse and drinking water regulations, the risk-based LRTs align with the Water Safety Plan approach promoted by the World Health Organization. Blackwater and stormwater may contain pathogenic microorganisms that, if not properly treated, can cause infection due to exposure to these waters when recycled and used onsite. The intent of the risk-based framework is to determine the appropriate level of treatment for pathogens that is needed to protect public health, accounting for such factors as the source water quality, specific end use, and acceptable risk of infection from exposure to the treated water. The risk threshold used for this application is the same as has been previously applied in the context of municipal drinking water, i.e. exposure to this water via toilet flushing, irrigation, and other non-potable uses poses no greater risk than drinking municipally supplied drinking water. Because the amount of pathogen reduction for reuse usually spans orders of magnitude, pathogen treatment requirements are specified in terms of log10 reduction; 1-log10 reduction equates to 90% removal, 2-log10 reduction to 99% removal, 3-log10 reduction to 99.9% removal, and so on. The treatment requirements developed using the risk-based methodology in this case are called log reduction targets, or LRTs. The LRTs were developed using a Quantitative Microbial Risk Assessment (QMRA). QMRA is a scientific approach to estimating the potential human health risks associated with exposure to microbial hazards (in this case, human pathogenic viruses, bacteria, and protozoa). LRTs for blackwater and stormwater reuse for unrestricted irrigation and toilet flushing were developed based on the annual risk level of 10-4 infections per person per year. Unit treatment processes that are effective at removing and/or inactivating pathogens can be used to meet the LRTs. In most cases, several unit processes are needed in series to provide sufficient treatment. The ability of unit processes to provide a certain level of treatment is verified through the use of ongoing monitoring and, in some cases, validation. For some unit processes, validation is critical to determine how the process can be used to achieve the LRTs. The AWTG also proposes to incorporate a monitoring approach for blackwater and stormwater systems that aligns with the research. The framework for monitoring deviates from traditional approaches of monitoring fecal indicator organisms (FIOs) in grab samples because there are recognized limitations of using FIOs. The primary limitation of FIO monitoring is that it cannot be done continuously to ensure safe water is delivered to the end use at all times. Rather, the AWTG is proposing continuous water quality monitoring of surrogate parameters such as

turbidity, residual chlorine, ultraviolet transmittance, and others to verify that treatment processes are operating as designed.

Discussion: The AWTG supports the use of a health riskbased approach to guide treatment and design requirements for blackwater and stormwater systems because it ensures that systems implemented using this framework are safe and reliable. The requirements being proposed are intended to ensure that public health is protected while still allowing for flexibility in design, as it does not prescribe that specific treatment processes must be used. It is timely that AWTG is proposing these requirements because several states have recently moved forward to adopt the risk-based framework at the state level. Much of this work has been driven by the work of the National Blue Ribbon Commission for Onsite Non-potable Water Systems, a coalition of public health agencies and water and wastewater utilities committed to advancing the safe, practical, and sustainable implementation of alternate water source systems. As a result of the Commission's work, several states including California, Colorado, Minnesota, Oregon, Washington, and Hawaii are proposing legislation to adopt the risk-based approach. Therefore, institutionalizing the riskbased approach in the UPC will create further consistency across the country by aligning plumbing and health code requirements for alternate water source systems. Resources: The AWTG used the following resources to develop the proposed text for both stormwater and blackwater treatment systems. These resources provided the AWTG with a technically sound template for the development of requirements for blackwater and stormwater treatment systems that fit well into the both the scope and format structure of model codes.
1. Risk-Based Framework for the Development of Public Health Guidance for Decentralized Non-Potable Water Systems https://www.werf.org/a/ka/Search/ResearchProfile.aspx?ReportId=SIWM10C15
2. A Guidebook for Developing and Implementing Regulations for Onsite Non-potable Water Systems developed by the National Blue Ribbon Commission for Onsite Non-Potable Water Systems
https://sfwater.org/Modules/ShowDocument.aspx?documentID=11586
3. San Francisco Department of Public Health Director's Rules and Regulations Regarding the Operation of Alternate Water Source Systems
https://www.sfdph.org/dph/files/EHSdocs/ehsWaterdocs/NonPotable/SFHC_12C_Rules.pdf

Proposals

Item #: 265

UPC 2024 Section: 1508.0, Table 1701.1

SUBMITTER: Jim Kendzel
American Supply Association
Rep. Chairman of the Alternate Water Sources Task Group

RECOMMENDATION:
Add new text

1508.0 Onsite Stormwater Treatment Systems.
1508.1 General. The provisions of this section shall apply to the water quality, monitoring, design, construction, alteration, repair, and operation requirements of onsite stormwater treatment systems for nonpotable use.
1508.2 Allowable Use of Stormwater. Where approved or required by the Authority Having Jurisdiction, stormwater shall be permitted to be used in lieu of potable water for uses such as, but not limited to, water closets, urinals, clothes washers, ornamental plant irrigation, and dust suppression.
1508.3 Design and Construction Requirements. Onsite stormwater treatment systems shall meet the design, construction, and performance requirements of Section 1508.3.1 or Section 1508.3.2.
1508.3.1 Listed Stormwater Treatment Systems. Onsite stormwater treatment systems shall be listed to ASPE/ARCSA 78, installed according to the manufacturer's instructions, and commissioned in accordance with Section 1508.13.
1508.3.2 Alternative Design Systems. Where approved by the Authority Having Jurisdiction, onsite stormwater treatment systems for residential and commercial applications shall comply with the provisions of Sections 1508.4 through Section 1508.15.
1508.4 Permit. It shall be unlawful for any person to construct, install, alter, or cause to be constructed, installed, or altered any stormwater treatment system in a building or on a premise without first obtaining a permit to do such work from the Authority Having Jurisdiction.
1508.5 Component Identification. System components shall be properly identified as to the manufacturer.
1508.6 Material Compatibility. Stormwater treatment 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.
1508.7 Log Reduction Targets. Stormwater treatment systems shall be designed to meet the log reduction targets as set forth in Table 1508.7. To meet the log reduction in Table 1508.7, treatment processes used in stormwater systems shall comply with Section 1508.8 for validation or be operated according to conditions approved by the Authority Having Jurisdiction.
1508.8 Effluent Water Quality Parameters. Stormwater treatment systems shall be designed to meet the effluent water quality parameters for water closet and urinal fixture use listed in Table 1508.8.
1508.9 Validation. Where required by the Authority Having Jurisdiction, treatment processes shall be tested to verify the pathogen reduction performance. The treatment processes shall be validated through third-party component validation or field verification using challenge testing. The results of the third-party component validation and/or challenge testing shall be summarized in a validation report prepared by a registered design professional. The validation report shall document the treatment technology's log reduction performance, including information on the operating conditions and surrogate parameters.

TABLE 1508.7

LOG REDUCTION TARGETS FOR 10^{-4} INFECTIONS PER PERSON PER YEAR BENCHMARKS FOR STORMWATER TREATMENT SYSTEMS

WATER USE SCENARIO	ENTERIC VIRUSES	PARASITIC PROTOZOA	ENTERIC BACTERIA
Stormwater Greater Than 0.1% Fecal Contamination Contribution[2]			
Ornamental plant irrigation[1]/dust suppression	5.0	4.5	4.0
Indoor Use	5.5	5.5	5.0
Stormwater with less than or equal to 0.1% fecal contamination contribution[2]			
Ornamental plant irrigation[1]/dust suppression	3.0	2.5	2.0
Indoor Use	3.5	3.5	3.0

Notes:

[1] Non-food

[2] Stormwater can contain some quantity of fecal contamination. The extent of fecal contamination present will depend on site-specific conditions. The appropriate LRT to apply for a stormwater treatment system depend on the site-specific extent of likely contamination of Stormwater with fecal contamination.

TABLE 1508.8

EFFLUENT WATER QUALITY PARAMETERS FOR WATER CLOSET AND URINAL FIXTURE USE

	MINIMUM	MAXIMUM
Alkalinity mg/L	20	200
TDS mg/L	0	500
Turbidity NTU	0	5
pH	6.0	9.0
Odor	Non-Offensive	
Oily Film and Foam	Visual Non-detectable	
Free Chlorine Residual ppm	NA	4
Combined Chlorine ppm	NA	4
Chloramines mg/L	NA	4

1508.10 Health and Safety. Treated stormwater shall not create a nuisance or odor, nor threaten human health, or damage the quality of surface water or groundwater.

1508.11 Monitoring Requirements. Monitoring of stormwater treatment systems shall be based on the risk level in accordance with Table 1508.11(1). The parameters listed in Table 1508.11(2) shall be monitored by sensors placed in the effluent of the system and connected to a smart controller. The smart controller shall activate an alarm when the parameters in Table 1508.11(2) are outside the specifications and shall shut the system down when the alarm is not acknowledged after a period of 8 hours has elapsed. For Category 2, quarterly grab samples shall be taken out of the effluent and analyzed by an accredited lab. The sensors' accuracy and response shall be validated upon commissioning of the system by an independent third party.

1508.12 Design and Installation. The design and installation of onsite stormwater treatment systems shall meet the requirements of Section 1508.12.1 through Section 1508.12.6.

1508.12.1 Connections to Potable or Reclaimed (Recycled) Water Systems. Stormwater treatment systems shall have no direct connection to any potable water supply or reclaimed (recycled) water source system. Potable water or reclaimed (recycled) water shall be permitted to be used as makeup water for a stormwater treatment system provided the potable or reclaimed (recycled) water supply connection is protected by an airgap.

1508.12.2 Bypass Connection. A bypass shall be provided for the input connection to the stormwater treatment system. The bypass shall be a diverter valve normally open to the stormwater treatment system. The normally closed port of the diverter valve shall be connected directly to the storm drainage system or combined sewer system in accordance with this code.

TABLE 1508.11(1)
RISK LEVELS

RISK LEVEL	TREATED WATER USAGE*
1	Ornamental plant irrigation and dust suppression
2	Water closets, urinals, clothes washers

* See Section 1508.2 for other uses approved by the Authority Having Jurisdiction.

TABLE 1508.11(2)
MONITORING PARAMETERS

CATEGORY	PARAMETERS TO BE MONITORED	VALIDATION PROCEDURE
1	Turbidity ORP UV intensity (if used)	IGC 324 - Sensor validation procedure using 5.4.1.1 (a), (b), (c), and (d)., as applicable
2	Turbidity ORP UV intensity (if used) pH Quarterly lab Sample for Total Coliform	

1508.12.3 Overflow Connection. Stormwater treatment overflow shall be connected directly to the storm drainage or combined sewer system in accordance with this code. The overflow shall be provided with a backwater valve at the point of connection to the storm drainage or combined sewer system. The backwater valve shall be accessible for inspection and maintenance.

1508.12.4 Fail-Safe Mechanisms. Stormwater treatment systems must be equipped with features that result in a controlled and non-hazardous automatic shutdown of the treatment process in the event of a malfunction.

1508.12.5 Flow Meter Totalizer. Buildings with stormwater treatment systems shall include a flow meter totalizer on the treated stormwater distribution system and a flow meter totalizer on the potable make-up water pipeline to the stormwater treatment system.

1508.12.6 Cross-Connection Inspection and Testing. A cross-connection test is required in accordance with Section 1502.0. 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. The test shall be ruled successful by the Authority Having Jurisdiction before final approval is granted.

1508.13 Commissioning. Onsite stormwater treatment systems shall be commissioned in accordance with the requirements of Section 1508.13.1 through Section 1508.13.4.

1508.13.1 Commissioning Requirements. Commissioning for stormwater treatment systems shall be included in the design and construction processes of the project. Commissioning shall be performed by a person who demonstrates competency in commissioning stormwater treatment systems as required by the Authority Having Jurisdiction.

1508.13.2 Commissioning Plan. The construction documents shall include the commissioning plan for the stormwater treatment system. The commissioning plan shall be approved by the Authority Having Jurisdiction prior to commissioning the stormwater treatment system. The commissioning plan shall include the following:

(1) General project information.
(2) Equipment to be tested, including the test methodology.
(3) Processes to be tested.
(4) Criteria or process for testing.
(5) Criteria or process for acceptance.
(6) Commissioning team contact information.
(7) Commissioning process activities, schedules, and responsibilities.
(8) Plans for the completion of functional performance testing, post construction documentation and training, and the commissioning report.

1508.13.3 Performance Testing. Performance tests shall verify that the installation and operation of the equipment of the stormwater treatment system is in accordance with the approved plans and specifications. The performance test report shall include the equipment tested, the testing methods utilized, and proof of proper calibration of the equipment.

1508.13.4 Commissioning Report. The commissioning report shall be submitted to the Authority Having Jurisdiction.

1508.14 Operation and Maintenance Manual. An operation and maintenance manual shall be provided in accordance with Section 1501.6 and shall also include the following:

(1) Instructions on operating and maintaining the system, including treatment process operations, instrumentation and alarms, and chemicals storage and handling.
(2) Site equipment inventory and maintenance notes.
(3) Equipment/system warranty documentation and information.
(4) As-Built design drawings.
(5) Details on training requirements and qualifications of personnel responsible for operating the system.
(6) Maintenance schedule.

1508.15 Inspection. Field inspections shall take place during and after construction while the contractor is on-site to verify that the stormwater treatment system components have been properly supplied and installed according to the plans and specifications used for installation. Record drawings shall be maintained with changes to the approved plans by the contractor and available for periodic inspection as needed.

Chapter 2 Definitions

205.0 -C-

Challenge Test. The evaluation of a unit treatment process for pathogen $\log_{10}$ reduction performance using selected surrogate or indigenous constituents. This includes a detailed technology evaluation study conducted to challenge the treatment technology over a wide range of operational conditions.

Commissioning. The activities associated with bringing a new process into normal working condition.

208.0 -F-

Field Verification. Performance confirmation study conducted using challenge testing, including surrogate microorganisms and/or other non-biological surrogates, usually during startup and commissioning.

214.0 -L-

$\log_{10}$ Reduction. The removal of a pathogen or surrogate in a unit process expressed in $\log_{10}$ units of the effluent concentration over the influent concentration (e.g., a 1-log reduction equates to 90% removal, 2-log reduction to 99% removal, 3-log reduction to 99.9% removal, and so on).

$\log_{10}$ Reduction Target (LRT). The $\log_{10}$ reduction target for the specified pathogen group (e.g., viruses, bacteria, or protozoa) to achieve the identified level of risk to individuals (e.g., 10^{-4} infection per year).

221.0 -S-

Stormwater. Natural precipitation that has contacted a surface at grade, below grade, or above ground parking surfaces.

Surrogate. A biological, chemical, or physical parameter used to verify pathogen reductions performances.

224.0 -V-

Validation Report. Report documenting the results of a challenge test conducted during field verification.

TABLE 1701.1
REFERENCED STANDARDS

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTION
ASPE/ARCSA 78-2015	Stormwater Harvesting System Design for Direct End-Use Applications	Miscellaneous	1508.3.1
IAPMO IGC 324-2019	Alternate Water Source Systems for Multi-Family, Residential, and Commercial Use	Miscellaneous	Table 1508.11(2)

(portions of table not shown remain unchanged)

Note: ASPE/ARCSA 78 and IAPMO IGC 324 meet the requirements for mandatory referenced standards in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

SUBSTANTIATION:
The Alternate Water Task Group (AWTG) proposes comprehensive requirements related to the water quality, monitoring, design, construction, commissioning, alteration, repair, and operation requirements of blackwater and stormwater systems for non-potable water reuse. These requirements for a properly designed system, together with appropriate construction, operation, and maintenance, will help ensure blackwater and stormwater systems will be implemented safely and reliably. The AWTG proposes to incorporate health risk-based water quality requirements for blackwater and stormwater systems. The risk-based water quality approach was developed through recent research by the National Water Research Institute (NWRI) and the Water Research Foundation (WRF), culminating

in the report Risk-Based Framework for the Development of Public Health Guidance for Decentralized Non-Potable Water Systems. Utilizing similar methodology as is employed in potable reuse and drinking water regulations, the riskbased LRTs align with the Water Safety Plan approach promoted by the World Health Organization. Blackwater and stormwater may contain pathogenic microorganisms that, if not properly treated, can cause infection due to exposure to these waters when recycled and used onsite. The intent of the risk-based framework is to determine the appropriate level of treatment for pathogens that is needed to protect public health, accounting for such factors as the source water quality, specific end use, and acceptable risk of infection from exposure to the treated water. The risk threshold used for this application is the same as has been previously applied in the context of municipal drinking water, i.e. exposure to this water via toilet flushing, irrigation, 55 and other nonpotable uses poses no greater risk than drinking municipally supplied drinking water. Because the amount of pathogen reduction for reuse usually spans orders of magnitude, pathogen treatment requirements are specified in terms of log10 reduction; 1-log10 reduction equates to 90% removal, 2-log10 reduction to 99% removal, 3-log10 reduction to 99.9% removal, and so on. The treatment requirements developed using the risk-based methodology in this case are called log reduction targets, or LRTs. The LRTs were developed using a Quantitative Microbial Risk Assessment (QMRA). QMRA is a scientific approach to estimating the potential human health risks associated with exposure to microbial hazards (in this case, human pathogenic viruses, bacteria, and protozoa). LRTs for blackwater and stormwater reuse for unrestricted irrigation and toilet flushing were developed based on the annual risk level of 10-4 infections per person per year. Unit treatment processes that are effective at removing and/or inactivating pathogens can be used to meet the LRTs. In most cases, several unit processes are needed in series to provide sufficient treatment. The ability of unit processes to provide a certain level of treatment is verified through the use of ongoing monitoring and, in some cases, validation. For some unit processes, validation is critical to determine how the process can be used to achieve the LRTs. The AWTG also proposes to incorporate a monitoring approach for blackwater and stormwater systems that aligns with the research. The framework for monitoring deviates from traditional approaches of monitoring fecal indicator organisms (FIOs) in grab samples because there are recognized limitations of using FIOs. The primary limitation of FIO monitoring is that it cannot be done continuously to ensure safe water is delivered to the end use at all times. Rather, the AWTG is proposing continuous water quality monitoring of surrogate parameters such as turbidity, residual chlorine, ultraviolet transmittance, and others to verify that treatment processes are operating as designed. Discussion: The AWTG supports the use of a health risk-based approach to guide treatment and design requirements for blackwater and stormwater systems because it ensures that systems implemented using this framework are safe and reliable. The requirements being proposed are intended to ensure that public health is protected while still allowing for flexibility in design, as it does not prescribe that specific treatment processes must be used. It is timely that AWTG is proposing these requirements because several states have recently moved forward to adopt the risk-based framework at the state level. Much of this work has been driven by the work of the National Blue Ribbon Commission for Onsite Nonpotable Water Systems, a coalition of public health agencies and water and wastewater utilities committed to advancing the safe, practical, and sustainable implementation of alternate water source systems. As a result of the Commission's work, several states including California, Colorado, Minnesota, Oregon, Washington, and Hawaii are proposing legislation to adopt the risk-based approach. Therefore, institutionalizing the riskbased approach in UPC will create further consistency across the country by aligning plumbing and health code requirements for alternate water source systems. Resources: The AWTG used the following resources to develop the proposed text for both stormwater and blackwater treatment systems. These resources provided the AWTG with a technically sound template for the development of requirements for blackwater and stormwater treatment systems that fit well into the both the scope and format structure of model codes.

1. Risk-Based Framework for the Development of Public Health Guidance for Decentralized NonPotable Water Systems https://www.werf.org/a/ka/Search/ResearchProfile.aspx?ReportId=SIWM10C15
2. A Guidebook for Developing and Implementing Regulations for Onsite Non-potable Water Systems developed by the National Blue Ribbon Commission for Onsite Non-Potable Water Systems
https://sfwater.org/Modules/ShowDocument.aspx?documentID=11586
3. San Francisco Department of Public Health Director's Rules and Regulations Regarding the Operation of Alternate Water Source Systems
https://www.sfdph.org/dph/files/EHSdocs/ehsWaterdocs/NonPotable/SFHC_12C_Rules.pdf

Proposals

Item #: 287

UPC 2024 Section: L 201.0, L 404.0 – L 404.4, Table 1701.2

SUBMITTER: Jim Kendzel
American Supply Association
Rep. Chairman of the Alternate Water Sources Task Group

RECOMMENDATION:
Add new text

APPENDIX L
SUSTAINABLE PRACTICES

L 404.0 Non-Sewered Sanitation Systems.
L 404.1 General. Non-sewered sanitation systems shall comply with ISO 30500.
L 404.2 Installation. The installation of non-sewered sanitation systems shall be in accordance with the manufacturer's installation instructions and Section 404.2.1 through Section 404.2.5.
L 404.2.1 Operating Conditions. A non-sewered sanitation system in either a conditioned or unconditioned space shall be installed where the ambient temperature, ambient humidity, and altitude (atmospheric pressure) are in accordance with the manufacturer's installation instructions or product listing.
L 404.2.2 Clearances for Servicing and Maintenance. A non-sewered sanitation system shall be located to permit access and sufficient clearance for service and maintenance. Unless otherwise specified by the manufacturer's installation instructions, not less than 30 inches in depth, width, and height of working space shall be provided at any access panel.
L 404.2.3 Backflow Prevention. A domestic water supply connection to a non-sewered sanitation system shall be protected in accordance with the plumbing code.
L 404.2.4 Effluent Storage. Any container or vessel for the storage of effluent discharged from a non-sewered sanitation system and not integral to such system shall be installed in accordance with the plumbing code.
L 404.2.5 Systems Employing Combustion. A non-sewered sanitation system employing combustion shall comply with the mechanical code.
Exception: A non-sewered sanitation system listed for unvented use.
L 404.3 Operation and Maintenance Manual. Non-sewered sanitation systems shall have an operation and maintenance manual provided by the manufacturer.
L 404.4 System Output. The use or disposal of all substances exiting the non-sewered sanitation system shall be determined by the Authority Having Jurisdiction.

(renumber remaining sections)

L 201.0 Definitions
Non-Sewered Sanitation System. A prefabricated integrated sewage treatment unit that is not connected to a public sewer or private sewage disposal system.

TABLE 1701.2
STANDARDS, PUBLICATIONS, PRACTICES, AND GUIDES

DOCUMENT NUMBER	DOCUMENT TITLE	APPLICATION
ANSI/CAN/IAPMO/ISO 30500-2019	Non-Sewered Sanitation Systems - Prefabricated Integrated Treatment Units - General Safety and Performance Requirements for Design and Testing	Miscellaneous

(portions of table not shown remain unchanged)

SUBSTANTIATION:
This proposal covers the essential considerations that a building official must assess when a nonsewered sanitation system (as defined) is installed in a building. To facilitate commercialization of hi-tech toilets and their acceptance by national regulatory bodies, an ISO standard was adopted in 2018 to establish the key performance attributes of non-sewered sanitation systems (NSSSs). Standard 30500, "Non-sewered sanitation systems - Prefabricated integrated treatment units - General safety and performance requirements for design and testing," sets performance requirements for solid and liquid outputs, odor, noise, air emissions, materials, safety, marking, and ergonomics, together with relevant test procedures for measuring the attainment of these requirements. Designed for operation without a sewer connection and, in many cases, without a dedicated water supply, NSSSs are anticipated to meet critical public health needs in developing countries with limited water and wastewater infrastructure. However, this new standard carries important implications for water and wastewater management and utility service in North America as well. From national parks to suburban shopping malls to net zero homes, high-tech toilets meeting the new ISO standard could find uses that upend our approach to sanitation and our expectations about future water demands and the placement and capacity of water-related infrastructure. In 2011, the Bill & Melinda Gates Foundation launched the "Reinvent the Toilet Challenge" to bring new technology to bear to achieve "sustainable sanitation solutions." The target is a device that provides complete and effective treatment of human sanitary waste, unconnected to any sewer or drainage network and with minimal inputs of water and energy. Eight teams have received foundation support to develop prototypes for lab testing, field trials, and eventual commercialization. Among these early devices, three broad pathways for treatment technology have been applied - electro-chemical, biological, and combustion - and in some cases, combinations of these in the same device. The provisions in this proposal address the considerations that must be taken into account by building officials regarding the placement and installation of NSSSs in buildings. The proposal would permit (but not require) the installation of a NSSS listed to the ISO standard, providing an exception to the general requirement that sanitation devices be connected to the building drainage system. Criteria for the functioning of the unit for its intended purpose are established by the ISO standard, and do not need to be repeated in code language in the UPC. Certain key protections, such as backflow prevention, proper ventilation of combustion-based units, and proper siting of any storage tanks external to the unit are each specified in the proposal. The clearance requirements in Section L 404.2.2 correspond with the basic requirements found in the Uniform Mechanical Code, Section 304.1. Considerations of the use and disposal of outputs of the system are specifically referred to an AHJ, which would most likely be a health department. With reinvented toilets now on the cusp of commercialization, the widespread use of toilets without water and sewer connections carries profound implications for US utilities and builders. While much is still unknown about their cost, maintenance, reliability, and even the business model for their installation and service, forwardlooking communities will want to be prepared to ensure the safe installation and use of this promising new technology, which will soon be available. This proposal lays the necessary groundwork for code officials to inspect and approve their installation.

Proposals

Item #: 288

UPC 2024 Section: L 201.0, L 402.3.2 - L 503.3.6, Table 1701.2

SUBMITTER: Jim Kendzel
American Supply Association
Rep. Chairman of the Alternate Water Sources Task Group

RECOMMENDATION:
Revise text

L 201.0 Definitions
Dedicated Meter. A water measuring device used at a subsection or end use of a water supply system for any of the following purposes: billing, water management, collecting and analyzing water usage data, detection of leaks, equipment failure, water waste, and irregular or abnormal use for a specific application. Also called a submeter.
Dry Weather Runoff. Water that flows along a surface, in a channel or sub-surface including groundwater seepage, and is not associated with a rain event.

ET_C. Evapotranspiration rate of the plants derived by multiplying ET_O by the appropriate plant factor or coefficient.
ET_O. Reference evapotranspiration for a cool-season grass as calculated by the standardized Penman-Monteith equation based on weather-station data.

Flow-Through Design. A fitting or a fitting configuration with two primary inlet connections and one, or more outlet connections with the purpose to supply water to a fixture fitting.

Low Flow Emitter. Low-flow irrigation emission device designed to dissipate water pressure and discharge a small uniform flow or trickle of water at a constant flow rate. ~~To be classified as a low flow emitter: drip emitters shall discharge water at less than 4 gallons (15 L) per hour per emitter; microspray, micro-jet, and misters shall discharge water at a maximum of 30 gallons (114 L) per hour per nozzle.~~

L 402.3.2 Nonwater Urinals with Drain Cleansing Action. Nonwater urinals with drain cleansing action shall comply with ASME A112.19.19 and shall be cleaned, maintained, and installed in accordance with the manufacturer's installation instructions.

L 402.6.2 Bath and Shower Diverters. ~~The rate of leakage out of the~~ tTub spout ~~of~~ bath and shower diverters, while operating in the shower mode, shall ~~not exceed 0.1 gpm (0.4 L/m) in accordance with ASME A112.18.1/CSA B125.1~~ perform with zero leakage.

L 402.6.3 Shower Valves. Shower valves shall comply with the temperature control performance requirements of ~~ASSE 1016 or ASME A112.18.1/CSA B125.1 where~~ ASSE 1016/ASME A112.1016/CSA B125.16 when tested ~~at 2.0 gpm (7.6 L/m)~~ for the rated flow rate of the installed showerhead.

L 402.6.3.1 Marking. Control valves for showers and tub/shower combinations shall be tagged, labeled, or marked with the manufacturer's minimum rated flow and such marking shall be visible after installation.

L 402.8 Commercial Pre-Rinse Spray Valves. The flow rate for a pre-rinse spray valve installed in a commercial kitchen to remove food waste from cookware and dishes before cleaning shall not be more than 1.28 gpm (4.8 L/m) at 60 psi (414 kPa). Where pre-rinse spray valves with maximum flow rates of 1.0 gpm (3.8 L/m) or less are installed, the static pressure shall be not less than 30 psi (207 kPa). Commercial kitchen pre-rinse spray valves shall be equipped with an integral automatic shutoff. ~~Pre-rinse spray valves shall be listed to the EPA WaterSense Commercial Pre-rinse Spray Valve Specification.~~

L 402.10 Drinking Fountains and Bottle Filling Stations. Bottle filling stations shall be included on or used as a substitute to meet the requirements of drinking fountains in at least 50 percent of the requirements for drinking fountains. Bottle filling stations and ~~D~~drinking fountains shall be self-closing.

L 404.2 Ice Makers. Ice makers shall be air cooled and shall be in accordance with Energy Star for energy use for commercial ice machines. Ice makers producing cubed-type ice shall not exceed 20 gallons (75.7 L) of water per 100 pounds (45.4 kg) of ice produced. Ice makers producing nugget and flake ice shall not exceed 14 gallons of water per 100 pounds (45.4 kg) of ice produced.

L 404.5 Grease Interceptors. Grease interceptor maintenance procedures shall not include post-pumping/cleaning refill using potable water. Refill shall be by connected appliance accumulated discharge only.
L 404.5.1 Temperature. Grease Interceptors shall be designed and installed to maintain a mean temperature not exceeding 95°F (35°C). FOG (fats, oils, and greases) disposal systems in compliance with ASME A112.14.6 using biological cultures shall not exceed 104°F (40°C). Passive or active cooling and heat recovery to be employed where applicable.

L 404.6 Dipper Well Faucets. Where dipper wells have a permanent water supply, the faucet shall have metered or sensor activated flow. The volume of water dispensed into a dipper well in each activation cycle of a self-closing fixture fitting shall not exceed the water capacity of the dipper well, and the maximum flow shall not exceed 0.2 gpm (0.8 L/m) at a supply pressure of 60 psi (414 kPa). ~~Where dipper wells are installed, the water supply to a dipper well shall have a shutoff valve and flow control. The flow of water into a dipper well shall be limited by not less than one of the following methods:~~
~~(1) Water flow shall not exceed the water capacity of the dipper well in one minute at a supply pressure of 60 psi (414 kPa), and the maximum flow shall not exceed 2.2 gpm (8.3 L/m) at a supply pressure of 60 psi (414 kPa). The water capacity of a dipper well shall be the maximum amount of water that the fixture can hold before water flows into the drain.~~
~~(2) The volume of water dispensed into a dipper well in each activation cycle of a self-closing fixture fitting shall not exceed the water capacity of the dipper well, and the maximum flow shall not exceed 2.2 gpm (8.3 L/m) at a supply pressure of 60 psi (414 kPa).~~

L 404.7.1 Pulpers and Mechanical Strainers. The water use for pulpers or mechanical strainers shall not exceed ~~3~~ 2 gpm (~~11.4~~ 7.6 L/m). A flow restrictor shall be installed on the water supply to limit the water flow.

L 404.8 Tempering Water. The discharge waste from commercial dishwashers, ware washers, combination ovens, and food steamers that exceeds 140°F (60°C) shall not be tempered with potable water.

(renumber remaining sections)

L 405.1 General. Where installed, leak detection and control devices shall comply with IAPMO IGC 115 or IAPMO IGC 349. Leak detection ~~and~~ with control devices ~~help protect property from water damage and also conserve water by shutting off the flow when leaks are detected~~ shall not be installed where they isolate fire sprinkler systems.

L 407.1 Required. A water meter shall be required for each building~~s~~ site connected to a public water system, including municipally supplied reclaimed (recycled) water. In other than single-family houses, a dedicated meter ~~multifamily structures of three stories or fewer above grade, and modular houses, a separate meter or submeter~~ shall be installed in accordance with Table L 407.1 ~~the following locations:~~
~~(1) The water supply for irrigated landscape with an accumulative area exceeding 2500 square feet (232.3 m^2).~~
~~(2) The water supply to a water-using process where the consumption exceeds 1000 gallons per day (gal/d) (0.0438 L/s), except for manufacturing processes.~~
~~(3) The water supply to each building on a property with multiple buildings where the water consumption exceeds 500 gals/d (0.021 L/s).~~
~~(4) The water supply to an individual tenant space on a property where one or more of the following applies:~~
~~(a) Water consumption exceeds 500 gals/d (0.021 L/s) for that tenant.~~
~~(b) Tenant space is occupied by a commercial laundry, cleaning operation, restaurant, food service, medical office, dental office, laboratory, beauty salon, or barbershop.~~
~~(c) Total building area exceeds 50 000 square feet (4645 m^2).~~
~~(5) The makeup water supplies to a swimming pool.~~

L 407.3 Remote Data Transfer Requirements. ~~**Consumption Data.** A means of communicating water consumption data from submeters to the water consumer shall be provided.~~ Where more than 10 non-utility-owned water meters are located at a building site, the meters shall include remote data transfer capability to collect and analyze the data at a single location.

TABLE L 407.1
DEDICATED WATER METERING REQUIREMENTS

APPLICATION	REQUIREMENTS
Cooling Towers	The makeup water supply to cooling towers, evaporative condensers, and fluid coolers. Cooling towers sharing a common basin can be grouped together using one meter.
Evaporative Coolers	The makeup water supply to an evaporative cooler having an air flow exceeding 30 000 cubic feet per minute (ft^3/min) (50 970.3 m^3/hr).
Fluid Coolers and Chillers – Open Systems	The makeup water supply on water-cooled fluid coolers and chillers not utilizing closed- loop recirculation.
Hydronic Cooling Systems – Closed Loop	Systems with 50 ton (175 843 W) or greater of cooling capacity and where a make-up water supply is connected.
Hydronic Heating Systems	The makeup water supply to one or more boilers collectively exceeding 1 000 000 British thermal units per hour (Btu/h) (293 071 W).
Industrial Processes	The water supply to an industrial water-using process where the average consumption exceeds 1000 gallons per day (gal/d) (3 785 L/d). Like equipment sharing one common water supply can be grouped together using one meter. **Exception:** Processes using untreated water where the water is directly returned to the original source after use.
Landscape Irrigation	Landscape irrigation water where either of the following conditions exist: (1) Total accumulated landscape area with in-ground irrigation system exceeds 2500 square feet (232 m^2), or (2) Total accumulated landscape area using an automatic irrigation controller exceeds 1500 square feet (139 m^2) **Exception:** Where the water purveyor provides a separate water supply meter that serves only the irrigation system, an additional dedicated meter is not required.
Onsite Water Collection Systems	Potable or reclaimed water supplies for supplementing onsite alternative water collection systems.
Ornamental Water Features	Potable or reclaimed water supplies for ornamental water features where the water feature uses an automatic refill valve.
Pools and Spas	A makeup water supply to a swimming pool or spa. **Exception:** Where the pool or spa has less than 100 square feet (9 m^2) of water surface and is refilled from a hose bibb without an automatic refill valve.
Roof Spray Systems	Roof spray systems for irrigating vegetated roofs or thermal conditioning covering an area greater than 300 square feet (28 m^2). **Exception:** Temporary above-surface spray systems connected to a hose bibb and without an automatic controller are not required to have a dedicated meter
Tenant Buildings - Common Areas	Water supplies used in common areas of a site. The dedicated meter for common area water use shall not include water supplied inside tenant space. Water supplies for sanitary fixtures and other water use in common areas can be grouped together for metering requirements, except where dedicated water meter installations are otherwise required.
Tenant Spaces - Residential	All water supplies to each residential tenant space for indoor water use. **Exception:** Where a water purveyor has individual meters for each tenant space, and the other meter requirements included in Table 407.1 do not apply, no additional dedicated meter is required.
Tenant Spaces - Non-residential, car washes	All water supplies to individual non-residential tenant spaces for indoor water use where any of the following conditions exist: (1) The nominal size of a water supply pipe(s) to the individual tenant space is greater than ½ inch, or (2) Water consumption within in the tenant space is estimated or expected to average greater than 1000 gallons/day (3 785 L/d). Where water is supplied to tenant space that is not required to have dedicated meter, the water supply pipe (s) shall be accessible to install a meter. **Exception:** Where a water purveyor has individual meters for each tenant space and the other meter requirements included in Table 407.1 do not apply, no additional dedicated meter is required.

L 410.3 Point-of-Use Reverse Osmosis Water Treatment Systems. Reverse osmosis water treatment systems ~~installed in residential occupancies~~ shall be equipped with automatic shutoff valves to prevent discharge when there is no call for producing treated water. Reverse osmosis water treatment systems shall ~~be listed in accordance~~ comply with NSF 58.

L 410.4 Drinking Water Treatment Systems. Drinking water treatment systems shall be listed to WQA/ASPE S-803.

L 411.1 General. Where landscape irrigation systems are installed, they shall be in accordance with Section L 411.2 through Section L 411.14. ~~Requirements limiting the amount or type of plant material used in landscapes shall be established by the Authority Having Jurisdiction.~~

~~**Exception:** Plants grown for food production.~~

L 411.1.1 Irrigation Design and Installation. The Authority Having Jurisdiction shall have the authority to require landscape irrigation contractors, installers, or designers to demonstrate competency. The system shall be designed and record drawings showing changes during installation shall be made available for the owner and for any required inspections. Where required by the Authority Having Jurisdiction, the contractor, installer, or designer shall be licensed, certified, or both to perform such work.

L 411.2 Plant and Irrigation System Limitations. Nuisance, invasive and noxious plants as defined by the Authority Having Jurisdiction shall not be used in the landscape. Plants not requiring supplement irrigation and not principally used as an athletic field or public recreation shall be used in no less than 60 percent of the landscape that is not principally used as an athletic field or public recreation. Inground irrigation system shall not be installed in more than 40 percent of the landscaped area.

Exceptions:

(1) Where average annual rainfall is less than 12 inches (305 mm) and in landscape areas where the plant materials have an annual ETc of not exceeding 15 inches (381 mm), an in-ground irrigation system shall be allowed.

(2) Where neither potable or reclaimed (recycled) water is used in the irrigation system, an in-ground irrigation system shall be allowed in 100 percent of the landscaped area and vegetative roofs.

L 411.3 Vegetative Roofs and Walls. Irrigation systems using potable water for vegetative roofs and walls are prohibited.

L 411.4 Maximum Velocity. Velocity of water flow shall not exceed 5 feet per second (1.5 m/s) for thermoplastic irrigation pipes. Velocity of water flow shall not exceed 7.5 feet per second (2.3 m/s) for metal irrigation pipes.

(renumber remaining sections)

L 411.2 Backflow Protection. Potable water and reclaimed water supplies to landscape irrigation systems shall be protected from backflow in accordance with this code and the Authority Having Jurisdiction.

L 411.3 Use of Alternate Water Sources for Landscape Irrigation. Where available by pre-existing treatment, storage, or distribution network, and where approved by the Authority Having Jurisdiction, alternative water source(s) shall be utilized for landscape irrigation. Where adequate capacity and volumes of pre-existing alternative water sources are available, the irrigation system shall be designed to use a minimum of 75 percent of alternative water for the annual irrigation demand before supplemental potable water is used.

Exception: Plants grown for food production for direct human consumption.

L 411.3.1 Master Valve. Where continuously pressurized alternate water sources supply an existing irrigation system, a master valve shall be installed at the point where the alternate water sources supply piping connects to the existing irrigation system downstream of the backflow preventer where required.

L 411.3.2 Identification. Where alternate water sources supply an existing irrigation system, the existing sprinkler heads, valve boxes, the continuously pressurized line supplying the irrigation master valve, or any other components required by the Authority Having Jurisdiction, shall be colored purple. The piping supplying the irrigation master valve shall be identified in accordance with Chapter 15 of this code.

L 411.3.2.1 Additional Zones. Newly installed zones shall have purple pipe.

L 411.4 Irrigation Control Systems. Where installed as part of a landscape irrigation system, irrigation control systems shall:

(1) Automatically adjust the irrigation schedule to respond to plant water needs determined by weather or soil moisture conditions.

(2) Utilize onsite sensors or remote weather data to inhibit or to suspend irrigation when adequate soil moisture is present or during a rainfall or freezing conditions.

(3) Utilize either one or more on-site sensors or a weatherbased irrigation controller listed to the US EPA WaterSense Weather Based Irrigation Controllers Specification to suspend irrigation where adequate soil moisture is present for plant growth.

(4) Have the capability to program multiple and different run times for each irrigation zone to enable cycling of water applications and durations to mitigate water flowing off of the intended irrigation zone.

(5) Be capable of indicating to the user when it is not receiving a signal or local sensor input.

(6) Be capable of allowing for a manual operation troubleshooting test cycle and shall automatically return to sensor input mode within some period of time as designated by the manufacturer, even when the switch is still positioned for

manual operation.
(~~5~~7) The site-specific settings of the irrigation control system ~~affecting the irrigation and~~ shall be posted at the control system location. The posted data, where applicable to the settings of the controller, shall include:
(a) Precipitation rate for each zone.
(b) Plant evapotranspiration coefficients for each zone.
(c) Soil absorption rate for each zone.
(d) Rain sensor settings.
(e) Soil moisture setting.
(f) Peak demand schedule including run times for each zone and the number of cycles to mitigate runoff and monthly adjustments or percentage change from peak demand schedule.

L 411.5 Irrigation Flow Sensing System. On commercial landscape irrigation systems, an irrigation flow sensing system shall be installed that shall interface with the control system to suspend irrigation for abnormal flow conditions. If equipped with totalizer capabilities, the irrigation flow sensing system shall also function as a meter for irrigation water.

(renumber remaining sections)

L 411.5 Low Flow Irrigation. Irrigation zones using low flow irrigation emitters[with emitter flow rates not to exceed 6.3 gallons (24 L) per hour] shall comply with ASABE/ICC 802 Landscape Irrigation Sprinkler and Emitter Standard and shall be equipped with filters sized according to the manufacturer's recommendation for the specific low flow emitter, and with a pressure regulator installed upstream of the irrigation emission devices as necessary to reduce the operating water pressure in accordance with the manufacturers' equipment requirements.
L 411.6 Mulched Planting Areas. Only low flow emitters with flow rates not to exceed 6.3 gallons (24 L) per hour are allowed to be installed in mulched planting areas with vegetation taller than 12 inches (305 mm).
L 411.7 System Performance Requirements. The landscape irrigation system shall be designed and installed to:
(1) Prevent irrigation water from runoff out of the irrigation zone.
(2) Prevent water in the supply line drainage from draining out between irrigation events.
(3) Not allow irrigation water to be applied onto or enter non-targeted areas including adjacent property and vegetation areas, adjacent hydrozones not requiring the irrigation water to meet its irrigation demand, non-vegetative areas, impermeable surfaces, roadways, and structures.
Exception: Landscape features outside of the public right of way such as paved walkways, jogging paths, and golf cart paths, are exempted from this requirement where run off drains into the same hydrozone without puddling.
L 411.8 Narrow or Irregularly Shaped Landscape Areas. Narrow or irregularly shaped landscape areas, less than 4 feet (1219 mm) in any direction across opposing boundaries, shall not be irrigated by an irrigation emission device except low flow emitters with flow rates not to exceed 6.3 gallons (24 L) per hour.

~~**L 411.9 Sloped Areas.** Where soil surface rises more than 1 foot (305 mm) per 4 feet (1219 mm) of length, the irrigation zone system average precipitation rate shall not exceed 0.75 inches (19.1 mm) per hour as verified through either of the following methods:~~
~~(1) Manufacturer documentation that the precipitation rate for the installed sprinkler head does not exceed 0.75 inches (19.1 mm) per hour where the sprinkler heads are installed not closer than the specified radius and where the water pressure of the irrigation system is not more than the manufacturer's recommendations.~~
~~(2) Catch can test in accordance with the requirements of the Authority Having Jurisdiction and where emitted water volume is measured with a minimum of six catchment containers at random places within the irrigation zone for a minimum of 15 minutes to determine the average precipitation rate, expressed as inches per hour (mm/h).~~
L 411.9 Irrigation System Inspection and Performance Check. The irrigation system shall be inspected to verify compliance with the irrigation design in accordance with the following:
(1) Inspection and performance check shall be by an independent third party having credentials in accordance with the US EPA WaterSense program or the Authority Having Jurisdiction.
(2) Sprinklers shall be installed as specified with proper spacing and required nozzle.
(3) Sprinklers shall be activated and visually inspected for covering areas without causing overspray or runoff.
(4) Valves shall be installed as specified.
(5) Drip irrigation systems shall be inspected to verify the proper valve, pressure regulation, filtering device, location of flush valves, and that the installed emitters comply with the irrigation plan.
(6) Control system shall be installed as specified and listed as a US EPA WaterSense labeled controller, and all sensors shall be installed and verified for proper installation and operation.
(7) The peak demand irrigation schedule shall be posted near the controller, or the scheduling parameters for the controller shall be listed for each station including cycle and soak times.
(8) Record drawings of the irrigation system shall be completed and provided for the irrigation inspection.
(9) An inspection report shall be provided to the property owner or management company identifying problems and what corrective actions are required.

L 411.10.1 Sprinkler Heads in Common Irrigation Zones. Sprinkler heads installed in irrigation zones served by a common valve shall be limited to applying water to plants with similar irrigation needs, and shall have matched precipitation rates (identical inches of water application per hour ~~as rated or tested,~~ plus or minus ~~5~~ 7 percent as labeled or declared in manufacturer's published performance data).

L 411.10.4 Sprinkler Head Maximum Precipitation Rate. Where the slope of the landscape exceeds 25 percent, the precipitation rate of sprinkler heads shall not exceed 1.75 inches per hour when tested to ASABE/ICC 802.

~~**L 411.11 Irrigation Zone Performance Criteria.** Irrigation zones shall be designed and installed to ensure the average precipitation rate of the sprinkler heads over the irrigated area does not exceed 1 inch per hour (25.4 mm/h) as verified through either of the following methods:~~
~~(1) Manufacturer's documentation that the precipitation rate for the installed sprinkler head does not exceed 1 inch per hour (25.4 mm/h) where the sprinkler heads are installed not closer that the specified radius and where the water pressure of the irrigation system is not more than the manufacturer's recommendations.~~
~~(2) Catch can test in accordance with the requirements of the Authority Having Jurisdiction and where emitted water volume is measured with a minimum of six catchment containers at random places within the irrigation zone for a minimum of 15 minutes to determine the average precipitation rate, expressed as inches per hour (mm/h).~~
L 411.11 Outside Hose Bibbs. Outside hose bibbs shall be allowed on irrigation pipe downstream of the backflow preventer. Hose bibbs supplying water from the irrigation system shall be indicated by posted signs marked with the words: "CAUTION: NONPOTABLE WATER. DO NOT DRINK" and the symbol in Figure 1505.9 of this code.

(renumber remaining sections)

~~**L 411.14 Qualifications.** The Authority Having Jurisdiction shall have the authority to require landscape irrigation contractors, installers, or designers to demonstrate competency. Where required by the Authority Having Jurisdiction, the contractor, installer, or designer shall be certified to perform such work.~~

L 501.2.2 Building Cavities. Building cavities used for hot water supply and return piping shall be large enough to accommodate the combined diameter of the pipe plus the insulation, plus any other objects in the cavity that the piping must cross.

L 502.7 Maximum Volume and Length of Hot Water. The maximum volume of water contained in a hot water branch ~~distribution pipes~~ shall be in accordance with Section L 502.7.1 ~~or Section L 502.7.2. The water volume shall be calculated using Table L 502.7.~~ The maximum length per volume of piping shall comply with Section L 502.7.2.
L 502.7.1 Maximum Volume of Hot Water in a Branch ~~Without Recirculation or Heat Trace~~. ~~The maximum volume of water contained in hot water distribution pipe between the water heater and any fixture fitting shall not exceed 32 ounces (oz) (946 mL). Where a fixture fitting shutoff valve (supply stop) is installed ahead of the fixture fitting, the maximum volume of water is permitted to be calculated between the water heater and the fitting shut-off valve (supply stop).~~ The water volume per foot of piping shall be calculated using Table L 502.7.1. The maximum volume of water in a fixture branch between any source of hot water (water heaters, recirculation loops and electrically heat traced pipe shall be considered sources of hot water) and the fixture fitting shall be:
(1) 24 oz. where a single branch serves a single fixture.
(2) 40 oz. where a series branch incorporating one or more flow-through design configurations that serves two or more fixtures.
(3) 60 oz. where a ring branch incorporating two or more flow-through design configurations that serves two or more fixtures.
Exceptions:
(1) The maximum volume of a single branch or series branch between any source of hot water and a kitchen sink and dishwasher located on an island or a peninsula where the floor is a concrete slab shall not contain more than 40 oz.
(2) The maximum volume of a single branch to a standalone tub shall not contain more than 80 oz.

L 502.7.2 Maximum Length Per Volume of Water in a Branch ~~Volume of Hot Water with Recirculation or Heat Trace~~.
~~The maximum volume of water contained in the branches between the recirculation loop or electrically heat traced pipe, and the fixture fitting shall not exceed 16 oz (473 mL). Where a fixture fitting shutoff valve (supply stop) is installed ahead of the fixture fitting, the maximum volume of water is permitted to be calculated between the recirculation loop or electrically, heat traced pipe and the fixture fitting shut-off valve (supply stop).~~
~~**Exception:** Whirlpool bathtubs or bathtubs that are not equipped with a shower are exempted from the requirements of Section L 502.7.~~ For fixture branches in accordance with Section 1003.7.1, the maximum length of piping shall be calculated using Table L 502.7.2(1) through Table 502.7.2(4). Where a fixture fitting shut off valve (supply stop) is installed ahead of the fixture fitting, the maximum length is measured between the source of hot water and the fixture fitting shut off valve (supply stop)

TABLE L 502.7.1
WATER VOLUME FOR DISTRIBUTION PIPING MATERIALS

OUNCES OF WATER PER FOOT LENGTH OF PIPING														
NOMINAL SIZE (inch)	COPPER M	COPPER L	COPPER K	CPVC CTS SDR 11	CPVC SCH 40	PEX-AL-PEX	PE-AL-PE	CPVC SCH 80	PEX CTS SDR 9	PE-RT SDR 9	PP SDR 6	PP SDR 7.3	PP SDR 11	CPVC PIPE SDR 11
3/8	1.06	0.97	0.84	NA 0.68	1.17	0.5963	0.5963	0.85 NA	0.64	0.64	0.8591	1.029	1.24 NA	1.48
½	1.69	1.55	1.45	1.235	1.89	1.2231	1.2231	1.464	1.18	1.18	1.3541	1.648	2.12NA	2.33
¾	3.43	3.22	2.90	2.5267	3.38	3.2839	3.2839	2.724	2.35	2.35	2.1423	2.5462	3.37NA	3.68
1	5.81	5.49	5.17	4.2443	5.53	5.3756	5.3756	4.587	3.8891	3.8891	3.4664	4.2236	5.56NA	5.83
11/4	8.70	8.36	8.09	6.3861	9.66	8.6549	8.6549	8.234	5.801	5.801	5.4773	6.5981	8.60NA	9.35
11/2	12.18	11.83	11.45	8.95 9.22	13.20	13.9188	13.9188	11.38	8.089	8.089	8.64 9.03	10.2761	13.47NA	12.27
2	21.0850	20.58	20.04	15.3879	21.88	21.48 23.16	23.16 21.48	19.11	13.86	13.86	13.64 14.28	16.4298	21.39NA	19.19

For SI units: 1 foot = 304.8 mm, 1 ounce = 29.573

TABLE L 502.7.2(1)
LENGTH (FT) PER VOLUME OF PIPING

	COPPER TYPE M			COPPER TYPE L			COPPER TYPE K		
NOMINAL SIZE (inch)	24 OZ	40 OZ	60 OZ	24 OZ	40 OZ	60 OZ	24 OZ	40 OZ	60 OZ
3/8	22.7	37.8	56.7	24.9	41.4	62.1	28.4	47.4	71.1
1/2	14.2	23.7	35.5	15.5	25.8	38.7	16.5	27.6	41.4
3/4	7.0	11.6	17.5	7.5	12.4	18.6	8.3	13.8	20.7
1	4.1	6.9	10.3	4.4	7.3	10.9	4.6	7.7	11.6
11/4	2.8	4.6	6.9	2.9	4.8	7.2	3.0	4.9	7.4
11/2	2.0	3.3	4.9	2.0	3.4	5.1	2.1	3.5	5.2
2	1.1	1.9	2.8	1.2	1.9	2.9	1.2	2.0	3.0

For SI units: 1 foot = 304.8 mm, 1 ounce = 29.573 mL

TABLE L 502.7.2 (2)
LENGTH (FT) PER VOLUME OF PIPING

	CPVC CTS SDR 11			CPVC SCH 40 PIPE			CPVC SCH 80 PIPE			CPVC SDR 11 PIPE		
NOMINAL SIZE (inch)	24 OZ	40 OZ	60 OZ	24 OZ	40 OZ	60 OZ	24 OZ	40 OZ	60 OZ	24 OZ	40 OZ	60 OZ
3/8	35.5	59.1	88.6	20.5	34.2	51.4	28.3	47.2	70.7	16.2	27.0	40.4
1/2	19.5	32.6	48.8	12.7	21.1	31.7	16.6	27.7	41.5	10.3	17.2	25.7
3/4	9.5	15.9	23.8	7.1	11.8	17.8	8.8	14.7	22.0	6.5	10.9	16.3
1	5.7	9.4	14.2	4.3	7.2	10.9	5.2	8.7	13.1	4.1	6.9	10.3
11/4	3.8	6.3	9.4	2.5	4.1	6.2	2.9	4.9	7.3	2.6	4.3	6.4
11/2	2.7	4.5	6.7	1.8	3.0	4.5	2.1	3.5	5.3	2.0	3.3	4.9
2	1.6	2.6	3.9	1.1	1.8	2.7	1.3	2.1	3.1	1.3	2.1	3.1

For SI units: 1 foot = 304.8 mm, 1 ounce = 29.573 mL

TABLE L 502.7.2 (3)
LENGTH (FT) PER VOLUME OF PIPING

	PEX & PE-RT CTS SDR 9			PEX-AL-PEX (DN)			PE-AL-PE (DN)		
NOMINAL SIZE, inches (DN)*	24 OZ	40 OZ	60 OZ	24 OZ	40 OZ	60 OZ	24 OZ	40 OZ	60 OZ
3/8(12)	37.5	62.5	93.8	40.7	67.8	101.8	40.7	67.8	101.8
1/2(16)	20.4	33.9	50.9	19.6	32.7	49.0	19.6	32.7	49.0
3/4(25)	10.2	17.0	25.5	7.3	12.2	18.3	7.3	12.2	18.3
1 (32)	6.2	10.3	15.5	4.5	7.4	11.2	4.5	7.4	11.2
11/4(40)	4.1	6.9	10.3	2.8	4.6	6.9	2.8	4.6	6.9
11/2(50)	3.0	4.9	7.4	1.7	2.9	4.3	1.7	2.9	4.3
2 (63)	1.7	2.9	4.3	1.0	1.7	2.6	1.0	1.7	2.6

For SI units: 1 foot = 304.8 mm, 1 ounce = 29.573 mL
* DN is outside diameter

TABLE L 502.7.2 (4)
LENGTH (FT) PER VOLUME OF PIPING

	PP SDR 6 (DN)			PP SDR 7.3 (DN)			PP SDR 11 (DN)1		
NOMINAL SIZE, Inches (DN)2	24 OZ	40 OZ	60 OZ	24 OZ	40 OZ	60 OZ	24 OZ	40 OZ	60 OZ
3/8(16)	28.2	46.9	70.4	23.5	39.2	58.8	NA	NA	NA
1/2(20)	17.7	29.6	44.3	14.7	24.4	36.6	NA	NA	NA
3/4(25)	11.2	18.7	28.0	9.5	15.8	23.6	NA	NA	NA
1 (32)	6.9	11.6	17.3	5.7	9.5	14.2	NA	NA	NA
11/4(40)	4.4	7.3	11.0	3.6	6.1	9.1	NA	NA	NA
11/2(50)	2.8	4.6	6.9	2.3	3.9	5.8	NA	NA	NA
2 (63)	1.8	2.9	4.4	1.5	2.4	3.7	NA	NA	NA

For SI units: 1 foot = 304.8 mm, 1 ounce = 29.573 mL
Notes:
1 PP SDR 11 products are not typically used or rated at 180°F
2 DN is outside diameter

L 503.3.3 Insulation. Insulation of hot water and return piping shall meet the provisions in Section L 501.2. ~~The following piping shall be insulated in accordance with Table L 503.3.3:~~
~~(1) Recirculating system piping, including the supply and return piping of a circulating tank type water heater.~~
~~(2) The first 8 feet (2438 mm) of outlet piping for a constant temperature nonrecirculating storage system.~~
~~(3) The first 8 feet (2438 mm) of branch piping connecting to recirculated, heat traced, or impedance heated piping.~~
~~(4) The inlet piping between the storage tank and a heat trap in a nonrecirculating storage system.~~
~~(5) Piping that is externally heated (such as heat trace or impedance heating). [ASHRAE 90.1:7.4.3]~~

~~**TABLE L 503.3.3**~~
~~**MINIMUM PIPING INSULATION THICKNESS FOR HEATING AND HOT-WATER SYSTEMS (STEAM, STEAM CONDENSATE, HOT-WATER HEATING, AND DOMESTIC WATER SYSTEMS) [ASHRAE 90.1: TABLE 6.8.3-1]**~~

FLUID OPERATING TEMPERATURE RANGE AND USAGE (°F)	INSULATION CONDUCTIVITY		=NOMINAL PIPE SIZE OR TUBE SIZE (inches)				
	CONDUCTIVITY Btu•inch/(h•ft^2•°F)	MEAN RATING TEMPERATURE (°F)	<1	1 to <11/2	11/2 to <4	4 to <8	8
			INSULATION THICKNESS (inches)				
>350	0.32 to 0.34	250	4.5	5.0	5.0	5.0	5.0
251 to 350	0.29 to 0.32	200	3.0	4.0	4.5	4.5	4.5
201 to 250	0.27 to 0.30	150	2.5	2.5	2.5	3.0	3.0
141 to 200	0.25 to 0.29	125	1.5	1.5	2.0	2.0	2.0
105 to 140	0.22 to 0.28	100	1.0	1.0	1.5	1.5	1.5

~~For SI units: °C=(°F-32)/1.8, 1 British thermal unit inch per hour square foot degree Fahrenheit = [0.1 W/(m•K)], 1 inch = 25 mm~~

~~**Notes:**~~

~~1 For insulation outside the stated conductivity range, the minimum thickness (*T*) shall be determined as follows:~~

~~$T = r\{(1 + t/r)K/k - 1\}$ Where:~~

~~*T* = minimum insulation thickness (inches) (mm).~~

~~*r* = actual outside radius of pipe (inches) (mm).~~

~~*t* = insulation thickness listed in this table for applicable fluid temperature and pipe size.~~

~~*K* = conductivity of alternate material at mean rating temperature indicated for the applicable fluid temperature [Btu•in/(h•ft^2•°F)] [W/(m•K)].~~

~~*k* = the upper value of the conductivity range listed in this table for the applicable fluid temperature.~~

~~2 These thicknesses are based on energy efficiency considerations only. Additional insulation is sometimes required relative to safety issues or surface temperature.~~

~~3 For piping 11/2 inches (40 mm) or less, and located in partitions within conditioned spaces, reduction of insulation thickness by 1 inch (25.4 mm) shall be permitted before thickness adjustment required in Footnote 1, but not a thickness less than 1 inch (25.4 mm).~~

~~4 For direct-buried heating and hot water system piping, reduction of insulation thickness by 11/2 inch (38 mm) shall be permitted before thickness adjustment required in Footnote 1, but not a thickness less than 1 inch (25.4 mm).~~

~~5 Table L 503.3.3 is based on steel pipe. Non-metallic pipes, Schedule 80 thickness or less shall use the table values. For other non-metallic pipes having a thermal resistance more than that of steel pipe, reduced insulation thicknesses shall be permitted where documentation is provided showing that the pipe with the proposed insulation has no more heat transfer per foot (mm) than a steel pipe of the same size with the insulation thickness shown in Table L 503.3.3.~~

L 503.3.6 Swimming Pools, Spas, and Hot Tubs. Pool, spa, and hot tub heating systems shall comply with Section L 503.3.6(1) through Section ~~L 503.3.6(3)~~ L 503.3.6(5).

(1) Pool, spa, and hot tub heaters shall be equipped with a readily accessible ~~ON/OFF~~ on and off switch to allow shutting off the heater without adjusting the thermostat setting. Pool heaters fired by natural gas shall not have continuously burning pilot lights. [ASHRAE 90.1:7.4.5.1]

(2) ~~Heated p~~Pools and inground permanently installed spas, and portable spas, shall be ~~equipped~~ provided with a non-liquid vapor retardant ~~pool~~ cover ~~on or at the water surface. Pools heated to more than 90°F (32°C) shall have a pool cover with a minimum insulation value of R-12~~.

Exception: ~~Pools that are deriving over~~ Where more than ~~60~~ 70 percent of the energy for heating, computed over an operating season, is from site-recovered energy such as from a heat pump or solar energy. [ASHRAE 90.1:7.4.5.2]

(3) Portable spa covers shall meet the requirements of APSP-14.

(~~3~~ 4) (remaining text unchanged)

(5) Pool pumps and replacement pool pump motors shall meet requirements of APSP-15.

TABLE 1701.2
STANDARDS, PUBLICATIONS, PRACTICES, AND GUIDES

DOCUMENT NUMBER	DOCUMENT TITLE	APPLICATION
ASABE/ICC 802-2014	Landscape Irrigation Sprinkler and Emitter Standard	Irrigation
ANSI/APSP/ICC-14-2019	Portable Electric Spa Energy Efficiency	Spas
ANSI/APSP/ICC-15a-2013	Residential Swimming Pool and Spa Energy Efficiency	Swimming Pool, Spa
Energy Star-2007	Program Requirements for Commercial Ice Machines	Miscellaneous
EPA WaterSense-2017	Specifications for Weather-Based Irrigation Controllers	Miscellaneous
WQA/ASPE/ANSI S-803-2017	Sustainable Drinking Water Treatment Systems	Miscellaneous

(portions of table not shown remain unchanged)

SUBSTANTIATION:
The proposed changes to Appendix L are updates correlate with the latest edition of the WeStand.

Proposals

Item #: 292

UPC 2024 Section: Table L 402.1, Table 1701.2

SUBMITTER: Robert Pickering
Eastern Research Group, Inc.
Rep. EPA WaterSense

RECOMMENDATION:
Revise text

TABLE L 402.1
MAXIMUM FIXTURE AND FIXTURE FITTINGS FLOW RATES

FIXTURE TYPE	FLOW RATE
Showerheads	2.0 gpm at 80 psi[1]
Kitchen faucets residential[4]	1.8 gpm at 60 psi
Lavatory faucets residential	1.5 gpm at 60 psi
Lavatory faucets other than residential	0.5 gpm at 60 psi
Metering faucets	0.25 gallons/cycle
Metering faucets for wash fountains	One 0.25 gallons/cycle fixture fit- ting for each 20 inches rim space
Wash fountains	One 2.2 gpm at 60 psi fixture fit- ting for each 20 inches rim space
Water Closets	1.28 gallons/flush[2]
Urinals	0.5 gallons/flush[3]
Commercial Pre-Rinse Spray Valves	1.3 gpm at 60

For SI units: 1 gallon per minute = 0.06 L/s, 1 pound-force per square inch = 6.8947 kPa, 1 inch = 25.4 mm, 1 gallon = 3.785 L

Notes:

[1] Shall be listed to EPA WaterSense Specification for Showerheads. For multiple showerheads serving one shower compartment see Section L 402.6.1.

[2] Shall be listed to EPA WaterSense Tank-Type Toilet Specification.

[3] Shall be listed to EPA WaterSense Flushing Urinal Specification. Non- water urinals shall comply with specifications listed in Section L 402.3.1.

[4] See Section L 402.4.

TABLE 1701.2
STANDARDS, PUBLICATIONS, PRACTICES, AND GUIDES

DOCUMENT NUMBER	DOCUMENT TITLE	APPLICATION
EPA WaterSense-2018	Specification for Showerheads	Fixtures

(portions of table not shown remain unchanged)

SUBSTANTIATION:
Revised note is consistent with other references to WaterSense specifications within Table L402.1 notes.

Proposals

Item #: 293

UPC 2024 Section: Table L 402.1, Table 1701.2

SUBMITTER: Robert Pickering
Eastern Research Group, Inc.
Rep. EPA WaterSense

RECOMMENDATION:
Revise text

TABLE L 402.1
MAXIMUM FIXTURE AND FIXTURE FITTINGS FLOW RATES

FIXTURE TYPE	FLOW RATE
Showerheads	2.0 gpm at 80 psi[1]
Kitchen faucets residential[4]	1.8 gpm at 60 psi
Lavatory faucets residential	1.5 gpm at 60 psi
Lavatory faucets other than residential	0.5 gpm at 60 psi
Metering faucets	0.25 gallons/cycle
Metering faucets for wash fountains	One 0.25 gallons/cycle fixture fit- ting for each 20 inches rim space
Wash fountains	One 2.2 gpm at 60 psi fixture fit- ting for each 20 inches rim space
Water Closets	1.28 gallons/flush[2]
Urinals	0.5 gallons/flush[3]
Commercial Pre-Rinse Spray Valves	1.3 gpm at 60

For SI units: 1 gallon per minute = 0.06 L/s, 1 pound-force per square inch = 6.8947 kPa, 1 inch = 25.4 mm, 1 gallon = 3.785 L

Notes:

[1] For multiple showerheads serving one shower compartment see Section L 402.6.1.

[2] Shall be listed to EPA WaterSense Secification for Tank-Type Toilet or Specification for Flushometer-Valve Water Closets.

[3] Shall be listed to EPA WaterSense Flushing Urinal Specification. Non- water urinals shall comply with specifications listed in Section L 402.3.1.

[4] See Section L 402.4.

TABLE 1701.2
STANDARDS, PUBLICATIONS, PRACTICES, AND GUIDES

DOCUMENT NUMBER	DOCUMENT TITLE	APPLICATION
EPA WaterSense-2015	Specification for Flushometer-Valve Water Closets	Fixtures

(portions of table not shown remain unchanged)

SUBSTANTIATION:
EPA WaterSense has developed separate specifications that differentiate between tank-type toilets (i.e., gravity, pressure assist, or electro-hydraulic tank-type water closets) and flushometer-valve water closets. Both specifications are currently referenced in Section L402.2, so notes should be consistent.

Proposals

Item #: 294

UPC 2024 Section: Table L 402.1

SUBMITTER: Robert Pickering
Eastern Research Group, Inc.
Rep. EPA WaterSense

RECOMMENDATION:
Revise text

TABLE L 402.1
MAXIMUM FIXTURE AND FIXTURE FITTINGS FLOW RATES

FIXTURE TYPE	FLOW RATE
Showerheads	2.0 gpm at 80 psi[1]
Kitchen faucets residential[4]	1.8 gpm at 60 psi
Lavatory faucets residential[5]	1.5 gpm at 60 psi
Lavatory faucets other than residential	0.5 gpm at 60 psi
Metering faucets	0.25 gallons/cycle
Metering faucets for wash fountains	One 0.25 gallons/cycle fixture fit- ting for each 20 inches rim space
Wash fountains	One 2.2 gpm at 60 psi fixture fit- ting for each 20 inches rim space
Water Closets	1.28 gallons/flush[2]
Urinals	0.5 gallons/flush[3]
Commercial Pre-Rinse Spray Valves	1.3 gpm at 60

For SI units: 1 gallon per minute = 0.06 L/s, 1 pound-force per square inch = 6.8947 kPa, 1 inch = 25.4 mm, 1 gallon = 3.785 L

Notes:

[1] For multiple showerheads serving one shower compartment see Section L 402.6.1.

[2] Shall be listed to EPA WaterSense Tank-Type Toilet Specification.

[3] Shall be listed to EPA WaterSense Flushing Urinal Specification. Non- water urinals shall comply with specifications listed in Section L 402.3.1.

[4] See Section L 402.4.

[5] Shall be listed to EPA WaterSense High-Efficiency Lavatory Faucet Specification.

SUBSTANTIATION:
Consistent with other references to WaterSense specifications within Table 402.1 notes. WaterSense Specification is already referenced in Section L 402.5.1.

Proposals

Item #: 295

UPC 2024 Section: L 402.8, Table L 402.8

SUBMITTER: Robert Pickering
Eastern Research Group, Inc.
Rep. EPA WaterSense

RECOMMENDATION:
Revise text

L 402.0 Water-Conserving Plumbing Fixtures and Fittings.

L 402.8 Commercial Pre-Rinse Spray Valves. The flow rate for a pre-rinse spray valve installed in a commercial kitchen to remove food waste from cookware and dishes before cleaning shall not be more than ~~1.28 gpm (4.8 L/m) at 60 psi (414 kPa)~~ the maximum flow rate, as specified in Table L 402.8. Where pre-rinse spray valves with maximum flow rates of 1.0 gpm (3.8 L/m) or less are installed, the static pressure shall be not less than 30 psi (207 kPa). Commercial kitchen pre-rinse spray valves shall be equipped with integral automatic shutoff. ~~Pre-rinse spray valves shall be listed to the EPA WaterSense Commercial Pre-rinse Spray Valve Specification.~~

TABLE L 402.8
COMMERCIAL PRE-RINSE SPRAY VALVE MAXIMUM FLOW RATE

PRODUCT CLASS BY SPRAY FORCE	MAXIMUM FLOW RATE (GPM)
Product Class 1 (</= 5.0 ounces-force)	1.00
Product Class 2 (> 5.0 ounces-force and </= 8.0 ounces-force)	1.20
Product Class 3 (> 8.0 ounces-force)	1.28

For SI units: 1 gallon per minute = 3.785 L/min, 1 ounce-force = 0.0625 pound-force

SUBSTANTIATION:
Effective as of January 2019, the Department of Energy has new maximum flow rate requirements for pre-rinse spray valves depending on the spray force. Suggest revising flow rate requirements within UPC to be consistent.

In response, WaterSense sunset its specification and no longer labels this product category. See https://www.epa.gov/watersense/pre-rinse-spray-valves for more information.

Proposals

Item #: 296

UPC 2024 Section: L 402.8

SUBMITTER: Tim Collings
self

RECOMMENDATION:
Add new text

L 402.0 Water-Conserving Plumbing Fixtures and Fittings.

L 402.8 Bath and Shower Flow-Reduction Devices. Bath and shower flow-reduction devices shall comply with IAPMO IGC 244.

(renumber remaining sections)

SUBSTANTIATION:
Tub and shower flow-reduction devices are intended for reducing the waste of water and energy by the use of a valve or system of valves that reduces the flow of water to a trickle once a set temperature is reached. This standard covers temperature-actuated flow-reduction devices and systems intended to be installed in tub spouts or immediately upstream of shower heads and specifies requirements for materials, physical characteristics, performance testing, and markings.

Proposals

Item #: 300

UPC 2024 Section: L 410.3, Table 1701.2

SUBMITTER: Jason M Shank
ASSE International

RECOMMENDATION:
Revise text

L 410.0 Water Softeners and Treatment Devices.

L 410.3 Point-of-Use Reverse Osmosis Water Treatment Systems. Reverse osmosis water treatment systems installed in residential occupancies shall be equipped with automatic shutoff valves to prevent discharge when there is no call for producing treated water. Reverse osmosis water treatment systems shall be listed in accordance with NSF 58 and ASSE 1086.

TABLE 1701.2
STANDARDS, PUBLICATIONS, PRACTICES, AND GUIDES

DOCUMENT NUMBER	DOCUMENT TITLE	APPLICATION
ASSE 1086-2020	Reverse Osmosis Water Efficiency – Drinking Water	Appliances

(portions of table not shown remain unchanged)

SUBSTANTIATION:
This standard covers water efficiency, automatic shut-off valves, and flow restrictor requirements for Residential RO systems and performance testing to address the membrane life concerns of high efficiency RO membranes. This standard includes test requirements for complete systems or components (RO membrane, automatic shut off valve, flow restrictor).

Proposals

Item #: 305

UPC 2024 Section: Appendix N, Table 1701.2

SUBMITTER: Julius Ballanco, P.E.
JB Engineering and Code Consulting, P.C.
Rep. Chair, UMC Legionella Task Group

RECOMMENDATION:
Revise text

APPENDIX N
IMPACT OF WATER TEMPERATURE ON THE POTENTIAL FOR SCALDING AND LEGIONELLA GROWTH

N 101.0 General.
N 101.1 Applicability. This appendix provides guidelines on the impact of water temperature in minimizing both scalding and Legionella growth potential associated with occupiable commercial, institutional, multi-unit residential, and industrial building plumbing systems.

This Appendix shall not include single-family residential buildings. This appendix shall not be considered a risk management guidance document for scalding or Legionella.

Note: Published documents which address Legionella risk management include ASHRAE 188, ASHRAE Guideline 12, or as required by the Authority Having Jurisdiction.

There are additional factors associated with the potential for scalding and Legionella growth other than temperature.

For scalding potential, other factors include, but are not limited to, user age, health, body part, length of contact time, and water source.

For Legionella growth potential other factors include, but are not limited to, water source and plumbing system: size, design, circulation rate, water age, disinfectant residual, piping material and component complexity.

N 102.0 Definitions.
N 102.1 General. For the purpose of this appendix the following definitions shall apply:
Biofilm. Microorganisms and the slime they secrete that grow on any continually moist surface.
~~**N 102.1**~~ **Cold Water.** Water at a temperature less than 77°F (25°C).
Control. The management to maintain compliance with established criteria.
Disinfection. Chemical or physical control measures or procedures used to kill or inactivate pathogens.
~~**N 102.8**~~ **Disinfecting Hot Water.** Water at a temperature not less than 160°F (71°C).
Hazard. See Risk.
Halogenation. A chemical reaction that involves the addition of one or more halogens, including, but not limited to, chlorine, bromine, or iodine, commonly used to disinfect water systems.
~~**N 102.6**~~ **Hot Water.** Water at a temperature not less than 130°F (54°C) and less than 140°F (60°C).
~~**N 102.9**~~ **Legionella Growth Potential.** The likelihood that Legionella bacteria will reproduce.
Monitor. Observing and checking the progress or quality of (something) or measuring the physical and chemical characteristics of control measures.
Risk. The potential to cause harm resulting from exposure.
~~**N 102.10**~~ **Scald Potential.** The likelihood of burning the skin.
~~**N 102.5**~~ **Tempered Hot Water.** Water at a temperature not less than 120°F (49°C) and less than 130°F (54°C).
~~**N 102.2**~~ **Tepid Cold Water.** Water at a temperature not less than 77°F (25°C) and less than 85°F (29°C).
~~**N 102.3**~~ **Tepid Water.** Water at a temperature not less than 85°F (29°C) and less than 110°F (43°C).

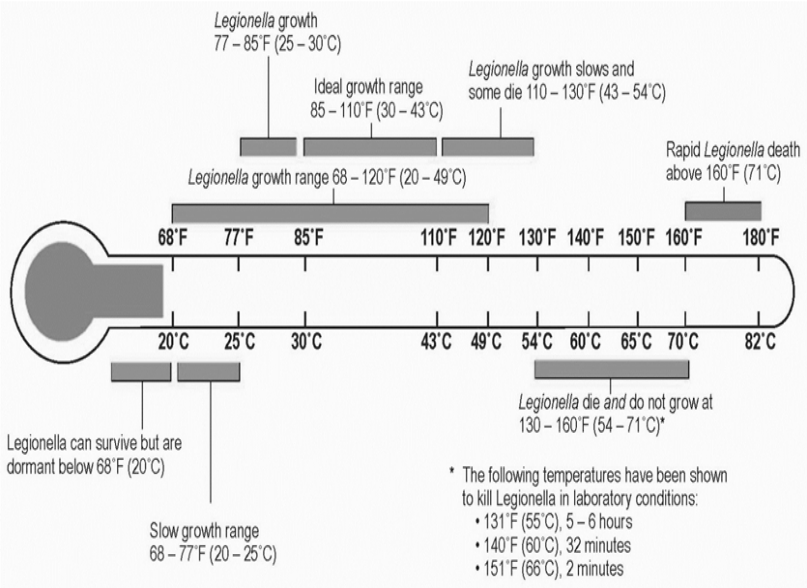
Test. The measurement of the physical, chemical, or microbial characteristics or quality of water.
~~**N 102.7**~~ **Very Hot Water.** Water at a temperature not less than 140°F (60°C) and less than 160°F (71°C).
~~**N 102.4**~~ **Warm Water.** Water at a temperature not less than 110°F (43°C) and less than 120°F (49°C).
Water Management Plan. A comprehensive risk management plan for controlling Legionella growth in building water systems.

N 103.0 Building Water System Design Documentation.
N 103.1 ~~Required~~ Design Documentation. Construction documents shall be required for new construction, renovation, refurbishment, replacement, or repurposing of an occupiable building water system, including a water management plan, and shall be submitted to the Authority Having Jurisdiction.
N 103.2 Onsite Documentation. Documentation shall be maintained onsite and shall be readily accessible to the Authority Having Jurisdiction.

N 104.0 Potential Exposure.

N 104.1 Legionella Growth Potential. The Authority Having Jurisdiction shall have the authority to require documentation to address Legionella growth potential, where water temperatures in a water distribution system are within ranges shown in ~~Table N 104.1~~ Figure N 104.1 that pose a Legionella growth potential.

FIGURE N 104.1
WATER TEMPERATURE RANGES AND LEGIONELLA GROWTH POTENTIAL*



For SI units: °C = (°F-32)/1.8

* Temperature ranges reported are experimentally determined in a laboratory setting in the absence of a realistic microbial community. Legionella can survive for longer periods of time at temperatures higher and lower than the growth temperature ranges indicated due to changes in their metabolic state and/or protection from thermal disinfection within biofilm or amoeba host organisms.

N 104.2 Scald Potential. Where the water distribution system's water temperature(s) range poses a scald potential in accordance with Table ~~N 104.1~~ N 104.2, protection shall be provided in accordance with Chapter 4.

TABLE ~~N 104.1~~ N 104.2
~~CORRELATION BETWEEN~~ WATER TEMPERATURE RANGES~~, LEGIONELLA,~~ AND SCALD POTENTIAL

WATER DESCRIPTION	TEMPERATURE (°F)	SCALD POTENTIAL~~1 *~~	~~LEGIONELLA GROWTH POTENTIAL2~~
Cold	<77	None	~~Minimal~~
Tepid Cold	>/=77 and <85	None	~~Low~~
Tepid	>/=85 and <110	None Hyperthermia is possible after long exposure in a bathtub or whirlpool tub.	~~High~~
Warm	>/=110 and <120	Minimal At 111°F, greater than 220 minutes for second-degree burn.	~~Moderate~~
Tempered Hot	>/=120 and <130	Low At 120°F, greater than 5 minutes for second-degree burn, and 10 minutes to third-degree burn; At 124°F, two minutes for second-degree burn, and 4 minutes, 10 seconds for third-degree burn.	~~Low~~
Hot	>/=130 and <140	Moderate to High At 130°F, 18 seconds for second-degree burn, and 30 seconds for third-degree burn.	~~None~~
Very Hot	>/=140 and <160	High At 140°F, three seconds for second-degree burn, and 5 seconds for third-degree burn; At 150°F, instant for second-degree burn, and less than two seconds for third-degree burn; At 158°F, instant for second-degree burn, and less than a second for third-degree burn.	~~None~~
Disinfecting Hot	>/=160	Immediate	~~None~~

~~**Notes:**~~

~~1~~ ~~*~~The infant, elderly, and infirmed have a higher potential for scalding at temperatures lower than listed.

~~2 Temperature ranges reported are experimentally determined in a laboratory setting in the absence of a realistic microbial community. Legionella can survive for longer periods of time at temperatures higher and lower than the growth temperature ranges indicated due to changes in their metabolic state and/or protection from thermal disinfection within biofilm or amoeba host organisms.~~

N 105.0 Disinfection.

N 105.1 Disinfection Documentation. Where required by the Authority Having Jurisdiction, documentation for disinfection of all building water systems shall be provided by the registered design professional in the construction documents.

~~Methods for new construction and any repaired system disinfection shall include, but not be limited to, the chlorination methods and procedures for flushing and disinfection in accordance with Section 609.10.~~

~~Other or alternative water treatment methods for disinfection shall include, but not be limited to, one of the following methods:~~

~~(1)~~ **N 105.1.1 Copper-Silver Ionization.** Copper-silver ionization methods and procedures, shall include ~~including~~ the following documentation.

(~~a~~1) Copper and silver ionization concentrations ~~shall be included in the documentation~~.

(~~b~~2) Methods and documentation for monitoring ion levels.
(~~c~~3) Electrode cleaning cycles and methods ~~shall be reported~~.
~~(2)~~ **N 105.1.2 Ultraviolet Light.** Ultraviolet light methods shall include the following documentation:
(~~a~~1) Locations of ultraviolet light units.
(~~b~~2) Cleaning cycles and methods of the quartz sleeves and housing ~~shall be documented~~.

N 105.2 Chemical Disinfection. Chemical biocide treatment shall be permitted to be used in accordance with the following:
(1) Oxidizing biocides in accordance with manufacturer's guidelines.
(2) Non-oxidizing biocides in accordance with manufacturer's guidelines.
(3) Alternating the use of different types of biocides, dose, and frequency is recommended.
(4) These treatment methods can be used for continuous, online disinfection or shock treatment online or offline.
(5) Biocides intended for potable water applications shall listed in accordance with NSF 60 and approved by the Authority Having Jurisdiction.

N 105.3 Non-Chemical Treatment. Non-chemical treatment devices shall be permitted to be used in accordance with manufacturer's guidelines.
N 105.3.1 Thermal Shock. Thermal treatment using heat shock at 158°F (70°C) for 30 minutes shall be permitted in accordance with applicable guidelines and the Authority Having Jurisdiction.
N 105.4 Frequency of Cleaning and Disinfection. Where a water management plan is implemented, the frequency of cleaning and disinfection logs shall be readily accessible to the water management team and the Authority Having Jurisdiction.
N 105.5 Control Measures. Control measures for Legionella prevention shall be evaluated for potential consequences that affect overall health risks.

N 201.0 Supply System Legionella Test Levels.
N 201.1 General. The minimum remediation action for water supply systems shall be in accordance with Table N 201.1.

TABLE N 201.1
LEGIONELLA REMEDIATION ACTIONS DOMESTIC WATER SYSTEMS

Percentage of Positive Legionella Test Sites	Remediation Action[1]
< 30	Maintain environmental assessment and Legionella monitoring in accordance with the water management plan.
>/= 30	Immediately institute short-term control measures[2] in accordance with the direction of a qualified professional,[3] and notify the Authority Having Jurisdiction, if required. · The water system shall be re-sampled no sooner than 7 days and no later than 4 weeks after disinfection to determine the efficacy of the treatment. · For persistent results, as determined by the Authority Having Jurisdiction, showing = 30 percent positive sites, long-term control measures[5] shall be implemented in accordance with the direction of a qualified professional[3] and the Authority Having Jurisdiction. · Retreat and retest. If retest is = 30 percent positive, repeat short-term control measures.[2] · With receipt of results < 30 percent positive[4], resume monitoring in accordance with the water management plan. · For persistent results, as determined by the Authority Having Jurisdiction, showing = 30 percent positive sites, long-term control measures[5] shall be implemented in accordance with the direction of a qualified professional[3] and the Authority Having Jurisdiction.

Notes:
[1] In the event that one or more cases of legionellosis are, or may be, associated with the facility, the sampling interpretation shall be in accordance with the direction of a qualified professional and the Authority Having Jurisdiction.
[2] Short-term control measures are temporary interventions that may include, but are not limited to, heating and flushing the water system, hyperchlorination, or the temporary installation of treatment such as copper silver ionization (CSI).
[3] Control measures shall be conducted in accordance with the direction of a qualified professional. A qualified professional is an Authority Having Jurisdiction licensed professional engineer; certified industrial hygienist; certified

water technologist; environmental consultant or water treatment professional with training and experience performing assessments and sampling in accordance with current standard industry protocols.

[4] Positive samples should be minimized.

[5] Long-term control measures may include supplemental disinfection treatments.

N 202.0 Emergency Response Plan.

N 202.1 General. An emergency response plan shall be provided when required by with the Authority Having Jurisdiction and shall include, but not be limited to, the following:

(1) Procedures to be followed if there are cases of Legionellosis associated with the plumbing system.

(2) Procedures to be followed if the plumbing system reaches greater than or equal to 30 percent of test sites positive for Legionella.

(3) Testing for Legionella shall be performed. Procedures shall include the type of tests to be performed, sampling, and the interpretation of test results.

(4) Procedures for emergency disinfection.

(5) Procedures for other actions identified by the water management plan to prevent exposure to contaminated water.

TABLE 1701.2
STANDARDS, PUBLICATIONS, PRACTICES, AND GUIDES

DOCUMENT NUMBER	DOCUMENT TITLE	APPLICATION
NSF/ANSI/CAN 60-2020	Drinking Water Treatment Chemicals - Health Effects	Water Treatment

(portions of table not shown remain unchanged)

SUBSTANTIATION:

The UMC Legionella Task Group met several times throughout 2020 to develop a new Appendix (Impact of Water Temperature on the Potential for Legionella Growth) to establish minimum requirements for building mechanical systems to minimize Legionella growth potential within such systems. The UMC Legionella Task Group also reviewed the existing UPC Appendix N (Impact of Water Temperature on the Potential for Scalding and Legionella Growth) to correlate and further enhance the UPC Appendix N.

Included in the recommendations are a new Figure N 104.1 that is a specifically scaled for Legionella growth potential. Figure N 104.2 (formerly Figure N 104.1) remains mostly unchanged, except that the Legionella growth potential temperature ranges have been relocated into a separate figure, Figure N 104.1. This update simplifies the temperature ranges for Legionella growth potential and scald potential and adds clarity for the end user on the use of the figures and assists when acquiring the important information needed. The updates also include a distinction between chemical and non-chemical disinfection and treatment criteria, remediation guidelines for domestic water, and an emergency response plan.

Proposals

Item #: 306

UPC 2024 Section: Appendix O, Table 1701.2

SUBMITTER: Edward R. Osann (Natural Resources Defense Council); C.J. Lagan (LIXIL Water Technology Americas); Albert Robert (Bob) Rubin (North Carolina State University)

RECOMMENDATION:
Add new text

Appendix O
Non-Sewered Sanitation Systems

O 101.0 General.
O 101.1 Applicability. The provisions of this chapter shall apply to the installation of non-sewered sanitation systems.
O 101.2 System Requirements. Non-sewered sanitation systems shall comply with ANSI/CAN/IAPMO/ISO 30500.

O 201.0 Definitions.
O 201.1 General. For purposes of this chapter, the following definitions shall apply.
Conditioned Space. An area, room, or space normally occupied and being heated or cooled for human habitation by any equipment.
Non-Sewered Sanitation System. A prefabricated integrated sewage treatment unit that is not connected to a public sewer or private sewage disposal system.

O 301.0 Installation.
O 301.1 General. The installation of non-sewered sanitation systems shall be in accordance with the manufacturer's installation instructions and with Section O 301.2 through Section O 301.7.
O 301.2. Operating Conditions. A non-sewered sanitation system in either a conditioned or unconditioned space shall be installed where the ambient temperature, ambient humidity, and altitude (atmospheric pressure) are in accordance with the manufacturer's installation instructions or product listing.
O 301.3 Clearances for Servicing and Maintenance. A non-sewered sanitation system shall be located to permit access and sufficient clearance for service and maintenance. Unless otherwise specified by the manufacturer's installation instructions, not less than 30 inches (762 mm) in depth, width, and height of working space shall be provided at any access panel.
O 301.4 Backflow Prevention. A domestic water supply connection to a non-sewered sanitation system shall be protected in accordance with this code.
O 301.5 Effluent Storage. Any container or vessel for the storage of effluent discharged from a non-sewered sanitation system and not integral to such system shall be installed in accordance with the plumbing code.
O 301.6 Systems Employing Combustion. A non-sewered sanitation system employing combustion shall comply with the mechanical code.
Exception: A non-sewered sanitation system listed for unvented use.
O 301.7 Connection to Plumbing System Not Required. Unless the Authority Having Jurisdiction determines otherwise, a non-sewered sanitation system is not required to be connected to the drainage system of the building or premises.

O 401.0 Manual Required.
O 401.1 Operation and Maintenance Manual. Non-sewered sanitation systems shall have an operation and maintenance manual provided by the manufacturer.

O 501.0 System Output. The use or disposal of all substances exiting the non-sewered sanitation system shall be determined by the Authority Having Jurisdiction.

TABLE 1701.2
STANDARDS, PUBLICATIONS, PRACTICES, AND GUIDES

DOCUMENT NUMBER	DOCUMENT TITLE	APPLICATION
ANSI/CAN/IAPMO/ISO 30500-2019	Non-Sewered Sanitation Systems - Prefabricated Integrated Treatment Units - General Safety and Performance Requirements for Design and Testing	Miscellaneous

(portions of tale not shown remains unchanged)

Note: ANSI/CAN/IAPMO/ISO 30500 meets the requirements for a mandatory reference standards in accordance with Section 3-3.7.1 of IAPMO's Regulations Governing Committee Projects.

SUBSTANTIATION:
This proposal covers the essential considerations that a building official must assess when a non-sewered sanitation system (NSSS) as defined herein is installed in a building. Designed for operation without a sewer connection and, in many cases, without a dedicated water supply, NSSSs are anticipated to meet critical public health needs in areas with limited water and wastewater infrastructure, water supply constraints, and/or unfavorable soils for traditional on-site disposal methods. In the U.S., over 20% of the population relies on an onsite wastewater system. And even today, a portion of our population does not have access to fully functioning sanitation, largely due to lack of affordable infrastructure or to challenging site conditions.

To facilitate commercialization of hi-tech toilets and their acceptance by state and national regulatory bodies, an ISO standard was adopted in 2018 to establish the key performance attributes of NSSSs. Standard 30500, Non-sewered sanitation systems - Prefabricated integrated treatment units - General safety and performance requirements for design and testing, sets performance requirements for solid and liquid outputs, odor, noise, air emissions, materials, safety, marking, and ergonomics, together with relevant test procedures for measuring the attainment of these requirements. This ISO standard was adopted in identical form as a US and Canadian national standard in 2019, designated as ANSI/CAN/IAPMO/ISO 30500:2019.

In 2011, the Bill & Melinda Gates Foundation launched the "Reinvent the Toilet Challenge" to bring new technology to bear to achieve sustainable sanitation solutions. The target is a factory-built device that provides complete and effective treatment of human sanitary waste, unconnected to any sewer or drainage network and with minimal inputs of water and energy. Eight teams have received foundation support to develop prototypes for lab testing, field trials, and commercialization. Among these initial devices, three broad pathways for treatment technology have emerged - electro-chemical, biological, and combustion - and in some cases, combinations of these in the same device. Manufacturers have been involved in these efforts, and LIXIL (owner of American Standard) and other companies are working to develop compliant systems for both domestic and international installations. It is the general preference of manufacturers to design systems that are compliant with published codes and standards, rather than one-off compliance reviews by individual jurisdictions.

The provisions in this proposal address the considerations that must be taken into account by building officials regarding the placement and installation of NSSSs in buildings. The proposal would permit (but not require) the installation of a NSSS listed to the ISO standard, and provide an exception to the general requirement in the UPC that sanitation devices be connected to the building drainage system, unless a connection is required by the AHJ. Certain key protections, such as backflow prevention, proper ventilation of combustion-based units, and proper siting of storage tanks (if any) external to the unit are each specified in the proposal. The clearance requirements in Section “O” 301.3 correspond with the basic requirements found in the Uniform Mechanical Code, Section 304.1. Considerations of the use and disposal of outputs of the system are specifically referred to an AHJ, which would most likely be a health department.

Criteria for the functioning of the unit for its intended purpose are established by the ISO standard, and do not need to be repeated in plumbing code language. It should be noted that the ISO standard was developed by an international team of scientists, engineers, and regulators to assure the highest levels of treatment available would apply to all outputs (air, water and solids) from the device. The microbiological reduction requirements for solid and liquid waste are based on the quantitative microbial risk assessment (QMRA) method recognized by the World Health Organization for this purpose. The requirements of the standard mimic the highest quality standards imposed by regulatory agencies on waste-derived materials destined for reuse. The standard’s test procedures are rigorous (both lab and field tests are required), and the proposal allows only NSSSs listed to the standard to be approved for installation.

With reinvented toilets now on the cusp of commercialization, the arrival of toilets without water and sewer connections at job sites across the country can reasonably be expected by the time this code update is published and adopted by states and localities, e.g., 2025. Clear code language will accelerate the availability of safe sanitation for people who lack it today. While much is still unknown about the cost, maintenance, and reliability of NSSSs, or even the business model for their installation and servicing, forward-looking communities and jurisdictions with acute sanitation needs will want to be prepared for the safe installation and use of this promising new technology as it enters the market.

This proposal lays the necessary groundwork for code officials to inspect and approve their installation, set out in an appendix available for voluntary adoption by state and local code bodies.

Proposals

Item #: 308

UPC 2024 Section: Q 101.0 – Q 101.3, Q 201.0, Q 201.1

SUBMITTER: Gary Klein
Self
Chair, Potable Water Working Group

RECOMMENDATION:
Add new text

APPENDIX Q
THE SAFE OPERATION, CLOSURE AND REOPENING OF BUILDING WATER SYSTEMS

Part I – General.

Q 101.0 General.
Q 101.1 Applicability. This appendix shall apply to risk management practices for all potable and non-potable water supply systems during normal operation, when closing, interruption to normal operation (system shutdown), and re-opening of all building occupancy types except for single- and two-family residential buildings. Part I shall apply to potable water systems and non-potable water systems. Part II shall apply to potable water systems. Part III shall apply to non-potable water systems.
Q 101.2 Building Water Systems. This appendix shall be applicable to building water systems for plumbing systems including the following:
(1) Potable water systems
(2) Non-potable water systems shall include, but not limited to, the following:
(a) Alternate water systems for outdoor use and indoor water use (dual plumbing systems)
(b) Utility supplied reclaimed water
(c) Rainwater catchment
(d) Gray water
(e) Landscape irrigation
(f) Decorative features
(g) Outdoor use systems (showers, hose bibs, etc.)
Q 101.3 Building Types. This appendix shall be applicable to the following building types:
(1) Non-residential (low- and high-rise)
(a) Office buildings
(b) Mercantile (seasonal retail)
(c) Schools/dormitories
(d) Hotels/motel
(e) Assembly
(f) Healthcare
(2) Residential
(a) All except single and double family residences

Q 201.0 Definitions.
Q 201.1 General. For the purpose of this appendix, the following definitions shall apply.
Building Water. Water collected, conveyed, circulated, stored, drained, or discharged by building plumbing systems for use in and around buildings.
Building Water Systems. Potable and non-potable water systems in the building, or on site.

Potable Water System. A building water distribution system that provides hot or cold water intended for direct or indirect human contact or consumption.
Risk. The potential to cause harm resulting from exposure.
Risk Management. Systematic activities to reduce risk.

SUBSTANTIATION:
The new section is being added to the UPC Appendix Q to address the safe operation, closure and reopening of building water systems. The additions in this section provide a broad overview of what building types and systems have an elevated risk profile for Legionella amplification and transmission. The definitions were added as these terms are needed for application, clarification and enforceability of the provisions above.

Proposals

Item #: 309

UPC 2024 Section: Q 201.0 - Q 201.1, Q 301.0 – Q 301.4.1.2

SUBMITTER: Gary Klein
Self
Chair, Potable Water Working Group

RECOMMENDATION:
Add new text

Q 301.0 Water Management Program.
Q 301.1 Development. Where a water management program is not in place, a water management program shall be developed for the building water systems covered in this appendix according to ASHRAE 188 that addresses:
(1) All building water systems described in Section Q 101.2.
(2) The physical, chemical, and biological risks to the building water systems.
(3) The normal operation, shutdown, maintenance, and start-up of building water systems.
Q 301.2 Application. Where a water management program is in-place, it shall be reviewed prior to applying this manual to ensure it covers the above information. When a water management program is not in place, this information shall be compiled in order to apply this appendix. The following elements of a water management program shall be developed, in accordance with ASHRAE 188, prior to implementing this appendix:
(1) A program team shall be identified.
(2) The potable and non-potable building water systems shall be described, and process flow diagrams created.
(3) An analysis of the building water systems, including all engineering controls, shall be conducted and documented.
Note: ASHRAE 188 defines a water management program as “the risk management plan for the prevention and control of legionellosis associated with building water systems, including documentation of the plan’s implementation and operation.” Building water systems, including water supply and sanitary drainage, can present many additional risks to water quality and human health that warrant careful management of physical, chemical, and biological characteristics through a water management program.
Managing water quality can also improve the performance of building water systems and extend the life of plumbing system. Managing water in building plumbing systems further requires understanding and monitoring the interaction between supply water and premise plumbing systems, compelling coordination with water providers to ensure building managers are aware of upstream risks that may impact building water quality (see also Section Q 301.3 on utility coordination).
Q 301.3 Utility Coordinator. Information shall be obtained about the specific disinfection and corrosion control chemicals being used in the supply water to the building from the water utility, including the following:
(1) General water quality information
(2) Type and level of disinfectant residual
(3) Corrosion control chemicals added to the water
(4) Distribution system maintenance near the building
(5) Expected water quality changes
Note: It is important to notify the water utility of any sensitive water quality parameters for the building or facility, and to review/develop the notification protocol for significant water quality.
Q 301.4 Microbiological Testing. Microbial testing shall be done in accordance with Section Q 301.4.1 through Section Q 301.4.1.2.
Q 301.4.1 Laboratory Testing. Laboratory testing shall utilize culture testing methodology. Where a sample contains at least 1 CFU/mL or exceeds the limit of detection where the LOD of the method used is greater than 1 CFU/mL, the sample shall be deemed positive for Legionella.
Note: Other methodologies such as quantitative-polymerase chain reaction (qPCR) may be considered, usually in conjunction with the culture testing method.

Q 301.4.1.1 Culture Testing. Legionella culture testing shall be conducted by an accredited laboratory in accordance with the Authority Having Jurisdiction.
Q 301.4.1.2 qPCR Testing. When qPCR testing is used, Legionella pneumophila qPCR testing shall be conducted by an accredited laboratory in accordance with the Authority Having Jurisdiction.

Q 201.0 Definitions.
Q 201.1 General. For the purposes of this appendix, the following definitions shall apply.
Legionella. The name of the genus of bacteria that can cause a pneumonia called Legionnaires' disease or a flu-like illness called Pontiac fever when inhaled, aspirated, or directly introduced into the lungs of susceptible individuals. Legionella are common aquatic bacteria found in natural and building water systems, as well as in some soils.
Legionellosis. The term used to describe Legionnaires' disease, Pontiac fever, and any illness caused by exposure to Legionella bacteria.
Program Team. The group or individual designated by the building owner or designee to be responsible for developing, implementing, and maintaining the program.
Risk. The potential to cause harm resulting from exposure.
Risk Management. Systematic activities to reduce risk.
System Reopening. The set of actions that should be taken to ready a building for normal operations after an extended period of no or limited operations.
Water Management Program (WMP). A risk management plan to help building managers identify risks to water quality and establish clear guidelines for managing these risks at various points in the building lifecycle, including start-up, normal operation, under occupancy, water system shutdown, and water system restart. Such programs often focus on Legionella risk prevention, as required in some states for certain building types to combat waterborne pathogens such as Legionellosis.

SUBSTANTIATION:
The new sections are being added to the UPC Appendix Q to address the safe operation, closure and reopening of building water systems. This section directs building owners with populations that are susceptible to Legionella outbreaks and provide the general framework to reduce the risk. The definitions were added as these terms are needed for application and enforceability of the provisions.

Proposals

Item #: 310

UPC 2024 Section: Q 201.0, Q 401.0

SUBMITTER: Gary Klein
Self
Chair, Potable Water Working Group

RECOMMENDATION:
Add new text

Part II – Potable Water Systems.

Reference sections need to be updated.

Q 401.0 Potable Water Systems.
Q 401.1 General. The five distinct building water conditions of a potable water system shall be as shown in Figure Q 401.1 and in accordance with the following:
(1) The building potable water system during construction activities shall be in accordance with Section Q 402.0.
(2) The building potable water system during normal operations shall be in accordance with Section Q 403.0.
(3) When the there is an interruption to normal operations (system shut down process), the potable water system shall be in accordance with Section Q 404.0.
(4) When a building is vacant or partially occupied (system is shutdown), the potable water system shall be in accordance with Section Q 405.0.
(5) The potable water system during reopening shall be in accordance with Section Q 406.0.

FIGURE Q 401.1
BUILDING WATER CONDITIONS

Q 401.2 Equipment Requirements. Personnel that perform flushing shall utilize appropriate personal protective equipment (PPE) based on a task specific risk assessment and in accordance with OSHA requirements.
Q 401.2.1 Other Equipment Requirements. The following equipment shall be required for plumbing system evaluation:
(1) Sampling bottles or supplies for laboratory samples.
(2) Chlorine meter/test kit with an accuracy of +/- 3 percent.
(3) Digital thermometer for measuring water temperature with an accuracy of +/- 2°F (+/-1°C).
(4) Tools for removing aerators and supply stop covers (check with the appropriate manufacturers).
Q 401.3 Water Stagnation. Maintenance personnel shall take steps to prevent stagnant water in the potable water system in accordance with the water management program.
Note: These steps may include reducing the length of “dead legs” or lengths of pipe that are unused to prevent stagnation of water in piping systems.

Q 401.4 Water Purveyor Communication. The water utility provider shall be contacted prior to initiating the flushing process as required in Section Q 401.4.1 and the following:
(1) Identify where the water purveyor is monitoring water quality nearest to the building in the distribution system and determine water quality at that location at present time and for the preceding years.
(2) Verify that fresh utility water is available in the building's incoming water supply line.
(3) Verify with the water utility provider on the expected disinfectant residual level in fresh utility water at your building.
(4) The flushing process shall be in accordance with the Authority Having Jurisdiction. Where available, the Authority Having Jurisdiction's data sheets shall be utilized to document the flushing process. If items (1) through (3) are not possible, the regulated contaminants and disinfectants in the water supply for preceding years in the annual Consumer Confidence Report (CCR) shall be used.
Note: The frequency of maintenance, inspection, flushing, and monitoring may be established or adjusted in the water management program based on the following:(1) Lack of historical water quality results
(2) Routine maintenance testing results that support an increased or reduced frequency
(3) Changes in source incoming water (permanent, seasonal, or temporary)
(4) Disruption in water quality due to water main breaks, weather impacts, external construction, or any other factors
(5) Building plumbing modifications
(6) Building use and occupants served
Q 401.4.1 Water Draws for Testing. Water obtained for testing shall be drawn from the fixture in accordance with the following:
(1) First Draw Test. Open faucet and collect water out of fixture to determine disinfectant residual.
(2) Long Draw Test. Determine distance into water main or branch inside building that results are desired for. Calculate the time needed to flush (volume of water based on pipe size, divide by flow rate of fixture) and obtain water from that portion. Flush for the calculated time and collect sample.
Note: First-draw tests will give an impression of water quality that possible users would experience. The longer the flush before the draw, the further upstream in the piping system the test results will describe. Long-draw will give a better indication of the water quality in the water main.
Q 401.4.2 Locations for Testing. Sampling locations shall be in accordance with the CDC guidelines and ASHRAE 188. Testing shall be done at all plumbing fixtures in a building over a given period of time in accordance with the water management program. The following shall be considered when selecting locations:
(1) Test fixtures that are frequently, moderately, and rarely used.
(2) Test sites that are near the building water entrance, sites that are hydraulically remote (i.e., distal sites), and those that are in between.
(a) Hydraulically remote locations shall not be required in the furthest room or sink from the water service entrance, but rather those locations that experience the least flow or have the highest-pressure loss through the piping system.
(3) For systems with multiple zones or risers, sampling shall take place in each zone and riser.
(4) Priority should be given to hot-water systems.
(5) The Authority Having Jurisdiction shall be permitted to determine, on a case-by-case basis, where cold-water sampling shall be conducted.
Q 401.5 Water Quality. The building water quality shall be considered in accordance with the Authority Having Jurisdiction and Section Q 401.5.1 through Section Q 401.5.5. Additional monitoring and reporting of water quality shall be in accordance with the Authority Having Jurisdiction.
Q 401.5.1 Disinfectant Residuals Considerations. Disinfectant residuals shall be evaluated in the cold-water and hot-water system. The water system shall be tested for free chlorine or chloramine as required by the water purveyor (water utility). Free chlorine shall be measured where the water utility disinfects using free chlorine. Total chlorine shall be measured where the water utility disinfects using chloramine.
Note: Because chlorine residual is an important factor affecting microbial (Legionella) growth in building plumbing, all buildings should measure and record chlorine residuals. The measured chlorine residual is used to manage plumbing water age.
Q 401.5.2 Temperature. Temperatures shall be evaluated in both cold-water and hot water systems to maintain disinfectant levels.
Note: Because temperature is an important factor affecting microbial (Legionella) growth in building plumbing, all buildings should accurately measure and record water temperatures, and use this data to manage plumbing water age. Temperatures should be evaluated in both cold-water and hot water systems, as disinfectant levels in hot water are more difficult to maintain as oxidizing disinfectants dissipate more rapidly as temperature increases.
Q 401.5.3 Total Suspended Solids (TSS). The total suspended solids (TSS) shall be evaluated and shall be within the requirements as required by the water purveyor.
Note: Sediment in the water has an impact on plumbing systems as it can clog strainers and cause ball valves to seize. It also has an impact on the microbiology and disinfectant of the building as sediment can:
(1) Reduce the residual disinfectant by consuming the disinfectant.
(2) Provide a food source for bacteria, as sediment can and will provide a carbon source of various quantities to support bacteriological life.
(3) Shield bacteria from disinfection as the pathogens can attach themselves to sediment. The sediment can then carry the pathogen into an area in the building where water quality conditions are ideal for its' growth.

Sediment can increase in vacant buildings due to the oxidizing disinfectants corroding the metallic piping as the water is stagnant.

Q 401.5.4 Legionella. Water samples for Legionella culture shall be analyzed by an accredited laboratory in which Legionella culture appears on the laboratory's scope of accreditation or a laboratory as approved by the Authority Having Jurisdiction.

Note: Knowing whether a building has Legionella, both in terms of concentrations and frequency of detection, enables an actual data-based assessment of building water quality and can guide appropriate actions to protect water users. This includes number of samples and locations that adequately represent the water system. Consider selecting a laboratory that has Legionella proficiency as demonstrated by Centers for Disease Control and Prevention (CDC) ELITE program certification or another internationally recognized proficiency program (such as the PHE Legionella isolation scheme).

Q 401.5.5 Water Quality Data Tracking and Evaluation. The water quality records and data shall be kept on file.

Q 201.0 Definitions.

Q 201.1 General. For the purposes of this appendix, the following definitions shall apply:

Building is Vacant or Partially-Occupied. The state of a building water system when the building is closed and not in use (vacant) or major portions of the building water system is not in use or the typical use is significantly reduced (partially-occupied). This includes the off hours of operation and buildings that are shut down for long periods of time (weeks to years). This could include the construction period before initial opening.

Construction Activities. The set of actions that are taken to ready a building for an initial occupancy.

Interruption to Normal Operations (System Shut Down Process). The set of actions that should be taken to ready a building for an extended period of no or limited operations.

Initial/Remedial/Full Flush. Initial/Remedial/Full flushing is a one-time event intended to replace all the water in the system with fresh water from the water supplier to reduce the presence and/or risk of exposure to contaminants (i.e., turnover approach).

Normal Operations. The state of a building water system when the building is open and being used as intended. This includes the normal hours of operation and the number of people that occupy the building.

Potable Water System. A building water distribution system that provides hot or cold water intended for direct or indirect human contact or consumption.

Process Flow Diagram. A step by step drawing of a building water system that includes the location of all water processing steps – including, but not limited to, conditioning, storing, heating, cooling, recirculation, and distribution – that are part of the building water system.

System Reopening. The set of actions that should be taken to ready a building for normal operations after an extended period of no or limited operations.

SUBSTANTIATION:

The new section is being added to the UPC Appendix Q to address the safe operation, closure and reopening of building water systems. This proposal describes the general concerns and conditions as it relates to Legionella amplification. These sections are general in nature and will be utilized in the various proposals that follow. The definitions were added as these terms are needed for application and enforceability of the provisions.

Proposals

Item #: 311

UPC 2024 Section: Q 402.0

SUBMITTER: Gary klein
Self
Chair, Potable Water Working Group

RECOMMENDATION:
Add new text

Q 402.0 Construction Activities.
Q 402.1 General. System opening is the set of actions that shall be taken to ready a building for normal operations after an extended period of no or limited operations. Systems that are being reopened after prolonged vacancy or partial vacancy shall comply with ASHRAE 188 and Section Q 402.0.
Q 402.2 Opening Process. The opening process of a building water system shall be in accordance with Section Q 402.2.1 through Section Q 402.6.
Q 402.2.1 Communication. An occupancy date and date of occupancy to all building occupants shall be determine and the steps required from maintenance staff shall be provided and available. The required steps shall provide instructions to occupants on how to avoid hazards and how to report concerns once building is occupied.
Q 402.2.2 Pre-Startup Inspection. The preparation of the documentation and pre-startup inspection shall be conducted by a qualified person or building owner designee. The required inspection shall include, but is not limited to, the following:
(1) Visually assessing the potable water system.
(2) Inspecting all components for the presence of contaminants and other adverse conditions.
(3) Checking that the equipment is working properly.
(4) Ensuring that records are complete.
Q 402.3 During Construction. The potable water system shall be left dry during construction until two weeks prior to occupancy.
Q 402.3.1 Water Fill Procedures. Wetted plumbing systems during construction shall comply with the following:
(1) Actions as described in Section Q 401.4 shall be performed in accordance with the water purveyor.
(2) Once acceptable water quality is verified, the cold and hot water distribution systems shall be filled with cold water. The required disinfectant at the percentage of plumbing fixtures shall be determined as required by the water management program.
Q 402.3.2 Flushing Procedure. Once the plumbing distribution system is filled with water, the following actions shall be taken until two weeks prior to occupancy:
(1) Remove aerators from all faucets and shower heads from all showers prior to commencing flushing.
(2) Turn on all water softeners, water filters, hot water recirculation pumps, etc. in accordance with the water management program. Water heaters shall remain off.
(3) The incoming water temperature and water temperature at plumbing fixtures shall be monitored and the following actions shall be taken:
(a) For parts of the building where the temperature is more than 75°F (24°C) (e.g., unconditioned), identify the temperature of incoming domestic cold water and flush 100 percent of domestic piping systems in these areas daily to maintain within 5°F (2.8°C) of incoming water temperature.
(b) For parts of the building where the temperature is 75°F (24°C) or less (e.g., wintered or conditioned), complete actions Q 402.3.2(4) through Section Q 402.3.2(6).
(4) Flush twice the storage volume of the piping in each area or zone of the building and each plumbing fixture.
(5) The water heater shall have at least 100 percent of water displaced every 7 days.
(6) Flush not less than 15 percent of all plumbing fixtures (hot and cold) per day. Every 7 days at least 100 percent of the building plumbing fixtures (hot and cold) shall be flushed.

Q 402.3.3 Disinfectant Residual. Not less than 5 percent and not more than 20 randomly selected plumbing fixtures shall be tested monthly for disinfectant residual. If residual is less than 0.2 ppm of chlorine or chloramine, the following actions shall be taken:
(1) The water utility shall be contacted to open the fire hydrant near building. This shall be completed prior to completing any flushing inside the building.
(2) Retest water after this step to determine if disinfectant residual is present.
(3) If disinfectant residual is still low after repeating the steps above, a supplemental disinfection for the building potable water systems shall be installed.
Q 402.3.4 Testing for Legionella. For buildings with populations that are susceptible to Legionella, at least 5 percent but not more than 20 randomly selected plumbing fixtures shall be tested daily for Legionella.
Q 402.3.5 Remedial/Full/Turnover-Approach Flush. If a building under construction has water in it for more than one week without commencing any daily flushing protocols as indicated in Section 402.3.2, a remedial flush will be needed prior to commencing daily flushing. A remedial flush shall be conducted in the following manner:
(1) Remove aerators from all faucets and shower heads from all showers prior to commencing flushing.
(2) Turn on all water softeners, water filters, hot water recirculation pumps, etc. in accordance with the water management program. Water heaters shall remain off.
(3) Systematically flush each main, branch, and fixture branch on the cold and hot water piping systems.
(4) The water shall flow at a rate to scour the pipes at not less than 2 feet per second (ft/s) (0.6 m/s).
(5) At least twice the storage volume of the cold and hot water piping in each area or zone of the building and each plumbing fixture shall be flushed. Continue flushing until the disinfectant residual target has been reached for both the cold and hot water.
Q 402.4 Charge in Plumbing System. At least two weeks prior to occupancy, the plumbing system has remained dry, the system shall be filled in accordance with Section Q 402.3.1.
Q 402.4.1 Disinfection of Potable Water System. The disinfection of the potable water systems shall be in accordance with Section 609.10. This procedure applies to hot and cold-water piping systems and shall be performed 7 days prior to opening. The water heater shall remain off.
Q 402.4.2 Daily Flushing. A flushing protocol as indicated in Section Q 402.3.2 shall be implemented.
Q 402.4.3 Testing for Chlorine. At least 5 percent but not more than 20 randomly selected plumbing fixtures shall be tested daily for disinfectant residual. If residual is less than 0.2 ppm of chlorine or chloramine, the following actions shall be taken:
(1) Contact the water utility to open the fire hydrant near building. This shall be completed prior to completing any flushing inside the building.
(2) Retest water after this step to determine if disinfectant residual is present.
(3) If disinfectant residual is still low after repeating the steps in Section Q 402.4.3(1) and Section Q 402.4.3(2), a supplemental disinfection for the building potable water systems shall be installed.
Q 402.4.4 Testing for Legionella. For buildings with populations that are susceptible to legionella, test at least 10 randomly selected plumbing fixtures from each hot water system once for legionella. Samples shall be collected at least 2 per floor and shall be hot water. Where applicable, the following actions shall be taken:
(1) Coordinate testing with laboratory to determine if expedited results can be provided. Considerations shall be made for utilizing rapid testing methods (qPCR) to supplement laboratory testing during this time.
(2) Any further testing shall be dictated by time (extended beyond 2 weeks) or corrective actions. Fixtures that repeatedly tests positively for legionella (greater than or equal to 1 CFU/mL) shall be flushed daily in accordance with the flushing protocol until opening. Continue testing these sites. Considerations shall be made for contacting a water treatment professional.
(3) Where more than 30 percent of randomly selected sites continually test positive for Legionella (greater than or equal to 1 CFU/mL), a water treatment professional shall be contacted.
Q 402.5 Hot Water System Start-Up. The start-up of a water heater shall not be initiated until after the occupancy date has been confirmed and the cold and hot water disinfectant residual meets the requirements as outlined in Section Q 402.4.3 and Section Q 402.4.4 (if applicable). The water heater shall be turned on within one week prior to occupancy and shall be in accordance with the following:
(1) Commission hot water system, verifying flow rates, temperatures, and hot water recirculation pumps are operating correctly.
(2) The hot water system shall be balanced.
(3) Confirm that all thermostatic mixing valves are operational and are not damaged/plugged.
(4) Monitor supply and return water temperatures. The temperature shall be not less than 140°F (60°C) on the supply and 122°F (50°C) on the return. If the building owner is utilizing supplemental disinfection, the minimum supply and return temperatures shall be permitted to be lowered in accordance with water treatment professional and/or water management team approval.
Q 402.6 Complete Installation. The following installation requirements shall be verified:
(1) Faucet aerators and shower heads shall be installed.
(2) Hot water delivery times shall be confirmed that at all hot water plumbing fixtures meet the manufacturer's specifications.

SUBSTANTIATION:
The new section is being added to the UPC Appendix Q to address the safe opening of newly constructed building water systems. Flushing protocols have been added to reduce the risk of stagnant waters and microbiological activity amplification during construction. Current construction practices, by not flushing the water daily/weekly allows disinfectant to dissipate and microbiological activity to amplify. By either keeping plumbing systems completely dry or flushing regularly once water is introduced the goal is to minimize biofilm and pathogen growth that could become an issue for building occupants later. This is especially critical for facilities such as healthcare and hospitality facilities where Legionella cases tend to occur the most. Regular flushing of water allows water with dissipated disinfectant to be replaced with water that has disinfectant in it. Additionally, flushing the water lines helps remove the accumulation of sediment and heavy metals, which can reduce residual disinfectant or create health issues themselves. Finally, flushing helps mitigate the accumulation of biofilm in plumbing systems, reducing the potential of future “hosts” of waterborne pathogens. Similar to Section Q 405.0 (Vacant or Partially Occupied Buildings) where a building is shutdown, regular flushing can help reduce the risk of issues.

Proposals

Item #: 312

UPC 2024 Section: Q 403.0 – Q 403.3, Table Q 403.3

SUBMITTER: Gary Klein
Self
Chair, Potable Water Working Group

RECOMMENDATION:
Add new text

Q 403.0 Normal Operation.
Q 403.1 General. System opening is the set of actions that shall be taken to ready a building for normal operations after an extended period of no or limited operations. Normal operation shall be when the state of a building water system is open and being used as intended. Systems that are being reopened after prolonged vacancy or partial vacancy shall comply with ASHRAE 188 and this section.
Q 403.2 Potable Water Supply. The potable water supply system shall include water that is satisfactory for drinking and culinary purposes, and that meets the requirements of the Authority Having Jurisdiction. For the purposes of this appendix, the potable water supply shall be from the meter to the points of use.

Section Q 403.0 shall apply to routine procedures during normal operation that work to maintain safe water qualities in building water systems and to avoid excessive water aging, and the harmful effects of waterborne pathogens. The required routine maintenance, inspection, flushing, and monitoring shall be the responsibility of the property owner unless otherwise required by the Authority Having Jurisdiction.
Q 403.3 Equipment Inspection. Equipment shall be inspected in accordance with the water management program and this Section. The equipment shall be serviced, repaired or replaced as needed. For the purposes of this appendix, equipment shall include, but not be limited to, the following:
(1) Water heaters
(2) Backflow preventers
(3) Water treatment equipment
(4) Other equipment connected at the entrance to the potable water supply system

Equipment in the mechanical room or the entrance to the building potable water supply system shall be checked for physical integrity and general function. Maintenance records shall be checked to confirm maintenance activities are up to date. Service contracts shall be checked to determine that regular service is being performed and that contractor recommendations are implemented. When maintenance is out of date, or a specific issue is identified, the equipment shall be maintained in accordance with the manufacturer's instructions or the registered design professional's requirements. Where the manufacturer's instructions do not provide inspection and maintenance frequency, the potable water systems and components shall be inspected and maintained in accordance with Table Q 403.3.
Inspection, testing and maintenance records shall be maintained.

TABLE Q 403.3
MINIMUM POTABLE WATER SOURCE INSPECTION, TESTING AND MAINTENANCE FREQUENCY DURING NORMAL OPERATION

DESCRIPTION	MINIMUM FREQUENCY
Inspect and verify water softeners and point-of-entry filtration devices are operational and maintaining minimum water quality requirements.	Follow manufacturer instructions.
Maintain water softeners and point-of-entry filtration devices.	As needed.
Inspect pumps and valves, and verify operation	After initial installation and every 3 months thereafter
Maintain pumps and valves	As needed.
Inspect water heaters or boiler	Every 3 months
Flush water heater under pressure until water runs clear	Every 12 months
Maintain water heaters	As needed
Inspect and test pressure type vacuum breaker, double check, reduce pressure principle backflow prevention devices and test	After initial installation or after any construction renovation or addition, and every 12 months thereafter
Repair and replace pressure type vacuum breaker, double check, reduce pressure principle backflow prevention devices and test	As needed.
Inspect point-of-use filters and screens including drinking fountain, aerators, and bottle filling stations	Every 3 months
Clean filters and screens including aerators, drinking fountain and bottle filling stations; and replace	As needed.
Inspect caution labels and markings	After initial installation and every 12 months thereafter
Replace caution labels and markings	As needed
Inspect and test eyewash stations and safety showers	At least weekly, in accordance with ISEA Z358.1, the Authority Having Jurisdiction, and the manufactures instructions.
If installed: Inspect and verify that supplemental disinfection systems are operational and maintaining minimum water quality requirements as determined by the Authority Having Jurisdiction	Follow manufacturer instructions, water treatment guidelines, and Authority Having Jurisdiction requirements
If installed: Maintain disinfection and water quality treatment devices and systems	As needed.

SUBSTANTIATION:
The new section is being added to the UPC Appendix Q to address the safe operation of building water systems during normal operating conditions. This section gives a broad overview of procedures and practices to help reduce the risk of a Legionella outbreak.

Proposals

Item #: 313

UPC 2024 Section: Q 403.4 – Q 403.4.5

SUBMITTER: Gary Klein
Self
Chair, Potable Water Working Group

RECOMMENDATION:
Add new text

Q 403.4 Water Quality Monitoring. The water quality monitoring of the potable water system shall be in accordance with Section Q 403.4.1 through Section Q 403.4.3.
Q 403.4.1 Building Characterization. The building types shall be as listed in ASHRAE 188 such as multiple housing units with a centralized water heater system, buildings over 10 stories with plumbing systems, chemotherapy patients, diabetes, and occupants over 65 years old.
Note: Not all buildings are at equal risk for a waterborne pathogen outbreak, specifically Legionella species. The building types that are at highest risk typically encompass complex plumbing systems and/or have populations that are immuno-compromised.
Q 403.4.2 Sample Protocol. Samples shall be collected from the same fixture locations and in accordance with Section Q 403.4.3 using first-draw samples in accordance with Section Q 401.4.1(1) and long-draw samples in accordance with Section Q 401.4.1(2).
Q 403.4.3 Location for Testing. Testing locations shall be done at one hundred percent of all distal sites in a building over a given period in accordance with the water management program. A certain percentage of strategically selected plumbing fixtures shall be tested per sampling event. Some considerations in selecting locations shall include, but not be limited to, the following:
(1) Test fixtures that are frequently, moderately, and rarely used.
(2) Test sites that are near the building water entrance, sites that are hydraulically remote (i.e. distal sites), and those that are in between.
(3) Locations that experience the least flow or have the highest-pressure loss through the piping system.
Q 403.4.3.1 Disinfectant Residual Testing Locations. The building owner shall establish routine monitoring sites as part of the water management program. To determine where to measure chlorine residuals in the building, an initial residual characterization survey shall be conducted in accordance with the following:
(1) Measure and record disinfectant residuals at all locations where utility water enters the building(s).
(2) Using the list of plumbing fixtures, as described in the water management program, measure and record the disinfectant residual of at least 5 percent of randomly selected faucets, lavatories, showers, drinking fountains, and ornamental fountains throughout the building for both hot and cold water.
(3) Determine which plumbing fixture locations require first-draw or long-draw testing, as required in Section Q 401.4.1. Some locations may have both types of water draws.
(4) These routine sites shall be chosen to include some sites that had:
(a) The lowest disinfectant residual.
(b) Serve sensitive users.
(c) That will be used for any ongoing microbial monitoring.
Q 403.4.3.2 Temperature Testing Locations. The building owner shall establish routine monitoring sites for temperature as part of the water management program. To determine where to measure these temperatures in the building, an initial temperature characterization survey shall be conducted in accordance with the following:
(1) Measure and record temperature at all locations where utility water enters the building(s).
(2) Using a list of plumbing fixtures (described in the water management program) measure and record the disinfectant residual of at least 5 percent of randomly selected faucets, lavatories, showers, drinking fountains, and ornamental fountains throughout the building for both hot and cold water.
(3) The temperature characterization shall be done in conjunction with the disinfectant residual characterization.

(4) Hot water temperatures shall be measured exiting the water heater, exiting the master mixing valve, and if applicable on the hot water recirculation return pipe before entering the water heater.

Q 403.4.3.3 Legionella Testing Locations. For buildings with populations that are susceptible to Legionella, the building owner shall establish routine monitoring sites for Legionella as part of the water management program. To determine where to measure Legionella in the building, an initial characterization survey shall be conducted in accordance with the following:

(1) Measure and record legionella (CFU/mL) at all locations where utility water enters the building(s).

(2) Using a list of plumbing fixtures, as described in the water management program, measure and record legionella (CFU/mL) of at least 5 percent of randomly selected faucets, lavatories, showers, drinking fountains, and ornamental fountains throughout the building for both hot and cold water.

(3) The legionella characterization shall be done in conjunction with the temperature and disinfectant residual characterizations.

Q 403.4.3.4 Supplemental Disinfectant Residual Testing Locations. For building that utilizes supplemental disinfection technologies, the frequency and locations of testing shall comply with state, federal, and Authority Having Jurisdiction requirements.

Q 403.4.4 Monitoring Frequency. Monitoring and testing frequency shall be in accordance with Section Q 403.4.4.1 through Section Q 403.4.4.4.

Q 403.4.4.1 Disinfectant Residual Frequency. The building owner shall establish routine disinfectant monitoring frequencies as part of the water management program. Routine disinfectant monitoring frequencies shall be in accordance with the following:

(1) Measure and record inlet disinfectant residuals as dictated by the water management program but no less than monthly. Adjust applicable control measures based on results.

(2) Measure and record disinfectant residuals at the other routine sampling sites 3 days a week or the frequency determined by the water management program, whichever is more frequent. Select the sample time to account for changes in variation of the occupancy. Adjust applicable control measures based on results.

(3) Consult with the Authority Having Jurisdiction for appropriate actions based on the result of testing.

Disinfectant residuals shall be maintained to prevent Legionella growth in hot and cold-water systems in accordance with ASHRAE 188, ASHRAE Guideline 12, and the Authority Having Jurisdiction.

Q 403.4.4.2 Temperature Monitoring Frequency. The owner shall establish routine temperature monitoring frequencies as part of the water management program. Routine disinfectant monitoring frequencies shall be in accordance with the following:

(1) Measure and record inlet cold water temperature and hot water temperatures exiting the water heater, exiting the master mixing valve, and if applicable on the hot water recirculation return pipe before entering the water heater. This shall be done daily. Adjust applicable control measures based on results.

(2) Measure and record the temperature of the cold and hot water at the same time, same location, and frequency as disinfectant residuals are measured. Adjust applicable control measures based on results.

(3) Consult with the Authority Having Jurisdiction for appropriate actions based on the result of testing.

Water temperatures shall be maintained to prevent Legionella growth in hot and cold-water systems in accordance with ASHRAE 188, ASHRAE Guideline 12 and Appendix N of this code.

Q 403.4.4.3 Legionella Monitoring Frequency. For buildings with populations that are susceptible to Legionella, the owner shall establish routine Legionella monitoring frequencies as part of the water management program. Routine Legionella monitoring frequencies shall be in accordance with the following:

(1) Measure and record every month for the first year. Adjust applicable control measures based on results.

(2) Re-evaluate monthly and adjust monitoring frequency based on facility risk assessment and results.

(3) Consult with the Authority Having Jurisdiction for appropriate actions based on the result of testing.

Q 403.4.4.4 Supplemental Disinfection Monitoring Frequency. For buildings that utilize supplemental disinfection technologies, the frequency and locations of testing shall comply with state, federal, and the Authority Having Jurisdiction requirements.

Q 403.4.5 Routine Flushing (Normal Operations). Flushing during normal operations shall comply with ASHRAE 188, CDC guidelines, and the building water management program. Flushing considerations shall be made for the following:

(1) Flush fixtures that are frequently, moderately, and rarely used.

(2) Flush sites that are near the building water entrance, sites that are hydraulically remote (i.e., distal sites), and those that are in between.

(3) Locations that experience the least flow or have the highest-pressure loss through the piping system.

SUBSTANTIATION:

The new section is being added to the UPC Appendix Q to address the safe operation of building water systems during normal operating conditions. This section gives better definition to the criteria that should be considered as part of a water management program and the frequency and location of control measures.

Proposals

Item #: 314

UPC 2024 Section: Q 403.4.6, Table Q 403.4.6

SUBMITTER: Gary Klein
Self
Chair, Potable Water Working Group

RECOMMENDATION:
Add new text

Q 403.4.6 Summary of Location and Frequency of Monitoring. The suggested minimum frequency and locations of monitoring for water quality shall be in accordance with Table Q 403.4.6.

TABLE Q 403.4.6
SUMMARY OF LOCATION AND FREQUENCY OF MONITORING[1, 2]

DESCRIPTION	MINIMUM FREQUENCY[3]	SAMPLE AT BUILDING ENTRANCE	SAMPLE AT RANDOMLY SELECTED PLUMBING FIXTURES (INCLUDING DISTAL SITES)
Water Quality Monitoring (Required)			
Disinfectant residuals	Monthly	X	X
Water Temperature (hot and cold)	Weekly	X	X
Legionella[4]	Monthly	X	X
Additional Water Quality Considerations for Improved Control (Not Required)			
HPC	Quarterly	-	X
Total Suspended Solids (TSS)	Monthly	X	X
pH	Monthly	X	X
DBP	Monthly	X	X
Corrosion Inhibitors	Quarterly	X[5]	-
Additional Water Treatment			
Supplemental Disinfection (If added to building)	In accordance with Authority Having Jurisdiction	In accordance with Authority Having Jurisdiction	In accordance with Authority Having Jurisdiction

Notes:

[1]Frequencies are based on good results. When unacceptable results are found, seek guidance from the Authority Having Jurisdiction.

[2]The target setpoints are based on the water management program.

[3]Testing may be performed more frequently than noted above. At a minimum, the testing frequency noted in the table above shall be performed with the laboratories and methods as noted in this appendix.

[4]Required only if building population is susceptible to Legionella. If not, then this shall be considered an “Additional Water Quality Considerations for Improved Control” (Not Required) in accordance with Table Q 403.4.6.

[5]Also consider sampling near central water heater or hydronic equipment to help determine impact on energy usage.

SUBSTANTIATION:
The new section is being added to the UPC Appendix Q to address the safe operation of building water systems during normal operating conditions. This section summarizes the information in new proposed Section Q 403.4 (Water Quality Monitoring).

Proposals

Item #: 315

UPC 2024 Section: Q 404.0 – Q 404.4.3

SUBMITTER: Gary Klein
Self
Chair, Potable Water Working Group

RECOMMENDATION:
Add new text

Q 404.0 Interruption to Normal Operation-System Shutdown Process.
Q 404.1 General. Interruption to normal operations (system shutdown Process) shall be the set of actions that is taken to ready a building for an extended period of no or limited operations. Systems that are being shutdown shall comply with ASHRAE 188 and Section Q 404.0.
Q 404.2 Communication. An announcement of a planned shutdown date of shall be provided to all building occupants with clear communication on what steps maintenance staff will take. The announcement shall include if shut down will be a complete or a partial shutdown.
Q 404.3 Shutdown. System shutdown shall be completed by shutting down the entire system or portions of a system in accordance with Section Q 404.3.1 or Section Q 404.3.2.
Q 404.3.1 Complete Shutdown. During complete shutdown, the building shall be occupied by only maintenance personnel or shall not be occupied. The following actions shall be considered to shut down building water system completely:
(1) Limit use of potable water to one bathroom nearest the building water service entrance.
(2) Turn off water heater, and flush water heater to displace a minimum of 100 percent of water volume in tank. Flush tank under pressure to remove as much biofilm/scale/build-up within tank as possible.
(3) Keep hot water recirculation pump on to circulate non-heater hot water.
(4) Keep any water softener, water filtration device, and any supplemental disinfection equipment on.
(5) Leave booster pump system operational.
(6) Leave all domestic water systems fully pressurized.
Q 404.3.2 Limited Operations-Partial Shutdown. Limited operation shall be when portions of the building are occupied while other portions of the building become unoccupied. Where the majority of the building is unoccupied, but some portion of a building is open to the public or non-staff occupants, the building shall be considered partially occupied.
Note: Partially occupied buildings present one of the greatest challenges to public health and safety, and owners should proceed very carefully when operating their buildings in this manner.
The following actions shall be considered to partially shut down building water system:
(1) Limit use of potable water by public or occupants to designated areas only that have regular usage.
(2) Do not isolate one side of the building from the other, all domestic water equipment should remain fully operational.
Q 404.4 Shutdown Testing and Inspection. The shutdown testing and inspection of the building water supply shall be in accordance with Section Q 404.4.1 through Section Q 404.4.3.
Q 404.4.1 System Inspection. On shutdown date, the potable water system shall be inspected in its entirety.
Q 404.4.2 System Documentation. Detailed records of all procedures, actions performed, and test results shall be kept. As-Built drawings of entire system including plans and diagrams shall be obtained. Where as-built drawings are not available, one shall be developed by a registered design professional including the following:
(1) The volume of entire water system including each fixture branch.
(2) The flushing times for the building in its entirety and each individual fixture.

Q 404.4.3 Baseline Test. Water samples from approximately 10 percent of plumbing fixtures and baseline values shall be determined for not less than the following:
(1) Incoming water disinfectant residual
(2) Incoming Legionella positivity
(3) Incoming water turbidity
(4) Ten percent of plumbing fixtures for Legionella positivity

SUBSTANTIATION:
The new section is being added to the UPC Appendix Q to address the safe closure of building water systems. This section was added to specifically indicate the specific set of actions to prepare a building for an extended period of time where a building is either fully or partially vacant. These actions prepare the building in a manner to be more easily maintained, as outlined in new proposed Section Q 405.0.

Proposals

Item #: 316

UPC 2024 Section: Q 405.0 – Q 405.4

SUBMITTER: Gary Klein
Self
Chair, Potable Water Working Group

RECOMMENDATION:
Add new text

Q 405.0 Vacant or Partially Occupied Buildings.
Q 405.1 General. Buildings shall be considered vacant or partially occupied (system is shutdown) when the building is closed and not in use (vacant) or major portions of the building water system are not in use (partially occupied). This includes the off hours of operation and buildings that are shut down for long periods of time (weeks to years). Systems that are being shutdown shall comply with ASHRAE 188 and Section 405.0.
Note: A building may also be considered vacant or partially occupied during the construction period before initial opening.
Q 405.2 Shutdown. System shutdown shall occur by shutting down the entire system or portions of a system.
Q 405.2.1 Complete Shutdown. Complete shutdown shall be when no one occupies the building other than maintenance personnel. The following protocols and actions shall be taken during complete shutdown:
(1) Limit the use of potable water to one bathroom nearest the building water service entrance.
(2) Remove aerators from all other faucets and shower heads from all other showers prior to commencing flushing.
(3) Turn on or leave on all water softeners, water filters, hot water recirculation pumps, and other similar equipment in accordance with the water management program. Water heaters shall remain off.
(4) Monitor incoming water temperature and water temperature at plumbing fixtures. Take the following actions:
(a) For parts of the building where the temperature is above 75°F (24°C) (e.g., unconditioned), identify temperature of incoming domestic cold water, and flush 100 percent of domestic piping systems in these areas daily to maintain within 5°F (2.8°C) of incoming water temperature.
(b) For parts of the building where the temperature is less than or equal to 75°F (24°C) (e.g., wintered or conditioned), complete actions required in Section Q 405.2.1(5) through Section Q 405.2.1(7).
(5) Flush twice the storage volume of the piping in each area or zone of the building and each plumbing fixture.
(6) The water heater shall still be off and pressurized. The water heater shall have at least 100 percent of water displaced every 7 days.
(7) Flush 15 percent of all plumbing fixtures (hot and cold) per day, every 7 days. At least 100 percent of the building plumbing fixtures (hot and cold) shall be flushed.
Q 405.2.2 Partial Shutdown. Partial shutdown shall be when portions of the building are occupied while other portions of the building become unoccupied. Where the majority of the building is unoccupied, but some portion of a building is open to the public or non-staff occupants, the building shall be considered partially occupied.
Note: Partially occupied buildings present one of the greatest challenges to public health and safety, and owners should proceed very carefully when operating their buildings in this manner.
The following protocols and actions shall be considered during partial shutdown:
(1) The building owner shall identify what normal water usage was prior to partial-shutdown and complete a daily flush to simulate typical daily water usage.
(2) Limit the use of potable water by public or occupants to designated areas only that have regular usage.
(3) Remove aerators from all faucets and shower heads from all showers prior to commencing flushing.
(4) Test incoming water for disinfectant residual. If residual reduces from baseline, as measured in Q 404.4.3, or reduces to less than 0.2 ppm of chlorine or chloramine, the following actions shall be taken:
(a) Contact water purveyor to determine the scope of the problem.
(b) Coordinate with water purveyor to determine if they can open fire hydrant near building. This shall be completed prior to completing any flushing inside the building.

(c) Retest water after this step to determine if disinfectant residual is present.
(d) If disinfectant residual is still low after repeating steps in Section Q 405.2.2(1) through Section Q 405.2.2(4), consider installation of a supplemental disinfection for the building potable water systems.
(5) Monitor incoming water temperature and water temperature at plumbing fixtures in accordance with the following actions:
(a) If the building temperature is above 75°F (24°C) (unconditioned), identify temperature of incoming domestic cold water and flush all domestic piping system daily to maintain within 5°F (2.8°C) of incoming water temperature and complete actions as required in Section Q 405.2.2(6) through Section Q 405.2.2(8).
(b) If the building temperature is less than or equal to 75°F (24°C) (wintered, conditioned), complete actions as required Section Q 405.2.2(6) through Section Q 405.2.2(8).
(6) Flush twice the storage volume of the piping in each area or zone of the building and each plumbing fixture.
(7) Flush 15 percent of all plumbing fixtures (hot and cold) per day; every 7 days. At least 100 percent of the building plumbing fixtures (hot and cold) shall be flushed.
(8) Mimic normal occupation with building flushing.

Q 405.2.3 Disinfectant Residual. Testing for disinfectant residual shall be completed at not less than 5 percent and not more than 20 randomly selected plumbing fixtures monthly. If residual reduces from baseline, in accordance with Section Q 404.4.3, or reduces to less than 0.2 ppm of chlorine or chloramine the following actions shall be taken:
(1) Contact the water utility to open the fire hydrant near building. This shall be completed prior to completing any flushing inside the building.
(2) Retest water after this step to determine if disinfectant residual is present.
(3) If disinfectant residual is still low after repeating steps in Section Q 405.2.3(1) and Section Q 405.2.3(2), considerations shall be made for installing a supplemental disinfection for the building potable water systems.

Q 405.2.4 Legionella Testing. For buildings with populations that are susceptible to legionella, there shall be test at least 5 percent, but not more than 20 randomly selected plumbing fixtures monthly for legionella.

Q 405.2.5 Remedial/Full/Turnover-Approach Flush. If a building is shutdown or partially shut down for more than one week without commencing any daily flushing protocols, as required in Section Q 405.2.1 or Q 405.2.2, a remedial flush shall be applied prior to commencing daily flushing. A remedial flush shall be conducted in accordance with the following:
(1) Remove aerators from all faucets and shower heads from all showers prior to commencing flushing.
(2) Turn on all water softeners, water filters, hot water recirculation pumps, etc. in accordance with the water management program. Water heaters shall remain off.
(3) Systematically flush each main, branch, and fixture branch on the cold and hot water piping systems.
(4) The water shall flow at a rate of not less than 2 feet per second (ft/s) (0.6 m/s) to scour the pipes.
(5) Not less than twice the storage volume of the cold and hot water piping in each area or zone of the building and each plumbing fixture shall be flushed. Continue flushing until the disinfectant residual target has been reached for both the cold and hot water.

Q 405.3 Flushing Concept. Flushing while a building is vacant or partially occupied (system is shutdown) shall be done in accordance with Section Q 405.3.1 through Section Q 405.3.4.

Q 405.3.1 Flushing Protocol. The flushing of stagnant water of the cold-water system and hot water system shall be conducted for the building water system by turning over the water system through regular use and/or flushing. Faucets, showers, and other distal sites shall be opened to replace water within the building plumbing with fresh water.
The flushing method used shall be done in accordance with one of the following methods:
(a) The plume-method using the flush method in accordance with Section Q 405.3.2.
(b) The longest-pull method using the flush method in accordance with Section Q 405.3.3.

Note: Flushing (duration, frequency, and repetition) overall has not been validated to prevent/remove WBPs and needs to be determined at the facility-specific level. What amount/level of flushing works for one building may not work for a larger or smaller or more complex building. Consult with the water management team, professional engineer, water treatment professional, or other water/plumbing consultant would be beneficial to determine how well the flushing is working. Additionally, collecting samples of water validation will be needed to verify effectiveness of flushing protocols.

Q 405.3.2 Plume Method. The plume method shall be the flushing protocol that proceeds from the service line toward locations farther from the point of entry.

Note: The “plume” of water with disinfection is slowly drawn further and further into the building, going from the water service entrance gradually to the furthest distal site.

Example: A flushing protocol that pulls water from the ground level, then to the 1st floor, then to the 2nd floor, then to the 3rd floor, and finally to the 4th floor.
The flushing protocol shall start on the basement or lowest level of the building at the fixture closest to the incoming flow of water.

Note: This will flush the water service line(s), bring fresh utility water into the building and completely flush the hot water system. Utility sink or floor sink faucets, such as those found in basements or janitor closets, typically have higher flow rates to facilitate the fast filling of buckets, etc. This makes them ideal for beginning the flushing process. If a service sink or floor sink is not available, go to the sink.

Q 405.3.3 Longest-Pull Method. The longest-pull method shall be the flushing protocol that attempts to pull water from water service entrance directly to furthest distal site.

Note: This is typically done by instituting a longer flush time at the furthest fixture, in order to displace 100 percent of the water in between. Each area between the water service entrance and furthest distal site is flushed at shorter intervals, thereby pulling water with disinfectant residual from the replenished mains.
Example: A flushing protocol that pulls water from the ground level and then proceeds to flush for a longer time the 4th floor. Once this step is complete, flushing occurs at the 2nd and 3rd floor in no particular order.
The flushing protocol shall start on the basement or lowest level of the building at the fixture closest to the incoming flow of water.
Note: This will flush the water service line(s), bring fresh utility water into the building and completely flush the hot water system. Utility sink or floor sink faucets, such as those found in basements or janitor closets, typically have higher flow rates to facilitate the fast filling of buckets, etc. This makes them ideal for beginning the flushing process. If a service sink or floor sink is not available, go to the sink.
Q 405.3.4 Hybrid Method. The hybrid method shall be when the flushing protocol includes any combination of the plume- or longest-pull-methods.
Q 405.4 Flushing Concerns. The following shall be considered when conducting the flushing protocol:
(1) Do not open 100 percent of plumbing fixtures within a building or area of the building when flushing.
Note: This will exceed the design parameters (i.e., Hunter's Curve) value of the building and could lead to siphoning of the water within the building.
(2) Contact the sewer provider for the building prior to flushing as water with high concentrations of disinfectant in it could create issues at the wastewater treatment plant.
(3) Buildings with a dedicated place to fill water bottles or drinking fountains shall consider making those devices inoperable and placing signage prohibiting public from utilizing devices.
(4) Steps shall be taken to maintain a fluid trap seal on drain waste and vent system. Verify that trap primers are operable and that traps that are served by trap primers (particularly pressure-differential trap primers) are not caused to be inoperable with flushing protocol.
(a) Sewer gases, floor drains and traps: If an overwhelming smell of sewer gas is detected in the building or when entering bathrooms that have been unused for long periods of time, the floor traps or fixture traps shall be checked to determine if they have run dry. If high concentrations of sewer gases are suspected in the building, the building shall be evacuated, and the local fire department shall be contacted to assess the condition.
(b) The plumbing system shall be checked to ensure there no dry traps. The building shall be inspected. Clean water shall be poured into floor drains and sinks to fully restore trap seals.
Note: Any dry trap provides a potential pathway for exposure to the virus and other harmful microorganisms to spread.
(1) The drainage system shall be checked for blockages prior to initiating the flushing process. A room shall not be left unattended while the flushing process is ongoing.
(2) When flushing urinals, consider covering the urinal with a plastic bag to trap aerosols if numerous, repetitive flush activations are required.

SUBSTANTIATION:
The new section is being added to the UPC Appendix Q to address the safe closure and reopening of building water systems. This new proposed Section Q 405.0 (Vacant or Partially Occupied Buildings), addresses the actions a building should take during extended partial or full vacancy to prevent the amplification of waterborne pathogen and the deterioration of water quality. Regular flushing of water allows water with dissipated disinfectant to be replaced with water that has disinfectant in it. Additionally, flushing the water lines helps remove the accumulation of sediment and heavy metals, which can reduce residual disinfectant or create health issues themselves. Finally, flushing helps mitigate the accumulation of biofilm in plumbing systems, reducing the potential of future "hosts" of waterborne pathogens. Similar to Section Q 402.0 (Construction Activities), regular flushing during extended shutdown can help reduce the risk of future issues.

Proposals

Item #: 317

UPC 2024 Section: Q 405.5 – Q 405.6.2.2

SUBMITTER: Gary Klein
Self
Chair, Potable Water Working Group

RECOMMENDATION:
Add new text

Q 405.5 Flushing Consideration. Flushing considerations when the building is vacant or partially shutdown (system is shutdown) shall be in accordance with Section Q 405.5.1 through Section Q 405.5.4.
Q 405.5.1 Flushing Times and Cycle. Stagnant water shall be removed from potable water supply lines. A registered design professional or plumbing professional shall be consulted to determine the number of flushes and flush times required to remove the stagnant water from the water supply lines.
Q 405.5.2 Faucet Flushing. When flushing faucets, the faucet aerator shall be removed, where applicable. The flushing shall be done as follows:
(1) Open the sink faucet's cold-water valve first to the highest flow rate possible without creating excessive splashing.
(2) Ensure that the sink drain can handle the flow of water without backing up and overflowing the sink. Using a digital thermometer to check water temperature, flush until the water temperature stabilizes.
(3) Turn off the cold valve and repeat the above process with the hot water valve.
(4) Flush the hot water system until the temperature reaches the same temperature as the cold water.
Note: This may take considerably longer depending on the volume of water in the hot water system.
(5) Clean and replace the faucet aerator.
Q 405.5.3 Bathroom-Group, Plumbing Fixture Flushing. When flushing bathroom-groups, the following flushing protocol shall be conducted:
(1) Flush toilet and urinal supply lines first, where applicable. Start with the fixture that is farthest away from the incoming flow of water and work back towards the incoming flow of water. The stagnant water shall be removed from the potable water supply lines. A registered design professional or plumbing professional shall be consulted to determine the number of flushes required to remove the stagnant water from the water supply lines.
The water lines servicing toilets or water closets can be flushed without excessive repetitive flush activations.
Note: The water closet tank flapper can be removed or the flushometer-valve can be temporarily disabled to provide for a run-on condition. This will flush cold water lines directly into the sanitary drain quickly and efficiently, and will also reduce the generation of aerosols. It is not recommended to put flushometer-valves servicing urinals into a run-on condition due to small trap diameters in urinal fixtures which could result in overflows. Consult manufacturer to determine if this is an option.
(1) Using the appropriate tool, the aerator from faucets shall be removed. The flushing shall be done as follows:
(a) Flush the cold water. Ensure that the sink drain can handle the flow of water without backing up and overflowing the sink.
(b) Using a digital thermometer, the water temperature shall be checked. Flush until the water temperature stabilizes.
(c) The hot water line shall be flushed using the same process in Section 405.5.3(2)(a) and Section 405.5.3 (2)(b).
(d) Test for residual chlorine: Using an approved chlorine testing device, check for the presence of residual chlorine at several bathroom locations. The location farthest away from the incoming flow of water shall be tested. Additional flushing shall be required until a chlorine residual is determined at all outlets. If, after additional flushing, residual chlorine is still not present, the water utility shall be contacted to report the lack of residual chlorine in the building after extensive flushing. The required chlorine levels and any remedies shall be in accordance with the Authority Having Jurisdiction.
(e) Clean and replace aerators. Remove, clean, and replace showerheads. Check all fixtures for proper functionality.
(f) After flushing, ensure that the presence of residual chlorine has been verified at the fixtures farthest away from the incoming flow of water. Where residual chlorine is not verified, additional flushing of those fixtures shall be required.

(g) Water cooler/fountain filters and aerators shall be cleaned.

Note: Any disruption of supply pressure that may have occurred while the building was shut down can dislodge particulates, including lead, which can get trapped in aerators and filters, spiking lead levels and reducing water quality.

Q 405.5.4 Water Treatment Systems and Drinking Water Filters. Where there are water treatment or filtration products used in the plumbing system, such systems shall be regenerated, flushed, or require filter replacement. The flushing and disinfection shall be done in accordance with the manufacturer's instructions.

Water lines shall be flushed, and the filters shall be cleaned leading to coffee makers, ice makers, dishwashers, clothes washing machines, and water fountains/coolers.

Note: Clean coffee makers and ice makers and run for a minimum of three cycles, discarding the water and ice. Contact the manufacturers of carbonated beverage machines and follow their flushing and disinfection instructions. In hair salons, special care should be taken to thoroughly flush and clean hand-held showerheads and hoses. All outdoor utilities and hose bibs should also be flushed.

Q 405.6 Flushing Consideration-Various Plumbing Distribution Types. Flushing procedures consideration when the building is vacant or partially shutdown (system is shutdown) for various premise plumbing system distribution types shall be in accordance with Section Q 405.6.1 and Section Q 405.6.2.

Q 405.6.1 Horizontal Distribution Systems. Horizontal distribution systems shall be flushed in accordance with the following:

(1) Flush furthest ends of water system on ground floor.

(2) Upon completion of first floor flush, continue flushing the furthest point on each floor to the highest floor.

Q 405.6.2 Vertical Distribution Systems. Flushing considerations for simple and complex vertical distribution systems shall be in accordance with Section Q 405.6.2.1 and Section Q 405.6.2.2.

Q 405.6.2.1 Simple Vertical Distribution. Simple vertical distribution systems shall be flushed in accordance with the following:

(1) Flush furthest ends of water system on ground floor.

(2) Upon completion of first floor flush, flushing the furthest point on the highest floor that is also the furthest horizontal distance from the mechanical room.

Q 405.6.2.2 Complex Vertical Distribution. Complex vertical distribution systems shall be flushed in accordance with the following:

(1) Top Feed:

(a) Flush the furthest room and most hydraulically remote location on each lateral branch.

(b) Flush the furthest point on each vertical stack (not express main) on floors below distribution floor;

(c) Utilize programmable faucets with a flushing protocol available to assist.

(2) Bottom Feed:

(a) Flush the furthest room and most hydraulically remote location on each lateral branch.

(b) Flush the furthest point on each vertical stack (not express main) on floors above distribution floor;

(c) Utilize programmable faucets with a flushing protocol available to assist.

SUBSTANTIATION:

The new section is being added to the UPC Appendix Q to address the safe closure and reopening of building water systems. Proposed Section Q 405.5 (Flushing Consideration), is in addition to Section Q 405.0 (Vacant or Partially Occupied Buildings), and addresses some of the additional considerations owners shall take to reduce the risk of health issues stemming from water distribution systems. This section also helps provide further considerations for various types of common distribution systems (although not all distribution system types) to give further detailed explanation.

Proposals

Item #: 318

UPC 2024 Section: Q 406.0 – Q 406.3.3

SUBMITTER: Gary Klein
Self
Chair, Potable Water Working Group

RECOMMENDATION:
Add new text

Q 406.0 System Reopening.
Q 406.1 General. System reopening shall be the set of actions taken to ready a building for normal operations after an extended period of no or limited operations. Systems that are being reopened after prolonged vacancy or partial vacancy shall comply with ASHRAE 188 and Section Q 406.0.
Q 406.2 Testing. The incoming water to the building shall be tested to determine disinfectant residual and waterborne pathogen (e.g., legionella) concentrations. The testing results shall be compared against baseline measurements.
Q 406.3 Reopening Process. The reopening process of the potable water supply systems shall be in accordance with Section Q 406.3.1 through Section Q 406.3.6.
Q 406.3.1 Communication. An occupancy date shall be determined and communicated to all building occupants. Clear communication for requirements of maintenance staff shall be provided. Clear instructions shall be provided to occupants for avoiding hazards and reporting concerns once the building is occupied.
Q 406.3.2 Pre-Startup Inspection. The following pre-startup inspection shall be done by a qualified person and shall include the following:
(1) Visually assessing the potable water system;
(2) Inspecting all components for the presence of contaminants and other adverse conditions;
(3) Checking that the equipment is working properly; and
(4) Ensuring that records are complete.
Q 406.3.3 Disinfection. New or repaired potable water systems shall be disinfected in accordance with Section 619.0. This procedure shall apply to the hot and cold-water piping systems and shall be performed 7 days prior to reopening. The water heater shall remain off.

SUBSTANTIATION:
The new section is being added to the UPC Appendix Q to address the safe reopening of building water systems after prolonged partial or full vacancy. The actions listed in the first part of Section Q 406.0 (System Reopening) are the general criteria that building owners are to take.

Proposals

Item #: 319

UPC 2024 Section: Q 406.3.4 – Q 406.3.6

SUBMITTER: Gary Klein
Self
Chair, Potable Water Working Group

RECOMMENDATION:
Add new text

Q 406.3.4 Two Weeks of Reopening. The following testing protocol shall be done within two weeks of reopening.
Q 406.3.4.1 Daily Flushing. Implement flushing protocol as indicated in accordance with Section Q 405.2.1 or Section Q 405.2.2.
Q 406.3.4.2 Testing for Chlorine. Test at least 5 percent and not more than 20 randomly selected plumbing fixtures monthly for disinfectant residual. If residual reduces from baseline in accordance with Section Q 404.4.3, or is less than 0.2 ppm of chlorine or chloramine, the following actions shall be taken:
(1) Contact the water utility to open the fire hydrant near building. This shall be completed prior to completing any flushing inside the building.
(2) Retest water after this step to determine if disinfectant residual is present.
(3) If disinfectant residual is still low after repeating the steps above, install a supplemental disinfection for the building potable water systems.
Q 406.3.4.3 Testing for Legionella. For buildings with populations that are susceptible to Legionella, at least 5 percent but no more than 20 randomly selected plumbing fixtures shall be tested daily for legionella. Where applicable, the following actions shall be taken:
(1) Coordinate testing with laboratory to determine if expedited results can be provided. Considerations shall be made for utilizing rapid testing methods (qPCR) to supplement laboratory testing during this time.
(2) Any further testing shall be dictated by time (extended beyond 2 weeks) or corrective actions. Fixtures that repeatedly test positively for legionella (greater than or equal to 1 CFU/mL) shall be flushed daily in accordance with the flushing protocol until opening. Testing shall be continued at these sites. Considerations shall be made for contacting a water treatment professional.
(3) Where more than 30 percent of randomly selected sites continually test positive for Legionella (greater than or equal to 1 CFU/mL), a water treatment professional shall be contacted.
Note: Initial re-occupancy date may need to be rescheduled or certain areas of the building may need to have restricted access.
Q 406.3.5 Hot Water System Start-Up. Where applicable, the start-up of a water heater shall not be initiated until after the occupancy date has been confirmed and the cold and hot water disinfectant residual meets the requirements of Section Q 406.3.4.2 and Section Q 406.3.4.3. The water heater shall be turned on within one week prior to occupancy. The start-up of a water heater shall be completed in accordance with the following:
(1) Recommission the hot water system. Verify the flow rates, temperatures, and hot water recirculation pumps are operating correctly.
(2) The hot water system shall be rebalanced where necessary.
(3) Confirm that all thermostatic mixing valves are operational and are not damaged/plugged.
(4) Monitor supply and return water temperatures. The temperature shall be not less 140°F (60°C) on the supply and 122°F (50°C) on the return. If the building owner is utilizing supplemental disinfection, the minimum supply and return temperatures shall be permitted to be lowered in accordance with the water treatment professional and/or water management team approval.
Q 406.3.6 Complete Reopening. Complete reopening shall be in accordance with the following:
(1) Faucet aerators and shower heads that were removed during the shutdown process shall be reinstalled.
(2) Confirm hot water delivery times at all hot water plumbing fixtures meet specifications throughout building.

SUBSTANTIATION:
The new section is being added to the UPC Appendix Q to address the safe reopening of building water systems after prolonged partial or full vacancy. The actions listed in the second part of Section Q 406.0 are the more specific criteria that building owners are to take within two weeks of reopening. This includes flushing and testing of water to verify that incoming and building water criteria meets minimum requirements and turning on and recommissioning the hot water system (if applicable).

Proposals

Item #: 320

UPC 2024 Section: Q 501.0 – Q 502.2, Table Q 502.2

SUBMITTER: Ramiro Mata
Self
Chair, Nonpotable Water Working Group

RECOMMENDATION:
Add new text

Part III – Nonpotable Water Systems.

Q 501.0 Nonpotable Water Systems.
Q 501.1 General. Section Q 501.0 through Section Q 504.0 shall apply to the continuous maintenance (normal operation), interruption to normal operation (system shutdown), and reopening of the nonpotable water system. For the purposes of Part III of this appendix, alternate water sources apply to nonpotable water applications. Closed systems shall be systems that are not open to atmosphere and do not require a supply or replenishment of water. Open systems shall be systems that are open to atmosphere or require a supply or replenishment of water.

Q 502.0 Normal Operation.
Q 502.1 General. Non-potable water shall include, but not be limited to, gray water, on-site treated nonpotable water, rainwater, process water and reclaimed water. Section Q 502.2 through Section Q 502.4 shall apply to alternate water source other than rainwater catchment system. Rainwater catchment systems shall comply with Section Q 502.5 through Section Q 502.5.5.
Q 502.2 Equipment Inspection. Equipment shall be checked for physical integrity and general function. Maintenance records shall be checked to confirm maintenance activities are up to date. Service contracts shall be checked to determine that regular service is being performed and that contractor recommendations are implemented. When maintenance is out of date, or specific issue is identified, the equipment shall be maintained in accordance with the manufacturer's instructions or the registered design professional's requirements. Where the manufacturer's instructions do not provide inspection and maintenance frequency, the nonpotable water systems and components shall be inspected and maintained. The alternate water source testing, inspection and maintenance frequency shall be performed in accordance with Table Q 502.2.

TABLE Q 502.2
MINIMUM ALTERNATE WATER SOURCE TESTING, INSPECTION, AND MAINTENANCE FREQUENCY

DESCRIPTION	MINIMUM FREQUENCY-OPEN SYSTEM	MINIMUM FREQUENCY-CLOSED SYSTEM
Inspect and clean filters and screens, and replace (if necessary)	Monthly	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	In accordance with manufacturer's instructions, and the Authority Having Jurisdiction
Inspect pumps and verify operation	After initial installation and every 3 months thereafter	After initial installation and every 12 months thereafter
Inspect valves and verify operation	After initial installation and every 3 months thereafter	After initial installation and every 12 months thereafter

Clear debris from and inspect storage tanks, locking devices, and verify operation	Monthly	After initial installation and every 12 months thereafter
Inspect caution labels and marking	After initial installation and every 12 months thereafter	After initial 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	As needed to maintain mulch depth and prevent ponding and runoff
Cross-connection inspection and test*	After initial installation and every 12 months thereafter	After initial 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 code.

SUBSTANTIATION:
With buildings are being shutdown, or in low use as a response to COVID-19, the need to establish minimum requirements for managing building water systems to mitigate health effects to building occupants has become critically important. Understandably, potable water systems are the primary focus in this effort. However, nonpotable water systems such as water features, cooling and produce sprays, and rainwater catchment systems, may also pose a significant risk to building occupants. Although there have been several published guidance to address building shutdowns, all are focused on the potable water system. This proposal is intended to be used by building owners and managers as a resource to safely operate and manage nonpotable water systems and by local jurisdictions as a tool to establish and enforce minimum requirements for nonpotable water systems during normal operation, building shutdowns and building re-openings. Except for the rainwater catchment system requirements which were derived from existing language in the UPC, requirements for nonpotable water systems were derived using potable water system requirements as a starting point.

Proposals

Item #: 321

UPC 2024 Section: Q 502.3 – Q 502.5.3, Table Q 502.5.3

SUBMITTER: Ramiro Mata
Self
Chair, Nonpotable Water Working Group

RECOMMENDATION:
Add new text

Q 502.3 Water Quality Monitoring. The maintenance procedures shall be followed to maintain the minimum water quality of the nonpotable water system. The minimum water quality for nonpotable water systems shall meet the applicable water quality requirements for the intended application as determined by the Authority Having Jurisdiction or the registered design professional's requirements as approved by the Authority Having Jurisdiction.
Water quality shall be checked at the following:
The most distant point in the nonpotable water distribution system
In areas that are known to be low or no-use
Before and after any water treatment and filtration system
Storage tanks or vessels
Q 502.4 Routine Flushing. The nonpotable water system shall be routinely flushed as required by the Authority Having Jurisdiction for bacterial control and to meet the water quality as stated in Section Q 504.1.2.
Q 502.5 Rainwater Catchment Systems. The rainwater catchment conveyance system shall be equipped with a debris excluder or other approved means to prevent the accumulation of leaves, needles, other debris, and sediment from entering the storage tank. Devices or methods used to remove debris or sediment shall be accessible and sized and installed in accordance with manufacturer's installation instructions.
Q 502.5.1 Water Treatment and Filtration Equipment. A filter permitting the passage of particulates not larger than 100 microns (100 µm) shall be provided for rainwater supplied to water closets, urinals, trap primers, and drip irrigation system. The water treatment and filtration shall be maintained in accordance with the manufacturer's installation instructions.
Q 502.5.2 Water Quality Monitoring. The minimum water quality for harvested rainwater shall meet the applicable water quality requirements for the intended applications as determined by the Authority Having Jurisdiction. In the absence of water quality requirements determined by the Authority Having Jurisdiction, the minimum treatment and water quality shall be in accordance with Table Q 502.5.3.
Exception: No treatment is required for rainwater used for subsurface or non-sprinkled surface irrigation where the maximum storage volume is less than 360 gallons (1363 L).
Q 502.5.3 Minimum Water Quality. Where the water quality is not acceptable as required in Section Q 502.5.2, determine whether routine flushing is needed. Where completed, routine flushing shall be done in accordance with Section Q 502.5.5. Where the water quality of the tested water cannot consistently be maintained at the minimum levels specified in Table Q 502.5.3, the system shall be equipped with an appropriate treatment device meeting applicable NSF standards or equivalent.
Water quality shall be checked at the following locations:
(1) The most distant point in the rainwater catchment distribution system,
(2) In areas that are known to be low or no-use,
(3) Before and after any water treatment and filtration system, and
(4) Storage tanks or vessels.

TABLE Q 502.5.3
MINIMUM WATER QUALITY
FOR RAINWATER CATCHMENT SYSTEMS

APPLICATION	MINIMUM TREATMENT	MINIMUM WATER QUALITY
Car washing	Debris excluder or other approved means in accordance with Section Q 502.5, and 100 microns in accordance with Section Q 502.5.1 for drip irrigation.	N/A
Subsurface and drip irrigation	Debris excluder or other approved means in accordance with Section Q 502.5, and 100 microns in accordance with Section Q 502.5.1 for drip irrigation.	N/A
Spray irrigation where the maximum storage volume is less than 360 gallons	Debris excluder or other approved means in accordance with Section Q 502.5, and disinfection in accordance with Section Q 502.5.4.	N/A
Spray irrigation where the maximum storage volume is equal to or more than 360 gallons	Debris excluder or other approved means in accordance with Section Q 502.5.	Escherichia coli: < 100 CFU/100 mL, and Turbidity: < 10 NTU
Urinal and water closet flushing, clothes washing, and trap priming	Debris excluder or other approved means in accordance with Section Q 502.5, and 100 microns in accordance with Section Q 502.5.1.	Escherichia coli: < 100 CFU/100 mL, and Turbidity: < 10 NTU
Ornamental fountains and other water features	Debris excluder or other approved means in accordance with Section Q 502.5.	Escherichia coli: < 100 CFU/100 mL, and Turbidity: < 10 NTU
Cooling tower make-up water	Debris excluder or other approved means in accordance with Section Q 502.5, and 100 microns in accordance with Section Q 502.5.1.	Escherichia coli: < 100 CFU/100 mL, and Turbidity: < 10 NTU

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

Q 502.5.4 Water Quality Devices and Equipment. Devices and equipment used to treat rainwater to maintain the minimum water quality requirements determined by the Authority Having Jurisdiction shall be listed or labeled (third-party certified) by a listing agency (accredited conformity assessment body) and approved for the intended application.
Q 502.5.5 Routine Flushing. The rainwater catchment system shall be routinely flushed as required by the Authority Having Jurisdiction for bacterial control and to meet water quality in accordance with Table Q 502.5.3.

SUBSTANTIATION:
With buildings being shut down or in low use as a response to COVID-19, the need to establish minimum requirements for managing building water systems to mitigate health effects to building occupants has become critically important. Understandably, potable water systems are the primary focus in this effort. However, nonpotable water systems such as water features, cooling and produce sprays, and rainwater catchment systems, may also pose a significant risk to building occupants. Although there have been several published guidance to address building shutdowns, all are focused on the potable water system. This proposal is intended to be used by building owners and managers as a resource to safely operate and manage nonpotable water systems and by local jurisdictions as a tool to establish and enforce minimum requirements for nonpotable water systems during normal operation, building shutdowns and building reopenings. Except for the rainwater catchment system requirements which were derived from existing language in the UPC, requirements for nonpotable water systems were derived using potable water system requirements as a starting point.

Proposals

Item #: 322

UPC 2024 Section: Q 503.0 – Q 503.4.1, Table Q 503.1

SUBMITTER: Ramiro Mata
Self
Chair, Nonpotable Water Working Group

RECOMMENDATION:
Add new text

Q 503.0 Interruption to Normal Operation (System Shutdown Process).
Q 503.1 General. This section shall apply to the closure strategies of the building water system for nonpotable systems when the normal operation is interrupted. The required inspection prior to shutting down the nonpotable water system shall be in accordance with Table Q 503.1.
Note: These procedures are general guidelines intended to supplement the requirements set forth by the registered design professional and the Authority Having Jurisdiction.
Q 503.2 Without Draining (Except Rainwater Catchment Systems). When the nonpotable water system is shutdown without draining of the system, the following shall be done:
(1) Prior to system shutdown, verify operation of bypass system.
(2) Inspect bypass system and verify proper operation at a minimum of every three months.
(3) Where applicable, implement procedures to prevent pipes from freeze damage.
(4) Use proper lockout/tagout procedures and follow manufacturer's instructions to remove stored energy from equipment.
Q 503.3 Shutting Down with System Draining. When the nonpotable water system is shutdown with draining of the system, the following shall be done:
(1) Shut off water supply and drain the tank.
(2) Drain the system following the manufacturer's instructions, the water management program, and the registered design professional or the Authority Having Jurisdiction.
(3) Close supply valves to storage water tanks and drain the tanks until the water runs clear.
(4) Shutoff and drain the water supply system.
Note: Unless the system can be physically dried, it is likely that pockets of water and condensation will remain even after the system is drained. These remaining pockets of water may be sufficient to allow waterborne pathogens to grow, including Legionella.
Q 503.4 Rainwater Catchment Systems. Rainwater harvesting systems shall be maintained in accordance with ARCSA/ASPE 63 and in functioning order for the life of the system. Failure to properly maintain such a system shall require the owner to abandon the system. Refer to Section Q 502.5 for continuous maintenance procedures during normal operation.
Q 503.4.1 System Bypass. Rainwater harvesting systems shall be placed in bypass mode and not be completely shutdown, even while the primary water supply system is shutdown during low use or building closure.

TABLE Q 503.1
REQUIRED INSPECTION PRIOR TO SYSTEM INTERRUPTION

DESCRIPTION	Open System	Closed System
Inspect and clean filters and screens, and replace (if necessary)	☑	☑
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	☑	☑
Inspect pumps and verify proper operation (for bypass systems)	☑	☑
Inspect valves and verify proper operation	☑ Including system by-pass valves	☑
Clear debris from and inspect storage tanks, locking devices, and verify operation	☑	☑
Inspect caution labels and markings	☑	☑
Inspect and maintain mulch basins for gray water irrigation systems	☑	☑
Inspect flushing system and verify proper operation	☑	☑
Cross-connection inspection and test*	☑	☑

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

SUBSTANTIATION:
With buildings being shutdown or in low use as a response to COVID-19, the need to establish minimum requirements for managing building water systems to mitigate health effects to building occupants has become critically important. Understandably, potable water systems are the primary focus in this effort. However, nonpotable water systems such as water features, cooling and produce sprays, and rainwater catchment systems, may also pose a significant risk to building occupants. Although there have been several published guidance to address building shutdowns, all are focused on the potable water system. This proposal is intended to be used by building owners and managers as a resource to safely operate and manage nonpotable water systems and by local jurisdictions as a tool to establish and enforce minimum requirements for nonpotable water systems during normal operation, building shutdowns and building reopenings. Except for the rainwater catchment system requirements which were derived from existing language in the UPC, requirements for nonpotable water systems were derived using potable water system requirements as a starting point.

Proposals

Item #: 323

UPC 2024 Section: Q 504.0 – Q 504.2.5

SUBMITTER: Ramiro Mata
Self
Chair, Nonpotable Water Working Group

RECOMMENDATION:
Add new text

Q 504.0 Reopening of Nonpotable Water Systems.
Q 504.1 General Systems. The reopening of nonpotable water systems shall be in accordance with Section Q 504.1.1 through Section Q 504.1.3. The reopening of the nonpotable rainwater systems shall be in accordance with Section Q 504.2 through Section Q 504.2.5.
Q 504.1.1 Equipment Inspections. Equipment shall be checked for physical integrity and general function. Equipment shall be inspected in accordance with the manufacturer's start up procedures. The alternate water source testing, inspection and maintenance frequency shall be performed in accordance with Section Q 502.2.
Q 504.1.2 Water Quality Testing. The water quality shall be tested until it meets the minimum water quality parameters of the non-potable water system. The minimum water quality for non-potable water systems shall meet the applicable water quality requirements for the intended application as determined by the Authority Having Jurisdiction or the registered design professional's requirements approved by the Authority Having Jurisdiction.
Water quality shall be checked at the following locations:
(1) The most distant point in the nonpotable water distribution system,
(2) In areas that are known to be low or no-use,
(3) Before and after any water treatment and filtration system, and
(4) Storage tanks or vessels.
Q 504.1.3 System Flushing. The nonpotable water system shall be flushed as required by the Authority Having Jurisdiction for bacterial control and to meet water quality in accordance with Section Q 504.1.2.
Q 504.2 Rainwater Catchment Systems. The rainwater catchment conveyance system shall be equipped with a debris excluder or other approved means to prevent the accumulation of leaves, needles, other debris and sediment from entering the storage tank. Devices or methods used to remove debris or sediment shall be accessible and sized and installed in accordance with manufacturer's installation instructions.
Q 504.2.1 Water Treatment and Filtration Equipment. A filter permitting the passage of particulates not larger than 100 microns (100 µm) shall be provided for rainwater supplied to water closets, urinals, trap primers, and drip irrigation system. The water treatment and filtration shall be maintained in accordance with the manufacturer's installation instructions.
Q 504.2.2 Water Quality Monitoring. The minimum water quality for harvested rainwater shall meet the applicable water quality requirements for the intended applications as determined by the Authority Having Jurisdiction. In the absence of water quality requirements determined by the Authority Having Jurisdiction, the minimum treatment and water quality shall be in accordance with Table Q 502.5.3.
Exception: No treatment is required for rainwater used for subsurface or nonsprinkled surface irrigation where the maximum storage volume is less than 360 gallons (1363 L).
Q 504.2.3 Minimum Water Quality. Where the water quality is not acceptable as required in Section Q 504.2.2, it shall be determined whether routine flushing is needed. Where completed, routine flushing shall be done in accordance with Section Q 504.2.5. Where the water quality of the tested water cannot consistently be maintained at the minimum levels specified in Table Q 502.5.3, then the system shall be equipped with an appropriate treatment device meeting applicable NSF standards or equivalent.
Water quality shall be checked in accordance with the following:
(1) At the most distant point in the rainwater catchment distribution system,
(2) In areas that are known to be low or no-use,

(3) Before and after any water treatment and filtration system, and
(4) Storage tanks or vessels.

Q 504.2.4 Water Quality Devices and Equipment. Devices and equipment used to treat rainwater to maintain the minimum water quality requirements determined by the Authority Having Jurisdiction shall be listed or labeled (third-party certified) by a listing agency (accredited conformity assessment body) and approved for the intended application.

Q 504.2.5 Routine Flushing. The rainwater catchment system shall be routinely flushed as required by the Authority Having Jurisdiction for bacterial control and to meet water quality in accordance with Table Q 502.5.3.

SUBSTANTIATION:
With buildings being shutdown or in low use as a response to COVID-19, the need to establish minimum requirements for managing building water systems to mitigate health effects to building occupants has become critically important. Understandably, potable water systems are the primary focus in this effort. However, nonpotable water systems such as water features, cooling and produce sprays, and rainwater catchment systems, may also pose a significant risk to building occupants. Although there have been several published guidance to address building shutdowns, all are focused on the potable water system. This proposal is intended to be used by building owners and managers as a resource to safely operate and manage nonpotable water systems and by local jurisdictions as a tool to establish and enforce minimum requirements for nonpotable water systems during normal operation, building shutdowns and building reopenings. Except for the rainwater catchment system requirements which were derived from existing language in the UPC, requirements for nonpotable water systems were derived using potable water system requirements as a starting point.

Proposals

Item #: 324

UPC 2024 Section: Appendix R

SUBMITTER: Samantha Liu
Self

RECOMMENDATION:
Add new text

APPENDIX R
TINY HOUSES

R 101.0 Tiny Houses.
R 101.1 Applicability. The tiny house plumbing systems shall be designed and installed in accordance with the requirements of this appendix and the requirements of this code, where applicable. Part I of this appendix shall apply to a single tiny house. Part II of this appendix shall apply to tiny house communities. The provision of this appendix shall apply to permanent structures of 400 square feet (37 m^2) or less. The provisions of this appendix shall not apply to recreational vehicles as defined in NFPA 1192. The provisions of this appendix shall not apply to recreational vehicle parks and campgrounds as defined in NFPA 1194 or to manufactured homes as defined in NFPA 501A.

R 102.0 Definitions.
R 102.1 General. For purposes of this appendix, the following definitions shall apply:

Tiny House. A structure, where erected, is 400 square feet (37 m^2) or less.

Tiny House, Community. A structure(s), where erected, is 400 square feet (37 m^2) or less, and of not less than two structure in the same lot.

Tiny House, Single. A structure, where erected, is 400 square feet (37 m^2) or less, and of not more than 1 structure in a lot.

R 103.0. General.
R 103.1 Construction Documents. Before plumbing or sewage disposal facilities are installed or altered in a tiny house, duplicate construction documents shall be filed, and proper permits obtained from the department or departments having jurisdiction. Plans shall show in detail:
(1) Plot plan drawn to scale, indicating elevations, property lines, driveways, existing or proposed buildings, and the sizes of the tiny house lots.
(2) Complete specification and piping layout of proposed plumbing systems or alteration.
(3) Complete specification and layout of proposed sewage disposal system or alteration.
(4) The nature and extent of the work proposed, showing that such work will comply to the provisions of this appendix and this code, where applicable.
R 103.2 Fuel-Gas Piping System. The size of each section of a gas piping system shall be determined in accordance with this code, NFPA 54, or by engineering methods acceptable to the Authority Having Jurisdiction. Liquid Petroleum Gas (LP-Gas) piping systems shall be sized in accordance with NFPA 58. Oil burning systems and equipment shall be installed in accordance with NFPA 31. Gas piping systems shall be of such size and so installed as to provide a supply gas sufficient to meet the maximum demand and supply gas to each appliance inlet at not less than the minimum supply pressure required by the appliance.
R 103.3 Water Heaters. Water heaters shall be applied, sized, and installed in accordance with the manufacturer's recommendations and instructions.
R 103.4 Potable Water Sources. Where an approved public water supply system is available, it shall be used. Alternate water sources shall be approved by a regulating agency. The supply or supplies of water shall comply with the potable water standards of the state, local health authority.

R 103.5 Water Supply to Fixtures. Except where not deemed necessary for safety or sanitation by the Authority Having Jurisdiction, each plumbing fixture shall be provided with an adequate supply of potable running water piped thereto in an approved manner.

R 103.5.1 Hot and Cold Water Required. Where plumbing fixtures are installed for private use, hot water shall be required for bathing, washing, laundry, cooking purposes, dishwashing or maintenance.

R 103.6 Storage Tanks. Where installed, water storage tanks shall be constructed of impervious materials, protected against contamination, and provided with locked, watertight covers. Overflow or ventilation openings shall be down-facing and provided with a corrosion-resistant screening of not less than number 24 mesh to prevent the entrance of insects and vermin. Water storage tanks shall not have direct connections to sewers.

R 103.7 Prohibited Connections. The potable water supply shall not be connected to a nonpotable or unapproved water supply, nor be subjected to backflow or back siphonage.

R 103.8 Backflow Prevention. No plumbing fixture, device, or construction shall be installed or maintained, or shall be connected to a domestic water supply, where such installation or connection provides a possibility of polluting such water supply or cross-connection between a distributing system of water for drinking and domestic purposes and water that becomes contaminated by such plumbing fixture, device, or construction unless there is provided a backflow prevention device approved for the potential hazard.

R 103.9 Shutoff Valve. A separate water shutoff valve shall be installed in each water service outlet at each tiny house. Where a backflow protective device is installed, the service shutoff shall be located upstream to the backflow protection device.

R 103.10 Mechanical Protection. Water service outlets, backflow preventers, and pressure-relief valves shall be protected from damage by vehicles or other causes. Such protection shall be permitted to consist of posts, fencing, or other permanent barriers.

R 103.11 Water-Treatment Equipment. Where installed, water-treatment equipment shall comply with the requirements of Section 611.0.

R 103.12 Testing. Installations of water supply, drainage, and venting systems shall be tested and inspected in accordance with this code.

Part I – Single Tiny House.

R 201.0 Tiny House Fixtures.

R 201.1 Kitchen. Each tiny house shall be provided with a kitchen area and every kitchen area shall be provided with a sink in accordance with Section 420.0.

R 201.3 Bathrooms Group. Every tiny house shall contain not less than one water closet, one lavatory, and one bath, shower or combination bath/shower. The walls and shower floors shall be water-tight and waterproof in accordance with Section 408.5 and Section 408.7.

R 201.3.1 Bathroom group Clearance. Bathrooms shall have a minimum ceiling height of not less than 6 feet 8 inches (2032 mm) from the floor when measured at the center, front area of the fixtures. The ceiling height above fixtures shall not interfere with the fixture's intended purpose.

Where a shower or combination bath/shower is installed, the ceiling height shall be not less than 6 feet 8 inches (2032 mm) where measured from the shower drain.

R 201.3.2 Bathtubs. Where installed, bathtubs or combination bath/showers shall be in accordance with Section 409.0.

R 201.3.3 Whirlpool Baths. Where installed, whirlpool baths shall be in accordance with Section 409.0.

R 201.3.4 Showers Compartments. Where installed, shower compartments, enclosures or field-constructed tile walled showers, shall be capable of fitting 30 inch diameter circle, flat on the shower base.

R 201.3.5 Water Closet. Water closets shall be in accordance with Section 411.0.

R 201.3.6 Bidets. Where installed, bidets shall be in accordance with Section 410.0.

R 201.3.7 Lavatories. Lavatories shall be in accordance with Section 407.0.

R 202.0 Tiny House Water Supply System.

R 202.1 Potable Water Supply. An accessible and approved supply of potable water shall be provided in each tiny house. Where an approved public water supply is not available, a private water supply system shall be developed and used as approved by the Authority Having Jurisdiction.

R 202.2 Water Service Outlet. Each tiny house shall be provided with a water service outlet delivering potable water. The water service outlet riser shall be not less than ¾ of an inch (20 mm) nominal pipe size and capable of delivering 12 water supply fixture units.

R 202.2.1 Water Supply Fixture Units. Water distribution systems shall be designed to deliver not less than 12 water supply fixture units to each tiny house. Plumbing materials shall be installed with materials in accordance with Chapter 3 for piping, and Chapter 4 for joints and connections.

R 202.2.2 Pressure. Each tiny house water distribution system shall be so designed and maintained at not less than 15 psig at each fixture inlet in accordance with Section 608.1. Pressures exceeding 80 psig, shall be limited in accordance with Section 608.2.

R 203.0 Tiny House Drainage System.
R 203.1 General. Plumbing fixtures shall be drained to a public sanitary waste system by gravity in accordance with Chapter 7. Private sanitary waste systems shall be in accordance with Chapter 7 or other method approved by the Authority Having Jurisdiction. See Appendix H for private sewage disposal system general guidelines.
R 203.2 Vents. All venting systems shall be in accordance with Chapter 9.
R 203.3 Engineered Design. Alternate engineered designed systems shall be in accordance with Section 301.3.
R 203.4 Materials. Drainage pipe and fittings installed underground shall be of a material approved for the purpose. Material for sanitary waste and drainage piping shall be in accordance with Table 701.2 of this code.

Part II – Tiny House Community.

R 301.0 Tiny House Community Plumbing System and Fixtures.
R 301.1 Community Facilities. Where provided, facilities for a community of tiny houses shall be in be in accordance with Section R 301.2 through Section R 301.7.1.
R 301.2 Toilet Facilities. Toilet facilities shall be provided at not less than one location, located within a 500 foot (152 m) radius from a tiny house.
R 301.2.2 Interior Finish. The interior finish of walls shall be moisture resistant to a height of not less than 4 feet (1219 mm) to facilitate washing and cleaning.
R 301.2.3 Receptacle. Each toilet room for women shall be provided with a receptacle for sanitary napkins. The receptacle shall be of durable, impervious, readily cleanable material, and shall be provided with a lid.
R 301.3 Water Closets. Public water closets shall be of an elongated bowl type and shall be provided with seats with open fronts. Water closets shall be in accordance with Section 411.0.
R 301.3.1 Size. Water closet compartments shall be not less than 30 inches (762 mm) in width. No water closet shall be set closer than 15 inches (381 mm) from its center to a side wall and shall have not less than 30 inches (762 mm) of clear space in front of each water closet.
R 301.4 Lavatories. Where water-supplied water closets are provided, an equal number of lavatories shall be provided for up to six water closets. One additional lavatory shall be provided for each two water closets where more than six water closets are required. Lavatories shall be in accordance with Section 407.0.
R 301.5 Urinals. Where separate facilities are provided for men and women, urinals shall be acceptable for not more than one-third of the water closets required in the men's facilities, except that one urinal shall be permitted to be used to replace a water closet. Individual stall or wall-hung types of urinals shall be installed. Floor-type trough units shall be prohibited. Urinals shall be in accordance with Section 412.0.
R 301.6 Floors and Drains. The floors shall be constructed of material impervious to water and shall be easily cleanable. A building having water-supplied water closets shall be provided with a floor drain in the toilet room. This drain shall be provided with means to protect the trap seal in accordance with this code.
R 301.7 Shower Compartments. Where installed, shower compartments, regardless of shape, shall have a minimum finished interior of 1024 square inches (0.6606 m^2) and shall also be capable of encompassing a 30 inch (762 mm) circle. The minimum required area and dimensions shall be measured at a height equal to the top of the threshold and a point tangent to its centerline. The area and dimensions shall be maintained to a point of not less than 70 inches (1778 mm) above the shower drain outlet with no protrusions other than the fixture valve or valves, showerheads, soap dishes, shelves, and safety grab bars, or rails. Fold-down seats in accessible shower stalls shall be permitted to protrude into the 30 inch (762 mm) circle.
Exceptions:
(1) Showers that are designed to be in accordance with ICC A117.1.
(2) The minimum required area and dimension shall not apply for a shower receptor having overall dimensions of not less than 30 inches (762 mm) in width and 60 inches (1524 mm) in length.
R 301.7.1 Drainage Connection. Shower sanitary drainage systems shall be in accordance with Chapter 7 and vents in accordance with Chapter 9. Each such area shall have an impervious, skid-resistant surface. Wooden racks (duckboards) over shower floors shall be prohibited.
R 301.8 Drinking Fountains. Where provided, drinking fountains shall be in accordance with Section 415.0.

R 302.0 Tiny House Community Potable Water Supply and Distribution.
R 302.1 Potable Water Required. Except where not deemed necessary for safety or sanitation by the Authority Having Jurisdiction, each plumbing fixture shall be provided with an adequate supply of potable running water piped thereto in an approved manner, so arranged as to flush and keep it in a clean and sanitary condition without danger of backflow or cross-connection.
Exception: Listed fixtures that do not require water for their operation and are not connected to the water supply.
R 302.2 Water Riser Pipe. Each potable water connection shall consist of a water riser pipe that is equipped with a threaded male spigot located not less than 12 inches (305 mm) but not more than 24 inches (610 mm) above grade level for the attachment of a standard water hose. The water riser pipe shall be protected from physical damage in accordance with this code. This connection shall be equipped with a listed antisiphon backflow prevention device.
R 302.3 Water Supply and Distribution. Water supply and distribution systems shall be in accordance with Chapter 6.

R 302.3.1 Water Supply Fixture Units. Water distribution systems shall be designed to deliver not less than 12 water supply fixture units to each tiny house. Plumbing materials shall be installed with materials in accordance with Chapter 6 for piping, and joints and connections.
R 302.4 Approval by Authority. No water piping supplied by a private water supply system shall be connected to any other source of supply without the approval of the Authority Having Jurisdiction, Health Department, or other department having jurisdiction.

R 303.0 Tiny House Community Drainage System.
R 303.1 Required Sanitary Drainage. Where available, tiny houses shall be connected to a public sanitary drainage system.
R 303.2 Materials. Pipe and fittings installed in the drainage system shall be of material conforming to the requirements of Table 701.2 or as approved by the Authority Having Jurisdiction. The drainage system shall be installed in accordance with this code.
R 303.3 Pipe Sizes. Water supply and distribution lines shall be sized in accordance with Chapter 6, Appendix A, Appendix C, or Appendix M of this code.
R 303.4 Traps and Cleanouts. Traps and cleanouts shall be provided in accordance with Chapter 7 of this code. Traps shall also be in accordance with Chapter 10.
R 303.4 Vents. All venting systems shall be in accordance with Chapter 9 of this code.
R 303.5 Location. Sewer lines shall be installed in a location that will be protected from damage by vehicular traffic.
R 303.6 Protection. The sewer riser pipes not in use shall be firmly embedded in the ground and protected against damage from movement. Unused sewer riser pipes shall be capped or plugged with a tight-fitting plug or cap, to prevent gases from escaping. The cap or plug shall be secured by a durable chain (or equivalent) to prevent loss.

TABLE 1701.2
STANDARDS, PUBLICATIONS, PRACTICES, AND GUIDES

DOCUMENT NUMBER	DOCUMENT TITLE	APPLICATION
NFPA 1194-2021	Standard for Recreational Vehicle Parks and Campgrounds	Recreational Vehicles

(portions of table not shown remain unchanged)

SUBSTANTIATION:
This appendix for Tiny Houses will correlate with the approved appendix accepted by the NSPC Technical Committee for their 2021 Edition of the NSPC.

The proposed appendix will assist a builder or enforcing agency ensure that plumbing systems for tiny houses are being installed in a safe manner with listed fixtures. Currently, no provisions exist to assist the end user building a tiny house with regards to minimum plumbing standards, and safe practices. Providing guidance for the tiny house communities will provide safe and reliable plumbing systems by requiring appropriate listed fixtures that are known to have to approved type of materials to prevent any contamination to the potable water system. Additionally, potable water should be protected, and regulations towards protecting the potable water system is not only important to the end user, but the water supplier as well. This appendix gives a foundation to establish safe practices and requirements that will keep habitants safe, healthy, and ensure a reliable plumbing system.

Tiny homes are becoming more popular and a need to address plumbing provisions is required for these specific types of structures since they are not considered Manufactured homes, Recreational Vehicles, or campgrounds. These homes are unique as classified by the building code and pluming provisions specifically addressing these types of homes is required as no provisions address these specific dwellings.

Proposals

Item #: 325

UPC 2024 Section: Appendix S

SUBMITTER: Pat Lando
Recode
Rep. Chairman of the Non-Traditional Toilet Task Group

RECOMMENDATION:
Add new text

APPENDIX S
COMPOSTING TOILET AND URINE DIVERSION SYSTEMS

S 101.0 General.
S 101.1 Applicability. The provisions of this section shall apply to the design, construction, performance, alteration, and repair of composting toilet and urine diversion systems.

S 201.0 Definition of Terms. For the purposes of this code, the definitions in Section S 201.1 shall apply to this appendix.

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

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

S 201.1 Definitions.

Commode. The composting toilet fixture for collecting, containing, or transporting excreta to the compost processor.
Compost Additives. Any material such as sawdust, wood shavings, and other compostable material added to the commode or compost processor to maintain operational conditions within the composting toilet system.
Composting Toilet System. A system designed to safely collect and process excreta and compost additives into humus through aerobic decomposition.
Compost Processor. The site of aerobic decomposition transforming excreta and compost additives into humus.
Desiccation. The process of dehydrating excreta or leachate.
Diverted Urine. Urine that is collected and has not made contact with feces.
Excreta. Includes but is not limited to urine, feces, menses, toilet paper, and other human body emissions and biodegradable cleaning products.
Humus. The biologically decomposed, soil-like output of the compost processor.
Leachate. Liquid draining from the compost processor.
Secondary Composting. Additional retention and continued decomposition of humus removed from compost processors in order to meet a safe retention time.
Site-Built. Constructed at the site of use.
Transfer. The controlled transfer of excreta or partially processed humus between commode and composting processor or between multi-stage composting processors.
Urine Diversion. Separation of urine from other excreta that occurs at the commode.
Vectors. An organism that has the potential to transmit disease.

S 301.0 Design and Construction.
S 301.1 Requirements. Composting toilets, composting toilet systems, and urine diversion systems shall meet the design, construction, and performance requirements of Section S 301.1.1 or Section S 301.1.2.
S 301.1.1 Listed Composting Toilets and Composting Toilet Systems. Composting toilets and composting toilet systems shall be listed to NSF 41.

S 301.1.2 Alternative Design Systems. Where approved by the Authority Having Jurisdiction, composting toilet and urine diversion systems for residential and commercial applications shall comply with the provisions of Section S 301.2 through Section S 501.1.

S 301.2 System Materials and Components. Pipe, pipe fittings, traps, fixtures, material, and devices used in composting toilet and urine diversion systems that are expected to contact leachate or diverted urine shall be listed or labeled (third-party certified) by a listing agency (accredited conformity assessment body), unless otherwise approved by the Authority Having Jurisdiction. Materials and components shall comply to approved applicable recognized standards referenced in this code and shall be free from defects. Unless otherwise provided for in this code, materials, fixtures, or devices used or entering into the construction of plumbing systems, or parts thereof, shall be submitted to the Authority Having Jurisdiction for approval.

S 301.3 System Design. Composting toilet and urine diversion systems complying with Section S 301.1 shall be designed by a person registered or licensed to perform plumbing design work or who demonstrates competency to design composting toilet and urine diversion systems.

S 301.4 Permit. It shall be unlawful for any person to construct, install, alter, or cause to be constructed, installed, or altered any composting toilet and urine diversion system in a building or on a premise without first obtaining a permit to do such work from the Authority Having Jurisdiction.

S 301.5 Maintenance and Inspection. Composting toilet and urine diversion systems and components shall be maintained and inspected in accordance with Section S 301.5.1 through Section S 301.5.3.

S 301.5.1 Maintenance Responsibility. The required maintenance and inspection of composting toilet and urine diversion systems shall be the responsibility of the property owner, unless otherwise required by the Authority Having Jurisdiction. The property owner is responsible for retaining test result records in accordance with Section S 401.6.2 and making them available to the Authority Having Jurisdiction upon request. Upon transfer of property or tenancy, all test records shall be transferred and humus shall be re-tested after its first treatment period and a record retained.

S 301.5.2 Operation. Composting toilet and urine diversion systems shall be operated in a safe and sanitary condition in accordance with the owner's manual in accordance with Section S 301.6.

S 301.5.3 Inspection. In the event of a nuisance complaint or documented system failure, the composting toilet and urine diversion system shall be made available for inspection and the owner or owner's agent shall conduct sufficient repairs or alterations to the composting toilet system. At the request of the Authority Having Jurisdiction, results of all laboratory testing and new tests in accordance with Section S 401.6 following repairs to alleviate dangerous or unsanitary conditions shall be provided at the owner's expense.

S 301.6 Operation and Maintenance Manual. An owner's manual shall present clear instructions for maintenance and be transferred to the new owner upon transfer of property or tenancy. The owner's manual shall include:

(1) Schedule for addition of necessary compost additives.
(2) Source or provider of necessary compost additives. Source may be on-site.
(3) Schedule and instructions for all regular maintenance tasks.
(4) Expected input of and capacity for excreta and compost additives to compost toilet system specifying loading of commode(s) and compost processor(s).
(5) Plan for container transfer and cleaning where transfer is used.
(6) Expected schedule for removing humus from composting processors and where used secondary composting bins.
(7) Plan for on-site disposal of humus or professional removal.
(8) Plan for managing leachate.
(9) Plan for microbial testing in accordance with Section S 401.6.2.

S 401.0 Composting Toilet System Design.

S 401.1 Requirements. The design and installation of composting toilet systems shall be in accordance with Section S 401.2 through Section S 401.7.

S 401.2 Corrosion Resistance. All components expected to contact excreta or leachate shall be constructed of corrosion-resistant material such as stainless steel or durable polymers. Concrete in contact with excreta or leachate shall meet requirements of Section S 401.3.

S 401.3 Concrete Construction. Concrete construction shall be reinforced, watertight and able to withstand loading weight. Where drainage is required, the processor floor shall be sloped not less than ¼-inch per foot (20.8 mm/m). The flange of each sub-drain shall be set level.

S 401.4 Commodes.

S 401.4.1 Odor. Commode design or use shall mitigate the infiltration of odors into the building during normal operation and in the event of temporary power failure.

S 401.4.2 Contact. Commodes shall transport excreta into the compost processor or contain excreta for transfer as designed according to the owner's manual.

S 401.4.3 Vectors. Commodes shall limit vectors and prevent human contact except for regular maintenance as designed according to the owner's manual.

S 401.5 Compost Processors. Compost processors shall be designed in accordance with Sections S 401.5.1 through S 401.5.9 and shall maintain unsaturated aerobic composting conditions within the compost mass, through the drainage, absorption, or desiccation of leachate, and aeration of the processor.

S 401.5.1 Leachate. Leachate shall be collected for removal or recirculation within the processor, evaporated, or drained to an approved plumbing drainage system or other location approved by the Authority Having Jurisdiction. Leachate storage tanks shall be constructed and installed in accordance with the following:

S 401.5.1.1 Venting. Leachate storage tanks shall be vented as required for pressure equalization. When required, vents shall be installed on leachate storage tanks and shall extend from the top of the tank. The connection of storage tank vents to the plumbing venting system shall be 6 inches (152 mm) above the flood level rim of the highest fixture. Vents extending to the outdoor shall terminate no less than 12 inches (305 mm) above grade. The vent terminal shall be directed downward and covered with a 3/32 inch (2.38 mm) mesh screen to prevent the entry of vermin and insects.

S 401.5.1.1.1 Vent Size. Pressure equalization vents that prevent nitrogen loss by the use of restrictions, or of piping or tubing that is less than the minimum pipe diameter required in the plumbing code shall be approved by the Authority Having Jurisdiction.

S 401.5.1.2 Overflow. Where storage tank overflows are installed, they shall be connected to the plumbing drainage system.

S 401.5.1.2.1 Backwater Valve. Storage tank overflows, when subject to backflow, shall be provided with a backwater valve at the point of connection to the plumbing drainage system. The backwater valve shall be accessible for inspections and maintenance.

S 401.5.1.3 Construction. Leachate storage tanks shall be constructed of polyethylene terephthalate (PET), polyethylene naphthalate (PEN), polyamide (Nylon) or a blend of PET, PEN, ethyl vinyl alcohol (EVOH), Nylon, HDPE, or other tanks listed or certified to US 49 CFR 178.274 Specifications for UN?Portable Tanks.

S 401.5.1.4 Above Grade. Above grade storage tanks are prohibited where subject to freezing conditions, or shall be provided with an adequate means of freeze protection. The above grade leachate storage tank shall be provided with an audible and visual high-water alarm.

S 401.5.1.5 Below Grade. Leachate storage tanks installed below grade 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 300 pounds per square foot (lb/ft^2) (1465 kg/m^2) when the tank is designed for underground installation. Below grade leachate tanks installed underground shall be provided with manholes. The manhole opening shall be a minimum diameter of 20 inches (508 mm) and located a minimum of 4 inches (102 mm) above the surrounding grade. The surrounding grade shall be sloped away from the manhole. Underground tanks shall be ballasted, anchored, or otherwise secured, to prevent the tank from floating out of the ground when empty. The combined weight of the tank and hold down system should meet or exceed the buoyancy force of the tank. The below grade leachate storage tank level shall be provided with an audible and visual high-water alarm.

S 401.5.1.6 Marking. Where openings are provided to allow a person to enter the tank, the opening shall be marked with the following words: “DANGER – CONFINED SPACE.”

S 401.5.1.7 Openings. All openings shall be covered and secured to prevent tampering. Openings shall be screened or covered to prevent rodent, vermin, and insect infiltration and be protected against unauthorized human entry.

S 401.5.2 Vectors. The compost processor shall be designed and installed to limit vector access through management as required in the owner’s manual.

S 401.5.3 Transfer. Where unfinished excreta or diverted urine is transferred between processors or from commode to processor, transfer and cleaning of containers and provisions for limiting user exposure shall be according to the owner’s manual.

S 401.5.4 Watertightness. Processors shall be constructed of watertight material in accordance with Section S 401.2.

S 401.5.5 Vermin (Rodent) Proofing. The compost processor shall be protected to prevent the entrance of rodents, vermin, and insects. No unsecured opening other than vents, drainage, or commode may exceed ½ inch (12.7 mm) in the least dimension.

S 401.5.6 Active Conditions. The compost processor or processors shall be sized to compost excreta for a minimum of one year of biologically active conditions. Biologically active conditions are at or above a daily average of 42°F (5.56°C).

Exception: Systems with shorter retention shall be permitted where either,

(1) humus from the compost processor has been tested according to Section S 401.6.2 and there is either a secondary composting stage where humus is retained in a well maintained compost bin or other facility designated for the exclusive purpose of containing humus removed from the compost processor, or

(2) humus is removed off site for processing or disposal at an approved facility.

S 401.5.7 Secondary Composting. Humus to be transferred to secondary composting shall first be tested according to Section S 401.6.2. Secondary composting shall be labeled and protected from human contact. Contact with precipitation and surface waters is prohibited.

S 401.5.8 Ventilation. Negative ventilation between the commode and compost processor shall be provided when the compost processor is connected directly to the commode without a trap. Commodes that are not connected to the compost processor do not require a vent.

S 401.5.8.1 Vent Terminals. Vent stacks shall terminate exterior the building as required by the plumbing or mechanical code.

S 401.5.9 Sizing. The compost processor shall be sized to accommodate the maximum daily adult usage as specified by the manufacturer’s published ratings. Site built compost processors shall be sized to hold a minimum of 10 gallons (37.8 L) of material per person per year while allowing for the removal of the humus, or as specified by the system designer.

S 401.6 Testing. Composting toilet systems shall be tested in accordance with Section S 401.6.1 and Section S 401.6.2.
S 401.6.1 Compost Processors. Compost processors shall be tested for water tightness by filling the system to the maximum designed liquid storage capacity of the unit for a duration of 24 hours.
S 401.6.2 Humus. The owner or owner's agent of the composting toilet system shall verify user's compliance with the manufacturer's maintenance and operation manual in accordance with Section S 403.7 by submitting a sample of the humus from the first treatment period after a minimum of one year of biologically active conditions to a certified laboratory before removal of humus from the composting processor. Where multiple compost processors are used, the humus sample shall be removed from the last compost processor. The sample collection shall be tested in accordance with EPA/625/R-92/013, Appendix F, Section 1.2. Humus shall not have a moisture content exceeding 75 percent by weight and shall not exceed 200 fecal coliforms/gram.
S 401.7 Humus Removal. Humus shall be removed according to the owner's manual. Humus from the compost processor used around ornamental shrubs, flowers, trees, or fruit trees shall be mixed with soil or mulch and covered with no less than 3 inches (76 mm) of cover material. Depositing humus from any composting toilet system around any edible vegetable or vegetation shall be prohibited.

S 501.0 Urine Diversion System Design.
S 501.1 Requirements. The design and installation of urine diversion systems shall be in accordance with Section S 501.2 through Section S 501.14.
S 501.2 Purpose. The purpose of this section is to enable the installation of urine diversion and collection systems to improve the function of composting toilet systems and prevent nutrient pollution of ground and surface waters.
S 501.3 Material Requirements. Material used for urine diversion shall be impermeable and resistant to corrosion from urine.
S 501.4 Identification. All urine diversion piping shall be identified.
S 501.5 Change of Direction. Changes in direction of urine diversion piping shall be made by a long-sweep 90 degree (1.57 rad) fitting or other approved fittings of equivalent sweep.
S 501.6 Sizing. Pipe sizes shall be in accordance with the plumbing code. Each urine diversion fixture shall be rated as one drainage fixture unit. Piping or tubing for urine diversion that is less than the minimum pipe diameter required in the plumbing code shall be approved by the Authority Having Jurisdiction.
S 501.7 Traps. Fixtures discharging into urine diversion piping connected to the plumbing drainage system shall be trapped and vented according to the plumbing code.
S 501.8 Grade of Horizontal Piping. Urine diversion piping shall be installed at a minimum grade of ½ inch per foot (41.6 mm/m), or 4 percent toward the point of disposal.
S 501.9 Cleanouts. A cleanout shall be provided at the upper terminal of each drain line, every 50 feet (15 240 mm) and at an aggregate horizontal change of direction exceeding 135 degrees (2.36 rad).
S 501.10 Venting. Commode fixtures without traps that require ventilation shall be connected to either a dry toilet ventilation stack or a urine diversion ventilation stack. Nonwater urinals used as urine diversion systems shall be connected to a dry toilet ventilation stack or a urine diversion ventilation stack.
S 501.11 Discharge. A urine-diversion system shall be diverted to a storage tank or discharge to an approved plumbing drainage system.
S 501.12 Urine Storage Tanks. Urine storage tanks shall be constructed and installed in accordance with Section S 501.12.1 through Section S 501.12.8.
S 501.12.1 Venting. Urine storage tanks shall be vented as required for pressure equalization. When required, vents shall be installed on urine storage tanks and shall extend from the top of the tank. The connection of storage tank vents to the plumbing venting system shall be six inches above the flood level rim of the highest fixture. Vents extending to the outdoor shall terminate no less than 12 inches (305 mm) above grade. The vent terminal shall be directed downward and covered with a 3/32 inch (2.38 mm) mesh screen to prevent the entry of vermin and insects.
S 501.12.1.1 Vent Size. Pressure equalization vents that prevent nitrogen loss by the use of restrictions, or of piping or tubing that is less than the minimum pipe diameter required in the plumbing code shall be approved by the Authority Having Jurisdiction.
S 501.12.2 Traps. Urine storage tanks shall prevent odors and nitrogen loss from the tank inlet by means of a P-trap, mechanical trap, submerged inlet piping, or other means approved by the Authority Having Jurisdiction. Submerged inlet piping shall remain submerged during use and after pumpout.
Exception: Tanks of five gallons or less connected to fixtures with active ventilation or having an integrated seal.
S 501.12.3 Overflow. Where storage tank overflows are installed, they shall be connected to a plumbing drainage system.
S 501.12.3.1 Backwater Valve. Storage tank overflows subject to backflow shall be provided with a backwater valve at the point of connection to the plumbing drainage system when connected to a public sewer system or on-site wastewater system. The backwater valve shall be accessible for inspections and maintenance.
S 501.12.4 Construction. Urine storage tanks shall be constructed of polyethylene terephthalate (PET), polyethylene naphthalate (PEN), polyamide (Nylon) or a blend of PET, PEN, ethyl vinyl alcohol (EVOH), Nylon, HDPE, or other tanks listed or certified to US 49 CFR 178.274 Specifications for UN?Portable Tanks.

S 501.12.5 Above Grade. Above grade storage tanks shall be prohibited where subject to freezing conditions, or shall be provided with an adequate means of freeze protection. The above grade urine storage tank shall be provided with an audible and visual high-water alarm.

S 501.12.6 Below Grade. Urine storage tanks installed below grade 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 300 pounds per square foot (lb/ft^2) (1465 kg/m^2) when the tank is designed for underground installation. Below grade urine tanks installed underground shall be provided with manholes. The manhole opening shall be a minimum diameter of 20 inches (508 mm) and located a minimum of 4 inches (102 mm) above the surrounding grade. The surrounding grade shall be sloped away from the manhole. Underground tanks shall be ballasted, anchored, or otherwise secured, to prevent the tank from floating out of the ground when empty. The combined weight of the tank and hold down system should meet or exceed the buoyancy force of the tank. The below grade urine storage tank level shall be provided with an audible and visual high-water alarm.

S 501.12.7 Marking. Where openings are provided to allow a person to enter the tank, the opening shall be marked with the following words: “DANGER – CONFINED SPACE.”

S 501.12.8 Openings. All openings shall be covered and secured to prevent tampering. Openings shall be screened or covered to prevent rodent infiltration and be protected against unauthorized human entry.

S 501.13 Maintenance Plan. Every urine diversion system shall have a maintenance plan that includes both a pumpout schedule and contract, or an onsite discharge plan. The maintenance plan shall also include a pipe cleaning schedule.

S 501.14 Treatment, Reuse, and Disposal. Where urine is to be reused onsite, a treatment method for sanitization shall be included in the owner’s manual. Approved methods of treatment shall include:

(1) Retention without addition for six months before usage. Two or more holding tanks shall be required for retention,
(2) Application to the compost processor,
(3) Pasteurization to 158°F (70°C) for thirty minutes, or
(4) Other method approved by the Authority Having Jurisdiction.

S 601.0 Composting Toilet and Urine Diversion Inspection Checklist.

S 601.1 Applicability. This appendix provides an inspection checklist for composting toilet and urine diversion systems designed in accordance with Section S 301.1.2. This is only a general checklist and is not intended to address all the provisions required by Section S 301.1.2.

S 601.2 Composting Toilet and Urine Diversion Inspection Checklist. This section includes the inspection checklist form.

COMPOSTING TOILET AND URINE DIVERSION INSPECTION CHECKLIST

System Materials and Components

☐ Verify that the system is approved by the Authority Having Jurisdiction as indicated in the approved design.
☐ All components expected to contact excreta or leachate shall be constructed of corrosion resistant material such as stainless steel or durable polymers (ABS, PVC Schedule 40, Polypropylene, High-density polyethylene, Fiber-reinforced polyester, or material of equivalent durability).

Concrete Construction

☐ Verify site built concrete mix, loading weight.
☐ Site built concrete construction shall be reinforced and without cracking, spalling or other observed faults.
☐ Verify site built concrete watertightness.
☐ Verify site built concrete adequate drainage where required; Floors of processors shall be sloped not less than ¼-inch per foot (20.8 mm/m). Note: The flange of each sub-drain shall be set level.

Commode

☐ If commode uses repurposed container for transporting excreta into compost processor, container meets third part listing by a listing agency, including US 49 CFR 178.274 Specifications for UN Portable Tanks.

Compost Processors

☐ Compost processors shall have a leachate collection, recirculation, evaporation, or drainage system. See also Leachate Storage Tank checklist.
☐ Compost processor is rodent proof. No unsecured opening other than vents, drainage, or commode may exceed ½ inch (12.7 mm) in the least dimension.
☐ All composting processors shall be labeled and protected from human contact, surface water and precipitation.
☐ Compost processor must pass a water tightness test by filling the system to the maximum designed liquid storage capacity of the unit for a duration of 24 hours.
☐ Where unprocessed excreta or diverted urine is transferred from commode to processor(s), provide tools and cleaning materials as described in the owner's manual.
☐ Commodes connected to compost processor without a trap shall maintain negative ventilation. If compost processor is not connected to the commode no vent is required.

☐ Vent stacks terminate at exterior of the building as required by the plumbing or mechanical code.
☐ The compost processor is sized in accordance with the approved design.

Leachate Storage Tanks
☐ Leachate storage tanks, where provided, shall be constructed of polyethylene terephthalate (PET), polyethylene naphthalate (PEN), polyamide (Nylon) or a blend of PET, PEN, ethyl vinyl alcohol (EVOH), Nylon, HDPE, or other tanks listed or certified to US 49 CFR 178.274 Specifications for UN Portable Tanks.
☐ Above grade storage tanks are prohibited where subject to freezing conditions or shall be provided with an adequate means of freeze protection. The above grade leachate storage tank shall be provided with a high-water alarm. The alarm shall report when 80 percent volume is reached.
☐ Where openings are provided to allow a person to enter the tank, the opening is marked "DANGER – CONFINED SPACE."
☐ All openings are covered and secured to prevent tampering. Openings shall be screened or covered to prevent rodent infiltration and be protected against unauthorized human entry.
☐ Below grade storage tanks shall be in accordance with the approved design.
☐ If pressure equalization vents are specified in the design, they are installed as designed.
☐ The connection of storage tank vents to the plumbing venting system shall be six inches above the flood level rim of the highest fixture.
☐ Vents extending to the outdoor shall terminate no less than 12 inches (305 mm) above grade.
☐ The vent terminal shall be directed downward and covered with a 3/32 inch (2.38 mm) mesh screen to prevent the entry of vermin and insects.
☐ Where storage tank overflows are installed they shall be connected to the plumbing drainage system.
☐ All leachate storage tanks shall have a high-water alarm. The alarm shall report when 80 percent volume is reached.
☐ Storage tank overflows shall be provided with a backwater valve or check valve at the point of connection to the plumbing drainage system when connected to a public sewer system. The backwater valve shall be accessible for inspections and maintenance.

Urine Storage Tanks
☐ Below grade urine storage tanks shall be in accordance with the approved design.
☐ Above grade storage urine storage tanks are constructed of polyethylene terephthalate (PET), polyethylene naphthalate (PEN), polyamide (Nylon) or a blend of PET, PEN, ethyl vinyl alcohol (EVOH), Nylon, HDPE, or other tanks listed or certified to US 49 CFR 178.274 Specifications for UN Portable Tanks.
☐ Above grade storage tanks are prohibited where subject to freezing conditions or shall be provided with an adequate means of freeze protection.
☐ If a vent is required for pressure equalization, then the vent shall extend above the top of the tank.
☐ The connection of storage tank vents to the plumbing venting system shall be six inches above the flood level rim of the highest fixture.
☐ Vents extending to the outdoor shall terminate no less than 12 inches (305 mm) above grade.
☐ Vent terminal is directed downward and covered with a 3/32 inch (2.38 mm) mesh screen to prevent the entry of vermin and insects.
☐ Pressure equalization vents that prevent nitrogen loss by the use of restrictions or use of piping or tubing that is less than the minimum pipe diameter required in the plumbing code shall be approved by the Authority Having Jurisdiction.
☐ If storage tank overflows are installed they shall be connected to a plumbing drainage system.
☐ Storage tank overflows have a backwater valve or check valve at the point of connection to the plumbing drainage system when connected to a public sewer system.
☐ The backwater valve is accessible for inspections and maintenance.
☐ Storage tank trap is a P-trap, mechanical trap, submerged inlet piping, or other means approved by the Authority Having Jurisdiction. Urine storage tanks of five gallons or less connected to fixtures with active ventilation or having an integrated seal do not require traps.
☐ If submerged inlet piping is used as trap, the inlet piping must remain submerged during use and after pumpout.

Urine Diversion System
☐ Material used for urine diversion shall be stainless steel or non-metallic pipe. Concrete piping is prohibited.
☐ Urine diversion piping is identifiable and labeled. Pipe diameters are sized in accordance with Authority Having Jurisdiction and the plumbing code.
☐ Where unprocessed urine is transferred from commode to processor(s), provide tools and cleaning materials as described in the owner's manual.
☐ Changes in direction of urine diversion piping shall be made by a long-sweep 90 degree (1.57 rad) fitting or other approved fittings of equivalent sweep.
☐ Fixtures discharging into urine diversion piping connected to the plumbing drainage system shall be trapped and vented according to the plumbing code.
☐ Urine diversion piping is installed at a minimum grade of ½ inch per foot (41.6 mm/m), or 4 percent toward the point of disposal.

☐ Urine is diverted to a storage tank or an approved plumbing drainage system.
☐ A maintenance plan shall be included per the design system.

Cleanouts
☐ Cleanouts installed at each aggregate horizontal change of direction exceeding 135 degrees (2.36 rad).
☐ A cleanout provided at the upper terminal of each drain line every 50 feet (15 240 mm).

Venting
☐ Commode fixtures connected directly to compost processor(s) without traps require a ventilation system.
☐ Nonwater urinals used as urine diversion systems shall be connected to a dry toilet ventilation stack or a urine diversion ventilation stack.

Operation and Maintenance Manual. An owner's manual is on site and accessible to the inspector and includes the following:

Product information
☐ Model/Serial number.
☐ Product certification references.
☐ Intended treatment capacity with regard to number of users and uses per day.
☐ Initial setup.

Start up and operation
☐ Schedule for addition of necessary compost additives.
☐ Source or provider of necessary compost additives. Source may be on-site.
☐ Schedule and instructions for all regular maintenance tasks.
☐ Expected input of and capacity for excreta and compost additives to compost toilet system specifying loading of commode(s) and compost processor(s).

Annual Maintenance
☐ Plan for container transfer and cleaning where transfer is used.
☐ Expected schedule for removing humus from composting processors and where used secondary composting bins.
☐ Plan for on-site disposal of humus or professional removal.
☐ Plan for managing leachate.
☐ Special conditions; cold climate operation and/or winterization.

Testing
☐ Plan for microbial testing.
☐ Humus Sampling.
☐ A laboratory is under contract to perform testing of finished compost.
☐ A sample of the previous treatment period shall be on-hand with fecal coliform/gram results.

Troubleshooting
☐ Guide to troubleshooting basic operating functions.

TABLE 1701.2
STANDARDS, PUBLICATIONS, PRACTICES, AND GUIDES

DOCUMENT NUMBER	DOCUMENT TITLE	APPLICATION
49 CFR 178.274	Specifications for UN portable tanks	Miscellaneous
EPA/625/R-92/013-2003	Control of Pathogens and Vector Attraction in Sewage Sludge	Miscellaneous

(portions of table not shown remain unchanged)

SUBSTANTIATION:
Composting toilets are widely used as an alternative where direct connection to private or local sewer systems are just not feasible. These provisions are important to persons who run into this situation and the addition of these established code requirements that have been in the WeStand will assist the end user to design and take the appropriate steps in designing a safe system. Dealing with waste is a serious health concern and should be referenced in the UPC as a new appendix. These provision will harmonize with the latest WeStand provision for composting toilets.