

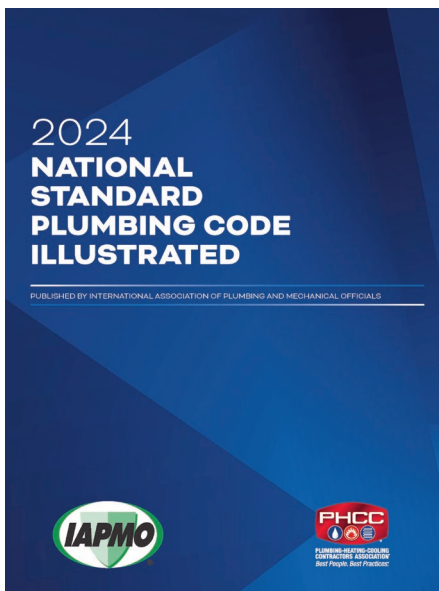


National Standard Plumbing Code



2024 PROPOSED CHANGES

to the 2021 NATIONAL STANDARD PLUMBING CODE



NSPC Public Hearing

August 11, 2022 — 8 a.m., Castanet

Tropicana

2831 Boardwalk, Atlantic City, N.J. 08401



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National Standard Plumbing Code



June 6, 2022

The National Standard Plumbing Code Committee will conduct a Public Hearing on Proposed Changes to the Code. This Hearing will be held August 11, 2022, at the Tropicana Casino and Resort in Atlantic City, New Jersey.

The public is invited to attend and comment will be allowed on the Proposed Changes. Adopted changes will be published in the *2024 National Standard Plumbing Code*.

There will be an 8:00 a.m. start of the Public Hearing in the Castanet rooms. A lunch break will be called at approximately noon and the meeting will reconvene at 1:00 p.m. or as directed by the Chairman.

Hotel accommodations are available through the Tropicana. Attendees can make reservations by calling (888) 516-2215 and referencing Group Code: ST08NS2. The deadline to receive the NSPC negotiated room rate is July 10 and is subject to availability.

The Proposed Changes are available to download from the IAPMO website at www.iapmo.org/nspc. No hard copies of the proposed changes will be available at the public hearing; interested parties are encouraged to download the file.

For more information, please contact the IAPMO NSPC staff at nspc@iapmo.org.

Matrix of Changes

2024 National Standard Plumbing Code

August 11, 2022

Matrix: 2024 NSPC Proposed Changes

Item #	Section Number	Person Submitting Change	Committee Action
24-01	ADM 1.9.2 Plans	Adam Segura	
24-02	2.9.5 From Soil Swelling	John Snyder	
24-03	Table 3.1.3 Part I	Jeff Matson	
24-04	Table 3.1.3 Part III	Mike Cudahy	
24-05	Table 3.1.3 Part III	Jeff Matson	
24-06	Table 3.1.3 Part IV	Jeff Matson	
24-07	Table 3.1.3 Part VII	Terry Burger	
24-08	Table 3.1.3 Part VII (Water Treatment)	Terry Burger	
24-09	Table 3.1.3 Part VIII & Table 18.1	Chris Haldiman	
24-10	Table 3.1.3 Part VIII	Jeff Matson	
24-11	Table 3.1.3 Part IX (ASSE 1-015, 1055, 1013, 1047)	Terry Burger	
24-12	Table 3.1.3 Part X (IAPMO PS 42, PS 95)	Terry Burger	
24-13	3.3.11 Septic Tanks and 16.4.4.3 Septic Tanks and Underground Disposal	Terry Burger	
24-14	Table 3.4 Materials for Potable Water Piping	Matson Jeff	
24-15	Table 3.4 Materials for Potable Water Piping	Mike Cudahy	
24-16	Table 3.4 Materials for Potable Water Piping	Matson Jeff	
24-17	4.2.6 Press-Connect Fittings	Matson Jeff	

Item #	Section Number	Person Submitting Change	Committee Action
24-18	4.2.6 Press-Connect Fittings and Table 3.1.3 Part I, Part II, Table 3.4 and Table 18.1	Terry Burger	
24-19	5.3.7 Drum Trap Solids Interceptors and 6.5 Solids Interceptors	Terry Burger	
24-20	6.2.1.3 Gravity Grease Interceptors (GGI)	Norm Dobo	
24-21	6.7.1 Special Applications - Laundries	Terry Burger	
24-22	Figure 7.3.2 Minimum Fixture Clearances	John Heine	
24-23	7.10.1 Showers - Compliance	Terry Burger	
24-24	7.10.6(g) Shower Floors and Shower Pan Liners	Dave Bishop	
24-25	7.11.2 Domestic Kitchen Sinks and Bar Sinks	Terry Burger	
24-26	7.15.1 Dishwashing Machines - Compliance and 10.15.10 Domestic Water Heaters	Adam Segura	
24-27	7.19.3 Flush Tanks: Gravity, Pump Assisted, Vacuum Assisted	Terry Burger	
24-28	7.21.2 Occupant Load and 7.21.4 Separate Facilities	Adam Segura	
24-29	7.21.4 Separate Facilities	Julius Ballanco	
24-30	7.21.10 Adult Changing Station and 422.6.1 Lavatory Location	Julius Ballanco	
24-31	7.21.11 Water Closet Compartment and 7.21.12 Urinal Partitions (option 1)	Julius Ballanco	
24-32	7.21.11 Water Closet Compartment and 7.21.12 Urinal Partitions (option 2)	Julius Ballanco	
24-33	7.22.2 Alkaline Water Treatment and 7.22.3 Scale Reduction Devices	Terry Burger	
24-34	7.25 Commercial Dishwashing Pre-Rinse Spray Valves	Robert Pickering	
24-35	9.1.1 General (Indirect Wastes)	John Heine	
24-36	Figure 9.3.4 Standpipe Receptors	Don Jones	
24-37	10.5.3 Backflow Preventers (ASSE 1035, 1055)	Terry Burger	
24-38	10.5.3 Backflow Preventers (ASSE 1022)	Terry Burger	
24-39	10.5.3 Backflow Preventers (ASSE 1015, 1013, CSA B64.4.1)	Terry Burger	

Item #	Section Number	Person Submitting Change	Committee Action
24-40	10.5.5 Installation of Backflow Preventers	Adam Segura	
24-41	10.5.5 (TIA) Installation of Backflow Preventers	Terry Burger	
24-42	10.5.10 Protection from Lawn Sprinklers and Irrigation Systems	Terry Burger	
24-43	10.12.10 Leak Detection Devices and Table 3.1.3 Part V and Table 18.1	Terry Burger	
24-44	10.13 Flexible Water Connectors	Adam Segura	
24-45	10.14.2 Size of Individual Fixture Supply Branches	Julius Ballanco	
24-46	10.14.6 Excessive Pressures	Chris Haldiman	
24-47	10.15.6 Mixed Water Temperature Control	Tom Polino	
24-48	10.15.6 Mixed Water Temperature Control	Terry Burger	
24-49	10.15.9,3(c) Drainage	Dave Bishop	
24-50	10.15.10 Domestic Water Heaters	Jeremy Brown	
24-51	10.15.10 Domestic Water Heaters	Adam Segura	
24-52	10.16.1 Tank Protection	Don Jones	
24-53	10.18.1 Drinking Water Treatment Units – Compliance with Standards	Terry Burger	
24-54	10.20.4 Materials for Combined System Piping	Jeff Matson	
24-55	11.4.2 Conversion of Flow in GPM to DFU	Norm Dobo	
24-56	11.5.5 Minimum Size of Underground Drainage	Kristopher Heine	
24-57	11.7.8b Discharge Piping	Norm Dobo	
24-58	12.10 Wet Venting	Steve Rodzinak	
24-59	12.20 Air Admittance Valves and Appendix E.8	Norm Dobo	
24-60	Table 18.1 Referenced Standards	Mike Cudahy	
24-61	Table 18.1 Referenced Standards	Don Jones	

Item #	Section Number	Person Submitting Change	Committee Action
24-62	Table 18.1 Referenced Standards	Don Jones	
24-63	Table 18.1 Referenced Standards	NSPC Staff	
24-64	Appendix G WE-Stand Excerpts	Enrique Gonzalez	
24-65	Appendix N Impact of Water Temperature on the Potential for Scalding and Legionella Growth	Enrique Gonzalez	
24-66	Appendix O Non-Sewered Sanitation Systems	Enrique Gonzalez	
24-67	Appendix T Indoor Horticulture Facilities	Enrique Gonzalez	

National Standard Plumbing Code 2024 Proposed Code Change Form Deadline: April 1, 2022

24 - 01

Proponent: Adam Segura Date: March 31, 2022

Representing: Self

Mailing Address: 2037 Edison Way

City: Los Angeles State: CA Zip: 90041

Phone: 323-344-1521 E-mail: adam.segura@hotmail.com

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: Amend section with this editorial change
 Change subsection to read as follows Delete subsection and substitute as follows
 Add new subsection to read as follows Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: ADM 1.9.2

ADM 1.9.2 Plans

Two or more sets of plans shall be submitted, or in a digital format where permitted by the Authority Having Jurisdiction, with each permit application. The plans shall contain all the engineering calculations, drawings, diagrams and other data as required for approval. The Authority Having Jurisdiction may also require that the plans, drawings, diagrams and calculations be designed by an engineer and/or architect licensed by the state in which the work is to be performed. Except that the Authority Having Jurisdiction may waive the submission of plans and other data, provided it is determined that the nature of the work covered by the permit does not require plan review to obtain code compliance.

Basis/Reason for Change:

While paper documentation is still used in the field, digital versions of documentation is also permitted by jurisdictions. The addition of this language will eliminate the paper documents from being printed where not necessary and will allow faster submission of documents where digital format is allowed and accepted.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

**National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: March 1, 2022**

24 - 02

Proponent: John Snyder

Date: 02/24/22

Representing: VoidForm Products, LLC

Mailing Address: 6151 Cowley Road

City: Fort Worth State: Texas Zip: 76119

Phone: 817-975-0326 E-mail: john.s@voidform.com

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

Amend section with this editorial change

Change subsection to read as follows

Delete subsection and substitute as follows

Add new subsection to read as follows

Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: 2.9.5 From Soil Swelling

Add new subsection:

For pipe installations under structurally supported, isolated foundations in expansive soil, pipes supported from the foundation shall be protected from the effects of soil swelling.

Basis/Reason for Change:

Plumbing and structures have been damaged or malfunctioned resulting in loss of use and lawsuits. Creating a provision for isolating plumbing suspended from isolated foundations will eliminate damage due to uplift.

Vote: Accept Accept as Amended

Accept in Part Accept in Principle Accept in Part and Principle

Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code 2024 Proposed Code Change Form Deadline: March 1, 2022

24 - 03

Proponent: Jeff Matson _____ Date: 1/26/2022

Representing: Viega LLC _____

Mailing Address: 585 Interlocken Blvd _____

City: Broomfield _____ State: CO _____ Zip: 80021 _____

Phone: (720) 531-8455 _____ E-mail: jeff.matson@viega.us

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: _____ Amend section with this editorial change

Change subsection to read as follows _____ Delete subsection and substitute as follows

_____ Add new subsection to read as follows _____ Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: Table 3.1.3 Part I

16	Steel pipe, black and hot-dipped, zinc-coated, welded, and seamless	ASTM A53/A53M ASTM F3226 IAPMO PS 117
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Basis/Reason for Change:

ASTM F3226 and IAPMO PS117 are standards for press-connect fittings which are appropriate for carbon steel pipe systems (and are already recognized for stainless in this table). These performance standards meet the requirements of the UPC and NSPC. Addition of these standards would increase the range of applicable product choices for steel pipe fittings for plumbers working in NSPC jurisdictions.

Vote: _____ Accept _____ Accept as Amended

_____ Accept in Part _____ Accept in Principle _____ Accept in Part and Principle

_____ Defeated _____ Failed Lack of Second _____ Tabled _____ Withdrawn _____ Other

- 1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.
- 2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code 2024 Proposed Code Change Form Deadline: March 1, 2022

24 - 04

Proponent: Michael Cudahy

Date: January 20th, 2022

Representing: Plastic Pipe and Fittings Association (PPFA)

Mailing Address: 800 Roosevelt Road, Bldg C Ste 312

City: Glen Ellyn State: IL Zip: 60137

Phone: 630 363 7933 E-mail mikec@cmservices.com

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

Amend section with this editorial change

Change subsection to read as follows

Delete subsection and substitute as follows

Add new subsection to read as follows

Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: Table 3.1.3 part III

Add **ASTM F3347-2021**, “Metal Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Crosslinked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing”

Add **ASTM F3348-2021a**, “Plastic Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PERT) Tubing”

Basis/Reason for Change:

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.

Vote: Accept Accept as Amended

Accept in Part Accept in Principle Accept in Part and Principle

Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

Rev.12.9.21

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code 2024 Proposed Code Change Form Deadline: March 1, 2022

24 - 05

Proponent: Jeff Matson

Date: 1/26/2022

Representing: Viega LLC

Mailing Address: 585 Interlocken Blvd

City: Broomfield

State: CO

Zip: 80021

Phone: (720) 531-8455

E-mail: jeff.matson@viega.us

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

- Amend section with this editorial change
 Change subsection to read as follows
 Delete subsection and substitute as follows
 Add new subsection to read as follows
 Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: Table 3.1.3-Part III Non-Metallic Pipe and Fittings

<u>31</u>	<u>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</u>	<u>ASTM F3347</u>
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(renumber previous items 31 onward)

<u>53</u>	<u>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</u>	<u>ASTM F3348</u>
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(renumber previous items 53 onward)

Basis/Reason for Change:

ASTM F3347 and F3348 are well accepted standards for fittings used with PEX and PE-RT tubing, and are also being proposed for addition to the UPC and UMC. These standards are already included in the USHGC as well as other national model Codes, and meet UPC and NSPC requirements. Inclusion of these Standards in NSPC will allow use of these proven fittings in NSPC jurisdictions, providing the installer with more options for materials.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

- 1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.
- 2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code 2024 Proposed Code Change Form

Deadline: March 1, 2022

24 - 06

Proponent: Jeff Matson

Date: 1/26/2022

Representing: Viega LLC

Mailing Address: 585 Interlocken Blvd

City: Broomfield

State: CO

Zip: 80021

Phone: (720) 531-8455

E-mail: jeff.matson@viega.us

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

Amend section with this editorial change

Change subsection to read as follows

Delete subsection and substitute as follows

Add new subsection to read as follows

Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: Table 3.1.3-Part IV Pipe Joints, Joining Materials, Couplings, Gaskets

<u>24</u>	<u>Press-Connect Joints</u>	<u>ASTM F3226</u> <u>IAPMO PS 117</u> <u>ASME B16.51</u>
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(renumber previous items 24 onward)

Basis/Reason for Change:

ASTM F3226, IAPMO PS 117 and ASME B16.51 are well accepted and proven standards for press-connect fittings used in plumbing systems. These standards are already included in the UPC, UMC and USHGC as well as other national model Codes. Inclusion of these Standards in NSPC will allow use of these fittings in NSPC jurisdictions. These fittings can eliminate hot work from jobs, thus the inclusion of the Standards in NSPC will improve worker and jobsite safety.

Vote: Accept Accept as Amended

Accept in Part Accept in Principle Accept in Part and Principle

Defeated Failed Lack of Second Tabled Withdrawn Other

- 1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.
- 2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code 2024 Proposed Code Change Form Deadline: April 1, 2022

24 - 07

Proponent: Terry Burger Date: March 31, 2022

Representing: ASSE

Mailing Address: 18927 Hickory Creek Drive, Suite 220

City: Mokena State: IL Zip: 60448

Phone: (708) 995-3019 E-mail terry.burger@asse-plumbing.org

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

Amend section with this editorial change

Change subsection to read as follows Delete subsection and substitute as follows

Add new subsection to read as follows Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section:

Table 3.1.3 - Part VII PLUMBING APPLIANCES and EQUIPMENT

14	Hot <u>and cold</u> water dispensers, household, electric, storage type	ASSE 1023
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Basis/Reason for Change:

ASSE has been updated and now addresses both hot and cold household, electric, and storage type water dispensers.

Vote: Accept Accept as Amended

Accept in Part Accept in Principle Accept in Part and Principle

Defeated Failed Lack of Second Tabled Withdrawn Other

National Standard Plumbing Code 2024 Proposed Code Change Form

Deadline: April 1, 2022

24 - 08

Proponent: Terry Burger Date: March 31, 2022

Representing: __ ASSE

Mailing Address: __ 18927 Hickory Creek Drive, Suite 220

City: __ Mokena State: __ IL Zip: 60448

Phone: __ (708) 995-3019 E-mail __ terry.burger@asse-plumbing.org

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

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- Change subsection to read as follows Delete subsection and substitute as follows
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Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: Table 3.1.3 Part VII

ADD to Table 3.1.3

	<u>Reverse Osmosis (RO) Water Efficiency – Drinking Water</u>	<u>ASSE 1086</u>
	<u>Commercial and Food Service Water Treatment Equipment Utilizing Drinking Water</u>	<u>ASSE 1087</u>
	<u>Drinking Water Atmospheric Water Generators (AWG)</u>	<u>ASSE 1090</u>
	<u>Point of Entry Reverse Osmosis Systems</u>	<u>ASSE LEC 2006</u>
	<u>Point of Entry Anion Exchange – Nitrate Reduction</u>	<u>ASSE LEC 2008</u>
	<u>Alkaline Water – Drinking Water Treatment Units</u>	<u>IAPMO IGC 322</u>
	<u>Scale Reduction Devices</u>	<u>IAPMO Z601</u>

*Place in Alphabetical order and renumber

Basis/Reason for Change:

The proposed standards are important water treatment system and devices standards that are currently silent in the NSPC. The addition of the referenced standards will assist the end users identify appropriate standards to ensure the health and safety of these systems and devices for the end users.

Vote:

- Accept Accept as Amended
- Accept in Part Accept in Principle Accept in Part and Principle
- Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code 2024 Proposed Code Change Form Deadline: March 1, 2022

24 - 09

Proponent: Chris Haldiman _____ Date: February 7, 2022 ___

Representing: Watts Water Technologies _____

Mailing Address: 2942 S. Timbercreek Ave. _____

City: Springfield __ State: MO _____ Zip: 65807 _____

Phone: 417-861-8070 _____ E-mail: chris.haldiman@wattswater.com

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: _____ Amend section with this editorial change

Change subsection to read as follows _____ Delete subsection and substitute as follows

_____ Add new subsection to read as follows _____ Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: Table 18.1 & Table 3.1.3-VIII

AWWA C530-2017	Pilot-Operated Control Valves	10.14.6
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Basis/Reason for Change:

This proposal is to add AWWA standard C530 to the Standards Referenced Table 18.1 and Table 3.1.3-VIII. This is in conjunction with my proposal to add AWWA C530 to Section 10.14.6.

I have the approval from AWWA to propose this change and approval to provide a copy of the standard for committee consideration.

Vote: ___ Accept ___ Accept as Amended

___ Accept in Part ___ Accept in Principle ___ Accept in Part and Principle

___ Defeated ___ Failed Lack of Second ___ Tabled ___ Withdrawn ___ Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

Rev.12.9.21

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code 2024 Proposed Code Change Form

Deadline: March 1, 2022

24 - 10

Proponent: Jeff Matson

Date: 1/26/2022

Representing: Viega LLC

Mailing Address: 585 Interlocken Blvd

City: Broomfield

State: CO

Zip: 80021

Phone: (720) 531-8455

E-mail: jeff.matson@viega.us

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

- Amend section with this editorial change
 Change subsection to read as follows
 Add new subsection to read as follows
 Delete subsection and substitute as follows
 Delete subsection without substitution

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Code Section: Table 3.1.3 Part VIII Valves and Appurtenances

4	Ball Valves	ASME A112.4.14 <u>IAPMO Z1157</u>
5	Ball valves, threaded, solder joint, grooved, flared, socket-welding, <u>press-connect</u>	MSS SP-110
13	Manually-operated valves for use in plumbing systems	ASME A112.4.14/ CSA B125.14 <u>IAPMO Z1157</u>

Basis/Reason for Change:

IAPMO Z1157 Ball Valves is an appropriate and well recognized Standard for ball valves and including it in Table 3.1.3 Part VIII will strengthen the Code. This Standard is accepted by the UPC and adding it to the NSPC will widen the available products for plumbers in NSPC jurisdictions. Press-connect valves are a proven technology in the plumbing industry and are compliant with standards such as MSS SP-110 and IAPMO Z1157.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

- Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.
- Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code 2024 Proposed Code Change Form

Deadline: April 1, 2022

24 - 11

Proponent: Terry Burger Date: March 31, 2022
 Representing: ASSE
 Mailing Address: 18927 Hickory Creek Drive, Suite 220
 City: Mokena State: IL Zip: 60448
 Phone: (708) 995-3019 E-mail terry.burger@asse-plumbing.org

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: Amend section with this editorial change
 Change subsection to read as follows Delete subsection and substitute as follows
 Add new subsection to read as follows Delete subsection without substitution

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Code Section: Table 3.1.3

Table 3.1.3 - Part IX BACKFLOW PREVENTION

1	Air gaps	ASME A112.1.2
2	Air gap fittings	ASME A112.1.3
3	Backflow preventers for beverage dispensing equipment	ASSE 1022
4	Backflow prevention in plumbing fixture fittings	ASME A112.18.3
5	Backflow prevention devices for hand-held showers	ASSE 1014
6	Backflow prevention for commercial dishwashing machines	ASSE 1004
7	Backflow prevention for chemical dispensers	ASSE/IAPMO 1055
8	Domestic dishwasher discharge air gap fittings	ASSE 1021
9	Double check backflow preventers	ASSE 1015 (DC) AWWA C510 CSA B64.5
10	Double check detector fire protection backflow preventers	ASSE 1048
11	Double check fire protection backflow preventers	ASSE 1015 (DCF) CSA B64.5.1
12	Dual check backflow preventers	ASSE 1024 CSA B64.6
13	Dual check backflow preventers with atmospheric port for carbonators	CSA B64.3.1
14	Dual check backflow preventers for post-mix carbonated beverage dispensers	ASSE 1032

- Proposed Code Changes gaining acceptance will appear in the 2024 NSPC. Rev.2.28.22
- Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

15	Dual check backflow preventers with atmospheric port	ASSE 1012 CSA B64.3
16	Dual check valve backflow preventers for fire protection systems (DuCF)	CSA B64.6.1
17	Hose connection backflow preventers	ASSE 1052
18	Hose connection vacuum breakers	ASSE 1011 CSA B64.2 CSA B64.2.1 CSA B64.2.1.1 CSA B64.2.2
19	Laboratory faucet backflow preventers	ASSE 1035 64.7

Table 3.1.3 - Part IX BACKFLOW PREVENTION (continued)

20	Outdoor enclosures for backflow preventers	ASSE 1060
21	Reduced pressure backflow preventers	ASSE 1013 (RP) AWWA C511 CSA B64.4
22	Reduced pressure detector fire protection backflow preventers	ASSE 1047 (RPDA)
23	Reduced pressure fire protection backflow preventers	ASSE 1013 (RPF) CSA B64.4.1 (RPF)
24	Vacuum breakers, atmospheric type	ASSE 1001 CSA B64.1.1
25	Vacuum breakers, pressure type	ASSE 1020 CSA B64.1.2
26	Vacuum breakers, spill resistant	ASSE 1056 CSA B64.1.3
27	Wall hydrants with backflow prevention	ASSE 1019
28	Wall hydrants with dual check backflow preventer	ASSE 1053
29	Yard hydrants with backflow prevention	ASSE 1057

Basis/Reason for Change:

The proposed changes reflect the latest updates to the standards which remove the phrase “fire protection.”

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC. Rev.2.28.22
2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code 2024 Proposed Code Change Form

Deadline: April 1, 2022

24 - 12

Proponent: Terry Burger Date: March 31, 2022

Representing: __ ASSE

Mailing Address: __ 18927 Hickory Creek Drive, Suite 220

City: __ Mokena State: __ IL Zip: 60448

Phone: __ (708) 995-3019 E-mail __ terry.burger@asse-plumbing.org

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

Amend section with this editorial change

Change subsection to read as follows Delete subsection and substitute as follows

Add new subsection to read as follows Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: Table 3.1.3 Part X

Table 3.1.3 - Part X MISCELLANEOUS MATERIALS

4	Grease interceptors, gravity, pre-fabricated	IAPMO/ANSI/ <u>CA</u> N Z1001
7	Pipe hangers and supports	MSS SP-58 <u>IAPMO PS 42</u> <u>IAPMO PS 95</u>

Basis/Reason for Change:

The proposed change updates The IAPMO ANSI Z10001 standards with the appropriate designation. Additionally, the pipe hangers and supports row is being updated with other relevant standards.

Vote: Accept Accept as Amended

Accept in Part Accept in Principle Accept in Part and Principle

Defeated Failed Lack of Second Tabled Withdrawn Other

National Standard Plumbing Code 2024 Proposed Code Change Form

Deadline: April 1, 2022

24 - 13

Proponent: Terry Burger Date: March 31, 2022
 Representing: __ ASSE
 Mailing Address: __ 18927 Hickory Creek Drive, Suite 220
 City: __ Mokena State: __ IL Zip: 60448
 Phone: __ (708) 995-3019 E-mail __ terry.burger@asse-plumbing.org

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: Amend section with this editorial change
 Change subsection to read as follows Delete subsection and substitute as follows
 Add new subsection to read as follows Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: 3.3.11, 16.4.4.3

3.3.11 Septic Tanks

- a. Plans for all septic tanks shall be submitted to the Authority Having Jurisdiction for approval. Such plans shall show all dimensions, reinforcing, structural calculations, and such other pertinent data as may be required.
- b. Septic tanks shall be constructed of sound durable materials, not subject to excessive corrosion or decay and shall be watertight. ***See Sections 16.6.5 and 16.6.6***
- c. Where installed, prefabricated septic tanks shall comply with IAPMO Z1000.

16.4.4.3 Septic Tanks and Underground Disposal Septic tanks and underground disposal means shall not be within 200 feet measured horizontally from the high water level in a reservoir or the banks of tributary streams when situated less than 3,000 feet upstream from an intake structure. Manufactured or prefabricated septic tanks shall comply with IAPMO/ANSI Z1000 and be approved by the Authority Having Jurisdiction. Prefabricated bituminous coated septic tanks shall comply with UL 70.

ADD to Table 3.1.3 – Part X

##	<u>Prefabricated septic tanks</u>	<u>IAPMO Z1000</u> <u>UL 70</u>
-----------	-----------------------------------	------------------------------------

Basis/Reason for Change:

The proposed changes add the appropriate standard for manufactured or prefabricated concrete, fiber-reinforced polyester, thermoplastic, and steel septic tanks. The current language does not provide a specific reference standard. However, the ANSI standard is available to define requirements for manufactured or prefabricated septic tanks to ensure the tanks are safe for use in their application. This proposed change also specifies UL 70 for bituminous coated septic tanks, so the inclusion of IAPMO/ANSI Z1000-2019 for concrete, fiber-reinforced polyester, thermoplastic, and steel septic tanks would be a parallel addition to the existing code structure.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

National Standard Plumbing Code 2024 Proposed Code Change Form

Deadline: March 1, 2022

24 - 14

Proponent: Jeff Matson

Date: 1/26/2022

Representing: Viega LLC

Mailing Address: 585 Interlocken Blvd

City: Broomfield

State: CO

Zip: 80021

Phone: (720) 531-8455

E-mail: jeff.matson@viega.us

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

Amend section with this editorial change

Change subsection to read as follows

Delete subsection and substitute as follows

Add new subsection to read as follows

Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: Table 3.4 Materials for Potable Water Piping

2	Copper Tube, seamless, Type K, L, or M	A	A	A	ASTM B88 <u>ASTM B75</u>	ASME B16.18 (cast, solder joint) ASME B16.22 (wrought, solder joint) ASME B16.24 (cast, flanged) ASME B16.26 (cast, flared) ASME B16.50 (wrought, braze joint) ASME B16.51 (copper, copper alloy, press-connect) ASTM F3226 (metallic, press-connect) IAPMO PS 117 (copper, copper alloy, press-connect) ASSE 1061 (copper, push fit) Split couplings per Section 4.2.17
---	---	---	---	---	-----------------------------	---

Basis/Reason for Change:

ASTM B75 copper tube is appropriate for use in plumbing systems and an accepted material in the UPC, and addition of this Standard to the NSPC would allow the material to be used in NSPC jurisdictions.

Vote: Accept Accept as Amended

Accept in Part Accept in Principle Accept in Part and Principle

Defeated Failed Lack of Second Tabled Withdrawn Other

- 1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.
- 2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code 2024 Proposed Code Change Form

Deadline: March 1, 2022

24 - 15

Proponent: Michael Cudahy

Date: January 20th, 2022

Representing: Plastic Pipe and Fittings Association (PPFA)

Mailing Address: 800 Roosevelt Road, Bldg C Ste 312

City: Glen Ellyn State: IL Zip: 60137

Phone: 630 363 7933 E-mail mikec@cmservices.com

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

Amend section with this editorial change

Change subsection to read as follows

Delete subsection and substitute as follows

Add new subsection to read as follows

Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: Table 3.4

19	PE-RT HW/CW Tubing	A	A	A	ASTM F2769 CSA B137.18	<u>ASTM F3347</u> (metal press insert) <u>ASTM F3348</u> (plastic press insert)
22	PEX Crosslinked Water Service Pipe	A	X	X	AWWA C904	<u>ASTM F3347</u> (metal press insert) <u>ASTM F3348</u> (plastic press insert)
23	PEX Plastic Tubing	A	A	A	ASTM F876	<u>ASTM F3347</u> (metal press insert)

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

						<u>ASTM F3348</u> <u>(plastic press insert)</u>
24	PEX Plastic HW/CW Tubing	A	A	A	ASTM F877	<u>ASTM F3347</u> <u>(metal press insert)</u> <u>ASTM F3348</u> <u>(plastic press insert)</u>

Add **ASTM F3347-2021**, “Metal Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Crosslinked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing”

Add **ASTM F3348-2021a**, “Plastic Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PERT) Tubing”

Basis/Reason for Change:

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 Materials for Potable Water table.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

**National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: March 1, 2022**

24 - 16

Proponent: Jeff Matson

Date: 1/26/2022

Representing: Viega LLC

Mailing Address: 585 Interlocken Blvd

City: Broomfield

State: CO

Zip: 80021

Phone: (720) 531-8455

E-mail: jeff.matson@viega.us

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

Amend section with this editorial change

Change subsection to read as follows

Delete subsection and substitute as follows

Add new subsection to read as follows

Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: Table 3.4 Materials for Potable Water Piping

- 1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.
- 2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

22	PEX Crosslinked Water Service Pipe	A	X	X	AWWA C904	ASTM F1807 (crimped metal insert) ASTM F1960 (metal cold expansion insert) ASTM F2080 (metal cold expansion compression) ASTM F2098 (SS clamps for ASTM F1807 fittings) <u>ASTM F3347 (metal insert press fittings with SS sleeve)</u> <u>ASTM F3348 (plastic insert press fittings with SS sleeve)</u>
23	PEX Plastic Tubing	A	A	A	ASTM F876	ASTM F1807 (crimped metal insert) ASTM F1960 (metal cold expansion insert) ASTM F2080 (metal cold expansion compression) ASTM F2098 (SS clamps for ASTM F1807 and F2159 fittings) ASTM F2159 (crimped plastic insert) ASTM F2434 (crimped metal insert) ASTM F2735 (crimped plastic) <u>ASTM F3347 (metal insert press fittings with SS sleeve)</u> <u>ASTM F3348 (plastic insert press fittings with SS sleeve)</u> ASSE 1061 (push-fit)
24	PEX Plastic HW/CW Tubing	A	A	A	ASTM F877	ASTM F1807 (crimped metal insert) ASTM F1960 (metal cold expansion insert) ASTM F2080 (metal cold expansion compression) ASTM F2098 (SS clamps for ASTM F1807 and F2159 fittings) ASTM F2159 (crimped plastic insert) ASTM F2434 (crimped metal insert) ASTM F2735 (crimped plastic) <u>ASTM F3347 (metal insert press fittings with SS sleeve)</u> <u>ASTM F3348 (plastic insert press fittings with SS sleeve)</u> ASSE 1061 (push-fit)

Basis/Reason for Change:

ASTM F3347 and F3348 are now well accepted standards for fittings used with PEX, and are also being proposed for addition to the UPC and UMC. These standards are already included in the USHGC as well as other national model Codes, and meet the performance requirements of the UPC and NSPC. Inclusion of these fitting Standards in NSPC will allow use of these fittings to be used in NSPC jurisdictions, providing installers with a broader choice of materials.

Note: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

National Standard Plumbing Code 2024 Proposed Code Change Form Deadline: March 1, 2022

24 - 17

Proponent: Jeff Matson _____ Date: 1/26/2022 _____

Representing: Viega LLC _____

Mailing Address: 585 Interlocken Blvd _____

City: Broomfield _____ State: CO _____ Zip: 80021 _____

Phone: (720) 531-8455 _____ E-mail: jeff.matson@viega.us

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: _____ Amend section with this editorial change
__X__ Change subsection to read as follows _____ Delete subsection and substitute as follows
_____ Add new subsection to read as follows _____ Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: Section 4.2.6 Press-Connect Fittings

- a. Copper fittings for water supply and distribution, designed for pressed connections to ASTM B88 hard drawn or ASTM B75 copper water tube, shall include an elastomeric sealing element complying with NSF 61 for potable water.

Stainless steel fittings for water supply and distribution, designed for pressed connections to ASTM A269 or A778 stainless tubing, or A312 stainless pipe, shall include an elastomeric sealing element complying with NSF 61 for potable water.

EXCEPTION: Press-connect fittings shall be permitted with annealed copper water tube when such use is included in the fitting manufacturer's technical data and installation instructions.

Basis/Reason for Change:

ASTM B75 copper tube is appropriate for use in plumbing systems and an accepted material in the UPC, and addition of this Standard to the NSPC would allow the material to be used in NSPC jurisdictions. ASTM A269, A778 and A312 stainless pipe and tubing are also appropriate for use in plumbing systems and are accepted materials in the UPC, and addition of these Standards to the NSPC would allow the materials to be used in NSPC jurisdictions

Vote: _____ Accept _____ Accept as Amended
_____ Accept in Part _____ Accept in Principle _____ Accept in Part and Principle
_____ Defeated _____ Failed Lack of Second _____ Tabled _____ Withdrawn _____ Other

-
- 1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.
 - 2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code 2024 Proposed Code Change Form Deadline: April 1, 2022

24 - 18

Proponent: Terry Burger Date: March 31, 2022

Representing: __ ASSE

Mailing Address: __ 18927 Hickory Creek Drive, Suite 220

City: __ Mokena State: __ IL Zip: 60448

Phone: __ (708) 995-3019 E-mail __ terry.burger@asse-plumbing.org

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: Amend section with this editorial change
 Change subsection to read as follows Delete subsection and substitute as follows
 Add new subsection to read as follows Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: 4.2.6, Table 3.1.3 (Part I), Table 3.1.3 (Part II), Table 3.4, and Table 18.1

4.2.6 Press-Connect Fittings

a. Copper fittings for water supply and distribution, designed for pressed connections to ASTM B88 hard drawn copper water tube, shall include an elastomeric sealing element complying with NSF 61 for potable water.

EXCEPTION: Press-connect fittings shall be permitted with annealed copper water tube when such use is included in the fitting manufacturer's technical data and installation instructions.

b. The fittings shall be listed to ASME B16.51, ASTM F3226, or ~~IAPMO PS 117~~ IAPMO Z1117.

c. During installation, the tube end shall be de-burred and depth-marked to permit visual verification of full insertion of the tube into the fitting socket.

d. The joint shall be pressed using a tool approved by the manufacturer of the fitting.

e. The fittings shall be rated by the manufacturer for not less than 200 psig at 200° F.

f. The fittings shall be permitted to be installed in concealed locations.

g. The fittings shall be permitted to be installed underground when such use is included in the fitting manufacturer's installation instructions.

In Table 3.1.3 (Part I), Table 3.1.3 (Part II), Table 3.4, and Table 18.1 – PS 117 (Strike) will be published as IAPMO Z1117 (ADD THIS STANDARD);

Globally change PS 117 to IAPMO Z1117 throughout code.

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

Rev.2.28.22

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

Basis/Reason for Change:

The IAPMO PS 117 standards is being replaced by the ANSI standard, IAPMO Z1117 and should be updated in the NSPC.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC. *Rev.2.28.22*
2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

**National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: April 1, 2022**

24 - 19

Proponent: Terry Burger Date: March 31, 2022
Representing: ASSE
Mailing Address: 18927 Hickory Creek Drive, Suite 220
City: Mokena State: IL Zip: 60448
Phone: (708) 995-3019 E-mail terry.burger@asse-plumbing.org

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: Amend section with this editorial change
 Change subsection to read as follows Delete subsection and substitute as follows
 Add new subsection to read as follows Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: 6.5

6.5 SOLIDS INTERCEPTORS

- a. Solids interceptors shall comply with IAPMO IGC 167 and be provided where necessary to prevent harmful solid materials from entering the drainage system on a continuing basis. Such harmful materials include, but are not limited to, aquarium gravel, barium, ceramic chips, clay, cotton, denture grindings, dental silver, fish scales, gauze, glass particles, hair, jewels, lint, metal grindings, plaster, plastic grindings, precious metal chips, sediment, small stones, and solid food particles.
- b. Solids interceptors shall separate solids by gravity, trapping them in a removable bucket or strainer.
- c. Solids interceptors shall be sized according to their drain pipe size or by the required flow rate.
- d. Drum trap solids interceptors shall comply with Section 5.3.7.

Basis/Reason for Change:

IGC 167 covers drum trap and other types of solids interceptors.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

**National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: April 1, 2022**

24 - 20

Proponent: Norm Dobo Date: 3/30/22

Representing: Myself

Mailing Address: 105 Allen St.

City: Hamilton State: NJ Zip: 08620

Phone: 609-610-3423 E-mail nola10044@aol.com

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

- Amend section with this editorial change
 Change subsection to read as follows Delete subsection and substitute as follows
 Add new subsection to read as follows Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: 6.2.1.3

6.2.1.3 Gravity Grease Interceptors (GGI)

Add Subsection to Section 6.2.1.3:

f. Where gravity grease interceptors are subject to backflow from a sewer or other point of disposal, their discharge line shall include an adjustable height backwater valve, installed in accordance with Section 5.5.

Basis/Reason for Change:

Other interceptors do not require a backwater valve as they are generally at a higher elevation so as not to flood. GGI interceptors the same plane as the main sewer and are subject to backflow the same as oil interceptors in 6.3.2f.

- Note:** Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

**National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: April 1, 2022**

24 - 21

Proponent: Terry Burger Date: March 31, 2022
Representing: ASSE
Mailing Address: 18927 Hickory Creek Drive, Suite 220
City: Mokena State: IL Zip: 60448
Phone: (708) 995-3019 E-mail terry.burger@asse-plumbing.org

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: Amend section with this editorial change
 Change subsection to read as follows Delete subsection and substitute as follows
 Add new subsection to read as follows Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: 6.7.1

6.7 SPECIAL APPLICATIONS

6.7.1 Laundries

Commercial laundries shall be equipped with one or more ~~lint~~lint solid interceptors having wire baskets or similar devices, removable for cleaning, that will prevent passage into the drainage system of solids 1/2 inch or larger in size, strings, rags, buttons, lint, and other materials that would be detrimental to the drainage system. Commercial laundry interceptors shall comply with IAPMO IGC 167.

Basis/Reason for Change:

IAPMO IGC 167 is the appropriate standard for commercial laundry interceptors and will guide the end user in confirming that the interceptors have met the minimum requirements for health and safety.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

**National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: March 1, 2022**

24 - 22

Proponent: John Heine Date: 3/28/22

Representing: Heine Plumbing & Water Treatment

Mailing Address: 270 Sparta Ave., Ste 104, PMB 139

City: Sparta State: NJ Zip: 07871

Phone: 973-383-0392 E-mail john@heineplumbing.com

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: Amend section with this editorial change
 Change subsection to read as follows Delete subsection and substitute as follows
 Add new subsection to read as follows Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: Figure 7.3.2

MINIMUM FIXTURE CLEARANCES

Add note to end of section:

NOTE: The lavatory wall clearance shall not apply to countertop and vanity installations. Countertops and vanities can butt up to the sidewall without having to maintain the 4 inch clearance. Filler strips may be added as necessary.

Basis/Reason for Change:

The minimum clearance does not allow for vanity or countertop installation and may be misinterpreted to require a 4 inch space on the side of a vanity or countertop.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC. Rev.2.28.22
2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code 2024 Proposed Code Change Form Deadline: April 1, 2022

24 - 23

Proponent: Terry Burger Date: March 31, 2022
Representing: ASSE
Mailing Address: 18927 Hickory Creek Drive, Suite 220
City: Mokena State: IL Zip: 60448
Phone: (708) 995-3019 E-mail terry.burger@asse-plumbing.org

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: Amend section with this editorial change
 Change subsection to read as follows Delete subsection and substitute as follows
 Add new subsection to read as follows Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: 7.10.1

7.10 SHOWERS

7.10.1 Compliance

a. Shower receptors and shower stalls shall comply with the following standards:

1. Plastic; CSA B45.5/IAPMO Z124
2. Enameled cast-iron; ASME A112.19.1/CSA B45.2
3. Enameled steel; ASME A112.19.1/CSA B45.2
4. Vitreous and non-vitreous china; ASME A112.19.2/CSA B45.1
5. Stainless steel; ASME A112.19.3/CSA B45.4
6. Aluminum and copper; CSA B45.12/IAPMO Z402
7. Terrazzo, concrete, composite stone, and natural stone; CSA B45.8/IAPMO Z403

7.10.1.1 Tileable Shower Receptors. Prefabricated tileable shower receptors and shower kits shall comply with IAPMO PS 106.

Basis/Reason for Change:

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 NSPC.

Note: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

**National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: March 1, 2022**

24 - 24

Proponent: _____ Dave Bishop _____ Date: _____ 1/31/22 _____
Representing: _____ Parsippany Plumbing Inspector _____
Mailing Address: _____ 1001 Parsippany Boulevard _____
City: _____ Parsippany _____ State: _____ NJ _____ Zip: _____ 07054 _____
Phone: _____ 973-795-0062 _____ E-mail _____ DBishop@Parsippany.net _____

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

- _____ Amend section with this editorial change
 Change subsection to read as follows _____ Delete subsection and substitute as follows
_____ Add new subsection to read as follows _____ Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: _____ 7.10.6(g) _____

7.10.6 SHOWER FLOORS AND SHOWER PAN LINERS

7.10.6(g)

Shower pan liners shall be tested for leakage and ponding. There shall be no leakage indicated on the floor surrounding the shower pan and no ponding of water for a period of not less than 15 minutes in the shower pan.

See Figure 7.10.6

Basis/Reason for Change:

To add ponding of water.

- Vote:** _____ Accept _____ Accept as Amended
_____ Accept in Part _____ Accept in Principle _____ Accept in Part and Principle
_____ Defeated _____ Failed Lack of Second _____ Tabled _____ Withdrawn _____ Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

Rev.12.9.21

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code 2024 Proposed Code Change Form Deadline: April 1, 2022

24 - 25

Proponent: Terry Burger Date: March 31, 2022
Representing: ASSE
Mailing Address: 18927 Hickory Creek Drive, Suite 220
City: Mokena State: IL Zip: 60448
Phone: (708) 995-3019 E-mail terry.burger@asse-plumbing.org

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: Amend section with this editorial change
 Change subsection to read as follows Delete subsection and substitute as follows
 Add new subsection to read as follows Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: 7.11.2

7.11.2 Domestic Kitchen Sinks and Bar Sinks

- a. Each compartment in a kitchen sink or bar sink shall have an outlet suitable for either a domestic food waste disposer or a basket strainer. The waste outlet pipe for each compartment shall be 1-1/2" nominal size. Outlet fittings shall have crossbars or other provisions for protecting the drain outlet and shall include a means of closing the drain outlet.
- b. Faucets for kitchen sinks and bar sinks shall be designed and manufactured so that they will not exceed a water flow rate of 2.2 gallons per minute when tested in accordance with ASME A112.18.1/CSA B125.1. **See Figure 7.11.2**
- c. Water dispensers for kitchen sinks and bar sinks shall comply with ASME A112.18.1/CSA B125.1. Electrically heated or cooled water dispensers shall comply with ASSE 1023.

Basis/Reason for Change:

These faucets are common on bar sinks and kitchen sinks to dispense treated water, heated water, or chilled water. The latest edition of ASSE 1023 has been updated with changes of the scope to the standard to include low-pressure water dispensers for heated and cooled water appliance. ASME A112.18.1/CSA B125.1 is the appropriate standard for these faucets. Additionally, UL 499 covers electrical safety portions of these appliances.

Note: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code 2024 Proposed Code Change Form Deadline: April 1, 2022

24 - 26

Proponent: Adam Segura Date: March 31, 2022
Representing: Self
Mailing Address: 2037 Edison Way
City: Los Angeles State: CA Zip: 90041
Phone: 323-344-1521 E-mail: tarantulito_lives@hotmail.com

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: _____ Amend section with this editorial change
 Change subsection to read as follows _____ Delete subsection and substitute as follows
_____ Add new subsection to read as follows _____ Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: _____ 7.15.1, 10.15.10 _____

(2021 NSPC)

7.15 DISHWASHING MACHINES

7.15.1 Compliance

a. Domestic dishwashing machines shall comply with UL 749 and AHAM DW-1. The water supply to domestic dishwashing machines shall be protected from backsiphonage by an integral air gap, another internal means, or a vacuum breaker. Air gap fittings for drain discharge shall comply with ASSE 1021. b. Commercial dishwashing machines shall comply with UL 921 and NSF 3. Backflow prevention shall comply with ASSE 1004. Dishwashing machines shall comply with the lead content as required by current Federal Law.

10.15 HOT WATER

10.15.1 Hot Water Supply System

In residences and buildings intended for human occupancy, hot water shall be supplied to all plumbing fixtures, appliances, and equipment that require hot water for their use.

EXCEPTION: In buildings other than dwelling units, tempered water supply systems shall be permitted to supply fixtures that deliver only tempered water.

10.15.10 Domestic Water Heaters

Water heaters shall comply with the lead content as required by current Federal Law.

- a. Water heaters shall be applied, sized, and installed in accordance with the manufacturer's recommendations and instructions.
- b. Gas-fired storage tank water heaters with input ratings of 75,000 Btuh or less shall comply with ANSI Z21.10.1/CSA 4.1.
- c. Gas-fired storage tank water heaters with input ratings above 75,000 Btuh shall comply with ANSI Z21.10.3/CSA 4.3.
- d. Gas-fired tankless water heaters shall comply with ANSI Z21.10.3/CSA 4.3.

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

Rev.2.28.22

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

- e. Oil-fired storage tank water heaters shall comply with UL 732.
- f. Household electric storage tank water heaters up to 120 gallons and 12 KW capacity shall comply with UL 174.
- g. Electric booster and commercial storage tank water heaters that are either over 120 gallons capacity, over 112 KW or have controls for more than 185 degree water shall comply with UL 1453.
- h. Tankless electric water heaters shall comply with UL 499.
- i. Heat pump water heaters shall comply with UL 60335-2-40.
- j. Water heaters with integral temperature control devices for hot water distribution systems shall comply with ASSE 1082.
- k. Water heaters with temperature limiting capacity shall comply with ASSE 1084.
- l. Water heaters for emergency equipment shall comply with ASSE 1085.

Basis/Reason for Change:

SUBSTANTIATION:

In September of 2020, the EPA finalized its final rule for interpreting the Safe Drinking Water Act. The final rule did change scope of products affected by the lead content requirements and sited dishwashers and water heaters as fixtures used for potable water according to the final rule. See definition below:

Fixture means a receptacle or device that is connected to a water supply system or discharges to a drainage system or both. Fixtures used for potable uses shall include but are not limited to:

- (1) Drinking water coolers, drinking water fountains, drinking water bottle fillers, dishwashers;
- (2) Plumbed in devices, such as point-of-use treatment devices, coffee makers, and refrigerator ice and water dispensers; and
- (3) Water heaters, water meters, water pumps, and water tanks, unless such fixtures are not used for potable uses.

Final rule is found at <https://www.federalregister.gov/documents/2020/09/01/2020-16869/use-of-lead-free-pipesfittings-fixtures-solder-and-flux-for-drinking-water>

Dishwashers and water heaters are singled out for proposed code sections because they would not normally be interpreted as fixtures intended to convey or dispense drinking water. As such they need a specific code section to require lead content to be consistent with the Safe Drinking Water Act.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

National Standard Plumbing Code 2024 Proposed Code Change Form Deadline: April 1, 2022

24 - 27

Proponent: Terry Burger Date: March 31, 2022

Representing: __ ASSE

Mailing Address: __ 18927 Hickory Creek Drive, Suite 220

City: __ Mokena State: __ IL Zip: 60448

Phone: __ (708) 995-3019 E-mail __ terry.burger@asse-plumbing.org

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: Amend section with this editorial change
 Change subsection to read as follows Delete subsection and substitute as follows
 Add new subsection to read as follows Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: 7.19.3

7.19.3 Flush Tanks: Gravity, Pump Assisted, Vacuum Assisted

a. Flush tanks shall have ballcocks or other means to refill the tank after each discharge and to shutoff the water supply when the tank reaches the proper operating level. Ballcocks shall be the anti-siphon type and comply with ~~ASSE 1002~~ ASSE 1002/ASME A112.1002/CSA B125.12.

See Figure 7.19.3

Basis/Reason for Change:

This is updating the standard to the latest tri-harmonized edition.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code 2024 Proposed Code Change Form Deadline: April 1, 2022

24 - 28

Proponent: Adam Segura Date: March 31, 2022

Representing: Self

Mailing Address: 2037 Edison Way

City: Los Angeles State: CA Zip: 90041

Phone: 323-344-1521 E-mail: adam.segura@hotmail.com

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: _____ Amend section with this editorial change
_____ Change subsection to read as follows _____ Delete subsection and substitute as follows
_____ Add new subsection to read as follows _____ Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: _____ 7.21 _____

7.21 Minimum Number of Required Fixtures

7.21.2 Occupant Load

- a. The minimum number of plumbing fixtures shall be based on the number of persons to be served by the fixtures, as determined by the person responsible for the design of the plumbing system.
- b. Where the occupant load is not established and is based on the egress requirements of a building code, the number of occupants for plumbing purposes shall be permitted to be reduced to two-thirds of that for fire or life safety purposes.
- c. Wherever both sexes are present in approximately equal numbers, the total occupant load shall be multiplied by 50 percent to determine the number of persons of each sex to be provided for, unless specific information concerning the percentage of male and female occupants is available.
- d. Plans for plumbing systems, where required, shall indicate the maximum number of persons to be served by the facilities.
- e. In occupancies having established seating, such as auditoriums and restaurants, the number of occupants for plumbing purposes shall not be less than the number of seats.
- f. For all gender bathrooms, the minimum number of fixtures shall be the aggregate calculated at 50 percent female and 50 percent male in accordance with Table 721.1. Where all gender bathroom fixtures are provided in addition to separate men's and women's facilities, those all gender bathroom fixtures shall be included in determining the number of fixtures provided in an occupancy.

7.21.4 Separate Facilities

- a. Separate toilet facilities shall be provided for each sex.

EXCEPTIONS:

- (1). Residential installations
- (2). In occupancies serving 15 or fewer people, 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 occupancies with a total floor area of 1500 square feet or less, one toilet facility, designed for use by no more than one person at a time, shall satisfy the requirements for serving customers and employees of both sexes

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

Rev.2.28.22

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(4). In mercantile occupancies with a net occupiable floor area of 1500 square feet or less that is accessible to customers, one toilet facility designed for use by no more than one person at a time shall satisfy the requirements for serving customers and employees of both sexes

(5). For all gender bathrooms, separate facilities shall not be required for each gender where in accordance with Section 721.2 (f).

Basis/Reason for Change:

The added language to Section 7.21.2(f) (Occupant Load) clarifies that the number of fixtures for common restrooms are the sum of the male and female toilet facility fixtures as calculated in Table 721.1. The code is currently silent on what minimum number of fixtures are required for these common restrooms. This will assist the end user.

Section 7.21.4(5) was added to Section 7.21.4 (Separate Facilities) to show that, where permitted, common facilities used by either sex which are those described in Section 7.21.2 are exempt from requiring separate facilities.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

**National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: April 1, 2022**

Proponent: Julius Ballanco

Date: March 31, 2022

Representing: JB Engineering and Code Consulting, P.C.

Mailing Address: 1661 CARDINAL DR

City: Munster

State: IN

Zip: 46321

Phone: 219-922-6171

E-mail: JBEngineer@aol.com

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

Amend section with this editorial change

Change subsection to read as follows follows

Delete subsection and substitute as follows

Add new subsection to read as follows

Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: 7.21.4

7.21.4 Separate Facilities

a. Separate toilet facilities shall be provided for each sex.

EXCEPTIONS:

(1). Residential installations

(2). In occupancies serving 15 or fewer people, 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 occupancies with a total floor area of 1500 square feet or less, one toilet facility, designed for use by no more than one person at a time, shall satisfy the requirements for serving customers and employees of both sexes

(4). In mercantile occupancies with a net occupiable floor area of 1500 square feet or less that is accessible to customers, one toilet facility designed for use by no more than one person at a time shall satisfy the requirements for serving customers and employees of both sexes

(5) 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.

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

Basis/Reason for Change:

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 Plumbing Code should have a similar requirement. Otherwise, the code are in conflict.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC. *Rev.2.28.22*
2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

**National Standard Plumbing Code
2024 Proposed Code Change Form
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Date: March 31, 2022

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Mailing Address: 1661 CARDINAL DR

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E-mail: JBEngineer@aol.com

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

Amend section with this editorial change

Change subsection to read as follows

Delete subsection and substitute as follows

Add new subsection to read as follows

Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: 7.21.10

7.21 MINIMUM NUMBER OF REQUIRED FIXTURES

7.21.10 Adult Changing Station. Where adult changing stations are provided for public use, they shall be located in accordance with one of the following:

(1) The adult changing station shall be installed in a single-user toilet room or bathroom.

(2) The adult changing station shall be installed in a family or assisted-use toilet room or bathroom.

(3) The adult changing station shall be installed in a toilet room or bathroom with multiple water closet compartments. The adult changing station shall be provided with privacy by a curtain or wall or be installed within a privacy compartment. Where separate facilities are provided for each sex, the adult changing station shall be installed in both toilet rooms or bathrooms.

(4) The adult changing station shall be installed in a separate room.

7.21.10.1 Lavatory Location. Where an adult changing station is installed in a privacy compartment or separate room, a lavatory shall be provided within that space. The lavatory shall comply with the accessibility requirement of ICC A117.1.

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

Exception: Where an adult changing station is installed in a separate room in an existing building, an alcohol-based hand sanitizer dispenser shall be permitted in lieu of a lavatory.
(renumber remaining sections)

Basis/Reason for Change:

The Adult Changing Table Committee of ICC A117.1 developed this code change to address the installation of adult changing stations that are installed on a voluntary basis. There is no mandate within this code change. A companion code change was proposed to Chapter 11 of the ICC International Building Code that would mandate adult changing stations in certain buildings.

If an adult changing station is installed, this code change provides the requirements for public access, cleanliness, and sanitation. The access to an adult changing station is outlined in the first section which lists the rooms in which an adult changing station can be installed. The first two options are obvious in that they would be installed in an individual toilet or bathing room. The third option would allow the changing station to be installed in a men's or ladies room or all gender toilet room having multiple fixtures. Privacy requirements are specified to allow the adult diaper changing to take place out of public view. The fourth option would be a separate room similar to a lactating room in a commercial building or nurses' station in a school.

Every toilet or bathing room has a lavatory. The new requirement would stipulate that when an adult changing station is installed in a privacy compartment or separate room a lavatory would be required for that room to allow for cleanup during and after diaper changing. If there is a separate room without plumbing located in the close proximity, an alcohol-based hand sanitizer dispenser could be used as a substitute for a lavatory.

Vote: Accept Accept as Amended

 Accept in Part Accept in Principle Accept in Part and Principle

 Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC. Rev.2.28.22
2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

**National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: April 1, 2022**

Proponent: Julius Ballanco

Date: March 31, 2022

Representing: JB Engineering and Code Consulting, P.C.

Mailing Address: 1661 CARDINAL DR

City: Munster

State: IN

Zip: 46321

Phone: 219-922-6171

E-mail: JBEngineer@aol.com

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

Amend section with this editorial change

Change subsection to read as follows

Delete subsection and substitute as follows

Add new subsection to read as follows

Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: 7.21.11, 7.21.12

7.21 MINIMUM NUMBER OF REQUIRED FIXTURES

7.21.11 Water Closet Compartment. Public water closets shall occupy a separate compartment with walls or partitions and a door enclosing the fixtures to ensure privacy. Partitions for water closets shall comply with the Type B security requirements of IAPMO Z124.10.

Exceptions:

(1) Water closet compartments shall not be required in a single-occupant toilet room having a lockable door.

(2) Toilet rooms in day care facilities having more than one water closets shall be permitted to have one water closet without an enclosing compartment.

7.21.12 Urinal Partitions. Each urinal shall be separated with walls or partitions to provide privacy. The horizontal dimension between walls or partitions at each urinal shall comply with Section 7.3.2. Partitions for urinals shall comply with the Type C security requirements of IAPMO Z124.10. Walls or partitions shall extend from not less than 12 inches (305 mm) above the finished floor to not less than 60 inches

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(1524 mm) above the finished floor. Walls shall extend outward from the wall surface not less than 18 inches (457 mm).

Exception: Urinal partitions shall not be required in a single occupant or family/assisted-use toilet room with a lockable door.

REFERENCED STANDARDS

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTION
<u>IAPMO</u> <u>Z124.10-2022</u>	<u>Water Closet and Urinal</u> <u>Partitions</u>	<u>Miscellaneous</u>	<u>7.21.11,</u> <u>7.21.12</u>

(portions of table not shown remain unchanged)

Basis/Reason for Change:

The standard number has been added as a modification since it was unknown at the time of the original submittal. The standard should be finalized by the May Technical Committee meeting.

The committee statement indicated that the partition requirements should be in the Building Code. Using this logic, the fixture table should be in the Building Code, not the Plumbing Code. I disagree since the use of plumbing fixtures, including privacy, is a plumbing issue not a building code issue.

I would note that the ICC International Building Code include Chapter 29 on Plumbing Systems. Within that Chapter is the plumbing fixture table. Also included are partition requirements. The reason the plumbing fixture table was added to the Building Code is because architects determine the number of plumbing fixtures for most buildings, not the plumbing engineer nor the plumbing contractor. However, while the table appears in the Building Code, it is the identical table in the ICC International Plumbing Code.

When reviewing the International Building Code, almost every section in Chapter 29 has a [P] before the section number. This [P] indicates that the section is regulated by the Plumbing Code Change Committee not one of the various Building Code Change Committees. Thus, the Building Code recognizes that partitions must be decided by the plumbing professionals. For that reason, the Plumbing Code and the Plumbing Technical Committee need to regulate partitions.

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Paruresis and parcopresis are real issues that need to be addressed in the Plumbing Code. The guarantee of privacy is the means of combating these issues. In addition to paruresis and parcopresis, there is a need to assure security for all gender toilet rooms. This has been a particular concern expressed by the female and transgender population.

The new IAPMO standard on partitions addressed paruresis, parcopresis, and security. There are three levels of partitions. Two partition types are what the industry classically calls standard partitions. These are the partitions currently used for water closet is separate gender toilet rooms and around urinals in men's room. The third new category in IAPMO Z124.10, identified as Type A, provide added privacy and security for all gender toilet rooms.

Vote: Accept Accept as Amended

 Accept in Part Accept in Principle Accept in Part and Principle

 Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC. Rev.2.28.22
2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

**National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: April 1, 2022**

Proponent: Julius Ballanco

Date: March 31, 2022

Representing: JB Engineering and Code Consulting, P.C.

Mailing Address: 1661 CARDINAL DR

City: Munster

State: IN

Zip: 46321

Phone: 219-922-6171

E-mail: JBEngineer@aol.com

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

Amend section with this editorial change

Change subsection to read as follows

Delete subsection and substitute as follows

Add new subsection to read as follows

Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: 7.21.11, 7.21.12

7.21 MINIMUM NUMBER OF REQUIRED FIXTURES

7.21.11 Water Closet Compartment. Public water closets shall occupy a separate compartment with walls or partitions and a door enclosing the fixtures to ensure privacy. Partitions for water closets located in separate gender toilet or bathrooms shall comply with the Type B security requirements of IAPMO Z124.10. Partitions for water closets located in all gender toilet or bathrooms shall comply with the Type A security requirements of IAPMO Z124.10.

Exceptions:

(1) Water closet compartments shall not be required in a single-occupant toilet room having a lockable door.

(2) Toilet rooms in day care facilities having more than one water closets shall be permitted to have one water closet without an enclosing compartment.

7.21.12 Urinal Partitions. Each urinal shall be separated with walls or partitions to provide privacy. The horizontal dimension between walls or partitions at each urinal shall comply with Section 7.3.2. Partitions for urinals shall comply with the Type C security requirements of IAPMO Z124.10. Walls or partitions shall extend from not

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

less than 12 inches (305 mm) above the finished floor to not less than 60 inches (1524 mm) above the finished floor. Walls shall extend outward from the wall surface not less than 18 inches (457 mm). Urinals located in all gender toilet rooms shall be visually separated from the remainder of the room or each urinal shall be installed in a privacy compartment complying with Type A security requirements of IAPMO Z124.10.

Exception: Urinal partitions shall not be required in a single occupant or family/assisted-use toilet room with a lockable door.

REFERENCED STANDARDS

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTION
<u>IAPMO Z124.10-2022</u>	<u>Water Closet and Urinal Partitions</u>	<u>Miscellaneous</u>	<u>7.21.11, 7.21.12</u>

(portions of table not shown remain unchanged)

Basis/Reason for Change:

If Section 7.21.10 is approved, there needs to be requirements for privacy and security in all gender toilet rooms. This modification would add the Type A security requirements for partitions installed in all gender toilet rooms.

The new IAPMO standard on partitions addressed paruresis, parcopresis, and security. There are three levels of partitions. Two partition types are what the industry classically calls standard partitions. These are the partitions currently used for water closet is separate gender toilet rooms and around urinals in men’s room. The third new category in IAPMO Z124.10, identified as Type A, provide added privacy and security for all gender toilet rooms.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC. Rev.2.28.22
2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code 2024 Proposed Code Change Form Deadline: April 1, 2022

24 - 33

Proponent: Terry Burger Date: March 31, 2022
Representing: __ ASSE
Mailing Address: __ 18927 Hickory Creek Drive, Suite 220
City: __ Mokena State: __ IL Zip: 60448
Phone: __ (708) 995-3019 E-mail __ terry.burger@asse-plumbing.org

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: Amend section with this editorial change
 Change subsection to read as follows Delete subsection and substitute as follows
 Add new subsection to read as follows Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section:

7.22 WATER TREATMENT SYSTEMS

7.22.1 Water Softener and Treatment Units

Water softeners, reverse osmosis water treatment units, and other drinking water treatment systems shall meet the requirements of the appropriate standards referenced in Section 10.18.1. Waste discharge from such equipment shall enter the drainage system through an air gap. Waste discharge piping shall be of a material approved for potable water, sanitary drainage, or storm drainage.

7.22.2 Alkaline Water Treatment. Alkaline water treatment devices shall comply with IAPMO IGC 322.

7.22.3 Scale Reduction Devices. Scale reduction devices shall comply with IAPMO Z601.

(renumber remaining sections)

Basis/Reason for Change:

The proposed text is adding two types of water treatment systems not currently addressed in the NSPC. The addition of these sections will also reference the appropriate standards.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

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Rev.2.28.22

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

**National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: April 1, 2022**

Proponent: Robert Pickering

Date: March 31, 2022

Representing: Environmental Protection Agency (EPA) WaterSense

Mailing Address: 1200 Pennsylvania Ave NW

City: Washington State: DC Zip: 20460

Phone: 919-468-7856 E-mail: Robert.Pickering@erg.com

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

Amend section with this editorial change

Change subsection to read as follows

Delete subsection and substitute as follows

Add new subsection to read as follows

Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: 7.25

7.25 COMMERCIAL DISHWASHING PRE-RINSE SPRAY VALVES

Commercial dishwashing pre-rinse spray valves shall have a maximum flow rate of ~~1.6 gallons per minute at 60 psi~~ in accordance with Table 7.25 and shall be equipped with an integral automatic shutoff.

TABLE 420.3

COMMERCIAL PRE-RINSE SPRAY VALVE MAXIMUM FLOW RATE

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

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

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

Basis/Reason for Change:

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>).

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

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2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

**National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: March 1, 2022**

24 - 35

Proponent: John Heine Date: 3/28/22

Representing: Heine Plumbing & Water Treatment

Mailing Address: 270 Sparta Ave., Ste 104, PMB 139

City: Sparta State: NJ Zip: 07871

Phone: 973-383-0392 E-mail john@heineplumbing.com

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: Amend section with this editorial change
 Change subsection to read as follows Delete subsection and substitute as follows
 Add new subsection to read as follows Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: 9.1.1 General

Drains from fixtures, fixture compartments, equipment, appliances, appurtenances, and other devices requiring protection against contamination from backflow or flooding from the drainage system or other source shall not be directly connected to the drainage system. Such drains shall discharge separately and indirectly to the drainage system through an air gap or, where permitted, an air break. Indirect wastes shall be trapped if required by Section 9.2.3. Where indirect wastes cannot be discharged by gravity and must be pumped, the connection to the pump shall be indirect through an airgap and the discharge from the pump may be either directly or indirectly connected to an approved point of disposal.

EXCEPTION: An air break shall be permitted where the potable water supply to boilers, water-cooled equipment, heating and air-conditioning systems, and similar cross-connections is protected by a backflow prevention device in accordance with Section 10.5.

Basis/Reason for Change:

By adding this text to the requirements for the airgap, the pump manufacturer's installation requirements are met as well clearing up possible misinterpretation by inspectors.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

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2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code 2024 Proposed Code Change Form Deadline: March 1, 2022

24 - 36

Proponent: Don Jones

Date: 2/2/2022

Representing: Self

Mailing Address: 202 W. Summit St

City: Vineland

State: NJ

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Phone: 609 517 1473

E-mail: donald_m_jones@att.net

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

Amend section with this editorial change

Change subsection to read as follows

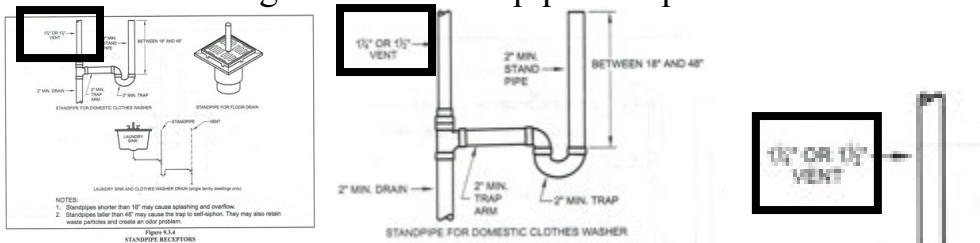
Delete subsection and substitute as follows

Add new subsection to read as follows

Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: Figure 9.3.4 Standpipe Receptors



1 1/4" ~~OR 1 1/2"~~ **MIN.**
VENT

Basis/Reason for Change: The trap arm and drain size are both shown as "MIN." (minimum) in Figure 9.3.4. The Figure will be uniform once the change is made. Figures should display the minimum Code requirements. Additionally, clothes washer standpipes and washer boxes are commonly vented with 2" pipe, which is the same size as the minimum drain.

Note: Accept Accept as Amended

Accept in Part Accept in Principle Accept in Part and Principle

Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

Rev.12.9.21

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code 2024 Proposed Code Change Form Deadline: April 1, 2022

24 - 37

Proponent: Terry Burger Date: March 31, 2022

Representing: ASSE

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IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: Amend section with this editorial change
 Change subsection to read as follows Delete subsection and substitute as follows
 Add new subsection to read as follows Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: 10.5.3

10.5.3 Backflow Preventers

a. With Continuous Water Pressure (CWP)

- 1) CWP, Backsiphonage, High or Low Hazard
 - a) ASSE 1020: pressure vacuum breaker assembly
 - b) ASSE 1056: spill resistant vacuum breaker assembly
 - c) CSA B64.1.2: pressure vacuum breaker (PVB)
 - d) CSA B64.1.3: spill resistant pressure vacuum breaker (SRPVB)
- 2) CWP, Backsiphonage, Backpressure, Low Hazard
 - a) ASSE 1012: backflow preventer with intermediate atmospheric vent
 - b) ASSE 1015 (DC): double check backflow preventer assembly
 - c) ASSE 1015 (DCF): double check fire protection backflow preventer assembly
 - d) ASSE 1022: backflow preventer for beverage dispensing equipment
 - e) ASSE 1024: dual check backflow preventer
 - f) ASSE 1032: dual check valve type backflow preventer for carbonated beverage dispensers, post mix type
 - g) ASSE 1048 (DCDA): double check detector fire protection backflow preventer assembly
 - h) ASSE 1048 (DCDA-II): double check detector fire protection backflow preventer assembly
 - i) AWWA C510: double check valve backflow prevention assembly j) CSA B64.3: dual check valve backflow preventer with atmospheric port (CDAP)
 - k) CSA B64.3.1: dual check valve backflow preventer with atmospheric port for carbonators (DCAPC)
 - l) CSA B64.5: double check valve (DCVA) backflow preventer
 - m) CSA B64.5.1: double check valve backflow preventer for fire protection (DCVAF)
 - n) CSA B64.6: dual check valve (DuC) backflow preventer

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

Rev.2.28.22

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

- o) CSA B64.6.1: dual check valve backflow preventer for fire protection systems (DuCF)
- 3) CWP, Backsiphonage, Backpressure, High or Low Hazard
 - a) ASSE 1013 (RP): reduced pressure principle backflow preventer
 - b) ASSE 1013 (RPF): reduced pressure principle fire protection backflow preventer
 - c) ASSE 1047 (RPDA): reduced pressure detector fire protection backflow prevention assembly
 - d) ASSE 1047 (RPDA-II): reduced pressure detector fire protection backflow prevention assembly
 - e) AWWA C511: reduced pressure principle backflow-prevention assembly
 - f) CSA B64.4: reduced pressure principle (RP) backflow preventer
 - g) CSA B64.4.1: reduced pressure principle backflow preventer for fire protection (RPF)
- b. Not with Continuous Water Pressure (NCWP)
 - 1) NCWP, Backsiphonage, High or Low Hazard
 - a) ASME A112.1.2: air gap in plumbing systems
 - b) ASME A112.1.3: air gap fitting for use in plumbing fixtures, appliances, and appurtenances
 - c) ASSE 1001: atmospheric type vacuum breaker
 - d) ASSE 1002: anti-siphon fill valve for water closet and urinal flush tanks
 - e) ASSE 1021: drain air gap for domestic dishwasher applications
 - f) CSA B64.1.1: atmospheric vacuum breaker (AVB)
 - h) ASSE 1035: laboratory faucet backflow preventer
 - i) ASSE 1055
 - 2) NCWP, Backsiphonage, Limited Backpressure, High or Low Hazard
 - a) ASSE 1011: hose connection vacuum breaker
 - b) ASSE 1019: wall hydrant with backflow prevention and freeze resistance
 - ~~e) ASSE 1035: laboratory faucet backflow preventer~~
 - d) ASSE 1052: dual check hose connection backflow preventer
 - e) ASSE 1053: dual check backflow preventer wall hydrant - freeze resistant
 - f) ASSE 1057 (I-V): freeze resistant sanitary yard hydrant with backflow prevention
 - g) CSA B64.2: hose connection vacuum breaker (HCVB)
 - h) CSA B64.2.1: hose connection vacuum breaker with manual drain (HCVB)
 - i) CSA B64.2.1.1: hose connection dual check vacuum breaker (HCDVB)
 - j) CSA B64.2.2: hose connection vacuum breaker with automatic drain (HCVB)
 - k) CSA B64.7: laboratory faucet vacuum breaker (LFVB)
 - l) CSA B125.3: anti-siphon fill valve for water closet and urinal flush tanks
- c. Limited Backpressure
 - 1) The backpressure on the following backflow preventers for hose connections shall be limited to 10 feet of water from an elevated hose: ASSE 1011, ASSE 1019, ASSE 1053, ASSE 1057 (I-V), CSA B64.2.1.1.
 - 2) The backpressure on the following backflow preventers for laboratory faucets shall be limited to 6 inches of water from an elevated discharge hose: ASSE 1035, CSA B64.7.

Basis/Reason for Change:

ASSE 1035 is only for back pressure and is being relocated to the appropriate location in the section for Backsiphonage, High or Low Hazard. Additionally, ASSE 1055 is being added to the same section for similar protection of Backsiphonage, High or Low Hazard.

Note: Accept Accept as Amended

Accept in Part Accept in Principle Accept in Part and Principle

Defeated Failed Lack of Second Tabled Withdrawn Other

National Standard Plumbing Code 2024 Proposed Code Change Form Deadline: April 1, 2022

24 - 38

Proponent: Terry Burger Date: March 31, 2022

Representing: __ ASSE

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IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: Amend section with this editorial change
 Change subsection to read as follows Delete subsection and substitute as follows
 Add new subsection to read as follows Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: 10.5.3

10.5.3 Backflow Preventers

a. With Continuous Water Pressure (CWP)

1) CWP, Backsiphonage, High or Low Hazard

a) ASSE 1020: pressure vacuum breaker assembly

b) ASSE 1056: spill resistant vacuum breaker assembly

c) CSA B64.1.2: pressure vacuum breaker (PVB)

d) CSA B64.1.3: spill resistant pressure vacuum breaker (SRPVB)

2) CWP, Backsiphonage, Backpressure, Low Hazard

a) ASSE 1012: backflow preventer with intermediate atmospheric vent

b) ASSE 1015 (DC): double check backflow preventer assembly

c) ASSE 1015 (DCF): double check fire protection backflow preventer assembly

d) ASSE 1022: backflow preventer for beverage dispensing equipment

e) ASSE 1024: dual check backflow preventer

f) ASSE 1032: dual check valve type backflow preventer for carbonated beverage dispensers, post mix type

g) ASSE 1048 (DCDA): double check detector fire protection backflow preventer assembly

h) ASSE 1048 (DCDA-II): double check detector fire protection backflow preventer assembly

i) AWWA C510: double check valve backflow prevention assembly

j) CSA B64.3: dual check valve backflow preventer with atmospheric port (CDAP)

k) CSA B64.3.1: dual check valve backflow preventer with atmospheric port for carbonators (DCAPC)

l) CSA B64.5: double check valve (DCVA) backflow preventer

m) CSA B64.5.1: double check valve backflow preventer for fire protection (DCVAF)

n) CSA B64.6: dual check valve (DuC) backflow preventer

o) CSA B64.6.1: dual check valve backflow preventer for fire protection systems (DuCF)

3) CWP, Backsiphonage, Backpressure, High or Low Hazard

a) ASSE 1013 (RP): reduced pressure principle backflow preventer

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

Rev.2.28.22

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

- b) ASSE 1013 (RPF): reduced pressure principle fire protection backflow preventer
- c) ASSE 1047 (RPDA): reduced pressure detector fire protection backflow prevention assembly
- d) ASSE 1047 (RPDA-II): reduced pressure detector fire protection backflow prevention assembly
- e) AWWA C511: reduced pressure principle backflow-prevention assembly
- f) CSA B64.4: reduced pressure principle (RP) backflow preventer
- g) CSA B64.4.1: reduced pressure principle backflow preventer for fire protection (RPF)
- h) ASSE 1022: backflow preventer for beverage dispensing equipment

Basis/Reason for Change:

ASSE 1022 is for continuous water pressure for “backpressure and backsiphonage” for high and low degrees of hazard. It should be updated in the listed sections.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC. Rev.2.28.22
 2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code 2024 Proposed Code Change Form Deadline: April 1, 2022

24 - 39

Proponent: Terry Burger Date: March 31, 2022

Representing: ASSE

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IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

<input type="checkbox"/>	Amend section with this editorial change
<input checked="" type="checkbox"/>	Change subsection to read as follows
<input type="checkbox"/>	Delete subsection and substitute as follows
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Code Section: 10.5.3

10.5.3 Backflow Preventers

a. With Continuous Water Pressure (CWP)

1) CWP, Backsiphonage, High or Low Hazard

- a) ASSE 1020: pressure vacuum breaker assembly
- b) ASSE 1056: spill resistant vacuum breaker assembly
- c) CSA B64.1.2: pressure vacuum breaker (PVB)
- d) CSA B64.1.3: spill resistant pressure vacuum breaker (SRPVB)

2) CWP, Backsiphonage, Backpressure, Low Hazard

- a) ASSE 1012: backflow preventer with intermediate atmospheric vent
- b) ASSE 1015 (DC): double check backflow preventer assembly
- ~~c) ASSE 1015 (DCF): double check fire protection backflow preventer assembly~~
- d) ASSE 1022: backflow preventer for beverage dispensing equipment
- e) ASSE 1024: dual check backflow preventer
- f) ASSE 1032: dual check valve type backflow preventer for carbonated beverage dispensers, post mix type
- g) ASSE 1048 (DCDA): double check detector ~~fire protection~~ backflow preventer assembly
- h) ASSE 1048 (DCDA-II): double check detector ~~fire protection~~ backflow preventer assembly
- i) AWWA C510: double

3) CWP, Backsiphonage, Backpressure, High or Low Hazard

- a) ASSE 1013 (RP): reduced pressure principle backflow preventer
- ~~b) ASSE 1013 (RPF): reduced pressure principle fire protection backflow preventer~~
- c) ASSE 1047 (RPDA): reduced pressure detector ~~fire protection~~ backflow prevention assembly
- d) ASSE 1047 (RPDA-II): reduced pressure detector ~~fire protection~~ backflow prevention assembly
- e) AWWA C511: reduced pressure principle backflow-revention assembly
- f) CSA B64.4: reduced pressure principle (RP) backflow preventer

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

Rev.2.28.22

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

- g) ~~CSA B64.4.1: reduced pressure principle backflow preventer for fire protection (RPF) (withdrawn)~~
- b. Not with Continuous Water Pressure (NCWP)
 - 1) NCWP, Backsiphonage, High or Low Hazard
 - a) ASME A112.1.2: air gap in plumbing systems
 - b) ASME A112.1.3: air gap fitting for use in plumbing fixtures, appliances, and appurtenances
 - c) ASSE 1001: atmospheric type vacuum breaker
 - d) ~~ASSE 1002~~ ASSE 1002/ASME A112.1002/CSA B125.12: anti-siphon fill valve for water closet and urinal flush tanks
 - e) ASSE 1021

(Remaining sections are unchanged)

Basis/Reason for Change:

The proposed change updates the intent of ASSE 1048 as the language no longer uses the term “fire protection.” Additionally, CSA B64.4.1 is being stricken as it has been withdrawn. ASSE is being updated to its new harmonized version.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC. Rev.2.28.22
 2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code 2024 Proposed Code Change Form Deadline: April 1, 2022

24 - 40

Proponent: Adam Segura Date: March 31, 2022

Representing: Self

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Phone: 323-344-1521 E-mail: adam.segura@hotmail.com

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: _____ Amend section with this editorial change
___X___ Change subsection to read as follows _____ Delete subsection and substitute as follows
_____ Add new subsection to read as follows _____ Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: _____ 10.5.5 _____

10.5.5 Installation of Backflow Preventers

a. All Types: All backflow preventers shall be accessible for testing (if testable), maintenance, repair, and replacement. Clearances shall be as recommended by the manufacturer. Backflow preventers having atmospheric vents shall not be installed in pits, vaults, or similar potentially submerged locations. Vacuum breakers and other devices with vents shall not be located within fume hoods. Where outdoor enclosures are provided for backflow prevention assemblies, they shall comply with ASSE 1060.

b. Atmospheric Vacuum Breakers: Pipe-applied atmospheric vacuum breakers shall be installed with the critical level not less than six inches above the flood level rim or highest point of discharge of the fixture being served. Approved deck-mounted and pipe-applied vacuum breakers and vacuum breakers within equipment, machinery and fixtures where the critical level is a specified distance above the source of contamination shall be installed in accordance with manufacturer's instructions with the critical level not less than one inch above the flood level rim. Such devices shall be installed on the discharge side of the last control valve to the fixture and no shutoff valve or faucet shall be installed downstream of the vacuum breaker. Vacuum breakers on urinals shall be installed with the critical level not less than six inches above the flood level rim ~~highest part of the urinal~~.

See Figures 10.5.5-A through 10.5.5-F.

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

Basis/Reason for Change:

This section is being updated as it is outdated and overly restrictive. To always require the vacuum breaker to be above the urinal does not apply to all urinal fixtures. At the time this language was generated, in the 1950's, all urinals with flushometers were located on top of the fixture. However, there are many styles of urinals that have internal flushometer valves that exit behind the fixture. This language makes for an impractical installation and should be updated.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC. *Rev.2.28.22*
2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code 2024 Proposed Code Change Form Deadline: April 1, 2022

24 - 41

Proponent: Terry Burger Date: March 31, 2022

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IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

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Code Section: 10.5.5

10.5.5 Installation of Backflow Preventers

a. All Types: All backflow preventers shall be accessible for testing (if testable), maintenance, repair, and replacement. Clearances shall be as recommended by the manufacturer. Backflow preventers having atmospheric vents shall not be installed in pits, vaults, or similar potentially submerged locations.

Vacuum breakers and other devices with vents shall not be located within fume hoods. Where outdoor enclosures are provided for backflow prevention assemblies, they shall comply with ASSE 1060.

b. Atmospheric Vacuum Breakers: Pipe-applied atmospheric vacuum breakers shall be installed with the critical level not less than six inches above the flood level rim or highest point of discharge of the fixture being served. Approved deck-mounted and pipe-applied vacuum breakers and vacuum breakers within equipment, machinery and fixtures where the critical level is a specified distance above the source of contamination shall be installed in accordance with manufacturer's instructions with the critical level not less than one inch above the flood level rim. Such devices shall be installed on the discharge side of the last control valve to the fixture ~~and no shutoff valve or faucet shall be installed downstream of the vacuum breaker~~ and have its outlet open to the atmosphere. Vacuum breakers on urinals shall be installed with the critical level not less than six inches above the highest part of the urinal.

Basis/Reason for Change:

This was a Tentative Interim Amendment to the 2021 edition of the Uniform Plumbing Code. Since this language in the National Standards Plumbing Code, it should also be updated. For informational purposes, the following were provided for justifying the proposed change.

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

Rev.2.28.22

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

Technical Merit: The 2021 UPC has a conflict regarding the installation requirements for atmospheric vacuum breakers (AVB). Table 603.2 states that there shall be “No valve downstream”. However, ASSE 1001 was updated in 2017 to remove the wording "no valve downstream" and add, "have its outlet open to atmosphere" (Attachment 1 of TIA 001-21). Table 1701.1 in the 2021 UPC for Reference Standards includes the 2017 edition of ASSE 1001 (Attachment 2 of TIA 001-21). Therefore, the installation requirements for atmospheric vacuum breakers in Table 603.2 must be updated as shown above to correct this conflict with the 2017 edition of ASSE 1001. Allowing a valve downstream from an AVB that does not create backpressure on the device is not a public health hazard. Historically, a valve in the outlet to the AVB would create backpressure if it were considered control valve and completely stopped the flow of water exiting the AVB. However, if the valve is not a shutoff or control valve and is located in a branch of a TEE that does not block the outlet of the AVB to atmosphere, the intent of the requirement is met. Prohibiting any downstream valve is design restrictive and does not represent current certified designs that meet the intent of the code, which is to prevent backpressure on the AVB. The validity of applications with a valve downstream from an AVB can be confirmed by the UPC 18-101 Request for Clarification issued by Bruce Pfeiffer, Chair of the UPC Answers and Analysis Committee (attachment 3 of TIA 001-21).

Updates to nationally recognized standards referenced in the UPC must always be taken into consideration so that the public can fully benefit from advancements in technology. Otherwise, there would be confusion for anyone enforcing the UPC or applying the standards.

Emergency nature:

1) Hardship on Owners/Users of Equipment - There are currently many commercial dishwashing machines on the market with an auxiliary valve downstream of an AVB. The valve is in a branch of a TEE that cannot prevent the AVB from being open to atmosphere. However, since it does not meet the literal interpretation of the wording in Table 603.2 of the UPC, some AHJ's have required these customers to replace the AVB with an RPZ or Spill Resistant Pressure Vacuum Breaker. Results of these nonconformance citations:

- Delays in receiving a final CO
- Plumbing modification fees from \$1,200 to \$2,000 per site
- Loss of manufacturer warranty due to non-standard part replacements
- Voiding the third-party sanitation certification

2) Loss of NSF Certification – When an NSF Certified commercial dishwashing machine is modified to replace the AVB with an untested device, that NSF Certification is rendered null and void. As such, the customer is susceptible to a possible public health citation for using a noncertified dish machine. An even more significant ramification is a possible reduction in the sanitizing efficacy of the dish machine which is a potential public health concern.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: April 1, 2022

Proponent: Terry Burger Date: March 31, 2022
Representing: __ ASSE
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IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: Amend section with this editorial change
 Change subsection to read as follows Delete subsection and substitute as follows
 Add new subsection to read as follows Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: __ 10.5.10

10.5 BACKFLOW PREVENTION

10.5.10 Protection from Lawn Sprinklers and Irrigation Systems

a. Potable water supplies to systems having no pumps or connections for pumping equipment, and no chemical injection or provisions for chemical injection, shall be protected from backflow by one of the following:

1. Atmospheric type vacuum breaker – ASSE 1001 (for non-continuous pressure)
2. Pressure vacuum breaker assembly – ASSE 1020
3. Spill resistant vacuum breaker (SVB) – ASSE 1056
4. Reduced pressure principle backflow preventer – ASSE 1013 (RP)
5. A valve complying with IAPMO PS 72

b. Where lawn sprinkler and irrigation systems have pumps, connections for pumping equipment, auxiliary air tanks or are otherwise capable of creating backpressure, the potable water supply shall be protected by the following type of device if the backflow prevention device is located upstream from the source of backpressure:

1. Reduced pressure principle backflow preventer – ASSE 1013 (RP)

c. Where systems have a backflow preventer installed downstream from a potable water supply pump or a potable water supply pump connection, the preventer shall be one of the following:

1. Atmospheric type vacuum breaker – ASSE 1001 (for non-continuous pressure)
2. Pressure vacuum breaker assembly (PVB) – ASSE 1020
3. Spill resistant vacuum breaker (SVB) – ASSE 1056
4. Reduced pressure principle backflow preventer – ASSE 1013 (RP)

d. Where systems include a chemical injector or any provisions for chemical injection, the potable water supply shall be protected by the following:

1. Reduced pressure principle backflow preventer – ASSE 1013 (RP)

Basis/Reason for Change:

Valves covered by this standard are intended for cold water installations requiring an integral anti-siphon device to prevent house water contamination when installed per the manufacturer's instructions.



Vote: Accept Accept as Amended

 Accept in Part Accept in Principle Accept in Part and Principle

 Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC. Rev.2.28.22
2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code 2024 Proposed Code Change Form

Deadline: April 1, 2022

24 - 43

Proponent: Terry Burger Date: March 31, 2022
 Representing: ASSE
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IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

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 Change subsection to read as follows Delete subsection and substitute as follows
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Code Section: 10.12.10 and Table 3.1.3 Part V, Table 18.1

10.12.10 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.

Table 3.1.3 - Part V PLUMBING FIXTURES

13	Hydromassage bathtubs	ASME A112.19.7/ CSA B45.10
14	Leak detection devices	IAPMO IGC 115 IAPMO IGC 349 <u>IAPMO Z1349</u>
15	Non-water urinals, vitreous china	ASME A112.19.19

NOTE: Strike and update in Table 3.1.3 (Part V) and Table 18.1

Basis/Reason for Change:

IGC 115 and IGC 349 were combined into IAPMO Z1349.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC. Rev.2.28.22
 2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code 2024 Proposed Code Change Form Deadline: April 1, 2022

24 - 44

Proponent: Adam Segura Date: March 31, 2022

Representing: Self

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IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: Amend section with this editorial change
 Change subsection to read as follows Delete subsection and substitute as follows
 Add new subsection to read as follows Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: 10.13 _____

10.13 FLEXIBLE WATER CONNECTORS

a. Flexible water connectors exposed to continuous pressure shall conform to ASME A112.18.6/CSA B125.6. Access shall be provided to all flexible water connectors.

b. Flexible metallic (copper and stainless steel), reinforced flexible, braided stainless steel, or polymer braided with EPDM core connectors that connect a water heater to the piping system shall comply with ASME A112.18.6/CSA B125.6. Copper, copper alloy, or stainless steel flexible connectors shall not exceed 24 inches (610 mm). PEX, PEX-AL-PEX, PE-AL-PE, or PE-RT tubing shall not be installed within the first 18 inches (457 mm) of piping connected to a water heater.

Exception:

PEX, PEX-AL-PEX, and PE-RT tubing shall be permitted to be connected directly to instantaneous water heaters intended for domestic water applications.

Basis/Reason for Change:

The code change adds length limitations to specific water heater connectors. The addition of this language will align with other codes and jurisdictions.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

**National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: April 1, 2022**

Proponent: Julius Ballanco

Date: March 31, 2022

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E-mail: JBEngineer@aol.com

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

Amend section with this editorial change

Change subsection to read as follows

Delete subsection and substitute as follows

Add new subsection to read as follows

Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: 10.14.2

10.14.2 Size of Individual Fixture Supply Branches

a. Individual fixture supply branch pipe sizes shall be based on the minimum available flowing water pressure at its point of connection to the water distribution system, any elevation difference between that connection and the fixture, and the allowable pressure loss in the fixture supply branch. The minimum fixture supply branch pipe sizes shall be as indicated in Table 10.14.2A. For design purposes, the required pressure at each fixture inlet shall be 15 psig minimum flowing, except 20 psig minimum flowing for flushometer valves on siphon jet water closets and 25 psig minimum flowing for flushometer valves on blowout water closets and blowout urinals. Flushometer tank (pressure assisted) water closets require a minimum of 25 psig static pressure. The following water flow rates shall be used for the purpose of sizing individual fixture supply branch pipes:

5.0 gpm for hose bibbs and wall hydrants;

4.0 gpm for bath faucets and clothes washers;

0.75 gpm for drinking fountains and water coolers;

2.2 gpm for sink faucets;

2.5 gpm for shower heads;

2.5 gpm for body spray;

2.2 gpm for lavatory faucets;

3.0 gpm for water closets other than the flushometer valve type;

12.0 gpm for flushometer valve urinals;

30.0 gpm for flushometer valve water closets

b. Fixture supply branches shall extend from the distribution system to within 30 inches of the point of connection to the fixture or device served and be within the same area and physical space as the point of connection to the fixture or device. Fixture supply tubes and flexible water connectors shall be not less than the size recommended by the manufacturer of the fixture, faucet, appliance or device served.

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

Add definition:

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

Basis/Reason for Change:

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 the NSPC. 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.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC. Rev.2.28.22
2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code 2024 Proposed Code Change Form Deadline: March 1, 2022

24 - 46

Proponent: Chris Haldiman _____ Date: February 7, 2022 _____

Representing: Watts Water Technologies _____

Mailing Address: 2942 S. Timbercreek Ave. _____

City: Springfield __ State: MO _____ Zip: 65807 _____

Phone: 417-861-8070 _____ E-mail: chris.haldiman@wattswater.com

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: _____ Amend section with this editorial change

Change subsection to read as follows _____ Delete subsection and substitute as follows

_____ Add new subsection to read as follows _____ Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: 10.14.6 Excessive Pressures

- a. Pressure reducing valves complying with ASSE 1003 or AWWA C530 shall be provided if required to limit the water supply pressure at any fixture, appliance, appurtenance, or outlet to not more than 80 psi under no-flow conditions.

Basis/Reason for Change:

There are two types of water pressure reducing or controlling valves, direct acting and pilot operated. The 2021 National Standard Plumbing Code only allows the use of an ASSE 1003 compliant valve. The current ASSE 1003 standard only includes sizes 1/2" - 4", which will meet the requirements of many buildings. However, there are occasions when sizes larger than 4" are needed to meet building water needs, and a AWWA C530 valve can accommodate the larger requirements as it includes 1-1/2" to 60" valves. Examples of buildings requiring flows larger than 4" could include large apartment buildings, hotels, factories and medical facilities. Pilot operated control valves also provide a tighter control of the delivered water pressure, which may be desired in some building water systems. Adding AWWA C530 valves would allow design flexibility. The primary thing to consider is that both valves accomplish the same function, reduce and control the building system water pressure if needed. By allowing the use of AWWA C530 Pilot Operated Control Valves system designers and AHJs would have the choice to use either, as well as being able to provide water pressure control for systems larger than the current maximum of 4".

I have the approval from AWWA to propose this change and approval to provide a copy of the standard for committee consideration.

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

Rev.12.9.21

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

Vote: ___ Accept ___ Accept as Amended
___ Accept in Part ___ Accept in Principle ___ Accept in Part and Principle
___ Defeated ___ Failed Lack of Second ___ Tabled ___ Withdrawn ___ Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

Rev.12.9.21

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code 2024 Proposed Code Change Form Deadline: April 1, 2022

24 - 47

Proponent: Thomas Polino

Date: 31 March 2022

Representing: Thomas Polino

Mailing Address: 405 Greenwood Ave

City: Riverside State: NJ Zip Code: 08075

Phone: (856) 906-7167 E-mail: Thomas.polino@yahoo.com

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

- Amend section with this editorial change
 Change subsection to read as follows Delete subsection and substitute as follows
 Add new subsection to read as follows Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: 10.15.6j.

j. Hand Washing Facilities: The hot water supply to the following hand washing fixtures shall be controlled to a temperature no higher than 110°F by a water temperature limiting device complying with ASSE 1070/ASME A112.1070/CSA B125.70 or a water heater complying with ASSE 1084:

1. in public toilet rooms
2. in hotel and motel guest rooms
3. in hospital patient rooms
4. in medical and clinical treatment rooms
5. wash fountains
6. group wash fixtures

Exception: Where there is a temperature control-mixing device installed to supply all required fixtures complying with ASSE 1017.

Basis/Reason for Change:

This would eliminate having to install water temperature limiting device at every fixture.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

**National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: April 1, 2022**

Proponent: Terry Burger Date: March 31, 2022
Representing: __ ASSE
Mailing Address: __ 18927 Hickory Creek Drive, Suite 220
City: __ Mokena State: __ IL Zip: 60448
Phone: __ (708) 995-3019 E-mail __ terry.burger@asse-plumbing.org

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: Amend section with this editorial change
 Change subsection to read as follows Delete subsection and substitute as follows
 Add new subsection to read as follows Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: 10.15.6

10.15.6 Mixed Water Temperature Control

(a - l) (remaining text unchanged)

m. Temperature Actuated Flow Reduction (TAFR) Valves:

Temperature actuated flow reduction (TAFR) valves that limit the maximum mixed water temperature to 120°F for individual fixture fittings shall comply with ASSE 1062. The installation of TAFR valves shall not supersede the other requirements of Section 10.15.6 for mixed water temperature control. 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.

(n - o) (remaining text unchanged)

Basis/Reason for Change:

The proposed language is provided supplemental scald protection as it is not intended for replacing the primary means of protection.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC. Rev.2.28.22
2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

**National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: March 1, 2022**

24 - 49

Proponent: _____ Dave Bishop _____ Date: _____ 1/31/22 _____
Representing: _____ Parsippany Plumbing Inspector _____
Mailing Address: _____ 1001 Parsippany Boulevard _____
City: _____ Parsippany _____ State: _____ NJ _____ Zip: _____ 07054 _____
Phone: _____ 973-795-0062 _____ E-mail _____ DBishop@Parsippany.net _____

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: _____ Amend section with this editorial change
_____ Change subsection to read as follows _____ Delete subsection and substitute as follows
_____ Add new subsection to read as follows _____ Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: _____ 10.15.9.3(c) _____

10.15.9.3 Drainage

c. For drip pans installed under water heaters that are located above ceilings, or above floors in multi-family dwellings and condominiums, the drain pipe from the drip pan shall extend to a point of disposal or indirect waste that is readily observable in an area below the heater.

EXCEPTION: In lieu of a no point of disposal from drip pan, a wet switch with an automatic shutoff shall be installed.

Basis/Reason for Change:

When replacing a water heater, the rehabilitation code should not apply to existing buildings. There should be some kind of protection for any owners or tenants from floors below when there are pans installed from the floors above.

Vote: _____ Accept _____ Accept as Amended
_____ Accept in Part _____ Accept in Principle _____ Accept in Part and Principle
_____ Defeated _____ Failed Lack of Second _____ Tabled _____ Withdrawn _____ Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

Rev.12.9.21

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code 2024 Proposed Code Change Form Deadline: April 1, 2022

24 - 50

Proponent: Jeremy Brown Date: 3-15-21

Representing: NSF International

Mailing Address: 789 N. Dixboro Rd

City: Ann Arbor State: MI Zip: 48105

Phone: 734-395-4667 E-mail brown@nsf.org

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: Amend section with this editorial change

Change subsection to read as follows Delete subsection and substitute as follows

Add new subsection to read as follows Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: 10.15.10

10.15.10 Domestic Water Heaters

- a. Water heaters shall be applied, sized, and installed in accordance with the manufacturer's recommendations and instructions.
- b. Gas-fired storage tank water heaters with input ratings of 75,000 Btuh or less shall comply with ANSI Z21.10.1/CSA 4.1.
- c. Gas-fired storage tank water heaters with input ratings above 75,000 Btuh shall comply with ANSI Z21.10.3/CSA 4.3.
- d. Gas-fired tankless water heaters shall comply with ANSI Z21.10.3/CSA 4.3.
- e. Oil-fired storage tank water heaters shall comply with UL 732.
- f. Household electric storage tank water heaters up to 120 gallons and 12 KW capacity shall comply with UL 174.
- g. Electric booster and commercial storage tank water heaters that are either over 120 gallons capacity, over 112 KW or have controls for more than 185 degree water shall comply with UL 1453.
- h. Tankless electric water heaters shall comply with UL 499.
- i. Heat pump water heaters shall comply with UL 60335-2-40.
- j. Water heaters with integral temperature control devices for hot water distribution systems shall comply with ASSE 1082.
- k. Water heaters with temperature limiting capacity shall comply with ASSE 1084.
- l. Water heaters for emergency equipment shall comply with ASSE 1085.
- m. Water heaters shall comply with NSF/ANSI/CAN 372

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

Basis/Reason for Change:

In September of 2020, the EPA finalized its final rule for interpreting the Safe Drinking Water Act. The final rule did change scope of products affected by the lead content requirements and sited dishwashers and water heaters as fixtures used for potable water according to the final rule. See definition below:

Fixture means a receptacle or device that is connected to a water supply system or discharges to a drainage system or both. Fixtures used for potable uses shall include but are not limited to:

- (1) Drinking water coolers, drinking water fountains, drinking water bottle fillers, dishwashers;
- (2) Plumbed in devices, such as point-of-use treatment devices, coffee makers, and refrigerator ice and water dispensers; and
- (3) Water heaters, water meters, water pumps, and water tanks, unless such fixtures are not used for potable uses.

Final rule is found at <https://www.federalregister.gov/documents/2020/09/01/2020-16869/use-of-lead-free-pipesfittings-fixtures-solder-and-flux-for-drinking-water>

Water heaters are singled out for proposed code sections because they would not normally be interpreted as fixtures intended to convey or dispense drinking water. As such they need a specific code section to require lead content to be consistent with the Safe Drinking Water Act.

In preparing this code change I purposefully did not reference back to the existing section 3.4.6 Limit on Lead Content. While water heaters are not necessarily outside the scope of NSF/ANSI/CAN 61, many do not consider hot water as drinking water. For example, EPA and Health Canada advise not to drinking hot water from the tap. Secondly, there is consideration of the availability of certified products. Many of the manufacturers of water heaters are listed to NSF/ANSI 372 already, but it is rare to find one that is certified to NSF/ANSI/CAN 61.

Electronic copies of the standard have been provided for distribution to the committee. For all others considering this code change free copies may be available by emailing brown@nsf.org.

Vote: Accept Accept as Amended

 Accept in Part Accept in Principle Accept in Part and Principle

 Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

**National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: April 1, 2022**

Proponent: Adam Segura Date: March 31, 2022
Representing: Self
Mailing Address: 2037 Edison Way
City: Los Angeles State: CA Zip: 90041
Phone: 323-344-1521 E-mail: adam.segura@hotmail.com

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: _____ Amend section with this editorial change
 Change subsection to read as follows _____ Delete subsection and substitute as follows
_____ Add new subsection to read as follows _____ Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: _____ 10.15.10 _____

10.15.10 Domestic Water Heaters

- a. Water heaters shall be applied, sized, and installed in accordance with the manufacturer’s recommendations and instructions.
- b. Gas-fired storage tank water heaters with input ratings of 75,000 Btuh or less shall comply with ANSI Z21.10.1/CSA 4.1.
- c. Gas-fired storage tank water heaters with input ratings above 75,000 Btuh shall comply with ANSI Z21.10.3/CSA 4.3.
- d. Gas-fired tankless water heaters shall comply with ANSI Z21.10.3/CSA 4.3.
- e. Oil-fired storage tank water heaters shall comply with UL 732.
- f. Household electric storage tank water heaters up to 120 gallons and 12 KW capacity shall comply with UL 174.
- g. Electric booster and commercial storage tank water heaters that are either over 120 gallons capacity, over 112 KW or have controls for more than 185 degree water shall comply with UL 1453.
- h. Tankless electric water heaters shall comply with UL 499.
- i. Heat pump water heaters shall comply with UL 60335-2-40.
- j. Water heaters with integral temperature control devices for hot water distribution systems shall comply with ASSE 1082.
- k. Water heaters with temperature limiting capacity shall comply with ASSE 1084.
- l. Water heaters for emergency equipment shall comply with ASSE 1085.

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC. Rev.2.28.22
2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

Basis/Reason for Change:

The proposed change is striking the term “Domestic” from the title as these water heater standards apply to more than only domestic applications.

Vote: ___ Accept ___ Accept as Amended
___ Accept in Part ___ Accept in Principle ___ Accept in Part and Principle
___ Defeated ___ Failed Lack of Second ___ Tabled ___ Withdrawn ___ Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC. *Rev.2.28.22*
2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

**National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: March 1, 2022**

24 - 52

Proponent: Don Jones

Date: 2/20/2022

Representing: Self

Mailing Address: 202 W. Summit St

City: Vineland State: NJ Zip: 08360

Phone: 609 517 1473 E-mail: donald_m_jones@att.net

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

Amend section with this editorial change

Change subsection to read as follows

Delete subsection and substitute as follows

Add new subsection to read as follows

Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: 10.16.1 Tank Protection

a. Pressure vessels used for heating water or storing heated water...

1. A separate pressure relief...

2. A combination pressure...

3. Either "1" or "2" above...

4. ~~Tank construction conforming to standard that does not require a temperature or pressure safety or relief valve.~~

Basis/Reason for Change:

The notion of # 4 is both antiquated and unrealistic. A T&P relief valve (or where installed, a separate pressure and temperature relief valve) provides ancillary safety benefits to the plumbing system in addition to protecting the water heater (or storage vessel) itself.

Note: Accept Accept as Amended

Accept in Part Accept in Principle Accept in Part and Principle

Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

Rev.12.9.21

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

**National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: April 1, 2022**

Proponent: Terry Burger Date: March 31, 2022
Representing: __ ASSE
Mailing Address: __ 18927 Hickory Creek Drive, Suite 220
City: __ Mokena State: __ IL Zip: 60448
Phone: __ (708) 995-3019 E-mail __ terry.burger@asse-plumbing.org

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: Amend section with this editorial change
 Change subsection to read as follows Delete subsection and substitute as follows
 Add new subsection to read as follows Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: 10.18.1

10.18 DRINKING WATER TREATMENT UNITS

10.18.1 Compliance with Standards

Drinking water treatment units shall comply with the appropriate standards listed below.

- a. NSF 42 Drinking Water Treatment Units - Aesthetic Effects
- b. NSF 44 Water Softeners (cation exchange)
- c. NSF 53 Drinking Water Treatment Units - Health Effects
- d. NSF 55 Ultraviolet Microbiological Water Treatment Systems
- e. NSF 58 Reverse Osmosis Drinking Water Systems
- f. CSA B483.1 Drinking Water Treatment Systems
- g. NSF 62 Distillation Water Treatment System
- h. IAPMO IGC 322 Alkaline Water Treatment Units
- i. IAPOMO Z601 Scale Reduction Devices
- j. ASSE 1090 Drinking Water Atmospheric Water Generators (AWG)
- k. ASSE LEC 2006 Point of Entry Reverse Osmosis Systems
- l. ASSE LEC 2008 Point of Entry Anion Exchange – Nitrate Reduction
- m. ASSE 1087 Commercial and Food Service Water Treatment Equipment Utilizing Drinking Water

Basis/Reason for Change:

The proposed update adds the appropriate recognized standards for water treatment systems and devices that are not currently covered in the NSPC.

There is a health trend in the market for drinking alkaline water, water with a pH above 7.0. There are many claimed health benefits, including neutralizing stomach acid and increasing oxygen levels in the blood. These water treatment products have not had any formal procedures in order to ensure their claims of effectiveness with regards to the level of alkalinity. Note that the goal is not to make health claims regarding positive health benefits, only that the products dispense alkaline water for safe consumption resulting in nondetrimental effects to health. IAPMO IGC 322 gives the output performance requirements for flow rate and oxidation reduction potential at given pH levels.

The IAPMO Z601 standard gives the performance criteria for any scale reduction device intended for tank-type and tankless water heaters as well as ion exchangers. It covers material safety, structural integrity, and various safety requirements. Products are being installed today in plumbing systems that have not been tested for scale reduction performance or safety. IAPMO Z601 fills that gap, ensuring products being installed will perform as marketed and meet minimum standard requirements for health and safety.

All these standards go through a consensus process. This change is adding missing standards.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

**National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: March 1, 2022**

Proponent: Jeff Matson _____ Date: 1/26/2022
Representing: Viega LLC _____
Mailing Address: 585 Interlocken Blvd _____
City: Broomfield _____ State: CO _____ Zip: 80021 _____
Phone: (720) 531-8455 _____ E-mail: jeff.matson@viega.us

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: _____ Amend section with this editorial change
 Change subsection to read as follows _____ Delete subsection and substitute as follows
_____ Add new subsection to read as follows _____ Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: Section 10.20.4 Materials for Combined System Piping

b. Copper piping shall be ASTM B88 copper water tube, Type L or K. Fittings shall be the solder joint type or press-connect. Solder joint fittings shall comply with ASME B16.22 wrought or ASME B16.18 cast. Press-connect fittings shall comply with ASTM F3226, IAPMO PS 117, or ASME B16.51.

Basis/Reason for Change:

Press-connect fittings are a proven and accepted joining method under the UPC, and are proposed elsewhere for inclusion in the NSPC for plumbing applications. As combined systems are a subset of general plumbing, press-connect fittings are appropriate for inclusion in Section 10.20.4 and will improve the available product range for plumbers installing these systems under the NSPC.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

-
- 1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.
 - 2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

**National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: April 1, 2022**

Proponent: Norm Dobo Date: 3/30/22

Representing: Myself

Mailing Address: 105 Allen St.

City: Hamilton State: NJ Zip: 08620

Phone: 609-610-3423 E-mail nola10044@aol.com

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

- Check All That Apply:**
- Amend section with this editorial change
 - Change subsection to read as follows
 - Delete subsection and substitute as follows
 - Add new subsection to read as follows
 - Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: 11.4.2

Section 11.4.2 Conversion of Flow in GPM to DFU

For continuous or semi-continuous flow, where the discharge rate of fixtures or equipment is expressed in gallons per minute (GPM) two (2) drainage fixture units (DFU) shall be allowed for each gallon per minute (GPM) of flow. Refer to 7.10.4 for shower drain sizes.

Basis/Reason for Change:

Applying 2 DFUs to 1 gallon/minute to items such as sewage pumps means no 3" building sewer can have a sewage pump. Additionally, by code a single fixture pump with a total dynamic head of 10' could pump as much as 30 gallons per minute which would equal 60 DFUs. Inserting continuous or semi-continuous removes these pumps from this section as they are intermittent flow.

- Vote:**
- Accept
 - Accept as Amended
 - Accept in Part
 - Accept in Principle
 - Accept in Part and Principle
 - Defeated
 - Failed Lack of Second
 - Tabled
 - Withdrawn
 - Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC. Rev.2.28.22
2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

**National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: March 1, 2022**

24 - 56

Proponent: Kristopher Heine Date: 3/29/22

Representing: Heine Plumbing & Water Treatment

Mailing Address: 270 Sparta Ave., Ste 104, PMB 139

City: Sparta State: NJ Zip: 07871

Phone: 973-383-0392 E-mail kris@heineplumbing.com

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

Amend section with this editorial change

Change subsection to read as follows

Delete subsection and substitute as follows

Add new subsection to read as follows

Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: 11.5.5 Minimum Size of Underground Drainage

No portion of the drainage system installed underground shall be less than ~~two~~ one and one half inch pipe size.

~~EXCEPTION: Underground condensate, waste, tub and shower traps and trap arms, and piping that receives the discharge from relief valves after an air gap may be normal size pipe less than 2 inches.~~

Basis/Reason for Change:

Due to low flow fixtures and lower DFU's there is no longer a need for 2 inch.

Vote: Accept Accept as Amended

Accept in Part Accept in Principle Accept in Part and Principle

Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code 2024 Proposed Code Change Form

Deadline: April 1, 2022

24 - 57

Proponent: Norm Dobo Date: 3/30/22

Representing: Myself

Mailing Address: 105 Allen St.

City: Hamilton State: NJ Zip: 08620

Phone: 609-610-3423 E-mail nola10044@aol.com

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

<input type="checkbox"/>	Amend section with this editorial change
<input checked="" type="checkbox"/>	Change subsection to read as follows
<input type="checkbox"/>	Delete subsection and substitute as follows
<input type="checkbox"/>	Add new subsection to read as follows
<input type="checkbox"/>	Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: 11.7.8b

11.7.8b The drainage load that sewage pumping units place on building gravity drain piping shall be based on two (2) drainage fixture units (DFU) for each gallon per minute of pump discharge. in accordance with Table 11.7.8b.

Table 11.7.8b	
Discharge capacity for sewage pumping units	
Up to 7 GPM	1 DFU
Over 7 up to 15 GPM	2 DFU
Over 15 up to 23 GPM	3 DFU
Over 23 up to 30 GPM	4 DFU
Each 7 GPM over 30 add	1 DFU

Basis/Reason for Change:

This change squares with the proposed change to 11.4.2 and uses approximately 7.48 gallons per minute as a basis.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC. Rev.2.28.22
 2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

**National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: April 1, 2022**

Proponent: Stephen Rodzinak Date: 03/31/2022

Representing: NJSLMP

Mailing Address: 6 Hastings Lane

City: Flemington State: NJ Zip: 08822

Phone: 908-625-6717 E-mail srodzinak@aol.com

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

Amend section with this editorial change

Change subsection to read as follows

Delete subsection and substitute as follows

Add new subsection to read as follows

Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: 12.10

Delete Section 12.10.1 through Section 12.10.4 in entirety and replace with new Section 12.10.1 through 12.10.6 as shown in the attached.

Basis/Reason for Change:

Current version requires a wet vent to be one pipe size larger the required drain causing practical difficulties for installations in conventional framing applications

We propose to revert back to the 2015 NSPC 12.10 which allows for more flexibility in wet venting applications

Vote: Accept Accept as Amended

Accept in Part Accept in Principle Accept in Part and Principle

Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

12.8.4 Water Closets and Other Siphonic Fixtures

For water closets and other fixtures that operate by siphonic action, the distance between the outlet of the fixture and its vent connection shall not exceed 3 feet vertically and 9 feet horizontally.

12.9 COMMON VENTS

12.9.1 Individual Vent as Common Vent

An individual vent, installed vertically, may be used as a common vent for two fixture traps when both fixture drains connect with a vertical drain at the same level.

12.9.2 Fixtures Drains Connected at Different Levels

A common vent may be used for two fixtures installed on the same floor but connecting to a vertical drain at different levels, provided that the vertical drain is one pipe size larger than the upper fixture drain but in no case smaller than the lower fixture drain. *See Figure 12.9.2*

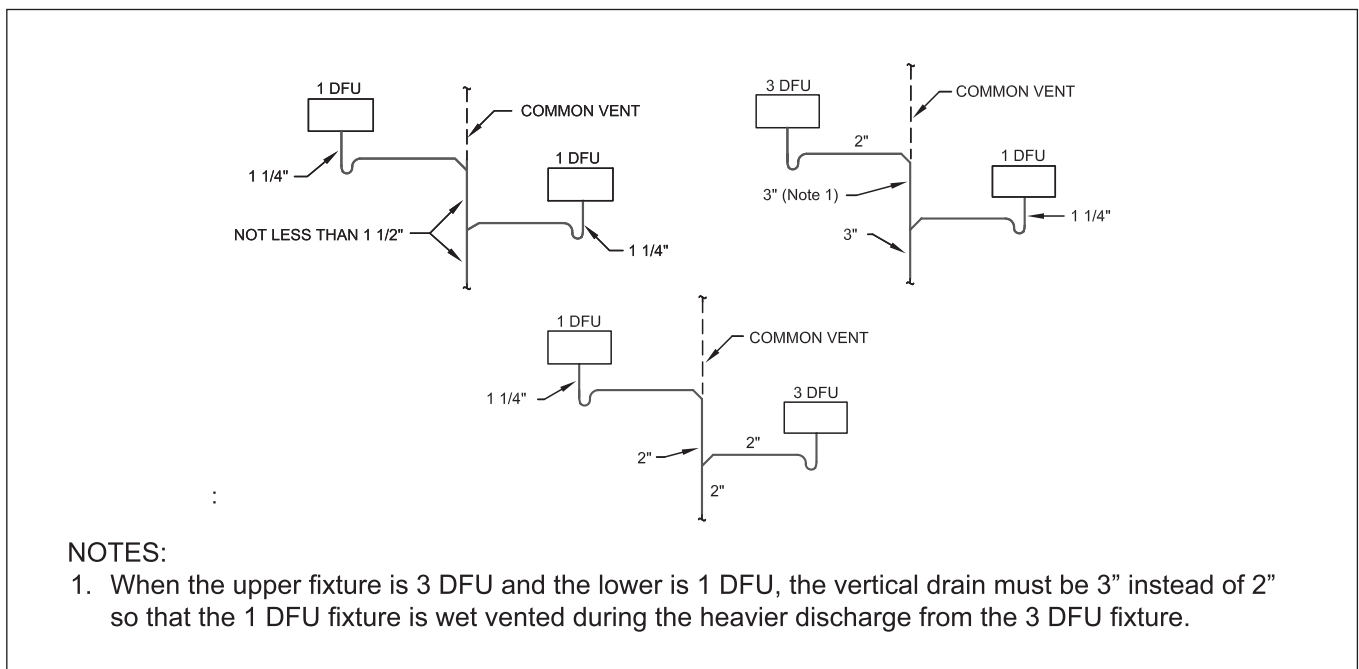


Figure 12.9.2
VENTING FIXTURES CONNECTED TO A
VERTICAL DRAIN AT DIFFERENT LEVELS

12.10 WET VENTING

12.10.1 Single Bathroom Groups

a. An individually vented lavatory in a single bathroom group shall be permitted to serve as a wet vent for the water closet, the bathtub or shower stall, or the water closet and bathtub/shower if all of the following conditions are met.

1. The wet vent is 1-1/2" minimum pipe size if the water closet bend is 3" size or it shall be 2" minimum pipe size if the water closet bend is 4" pipe size.
2. A horizontal branch drain serving both the lavatory and the bathtub or shower stall is 2" minimum pipe size.

3. The length of the trap arm for the bathtub or shower stall is within the limits of Table 12.8.1. If not, the bathtub or shower stall shall be individually vented.

4. The distance from the outlet of the water closet to the connection of the wet vent is within the limits established by Section 12.8.4. Otherwise, the water closet shall be individually vented.

5. A horizontal branch serving the lavatory and the bathtub or shower stall shall connect to the stack at the same level as the water closet, or it may connect to the water closet bend, or the lavatory and bathtub or shower stall may individually connect to the water closet bend.

6. When the bathroom group is the topmost load on a stack, a horizontal branch serving the lavatory and the bathtub or shower stall may connect to the stack below the water closet bend, or the lavatory and the bathtub or shower stall may individually connect to the stack below the water closet bend.

See Figures 12.10.1-A through -C

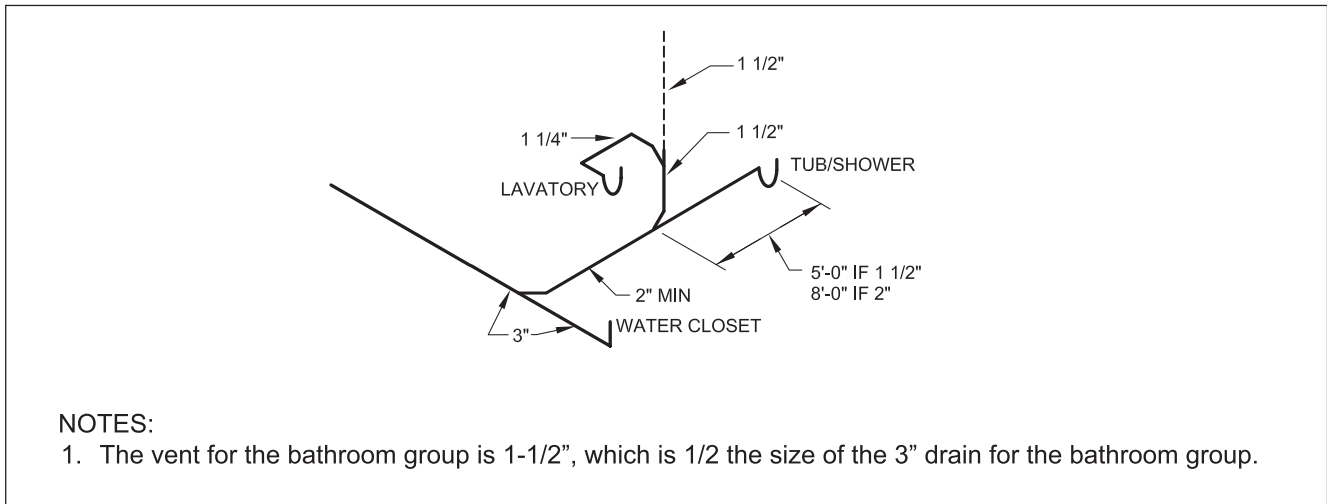


Figure 12.10.1 - A
A WET VENTED BATHROOM GROUP WITH A 3" CLOSET BEND

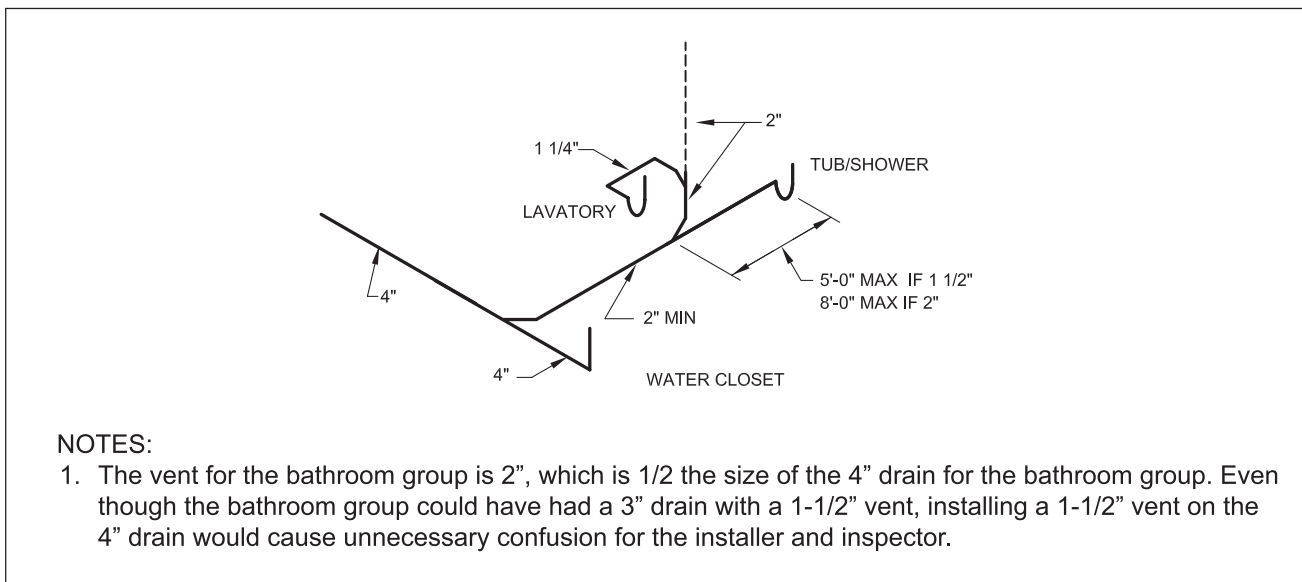


Figure 12.10.1 - B
A WET VENTED BATHROOM GROUP WITH A 4" CLOSET BEND

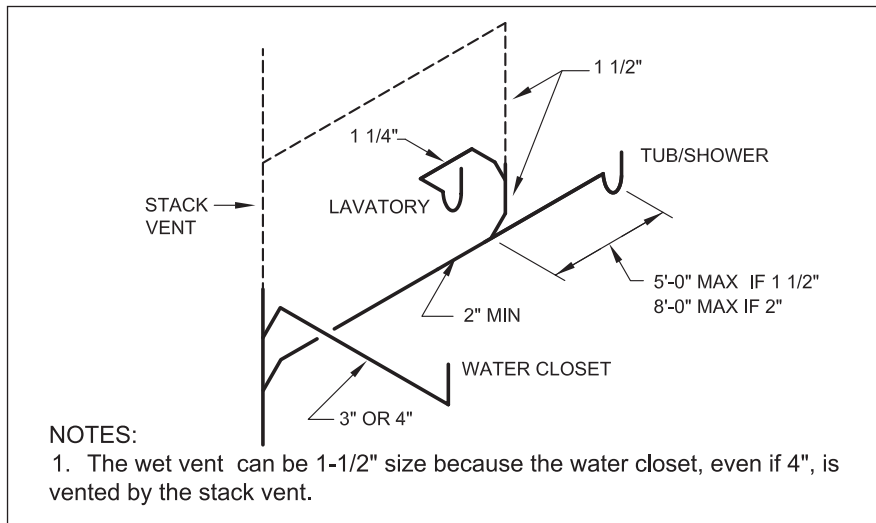


Figure 12.10.1 - C
A WET VENTED BATHROOM GROUP WITH 3" OR 4" CLOSET BEND
(SINGLE STORY OR TOP FLOOR)

12.10.2 Double Bathtubs and Lavatories

Two lavatories and two bathtubs or showers back-to-back may be installed on the same horizontal branch with a common vent for the lavatories and with no back vent for the bathtubs or shower stalls provided the wet vent is 2" in size and the lengths of the tub/shower drains conform to Table 12.8.1. *See Figure 12.10.2*

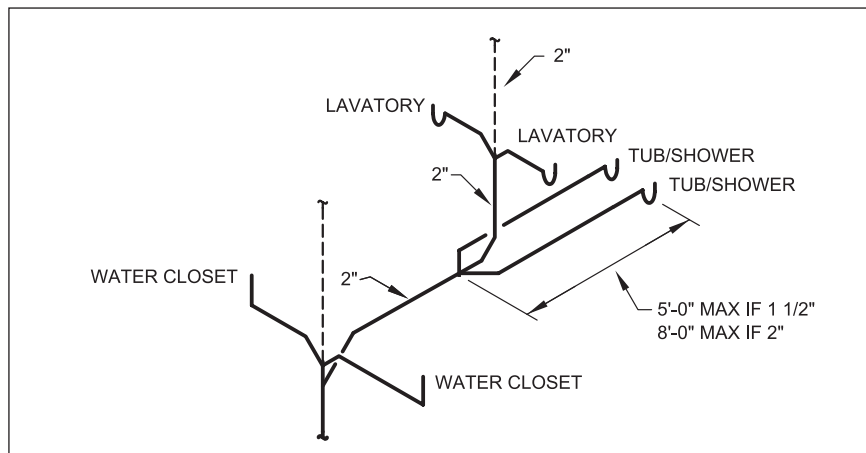


Figure 12.10.2
WET VENTED BACK-TO-BACK BATHROOM GROUPS
(SINGLE STORY OR TOP FLOOR)

12.10.3 Multi-Story Bathroom Groups

a. On the lower floors of a stack, the waste pipe from one or two lavatories may be used as a wet vent for one or two bathtubs or showers as provided in Section 12.10.2.

b. Each water closet below the top floor shall be individually back vented.

EXCEPTION: The water closets in bathroom groups shall not be required to be back vented if the following conditions are met:

(1) The 2" waste serving the tubs/showers and lavatories connect directly into the water closet bend with a 45° wye tap in the direction of flow or,

(2) A special stack fitting is used that consists of a 3" or 4" closet opening and two side inlets each 2" in size and the inverts of which are above the center, and below the top of the water closet opening; and one of the 2" inlets is connected to the tub/shower drains, and the other is connected to the waste pipe from a maximum of two lavatories that are vented to a vent stack or stack vent; or,

(3) In lieu of the special stack fitting of Section 12.10.3b(2) above, 4" closet bends with two 2" wye taps may be used.

See Figures 12.10.3-A through -E

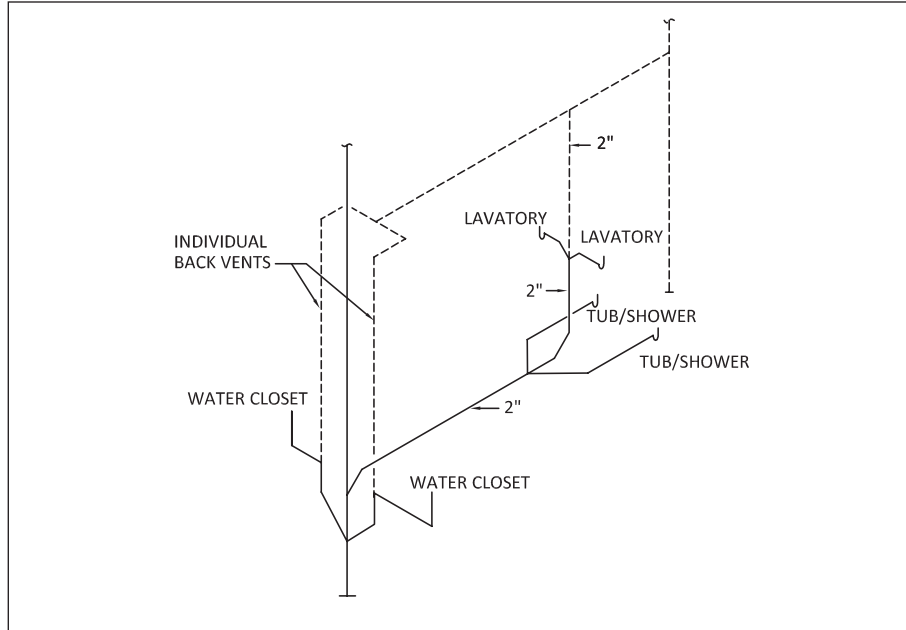


Figure 12.10.3 - A
WET VENTED BACK-TO-BACK BATHROOM GROUPS ON A LOWER FLOOR
WITH BACK VENTED WATER CLOSETS (ONE ARRANGEMENT)

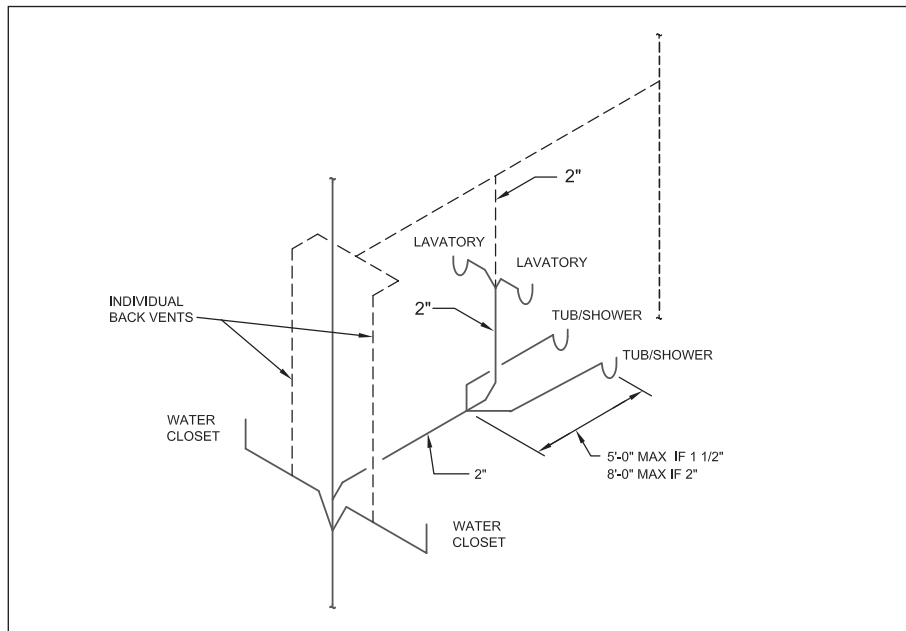
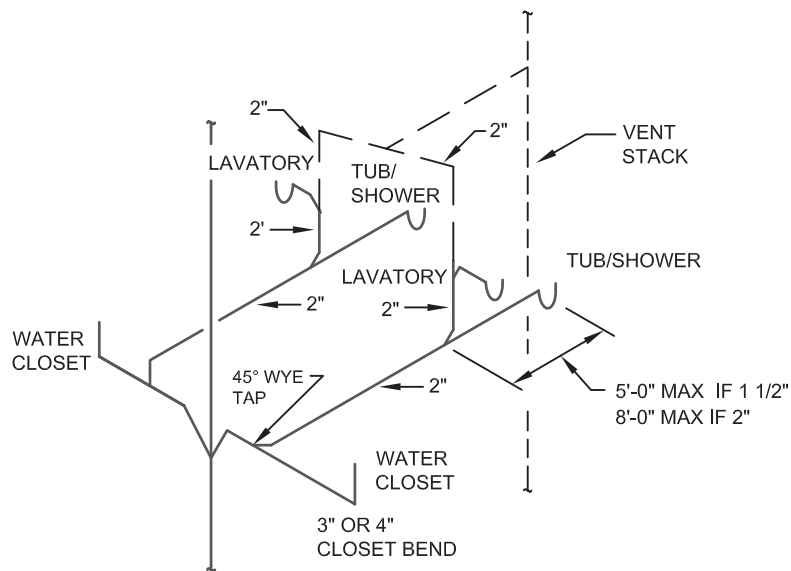


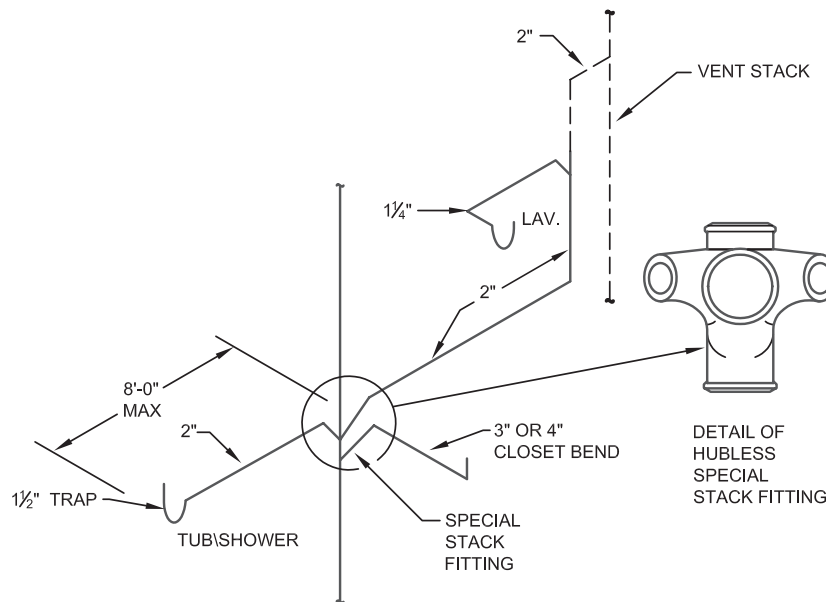
Figure 12.10.3 - B
WET VENTED BACK-TO-BACK BATHROOM GROUPS ON A LOWER FLOOR
WITH BACK VENTED WATER CLOSETS (ANOTHER ARRANGEMENT)



NOTES:

1. This is an example of Exception #1 to Section 12.10.3.
2. Two adjacent bathroom groups are shown but individual bathroom groups can also be wet vented in this manner.
3. A lower floor is shown, but the arrangement can be used at the top of a drain stack.

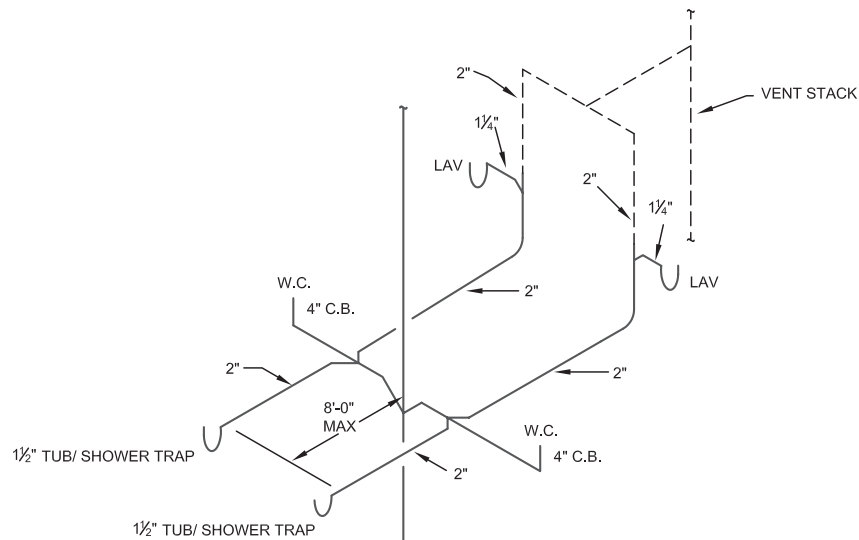
**Figure 12.10.3 - C
ADJACENT BATHROOM GROUPS WET VENTED WITH 45 DEGREE WYE TAPS**



NOTES:

1. This is an example of Exception #2 to Section 12.10.3.
2. The side inlets to the special stack fitting are slightly higher than the water closet connection and the side connection that is wet vented vents all of the fixtures that are connected to the fitting.
3. A lower floor is shown, but the special stack fitting can be used at the top of a stack.

**Figure 12.10.3 - D
A BATHROOM GROUP WET VENTED WITH A SPECIAL STACK FITTING**



NOTES:

1. This is an example of Exception #3 to Section 12.10.3.
2. The oversized 4" water closet fixture drain permits the tub/shower on one side of the drain to be wet vented by the lavatory on the other side of the drain.
3. Two adjacent bathroom groups are shown, but individual bathroom groups can be wet vented in this manner.
4. A lower floor is shown, but the arrangement can be used at the top of a drain stack.

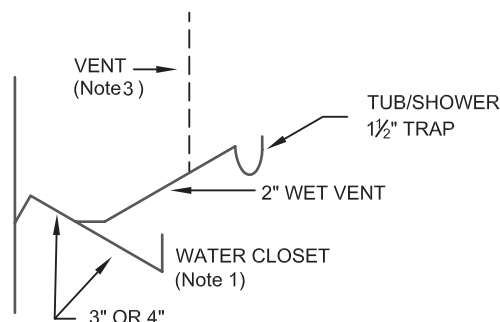
Figure 12.10.3 - E
ADJACENT BATHROOM GROUPS WET VENTED WITH 4" CLOSET BENDS
HAVING TWO 2" WYE TAPS

12.10.4 Bathtubs and Water Closets

a. An individually-vented bathtub in a single bathroom group shall be permitted to serve as a wet vent for the water closet if all of the following conditions are met:

1. The wet vent is 2" minimum size.
2. The distance from the outlet of the water closet to the connection of the wet vent is within the limits established by Section 12.8.4. Otherwise, the water closet shall be individually vented.

See Figure 12.10.4



NOTES:

1. The maximum distance from the water closet outlet to its vent connection is 9 feet horizontal and 3 feet vertical.
2. A lower floor is shown, but the arrangement can be used at top of stack.
3. The vent must be 1 1/2" for a 3" closet bend or 2" for a 4" closet bend.

Figure 12.10.4
A WATER CLOSET WET VENTED BY A BATHTUB

12.10.5 Reserved

12.10.6 Floor Drains and Floor Sinks

- a. A lavatory or sink shall be permitted to serve as a wet vent for a floor drain or floor sink if all of the following conditions are met:
1. The wet vent shall be not less than 1-1/2" size for a 1 DFU lavatory or 2" for a 2 DFU sink.
 2. The wet vent shall be larger than 1/2 the size of the drain for the floor drain or floor sink.
 3. The distance from the outlet of the floor drain or floor sink to the connection of the wet vent shall be within the limits established by Table 12.8.1.

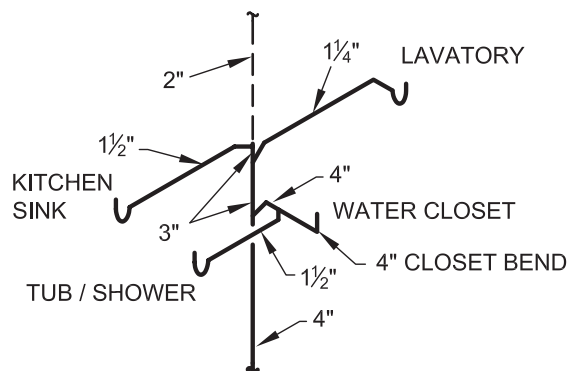
12.11 STACK VENTING

12.11.1 Fixture Groups

a. A single bathroom group and a kitchen sink (with or without a disposer and/or dishwasher) located back-to-back, or two bathroom groups back-to-back may be installed without individual fixture vents in a one-story building or on the highest branch of a stack in a multi-story building provided that the following conditions are met:

1. Each fixture drain connects independently to the stack.
2. The tub and/or shower and water closet enter the stack at the same level.
3. The requirements of Table 12.8.1 are met.
4. A side inlet connection into a 4" closet bend shall be considered to be an independent connection to the stack.

See Figures 12.11.1-A and 12.11.1-B



NOTES:

1. The arrangement shown is permitted in a one-story building or at the top of a stack.
2. Each fixture must connect independently to the stack except that the tub/shower connection to the 4" water closet fixture drain is considered to be a connection to the stack because the 4" drain is oversized for the water closet.
3. The length of all trap arms from their trap weir to their vent opening at the stack must not exceed the limits in Table 12.8.1. The vent distance for the water closet must be in accordance with Section 12.8.4.
4. Bathroom groups without kitchen sinks can also be stack vented as shown.
5. If the drain stack has 5 or more branch intervals, the drain stack and stack vent must be full size of the base of the drain stack or 4" minimum for the branch connection from the water closet and tub/shower.

Figure 12.11.1 - A
STACK VENTING A BATHROOM GROUP AND AN ADJACENT KITCHEN SINK

**National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: April 1, 2022**

Proponent: Norm Dobo Date: 3/30/22

Representing: Myself

Mailing Address: 105 Allen St.

City: Hamilton State: NJ Zip: 08620

Phone: 609-610-3423 E-mail nola10044@aol.com

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: Amend section with this editorial change
 Change subsection to read as follows Delete subsection and substitute as follows
 Add new subsection to read as follows Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: Section 12.20 Air Admittance Valves and Appendix E.8
Delete Section E.8 in entirety.

Add the following Definitions to Chapter 1:

1.2 Definition of Terms

Air Admittance Valve: A one-way valve designed to allow air to enter the plumbing drainage system when negative pressures develop in the system. The device closes by gravity, without springs or other mechanical means, and seals the vent terminal at zero differential pressure (no flow conditions) and also under positive internal pressure. The purposes of an air admittance valve are (1) to provide a method of allowing air to enter the plumbing drainage system without the need for a vent extended outdoors to open air, and (2) to prevent sewer gases from escaping into the building.

Branch Relief Vent: A positive pressure vent pipe from the horizontal connection of a branch drain to a drain stack where the branch drain includes one or more fixtures vented by air admittance valves and the branch drain is more than four (4) branch intervals from the top of the drain stack. It is connected to either (1) a vent stack, (2) the stack vent for the drain stack, or (3) atmospheric vent piping that terminates outdoors in open air.

Add the following standards to Table 18.1:

Table 18.1 Referenced Standards

ASSE 1049-2021 Performance Requirements for individual and Branch Type Air Admittance Valves for Chemical waste Systems.

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC. Rev.2.28.22
2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

ASSE 1050-21 Performance Requirements for Stack Air Admittance Valves for Sanitary Drainage Systems.

ASSE 1051-2021 Performance Requirements for Individual and Branch Type Air Admittance Valves for Sanitary Drainage Systems.

Add new Section 12.20 and renumber remaining sections.

12.20 AIR ADMITTANCE VALVES

12.20.1 Where Permitted

Air admittance valves shall be permitted in the following plumbing vent applications, subject to the DFU limits in ASSE 1050 and ASSE 1051, and other requirements of Section 12.20:

- a. Individual, continuous, and common vents shall be permitted to be terminated with an air admittance valve complying with ASSE 1049 (Chemical Waste) or ASSE 1051.
- b. Branch, circuit, loop, and group vents shall be permitted to be terminated with an air admittance valve complying with ASSE 1049 (Chemical Waste) or ASSE 1051.
- c. Stack vents for drain stacks having not more than six (6) branch intervals shall be permitted to be terminated with a stack type air admittance valve complying with ASSE 1050.

12.20.2 Where Not Permitted

Air admittance valves shall not be permitted in the following applications:

- a. vent stacks for drain stacks.
- b. branch relief vents required by Section 12.20.3.
- c. stack vents for drain stacks having more than six (6) branch intervals.
- d. vents for pneumatic sewage ejectors. (Section 12.14.3)
- e. suds pressure zone venting. (Section 12.15)
- f. relief vents required by Section 12.20.3.1.
- g. in locations not accessible (Section 1.2 - Accessible).
- h. where the drainage load (DFU) being vented exceeds the required capacities of air admittance valves in ASSE 1049, ASSE 1050 and ASSE 1051.

Comment: The DFU capacity of some ASSE air admittance valves is less than the maximum DFU capacity of some horizontal drain piping at various slopes.

12.20.3 Branch Relief Vents for Positive Pressure

12.20.3.1: A branch relief vent shall be provided where a drain stack has a branch connection that is more than four (4) branch intervals from the top of the drain stack and serves one or more fixtures that are vented by air admittance valves. The branch relief vent shall connect vertically to the branch connection of the drain stack. Branch relief vents shall be connected to the vent stack or stack vent for their drain stack or they shall be connected to vent piping that is extended to an outdoor vent terminal.

12.20.3.2 Branch relief vents shall be the full size of the drain stack branch connection that they are connected to, up to 3" maximum required size for the vent. Branch relief vent piping connecting multiple branch relief vents shall be sized equal to its largest branch vent connection. Branch relief vent piping shall not affect the size of vent stacks or stack vents that it is connected to.

12.20.4 Installation

12.20.4.1 Air admittance valves shall be installed in accordance with the manufacturer's instructions and Section 12.20.

12.20.4.2 Air admittance valves shall connect to fixture trap arms within the maximum allowable trap arm lengths in Table 12.8.1.

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

- 12.20.4.3 Individual and branch type air admittance valves shall be installed at least 4 inches above the top of the trap arm or horizontal drain piping that they serve.
- 12.20.4.4 Stack type air admittance valves shall be installed at least 6 inches above the flood level rim of the highest fixture served by the valve.
- 12.20.4.5 Air admittance valves shall be installed in accessible locations having free movement of air to enter the valve.
- 12.20.4.6 Air admittance valves shall not be installed in HVAC supply or return air plenums or other areas subject to other than atmospheric pressure.
- 12.20.4.7 Air admittance valves shall be sized based on the total drainage fixture units (DFU) being vented. Vent pipes shall be not less than one-half the size of the drain pipe being vented. Air admittance valves may be adapted to the pipe size of the installed vent pipe.
- 12.20.4.8 Air admittance valves shall not be installed until all required pressure tests of the drainage and vent piping are successfully completed.

12.20.5 Vent to Outdoors Required

- 12.20.5.1 Where a plumbing drainage system is vented by one or more air admittance valves, at least one vent pipe shall extend to an outdoor vent terminal complying with Section 12.4. Outdoor venting shall comply with either Section 12.20.5.2 or 12.20.5.3.
- 12.20.5.2 The aggregate size of the outdoor vent terminals shall comply with Section 12.16.8 unless the building drain is vented in accordance with Section 12.20.5.3.
- 12.20.5.3 Where the aggregate size of outdoor vent terminals does not comply with Section 12.20.5.2, a dry vent shall be provided downstream from the last fixture connection, branch connection, or stack connection to the building drain before the connection of the building drain to the building sewer. The vent shall be not less than one-half the pipe size of the building drain.

~~12.20~~ **12.21 OTHER DESIGNS**

Venting systems not described in this Code ~~may~~ shall be permitted by the Authority Having Jurisdiction if ~~they~~ the systems provide the protection required by Section 12.2.1 and are individually designed by a licensed professional engineer. *See Appendix E – SPECIAL DESIGN PLUMBING SYSTEMS.*

Basis/Reason for Change:

This proposal recommends moving Section E.8 out of the Appendix and into the body of the code in Chapter 12. AAV systems are not considered special design plumbing systems. They are one of the many methods allowed in Chapter 12 and meet the protection requirements in Section 12.2.1.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC. Rev.2.28.22
 2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: March 1, 2022

24 - 60

Proponent: Michael Cudahy

Date: January 20th, 2022

Representing: Plastic Pipe and Fittings Association (PPFA)

Mailing Address: 800 Roosevelt Road, Bldg C Ste 312

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Phone: 630 363 7933 E-mail mikec@cmservices.com

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: Amend section with this editorial change

Change subsection to read as follows Delete subsection and substitute as follows

Add new subsection to read as follows Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: Table 18.1

Add

ASTM F3347-2021, "Metal Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Crosslinked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing" – Table 3.1.3-III, Table 3.4, Table 3.4.3

ASTM F3348-2021a, "Plastic Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PERT) Tubing" – Table 3.1.3-III, Table 3.4, Table 3.4.3

Basis/Reason for Change:

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 Referenced standards table.

Vote: Accept Accept as Amended

Accept in Part Accept in Principle Accept in Part and Principle

Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

Rev.12.9.21

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code 2024 Proposed Code Change Form Deadline: March 1, 2022

24 - 61

Proponent: Don Jones

Date: 2/20/2022

Representing: Self

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State: NJ

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IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

Amend section with this editorial change

Change subsection to read as follows

Delete subsection and substitute as follows

Add new subsection to read as follows

Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: Table 18.1 Referenced Standards

Add the underlined sections to the existing list--

Standard Number	Standard Title	2024 NSPC
ASME A112.4.1	Water Heater Relief Valve Drain Tubes...	<u>10.16.6</u>
ASME A112.6.4	Roof, Deck, and Balcony Drains	<u>3.3.9</u>
ASME BPVC-IV	Boiler and Pressure Vessel Code...	<u>3.3.8</u>
ASME BPVC-VIII	Rules for Construction of Pressure...	<u>3.3.8</u>
ASSE 1001	Performance Requirements for Atmospheric...	<u>7.7.2</u>
CSA B64	Backflow Preventers and Vacuum...	<u>7.7.2</u>

Basis/Reason for Change:

The above Standards are referenced in the body of the NSPC but are omitted from the list in Chapter 18.

Vote: Accept Accept as Amended

Accept in Part Accept in Principle Accept in Part and Principle

Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

Rev.12.9.21

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

**National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: March 1, 2022**

24 - 62

Proponent: Don Jones

Date: 2/25/2022

Representing: Self

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IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: Amend section with this editorial change
 Change subsection to read as follows Delete subsection and substitute as follows
 Add new subsection to read as follows Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: Table 18.1 Referenced Standards

Add the underlined section to the existing list--

Standard Number	Standard Title	2024 NSPC
ASME A112.6.3	Floor and Trench Drains	<u>7.11.5</u>

Basis/Reason for Change:

The above Standard is referenced in the body of the NSPC but omitted from the list in Chapter 18.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC. Rev.12.9.21
2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

**National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: March 1, 2022**

24 - 63

Proponent: NSPC Staff Date: 02-20-2022

Representing: NSPC Committee

Mailing Address: 18927 Hickory Creek Drive, Suite 220

City: Mokena State: IL Zip: 60448

Phone: 1-909-472-4100 E-mail nspc@iapmo.org

IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply: Amend section with this editorial change

Change subsection to read as follows Delete subsection and substitute as follows

Add new subsection to read as follows Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: TABLE 18.1 REFERENCED STANDARDS

UPDATES FOR REFERENCED STANDARDS IN 2024 NSPC TABLE 18.1

See the following pages for changes.

Basis/Reason for Change:

To update, and make current, all of the information in Table 18.1 for the 2024 NSPC.

Vote: Accept Accept as Amended

Accept in Part Accept in Principle Accept in Part and Principle

Defeated Failed Lack of Second Tabled Withdrawn Other

-
- 1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.
 - 2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

Table 18.1 REFERENCED STANDARDS		
Standard Number	Standard Title	Note
ANSI/AHAM DW- 1-2010 <u>2-2020</u>	Household Electric Dishwashers	Year & title updated; standard received
AHAM FWD- 1-2016 <u>2-2021</u>	<u>Method for Measuring Performance of Household</u> Food Waste Disposers	Year & title updated; standard received
AHAM HLW- 1-2016 <u>2-2020</u>	Performance Evaluation Procedures for Household Clothes Washers	Year & title updated; standard received
ANSI/PSAI Z4.3-2016	Sanitation – Non-sewered <u>Sewered</u> Waste-Disposal Systems; – Minimum Requirements	Title updated; standard received No update to year per promulgator.
<u>CSA/ANSI Z21.10.1-2019/CSA 4.1-2017</u> <u>2019</u>	Gas Water Heaters, –Volume I, Storage Water Heaters with Input Ratings of 75,000 Btu per Hour or Less	Year & title updated; standard received
<u>CSA/ANSI Z21.10.3-2019/CSA 4.3-2017</u> <u>2019</u>	Gas-Fired Water Heaters, –Volume III, Storage Water Heaters with Input Ratings above 75,000 Btu Per Hour, Circulating and Instantaneous	Year & title updated; standard received
ANSI Z21.22- <u>2015/CSA 4.4-2015</u> <u>(R2020)</u>	Relief Valves for Hot Water Supply Systems	Year updated; standard received
ANSI/ISEA Z358.1 - 2014	American National Standard for Emergency Eyewash and Shower Equipment	No change
ASHRAE Standard 18 – 2008 (R2013)	Methods of Testing for Rating Drinking Water Coolers with Self-Contained Mechanical Refrigeration WITHDRAWN BY ASHRAE <u>SEE EMAIL 11.19.21</u>	No update; Standard withdrawn by ASHRAE
ASME A13.1 – 2015 <u>2020</u>	Scheme for the Identification of Piping Systems	Year updated; standard received
ASME A112.1.2 - 2012(R2017)	Air Gaps in Plumbing Systems (for Plumbing Fixtures and Water-Connected Receptors)	No change
ASME A112.1.3 - 2000(R2015) <u>(R2019)</u>	Air Gap Fittings for Use with Plumbing Fixtures, Appliances, and Appurtenances	Year updated; standard received
ASME A112.3.1 – 2007(R2017)	Stainless Steel Drainage Systems for Sanitary DWV, Storm, and Vacuum Applications, Above- and Below-Ground	No change
ASME A112.3.4 - 2018	Macerating Toilet Systems and Waste-Pumping Systems for Plumbing Fixtures	No change
ASME A112.4.1 - 2009(R2014) <u>(R2019)</u>	Water Heater Relief Valve Drain Tubes	Year updated; standard received
ASME A112.4.2/CSA B45.16 – 2015 <u>ASME A112.4.2-2021/CSA B45.16-2021</u>	Personal Hygiene Devices for Water Closets	Year updated; standard received
ASME A112.4.3 - 1999(R2015) <u>(R2019)</u>	Plastic Fittings for Connecting Water Closets to the Sanitary Drainage System	Year updated; standard received
ASME A112.4.14/CSA B125.14-2017	Manually Operated, Quarter-Turn Shutoff Valves for Use in Plumbing Systems	Title update, standard received
ASME A112.6.1M - 1997 (R2017)	Floor- Affixed Supports for Off-the-Floor Plumbing Fixtures for Public Use	No change
ASME A112.6.2 - 2017	Framing-Affixed Supports (Carriers) for Off-the-Floor Plumbing Fixtures	No change
ASME A112.6.3 – 2016 <u>2019</u>	Floor and Trench Drains	Year updated; standard received
ASME A112.6.4 - 2003(R2012)	Roof, Deck, and Balcony Drains	No change
ASME A112.6.7 - 2010 (R2015) <u>(R2019)</u>	Sanitary Floor Sinks	Year updated; standard received
ASME A112.14.1 - 2003 (R2017)	Backwater Valves	No change
ASME A112.14.3 - 2000 (R2014) <u>2018</u>	<u>Hydromechanical</u> Grease Interceptors	Year & title updated; standard received
ASME A112.14.4 - 2001 (R2017)	Grease Removal Devices- (GRD)	No change
ASME A112.14.6 - 2010 (R2015) <u>(R2019)</u>	FOG (Fats, Oils, and Greases) Disposal Systems	Year updated; standard received
ASME A112.18.1/CSA B125.1-2018	Plumbing Supply Fittings	No change

Table 18.1 REFERENCED STANDARDS		
Standard Number	Standard Title	Note
ASME A112.18.2- 2020 /CSA B125.2 - 2015 2020	Plumbing Waste Fittings	Year updated; standard received
ASME A112.18.3 - 2002 (R2017)	Performance Requirements for Backflow Protection Devices and Systems in Plumbing Fixture Fittings	No change
ASME A112.18.6/CSA B125.6 -2017	Flexible Water Connectors	No change
ASME A112.18.9 - 2017 2011 (R2017)	Protectors/Insulators for Exposed Waste and Supplies on Accessible Fixtures	No change the table shows Standard Number incorrectly. standard received
ASME A112.19.1/CSA B45.2-2018	Enameled Cast Iron and Enameled Steel Plumbing Fixtures	No change
ASME A112.19.2/CSA B45.1 - 2018	Ceramic Plumbing Fixtures	No change
ASME A112.19.3/CSA B45.4 - 2017	Stainless Steel Plumbing Fixtures	No change
ASME A112.19.5/CSA B45.15 - 2017	Flush Valves and Spuds for Water Closets, Urinals, and Tanks	No change
ASME A112.19.7- 2020 /CSA B45.10 - 2012 (R2017) 2020	Hydromassage Bathtub Systems	Year updated; standard received
ASME A112.19.10 - 2017	Retrofit Dual Flush Devices for Water Closets	No change
ASME A112.19.12 – 2014 (R2019)	Wall Mounted, Pedestal Mounted, Adjustable, Elevated Elevating, Tilting, and Pivoting Lavatory, Sink, and Shampoo Bowl Carrier Systems and Drain Waste Systems	Year & title updated; standard received
ASME A112.19.14 – 2018 2013 (R2018)	Six-Liter Water Closets Equipped with a Dual Flushing Device	No change, the table shows Standard Number incorrectly. standard received
ASME A112.19.15 – 2017 2012 (R2017)	Bathtubs/Whirlpool Bathtubs with Pressure Sealed Doors	No change, the table shows Standard Number incorrectly. standard received
ASME A112.19.17 – 2018 2010 (R2018)	Manufactured Safety Vacuum Release Systems (SVRS) for Residential and Commercial Swimming Pool, Spa, Hot Tub, and Wading Pool Suction Systems	No change, the table shows Standard Number incorrectly. standard received
ASME A112.19.19 – 2016 (R2021)	Vitreous China Nonwater Urinals	Year updated; standard received
ASME A112.36.2M - 1991 (R2017)	Cleanouts	No change
ASME A112.1002—2015 ASSE 1002-2020/ASME A112.1002-2020/CSA B125.12-2020	Anti-Siphon Fill Valves for Water Closet Tanks	Year updated; standard received
ASME B1.20.1 - 2013 (R2018)	Pipe Threads, General Purpose (Inch)	No change
ASME B16.3 - 2016	Malleable Iron Threaded Fittings: Classes 150 and 300	No change
ASME B16.4 - 2016	Gray Iron Threaded Fittings: Classes 125 and 250	No change
ASME B16.5 – 2017 2020	Pipe Flanges and Flanged Fittings: NPS 1/2 through NPS 24 Metric/ Inch Standard	Year updated; standard received
ASME B16.12 - 2009 (R2014) 2019	Cast Iron Threaded Drainage Fittings	Year updated; standard received
ASME B16.14 - 2018	Ferrous Pipe Plugs, Bushings, and Locknuts with Pipe Threads	No change
ASME B16.15 - 2018	Cast Copper Alloy Threaded Fittings: Classes 125 and 250	No change
ASME B16.18 - 2018	Cast Copper Alloy Solder Joint Pressure Fittings	No change
ASME B16.22 - 2018	Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings	No change
ASME B16.23 - 2016	Cast Copper Alloy Solder Joint Drainage Fittings: DWV	No change
ASME B16.24 - 2016	Cast Copper Alloy Pipe Flanges, Flanged Fittings, and Valves:Classes 150, 300, 600, 900, 1500, and 2500	No change
ASME B16.26 - 2018	Cast Copper Alloy Fittings for Flared Copper Tubes	No change

Table 18.1 REFERENCED STANDARDS		
Standard Number	Standard Title	Note
ASME B16.29 - 2017	Wrought Copper and Wrought Copper Alloy Solder-Joint Drainage Fittings - DWV	No change
ASME B16.50 - 2018	Wrought Copper and Copper Alloy Braze-Joint Pressure Fittings	No change
ASME B16.51 - 2018	Copper and Copper Alloy Press-Connect Pressure Fittings	No change
ASME BPVC Section-IV - 2017 <u>2021</u>	Boiler and Pressure Vessel Code Section IV: Rules for Construction of Heating Boilers	Year & title updated; standard received
ASME BPVC Section-VIII.1 - 2017 <u>2021</u>	Rules for Construction of Pressure Vessels Division 1	Year & title updated; standard received
ASME CSD-1 – 2018	Controls and Safety Devices for Automatically Fired Boilers	No change
ASSE 1001-2017	Performance Requirements for Atmospheric Type Vacuum Breakers	No change
ASSE 1002- 2020 /ASME A112.1002- 2020 /CSA B125.12- 2015 <u>2020</u>	Anti-Siphon Fill Valves for Water Closet Tanks	Year updated; standard received
ASSE 1003 – 2009 <u>2020</u> ²	Performance Requirements for Water Pressure Reducing Valves for Domestic Potable Water Distribution Systems	Year & title updated; standard received
ASSE 1004 - 2017	Backflow Prevention Performance Requirements for Commercial Dishwashing Machines	Title updated; standard received
ASSE 1008 – 2006 <u>2020</u>	Performance Requirements for Plumbing Aspects of Residential Food Waste Disposer Units	Year updated; standard received
ASSE 1010 - 2004	Performance Requirements for Water Hammer Arresters	No change
ASSE 1011 - 2017	Performance Requirements for Hose Connection Vacuum Breakers	No change
ASSE 1012 – 2009	Performance Requirements for Backflow Preventers with an Intermediate Atmospheric Vent	No change
ASSE 1013 – 2011 <u>2021</u>	Performance Requirements for Reduced Pressure Principle Backflow Preventers and Reduced Pressure Principle Fire Protection Backflow Preventers-Prevention Assemblies	Year & title updated; standard received
ASSE 1014 – 2005 <u>2020</u>	Performance Requirements for Backflow Prevention Devices for Hand- H held Showers	Year & title updated; standard received
ASSE 1015 – 2011 <u>2021</u>	Performance Requirements for Double Check Backflow Prevention Assemblies and Double Check Fire Protection Backflow Prevention Assemblies	Year & title updated; standard received
ASSE 1016- 2017 /ASME A112.1016- 2017 /CSA B125.16 - 2017	Performance Requirements for Automatic Compensating Valves for Individual Showers and Tub/Shower Combinations	Editorial change in year only
ASSE 1017 - 2009	Performance Requirements for Temperature Actuated Mixing Valves for Hot Water Distribution Systems	No change
ASSE 1018 – 2001 (<u>R2021</u>)	Performance Requirements for Trap Seal Primer Valves – Potable Water Supplied	Year updated; standard received
ASSE 1019 – 2016 <u>2011</u> (<u>R2016</u>)	Performance Requirements for Wall Hydrants with Backflow Protection and Freeze Resistance	Year & title updated; standard received
ASSE 1020 – 2004 <u>2020</u>	Performance Requirements for Pressure Vacuum Breaker Assembly-Assemblies	Year & title updated; standard received
ASSE 1021 - 2001	Performance Requirements for Drain Air Gaps for Domestic Dishwasher Applications (<u>with Errata dated January 2, 2003</u>)	Title updated; standard received
ASSE 1022 – 2003 <u>2021</u>	Performance Requirements for Backflow Preventer for Beverage Dispensing Equipment	Year updated; standard received
ASSE 1023 – 2019 <u>2020</u>	Performance Requirements for Electrically Heated or Cooled Water Dispensers	Year updated; standard received
ASSE 1024 – 2004 <u>2017</u> (<u>R2021</u>)	Performance Requirements for Dual Check Backflow Preventers	Year updated; standard received
ASSE 1032 - 2004 (R2011) (<u>R2021</u>)	Performance Requirements for Dual Check Valve Type Backflow Preventers for Carbonated Beverage Dispensers, –Post Mix Type	Year & title updated; standard received
ASSE 1035 – 2008 <u>2020</u>	Performance Requirements for Laboratory Faucet Backflow Preventers	Year updated; standard received
ASSE 1037- 2020 /ASME A112.1037- 2020 /CSA B125.37- 2015 <u>2020</u>	Performance Requirements for Pressurized Flushing Devices for Plumbing Fixtures	Year updated; standard received
ASSE 1044 – 2015 (<u>R2020</u>)	Performance Requirements for Trap Seal Primer – Drainage Types and Electric Design Types	Year updated; standard received

Table 18.1 REFERENCED STANDARDS		
Standard Number	Standard Title	Note
ASSE 1047 – 2011 <u>2021</u>	Performance Requirements for Reduced Pressure Detector Fire-Protection Backflow Prevention Assemblies	Year & title updated; standard received
ASSE 1048 - 2011 <u>2021</u>	Performance Requirements for Double Check Detector Fire-Protection Backflow Prevention Assemblies	Year & title updated; standard received
ASSE 1052 - 2016	Performance Requirements for Hose Connection Backflow Preventers	No change
ASSE 1053 – 2004 <u>2019</u>	Performance Requirements for Dual Check Backflow Preventer Wall Hydrants – Freeze Resistant Type	Year updated; standard received
<u>ANSI/CAN/ASSE/IAPMO 1055 – 2018 2020</u>	Performance Requirements for Chemical Dispensing Systems-Dispensers with Integral Backflow Protection	Year & title updated; standard received
ASSE 1056 – 2013 (<u>R2021</u>)	Performance Requirements for Spill Resistant Vacuum Breaker Assemblies	Year updated; standard received
ASSE 1057 - 2012	Performance Requirements for Freeze Resistant Sanitary Yard Hydrants with Backflow Protection	No change
ASSE 1060 - 2017	Performance Requirements for Outdoor Enclosures for Fluid Conveying Components (<u>with Errata dated February 1, 2019</u>)	Title updated; standard received
ASSE 1061 – 2015 <u>2020</u>	Performance Requirements for Push-Fit Fittings	Year updated; standard received
ASSE 1062 – 2017 (<u>R2021</u>)	Performance Requirements for Temperature Actuated, Flow Reduction (TAFR) Valves for Individual Supply Fittings	Year updated; standard received
ASSE 1066 - 1997	Performance Requirements for Individual Pressure Balancing In-Line Valves for Individual Fixture Fittings	No change
ASSE 1069 – 2005 <u>2020</u>	Performance Requirements for Automatic Temperature Control Mixing Valves	Year updated; standard received
ASSE 1070- 2020 /ASME A112.1070- 2020 /CSA B125.70 – 2015 <u>2020</u>	Performance Requirements for Water Temperature Limiting Devices	Year updated; standard received
ASSE 1071 – 2012 (<u>R2021</u>)	Performance Requirements for Temperature Actuated Mixing Valves for Plumbed Emergency Equipment	Year updated; standard received
ASSE 1072 – 2007 <u>2020</u>	Performance Requirements for Barrier Type Floor Drain Trap Seal Protection Devices for Floor Drains	Year & title updated; standard received
ASSE 1079 – 2012 (<u>R2021</u>)	Performance Requirements for Dielectric Pipe Unions	Year updated; standard received
ASSE/IAPMO/ANSI Series 5000 - 2015	Cross-Connection Control Professional Qualifications Standard	No change
ASSE/IAPMO/ANSI Series 6000 – 2015 <u>2021</u>	Professional Qualifications Standard for Medical Gas Systems Personnel	Year updated; standard received
ASTM A53/A53M – 2018 <u>2020</u>	Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless	Year updated; standard received
ASTM A74 – 2017 <u>2021</u>	Standard Specification for Cast Iron Soil Pipe and Fittings	Year updated; standard received
ASTM A269 - 15a (2019)	Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service	No change
ASTM A312/A312M - 2016a <u>2021</u>	Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes	Year updated; standard received
ASTM A377 - 2018	Standard Index of Specifications for Ductile-Iron Pressure Pipe	No change
ASTM A554 – 2016 <u>2021</u>	Standard Specification for Welded Stainless Steel Mechanical Tubing	Year updated; standard received
ASTM A716 - 2018	Standard Specification for Ductile Iron Culvert Pipe	No change
ASTM A746 - 2018	Standard Specification for Ductile Iron Gravity Sewer Pipe	No change
ASTM A778/A778M – 2015 <u>2016 (R2021)</u>	Standard Specification for Welded, Unannealed Austenitic Stainless Steel Tubular Products	Year updated; standard received
ASTM A888 - 2018a <u>2021a</u>	Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications	Year updated; standard received
ASTM A1056 - 2012(R2017) <u>2020</u>	Standard Specification for Cast Iron Couplings for Joining Hubless Cast Iron Soil Pipe and Fittings	Year updated; standard received
ASTM B29 - 2014 <u>2019</u>	Standard Specification for Reined Lead	Year updated; standard received
ASTM B32 - 2008 (R2014) <u>2020</u>	Standard Specification for Solder Metal	Year updated; standard received

Table 18.1 REFERENCED STANDARDS		
Standard Number	Standard Title	Note
ASTM B43 – 2015 2020	Standard Specification for Seamless Red Brass Pipe, Standard Sizes	Year updated; standard received
ASTM B88 – 2016 2020	Standard Specification for Seamless Copper Water Tube	Year updated; standard received
ASTM B302 - 2017	Standard Specification for Threadless Copper Pipe, Standard Sizes	No change
ASTM B306 – 2013 2020	Standard Specification for Copper Drainage Tube (DWV)	Year updated; standard received
ASTM B813 - 2016	Standard Specification for Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube	No change
ASTM B828 - 2016	Standard Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings	No change
ASTM C4 - 2004 (R2018)	Standard Specification for Clay Drain Tile and Perforated Clay Drain Tile	No change
ASTM C12 – 2017 2021	Standard Practice for Installing Vitrified Clay Pipe Lines	Year updated; standard received
ASTM C14 - 2015a 2020	Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe	Year updated; standard received
ASTM C76 – 2019 2020	Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe	Year updated; standard received
ASTM C412 – 2015 2019	Standard Specification for Concrete Drain Tile	Year updated; standard received
ASTM C425 - 2004(R2018) 2021	Standard Specification for Compression Joints for Vitrified Clay Pipe and Fittings	Year updated; standard received
ASTM C443 - 2012(R2017) 2020	Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets	Year updated; standard received
ASTM C444/C444M – 2017 2021	Standard Specification for Perforated Concrete Pipe	Year updated; standard received
ASTM C564 – 2014 2020a	Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings	Year updated; standard received
ASTM C700 - 2018	Standard Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated	No change
ASTM C1173 - 2018	Standard Specification for Flexible Transition Couplings for Underground Piping Systems	No change
ASTM C1277 – 2018 2020	Standard Specification for Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings	Year updated; standard received
ASTM C1460 – 2017 2021	Standard Specification for Shielded Transition Couplings for Use With Dissimilar DWV Pipe and Fittings Above Ground	Year updated; standard received
ASTM C1461 - 2008(R2017) 2021	Standard Specification for Mechanical Couplings Using Thermoplastic Elastomeric (TPE) Gaskets for Joining Drain, Waste, and Vent (DWV), Sewer, Sanitary, and Storm Plumbing Systems for Above and Below Ground Use	Year updated; standard received
ASTM C1540 – 2018 2020	Standard Specification for Heavy Duty Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings	Year updated; standard received
ASTM C1822- 2015 2021	Insulating Covers on Accessible Lavatory Piping	Year updated; standard received
ASTM D1330 - 2004(R2015)e1	Standard Specification for Rubber Sheet Gaskets	No change
ASTM D1785 - 2015e1 2021a	Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120	Year updated; standard received
ASTM D2235 - 2004(R2016)	Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings	No change
ASTM D2239 - 2012a 2021	Standard Specification for Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter	Year updated; standard received
ASTM D2241 – 2015 2020	Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)	Year updated; standard received
ASTM D2321 – 2018 2020	Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications	Year updated; standard received
ASTM D2464 - 2015	Standard Specification for Threaded Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80	No change

Table 18.1 REFERENCED STANDARDS		
Standard Number	Standard Title	Note
ASTM D2466 – 2015 2021	Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40	Year updated; standard received
ASTM D2467 – 2015 2020	Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80	Year updated; standard received
ASTM D2564 - 2012(R2018) 2020	Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems	Year updated; standard received
ASTM D2609 – 2015 2021	Standard Specification for Plastic Insert Fittings for Polyethylene (PE) Plastic Pipe	Year updated; standard received
ASTM D2657 - 2007(R2015)	Standard Practice for Heat Fusion Joining of Polyolefin Pipe and Fittings	No change
ASTM D2661 - 2014e1	Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe and Fittings	No change
ASTM D2665 – 2014 2020	Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings	Year updated; standard received
ASTM D2672 – 2014 2020e1	Standard Specification for Joints for IPS PVC Pipe Using Solvent Cement	Year updated; standard received
ASTM D2680 - 2001(R2014) 2020	Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly(Vinyl Chloride) (PVC) Composite Sewer Piping	Year updated; standard received
ASTM D2683 – 2014 2020	Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing	Year updated; standard received
ASTM D2729 - 2017	Standard Specification for Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings	No change
ASTM D2737 - 2012a 2021	Standard Specification for Polyethylene (PE) Plastic Tubing	Year updated; standard received
ASTM D2774 – 2012 2021a	Standard Practice for Underground Installation of Thermoplastic Pressure Piping	Year updated; standard received
ASTM D2846/D2846M –2019a	Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Hot- and Cold-Water Distribution Systems	Year updated; standard received
ASTM D2852 - 2016	Standard Specification for Styrene-Rubber (SR) Plastic Drain Pipe and Fittings	No change
ASTM D2855 – 2015 2020	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	Year updated; standard received
ASTM D2949 - 2018	Standard Specification for 3.25-in. Outside Diameter Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings	No change
ASTM D3034 - 2016	Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings	No change
ASTM D3035 – 2015 2021	Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter	Year updated; standard received
ASTM D3122 - 2015	Standard Specification for Solvent Cements for Styrene-Rubber (SR) Plastic Pipe and Fittings	No change
ASTM D3138 - 2004(R2016)	Standard Specification for Solvent Cements for Transition Joints Between Acrylonitrile-Butadiene-Styrene (ABS) and Poly(Vinyl Chloride)(PVC) Non-Pressure Piping Components	No change
ASTM D3139 - 1998(R2011) 2019	Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals	Year updated; standard received
ASTM D3212 - 2007(R2013) 2020	Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals	Year updated; standard received
ASTM D3261 - 2016	Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing	No change
ASTM D3262 – 2016 2020	Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer Pipe	Year updated; standard received
ASTM D3311 - 2017	Standard Specification for Drain, Waste, and Vent (DWV) Plastic Fittings Patterns	No change
ASTM D3517 – 2014 2019	Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pressure Pipe	Year updated; standard received

Table 18.1 REFERENCED STANDARDS		
Standard Number	Standard Title	Note
ASTM D3840 – 2014 <u>2019</u>	Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Fittings for Non-Pressure Applications	Year updated; standard received
ASTM D4068 - 2017	Standard Specification for Chlorinated Polyethylene (CPE) Sheeting for Concealed Water-Containment Membrane	No change
ASTM D4551 - 2017	Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Flexible Concealed Water-Containment Membrane	No change
ASTM F402 - 2018	Standard Practice for Safe Handling of Solvent Cements, Primers, and Cleaners Used for Joining Thermoplastic Pipe and Fittings	No change
ASTM F409 - 2017	Standard Specification for Thermoplastic Accessible and Replaceable Plastic Tube and Tubular Fittings	No change
ASTM F437 – 2015 <u>2021</u>	Standard Specification for Threaded Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80	Year updated; standard received
ASTM F438 - 2017	Standard Specification for Socket-Type Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 40	No change
ASTM F439 – 2013 <u>2019</u>	Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80	Year updated; standard received
ASTM F441/F441M – 2015 <u>2020</u>	Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80	Year updated; standard received
ASTM F442/F422M - 2013e1 <u>2020</u>	Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe (SDR-PR)	Year updated; standard received
ASTM F477 – 2014 (<u>R2021</u>)	Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe	Year updated; standard received
ASTM F481 - 1997(R2014) (<u>R2019</u>)	Standard Practice for Installation of Thermoplastic Pipe and Corrugated Pipe in Septic Tank Leach Fields	Year updated; standard received
ASTM F493 – 2014 <u>2020</u>	Standard Specification for Solvent Cements for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe and Fittings	Year updated; standard received
ASTM F628 – 2013 2012e3 <u>2022</u>	Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe with a Cellular Core	Year updated, Standard received
ASTM F656 – 2015 <u>2021</u>	Standard Specification for Primers for Use in Solvent Cement Joints of Poly(Vinyl Chloride) (PVC) Plastic Pipe and Fittings	Year updated; standard received
ASTM F667/F667M – 2016 (<u>R2021</u>)	Standard Specification for 3 through 24 in. Corrugated Polyethylene Pipe and Fittings	Year updated; standard received
ASTM F714 – 2013 <u>2021a</u>	Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Outside Diameter	Year updated; standard received
ASTM F810 - 2012(R2018)	Standard Specification for Smoothwall Polyethylene (PE) Pipe for Use in Drainage and Waste Disposal Absorption Fields	No change
ASTM F876 – 2017 <u>2020b</u>	Standard Specification for Crosslinked Polyethylene (PEX) Tubing	Year updated; standard received
ASTM F877 – 2018 <u>2020</u>	Standard Specification for Crosslinked Polyethylene (PEX) Hot- and Cold-Water Distribution Systems	Year updated; standard received
ASTM F891 - 2016	Standard Specification for Coextruded Poly(Vinyl Chloride) (PVC) Plastic Pipe with a Cellular Core	No change
ASTM F1055 - 2016a	Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene and Crosslinked Polyethylene (PEX) Pipe and Tubing	No change
ASTM F1281 – 2017 (<u>R2021</u>)e1	Standard Specification for Crosslinked Polyethylene/Aluminum/Crosslinked Polyethylene (PEX-AL-PEX) Pressure Pipe	Year updated; standard received
ASTM F1282 - 2017	Standard Specification for Polyethylene/Aluminum /Polyethylene (PE-AL-PE) Composite Pressure Pipe	No change
ASTM F1290 - 2019	Standard Practice for Electrofusion Joining Polyolefin Pipe and Fittings	No change
ASTM F1336 – 2015 <u>2020</u>	Standard Specification for Poly(Vinyl Chloride) (PVC) Gasketed Sewer Fittings	Year updated; standard received
ASTM F1476 - 2007(R2013) (<u>R2019</u>)	Standard Specification for Performance of Gasketed Mechanical Couplings for Use in Piping Applications	Year updated; standard received
ASTM F1498 - 2008 (R2012)e1(<u>R2020</u>)	Standard Specification for Taper Pipe Threads 60° for Thermoplastic Pipe and Fittings	Year updated; standard received

Table 18.1 REFERENCED STANDARDS		
Standard Number	Standard Title	Note
ASTM F1548 - 2001(R2018)	Standard Specification for Performance of Fittings for Use with Gasketed Mechanical Couplings Used in Piping Applications	No change
ASTM F1760 – 2016 (R2020)	Standard Specification for Coextruded Poly(Vinyl Chloride) (PVC) Non-Pressure Plastic Pipe Having Reprocessed-Recycled Content	Year updated; standard received
ASTM F1807 - 2018a <u>2019b</u>	Standard Specification for Metal Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing	Year updated; standard received
ASTM F1866 - 2018	Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Schedule 40 Drainage and DWV Fabricated Fittings	No change
ASTM F1960 - 2018a <u>2021</u>	Standard Specification for Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-linked Polyethylene (PEX) and Polyethylene of Raised Temperature (PE-RT) Tubing	Year updated; standard received
ASTM F1970 - 2012e+ <u>2019</u>	Standard Specification for Special Engineered Fittings, Appurtenances or Valves for use in Poly(Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Systems	Year updated; standard received
ASTM F1974 - 2009(R2015) <u>(R2020)</u>	Standard Specification for Metal Insert Fittings for Polyethylene/ Aluminum/Polyethylene and Crosslinked Polyethylene/Aluminum/ Crosslinked Polyethylene Composite Pressure Pipe	Year updated; standard received
ASTM F2014 - 2000(R2013) <u>(R2019)</u>	Standard Specification for Non-Reinforced Extruded Tee Connections for Piping Applications	Year updated; standard received
ASTM F2080 – 2018 <u>2019</u>	Standard Specification for Cold-Expansion Fittings with Metal Compression-Sleeves for Crosslinked Polyethylene (PEX) Pipe and SDR9 Polyethylene of Raised Temperature (PE-RT) Pipe	Year updated; standard received
ASTM F2098 - 2018	Standard Specification for Stainless Steel Clamps for Securing SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) to Metal Insert and Plastic Insert Fittings	No change
ASTM F2159 - 2018a <u>2021</u>	Standard Specification for Plastic Insert Fittings Utilizing a Copper Crimp Ring, <u>or Alternate Stainless Steel Clamps</u> for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing	Year updated; standard received
ASTM F2165 - 2019	Standard Specification for Flexible Pre-Insulated Piping	No change
ASTM F2389 - 2017a <u>2021</u>	Standard Specification for Pressure- R ated Polypropylene (PP) Piping Systems	Year updated; standard received
ASTM F2434 – 2018 <u>2019</u>	Standard Specification for Metal Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Cross-linked Polyethylene/Aluminum/Cross-linked Polyethylene(PEX-AL-PEX) Tubing	Year updated; standard received
ASTM F2618 – 2019 <u>2021</u>	Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Pipe and Fittings for Chemical Waste Drainage Systems	Year updated; standard received
ASTM F2620 – 2019 <u>2020ae1</u>	Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings	Year updated; standard received
ASTM F2735 – 2018 <u>2021</u>	Standard Specification for Plastic Insert Fittings for SDR9 Cross-linked Polyethylene (PEX) and Polyethylene of Raised Temperature (PE-RT) Tubing	Year updated; standard received
ASTM F2769 - 2018	Standard Specification for Polyethylene of Raised Temperature (PE-RT) Plastic Hot and Cold-Water Tubing and Distribution Systems	No change
ASTM F2788/F2788M - 2019 <u>2021</u>	Standard Specification for Metric and Inch-Sized Crosslinked Polyethylene (PEX) Pipe	Year updated; standard received
ASTM F2855 – 2012 <u>2019</u>	Standard Specification for Chlorinated Poly(Vinyl Chloride)/ Aluminum/Chlorinated Poly(Vinyl Chloride) (CPVC-AL-CPVC) Composite Pressure Tubing	Year updated; standard received
ASTM F3226/ <u>F3226M-2019</u>	Standard Specification for Metallic Press-Connect Fittings for Piping and Tubing Systems	Year updated; standard received
AWS A5.8/A5.8M - 2011 <u>AMD1-2019</u>	Specification for Filler Metals for Brazing and Braze Welding	Year updated; standard received
ANSI/AWWA C104/A21.4-2016	Cement-Mortar Lining for Ductile-Iron Pipe and Fittings	NO CHANGE
ANSI/AWWA C110/A21.10-2012	Ductile-Iron and Gray-Iron Fittings	No change

Table 18.1 REFERENCED STANDARDS		
Standard Number	Standard Title	Note
ANSI/AWWA C111/A21.11 - 2017	Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings	No change
ANSI/AWWA C151/A21.51 - 2017	Ductile-Iron Pipe, Centrifugally Cast, for Water	Title updated, standard received
ANSI/AWWA C153/A21.53- 2014 2019	Ductile-Iron Compact Fittings	Year updated; standard received
ANSI/AWWA C500 – 2009 2019	Metal-Seated Gate Valves for Water Supply Service	Year updated; standard received
ANSI/AWWA C510 - 2017	Double Check Valve Backflow Prevention Assembly	No change
ANSI/AWWA C511 - 2017	Reduced Pressure Principle Backflow Prevention Assembly	No change
ANSI/AWWA C600 - 2017	Installation of Ductile-Iron Water Mains and Their Appurtenances	No change
ANSI/AWWA C606 - 2015	Grooved and Shouldered Joints	No change
ANSI/AWWA C800 – 2014 2021	Underground Service Line Valves and Fittings	Year updated; standard received
ANSI/AWWA C900 - 2016	Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 60 In.	No change
ANSI/AWWA C901 – 2017 2020	Polyethylene (PE) Pressure Pipe and Tubing, 1/2 <u>3/4</u> In. Through 3 In. for Water Service	Year updated; standard received
ANSI/AWWA C903 - 2016	Polyethylene-Aluminum-Polyethylene (PE-AL-PE) Composite Pressure Pipe, 1/2 In. through 2 In., for Water Service	No change
ANSI/AWWA C904 - 2016	Cross-linked Polyethylene (PEX) Pressure Tubing, 1/2 In. through 3 In. for Water Service	No change
ANSI/AWWA C906 – 2015 w/erratum-2021	Polyethylene (PE) Pressure Pipe and Fittings, 4 In. through 65 In., for Waterworks	Year updated; standard received
ANSI/AWWA C950 - 2013 w/errata-2020	Fiberglass Pressure Pipe	Year updated; standard received
CISPI 301 - 2018 <u>2021</u>	Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications	Year updated Standard received
CISPI 310 – 2018 <u>2020</u>	Specification for Coupling for Use in Connection with Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications	Year updated; standard received
CSA B45.5- 2017 /IAPMO Z124-2017	Plastic Plumbing Fixtures	No change
CSA B45.8- 2018 /IAPMO Z403 - 2018	Terrazzo, concrete, composite stone, and natural stone plumbing fixtures	No change
CSA B45.11- 2017 /IAPMO Z401 - 2017	Glass plumbing fixtures	No change
CSA B45.12- 2013 /IAPMO Z402-2013 (R2018)	Aluminum and copper plumbing fixtures	Year updated; standard received
CSA B64 Series - 2011 (R2016) 2021	Backflow Preventers and Vacuum Breakers	Year updated; standard received
CSA B79 - 2008 (R2018)	Commercial and Residential Drains and Cleanouts	No change
CSA B125.3 - 2018	Plumbing Fittings	No change
CSA B137.6 – 2017 <u>2020</u>	Chlorinated Polyvinylchloride (CPVC) Pipe, Tubing, and Fittings for Hot- and Cold-Water Distribution Systems	Year updated; standard received
CSA B137.9 – 2017 <u>2020</u>	Polyethylene/Aluminum/Polyethylene (PE-AL-PE) Composite Pressure-Pipe Systems	Year updated; standard received
CSA B137.10 - 2017 <u>2020</u>	Crosslinked Polyethylene/Aluminum/Crosslinked Polyethylene(PEX-AL-PEX) Composite Pressure-Pipe Systems	Year updated; standard received
CSA B137.18 - 2017 <u>2020</u>	Polyethylene of Raised Temperature Resistance (PE-RT) Tubing Systems for Pressure Applications	Year updated; standard received
CSA B181.1 – 2018 <u>2021</u>	Acrylonitrile-Butadiene-Styrene (ABS) Drain, Waste, and Vent Pipe and Pipe Fittings (Contained in CSA B1800- 2018 <u>2021</u>)	Year updated; standard received
CSA B181.2 - 2018 <u>2021</u>	Polyvinylchloride (PVC) and Chlorinated Polyvinylchloride (CPVC) Drain, Waste, and Vent Pipe and Pipe Fittings (Contained in CSA B1800- 2018 <u>2021</u>)	Year updated; standard received
CSA B481 Series - 2012(R2017 R2021)	Grease Interceptors	Year updated; standard received

Table 18.1 REFERENCED STANDARDS		
Standard Number	Standard Title	Note
CSA B483.1 - 2007 (R2017) 2021	Drinking Water Treatment Systems	Year updated; standard received
CSA B602 – 2016 2020	Mechanical Couplings for Drain, Waste, and Vent Pipe and Sewer Pipe	Year updated; standard received
FM 1680 - 1989	Approval Standard for Couplings Used in Hubless Cast Iron Systems for Drain, Waste or Vent, Sewer, Rainwater or Storm Drain Systems Above and Below Ground, Industrial/Commercial and Residential	No change
IAPMO IGC 115-2013e1	Automatic Water Leak Detection Devices	No change
IAPMO IGC 127-2018	Combined Hand-Washing Systems	No change
IAPMO IGC 154-2019	Shower and Tub/Shower Enclosures, Bathtubs with Glass Pressure-Sealed Doors, and Shower/Steam Panels	No change
IAPMO IGC 349-2018 ^{e1}	Electronic Plumbing Supply System Integrity Protection Devices	Year updated; standard received
IAPMO PS 66 - 2015	Dielectric Waterway Fittings	Title updated; standard received
IAPMO PS 94-2012e1	Insulated Protectors for P-Traps, Supply Stops, and Risers	No change current
IAPMO PS 117- 2019 2021	<u>Industry Standard for</u> Press Connections	Year & title updated; standard received
IAPMO/ANSI Z124.5 -2013 ^{e1} (R2018)	Plastic Toilet Seats	Year updated; standard received
IAPMO/ANSI Z124.7-2013 (R2018)	Prefabricated Plastic Spa Shells	Year updated; standard received
IAPMO/ANSI Z124.8 -2013e2 (R2018)	Plastic Liners for Bathtubs and Shower Receptors	Year updated; standard received
ANSI/CAN/IAPMO/ANSI Z1001 – 2016 2021	Prefabricated Gravity Grease Interceptors	Year updated; standard received
IAPMO/ANSI Z1088- 2013 2019e1	Pre-Pressurized Water Expansion Tanks	Year updated; standard received
MSS SP-58 - 2018	Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation (<u>with Amendment 1</u>)	Adding amendment info to title
MSS SP-70 - 2011	Gray Iron Gate Valves, Flanged and Threaded Ends	No change
MSS SP-71 - 2018	Gray Iron Swing Check Valves, Flanged and Threaded Ends	No change
MSS SP-80- 2013 2019	Bronze Gate, Globe, Angle and Check Valves	Year updated; standard received
MSS SP-110-2010 w/errata	Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends (<u>with Errata</u>)	Moving errata info to title
NFPA 13 - 2019 2022	Standard for the Installation of Sprinkler Systems	Year updated; standard received
NFPA 13D – 2019 2022	Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes	Year updated; standard received
NFPA 13R – 2019 2022	Standard for the Installation of Sprinkler Systems in Low-Rise Residential Occupancies	Year updated; standard received
NFPA 99 – 2018 2021	Health Care Facilities Code	Year updated; standard received
NSF/ ANSI 3 – 2017 2019	Commercial Warewashing Equipment	Year updated; standard received
NSF/ ANSI 14 – 2018 2020	Plastics Piping System Components and Related Materials	Year updated; standard received
NSF/ ANSI 42 – 2018 2021	Drinking Water Treatment Units - Aesthetic Effects	Year updated; standard received
NSF 44 - 2018	Residential Cation Exchange Water Softeners	No change
NSF/ ANSI 53 – 2018 2020	Drinking Water Treatment Units - Health Effects	Year updated; standard received
NSF/ ANSI 55 – 2018 2020	Ultraviolet Microbiological Water Treatment Systems	Year updated; standard received
NSF/ ANSI 58 – 2016 2020	Reverse Osmosis Drinking Water Treatment Systems	Year updated; standard received

Table 18.1 REFERENCED STANDARDS		
Standard Number	Standard Title	Note
NSF/ ANSI/CAN 61 - 2018 2020	Drinking Water System Components - Health Effects	Year updated; standard received
NSF/ ANSI/CAN 372 - 2016 2020	Drinking Water System Components - Lead Content	Year updated; standard received
PDI G101 - 2017	Testing and Rating Procedure for Hydro Mechanical Grease Interceptors with Appendix of Installation and Maintenance	No change
PDI G102 - 2010 2009	Testing and Certification for Grease Interceptors with FOG Sensing and Alarm Devices	Year correction, standard received
PDI WH 201 - 2017	Water Hammer Arrestors	No change
UL 174- 11th Edition ,2004 (R2016)	Standard for Safety Household Electric Storage Tank Water Heaters (with revisions through October 14, 2021)	standard updated and received
UL 399 - 8th Edition , 2017	Standard for Safety Drinking-Water Coolers (with revisions through July 31, 2020)	standard updated and received
UL 430- 8th Edition , 2015 (2018)	Standard for Safety Waste Disposers Coolers (with revisions through September 14, 2021)	standard updated and received
UL 499 - 14th Edition ,2014 (R2017)	Standard for Safety Electric Heating Appliances (with revisions through October 22, 2021)	standard updated and received
UL 726 - 7th Edition , 1995 (R2013)	Standard for Safety Oil-Fired Boiler Assemblies (with revisions through October 09, 2013)	standard updated and received
UL 732- 6th edition ,2018	Standard for Safety Oil-Fired Storage Tank Water Heaters (with revisions through August 09, 2018)	standard updated and received
UL 749- 11th Edition ,2018	Standard for Safety Household Dishwashers (with revisions through November 30, 2018)	standard updated and received
UL 834- 5th Edition , 2004 (2018)	Standard for Safety Heating, Water Supply, and Power Boilers – Electric (with revisions through July 17, 2019)	standard updated and received
UL 921- 7th Edition , 2016 2020	Standard for Safety Commercial Dishwashers	standard updated and received
UL 1206- 4th Edition ,2003 (R2017)	Standard for Safety Electric Commercial Clothes-Washing Equipment (with revisions through June 14, 2021)	standard updated and received
UL 1453 - 6th Edition ,2016- (R2018)	Standard for Safety Electric Booster and Commercial Storage Tank Water Heaters (with revisions through May 18, 2018)	standard updated and received
UL 2157 - 4th Edition ,2018	Standard for Safety Electrical Clothes Washing Machines and Extractors (with revisions through September 20, 2019)	standard updated and received
UL 60335-2-40 - 2nd Edition , 2017 2019	Standard for Safety of Household and Similar Electric-Electrical Appliances Safety Part 2-40: Particular Requirements for Electrical Heat Pumps, Air Conditioners, and Dehumidifiers	standard updated and received

**National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: April 1, 2022**

Proponent: Enrique Gonzalez
Representing: IAPMO

Date: March 31, 2022

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IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

Amend section with this editorial change

Change subsection to read as follows

Delete subsection and substitute as follows

Add new subsection to read as follows

Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: Appendix G _____

See attached Appendix G Document

Basis/Reason for Change:

Appendix G of the 2021 NSPC was update against the 2020 WeStand

Vote: Accept Accept as Amended

Accept in Part Accept in Principle Accept in Part and Principle

Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

APPENDIX G
WE-STAND EXCERPTS
Water Efficiency and Sanitation Standard for the Built ~~Environment~~ Environment
(as amended for the National Standard Plumbing Code)

G.1 FOREWORD

Appendix G serves as a resource for code officials, plumbers, contractors, engineers, and manufacturers in designing, installing, inspecting and maintaining sustainable plumbing systems. Appendix G is intended to provide a comprehensive set of technically sound provisions that encourage sustainable practices and works towards enhancing the design of plumbing systems that result in a positive long-term environmental impact. Appendix G consists of excerpts from the ~~2017~~2020 WE-Stand ~~Supplement~~ copyrighted by the International Association of Plumbing and Mechanical Officials (IAPMO). No part of this Appendix may be reproduced without the permission of IAPMO.

G.2 DEFINITIONS

G.2.1 General

For the purpose of this standard, the following terms have the meanings indicated in this chapter.

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 standard to avoid misunderstanding.

The definitions of terms are arranged alphabetically according to the first word of the term.

G.2.2 Definition of Terms.

G.2.3 -A-

Accessible: Where applied to a fixture, connection, appliance, or equipment, “accessible” means having access thereto, but which first may require the removal of an access panel, door, or similar obstruction. [UPC:203.0]

Alternate Water Source: Nonpotable source of water that includes but not limited to gray water, on-site treated nonpotable water, rainwater, and reclaimed (recycled) water.

Authority Having Jurisdiction: The organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, installations, or procedures. The Authority Having Jurisdiction shall be a federal, state, local, or other regional department or an individual such as a plumbing official, mechanical official, labor department official, health department official, building official, or others having statutory authority. In the absence of a statutory authority, the Authority Having Jurisdiction may be some other responsible party. This definition shall include the Authority Having Jurisdiction’s duly authorized representative. [UPC:203.0]

G.2.4 -B-

Bottle Filling Station: A plumbing fixture that is connected to the potable water distribution and building drainage system that is designed and intended for filling personal use drinking water bottles or containers not less than 10 inches (250 mm) in height. Such fixtures can be separate from or integral to a drinking fountain and can incorporate a water filter and a cooling system for chilling the drinking water.

Branch: A part of the piping system other than a main, riser, or stack.

Building Code: The building code that is adopted by the jurisdiction.

G.2.5 -C-

Catch Can Test: Method to measure the precipitation rate of an irrigation system by placing catchment containers at various random positions in the irrigation zone for a prescribed amount of time during irrigation application. The volumes of water in the containers are measured, averaged and calculated to determine precipitation rate. Tests are conducted using irrigation industry accepted practices.

Combination Ovens: A device that combines the function of hot air convection (oven mode) and saturated and superheated steam heating (steam mode), or both, to perform steaming, baking, roasting, rethermalizing, and proofing of various food products. In general, the term combination oven is used to describe this type of equipment, which is self contained. The combination oven is also referred to as a combination oven/ steamer, combi or combo.

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.

Condensate: Liquid water separated from a gaseous state due to changes in temperature or pressure, or both, and remains liquid at standard conditions.

G.2.6 -D-

Debris Excluder: A device installed on a rainwater or stormwater catchment conveyance system to prevent the accumulation of leaves, needles, or other debris in the system.

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.

Desiccation: The process of dehydrating excreta or leachate.

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

Diverted Urine: Urine that is collected and has not made contact with feces.

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.

G.2.7 -E-

Energy Star: A joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy. Energy Star is a voluntary program designed to identify and promote energy-efficient products and practices.

Evapotranspiration (ET): The water transpired from vegetation, evaporated from the soil, water, and plant surfaces. Evapotranspiration rates are values expressed in inches per unit of time (day, week, month, or year). Evapotranspiration rates vary by components of weather conditions, including insolation, humidity, temperatures and wind, and time of year.

Excreta: Includes but is not limited to urine, feces, menses, toilet paper, and other human body emissions and biodegradable cleaning products.

G.2.8 -F-

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.

Food Steamers (Steam Cookers): A cooking appliance wherein heat is imparted to food in a closed compartment by direct contact with steam. The compartment can be at or above atmospheric pressure. The steam can be static or circulated.

G.2.9 -G-

Gang Showers: Shower compartments designed and intended for use by multiple persons simultaneously.

Geothermal: Renewable energy generated by deep-earth.

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

Gray Water Diverter Valve: A valve that directs gray water to the sanitary drainage system or to a subsurface irrigation system.

Ground Source Heat Pump: A heat pump that uses the thermal energy of the ground or groundwater to provide space conditioning or water heating.

G.2.10 -H-

Humus: The biologically decomposed, soil-like output of the compost processor.

Hydrozone: A grouping of plants with similar water requirements that are irrigated by the same irrigation zone.

G.2.11 -I-

Irrigation Control System: An irrigation control system consists of a combination of a programmable controller using one or more inputs or sensors that, in combination, estimate or measure the availability of moisture for plants in order to operate an irrigation system, in such a manner that the system replenishes water as needed while minimizing excess water use. A properly programmed irrigation control system requires initial site specific set-up and will make irrigation schedule adjustments, including run times and required cycles throughout the irrigation season without human intervention.

Irrigation Demand: The amount of water not supplied by natural precipitation that is needed to maintain landscape plant life in good condition. Irrigation demand is calculated by subtracting natural effective precipitation from the ET rate adjusted by the landscape coefficient which includes the functional purpose and desired quality of the plant being irrigated.

Irrigation Emission Device: The various landscape irrigation equipment terminal fittings or outlets that emit water for irrigating vegetation in a landscape.

Irrigation Zone: The landscape area that is irrigated by a set of landscape irrigation emission devices installed on the same water supply line downstream of a single valve.

G.2.12 **-J-**

No Definitions.

G.2.13 **-K-**

Kitchen and Bar Sink Faucets: A faucet that discharges into a kitchen or bar sink in domestic or commercial installations. Supply fittings that discharge into other type sinks, including clinic sinks, floor sinks, service sinks and laundry trays are not included.

G.2.14 **-L-**

Lavatory: 1) a basin or vessel, for washing. 2) a plumbing fixture, as defined in (1), especially placed for use in personal hygiene. Principally not used for laundry purposes and never used for food preparation, or utensils, in food services. 3) a fixture designed for the washing of the hands and face. Sometimes called a wash basin.

Lavatory Faucet: A faucet that discharges into a lavatory in a domestic or commercial installation.

Leachate: Liquid draining from the compost processor.

Listed (Third-party Certified): Equipment or materials included in a list published by a listing agency (accredited conformity assessment body) that maintains periodic inspection ~~on~~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. [UPC:214.0]

Listing Agency: An agency accredited by an independent and authoritative conformity assessment body to operate a material and product listing and labeling (certification) system and that is accepted by the Authority Having Jurisdiction, which is in the business of listing or labeling. The system includes initial and ongoing product testing, a periodic inspection on current production of listed (certified) products, and that makes available a published report of such listing in which specific information is included that the material or product is in accordance with applicable standards and found safe for use in a specific manner. [UPC:214.0]

Low Application Rate Irrigation: A means of irrigation using Low Precipitation Rate Sprinkler Heads or Low Flow Emitters in conjunction with cycling irrigation schedules to apply water at a rate less than the soil absorption rate.

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; micro-spray, micro-jet and misters shall discharge water at a maximum of 30 gallons (113 L) per hour per nozzle.~~

Low Precipitation Rate Sprinkler Heads: Landscape irrigation emission devices or sprinkler heads with maximum precipitation rate of 1 inch per hour over the applied irrigation area.

G.2.15 **-M-**

Main: The principal artery of a system of continuous piping to which branches may be connected.

Maintenance: The upkeep of property or equipment by the owner of the property in compliance with the requirements of this standard.

Mechanical Code: The mechanical code that is adopted by the jurisdiction. Where a mechanical code is not adopted or where the content of the mechanical code adopted by the jurisdiction is not applicable, then mechanical code shall mean the Uniform Mechanical Code (UMC) promulgated by the International Association of Plumbing and Mechanical Officials (IAPMO).

Metering Faucet: A self-closing faucet that dispenses a specific volume of water for each actuation cycle. The volume or cycle duration can be fixed or adjustable.

Modified Evapotranspiration: Numeric values, expressed in inches/hr., of evapotranspiration rates, derived by altering ET_o rates by applying factors of specific needs of the vegetation and local climate conditions. Modified evapotranspiration rates are used as a factor in estimating the irrigation water needs of landscapes. Common usage includes reference evapotranspiration as the base rate, modified by coefficients or factors for specific plant types and densities.

Mulch: Organic materials, such as wood chips and fines, tree bark chips, and pine needles that are used in a mulch basin to conceal gray water outlets and permit the infiltration of gray water.

Mulch Basin: A subsurface catchment area for gray water that is filled with mulch and of sufficient depth and volume to prevent ponding, surfacing or runoff.

Multi-Occupant Spaces: Indoor spaces used as a place of congregation for activities such as presentations and training, including classrooms and conference rooms.

G.2.16 **-N-**

No Definitions.

G.2.17 **-O-**

On-Site Treated Nonpotable Water: Nonpotable water, that has been collected, treated, and intended to be used on-site and is suitable for direct beneficial use.

Owner's Manual: A manual provided to the owner containing instructions for all management aspects of that system.

G.2.18 **-P-**

Plumbing Code: The plumbing code that is adopted by the jurisdiction. Where a plumbing code is not adopted or where the content of the plumbing code adopted by the jurisdiction is not applicable, then plumbing code shall mean the Uniform Plumbing Code (UPC) promulgated by the International Association of Plumbing and Mechanical Officials (IAPMO).

Potable Water: Water that is satisfactory for drinking, culinary, and domestic purposes and that meets the requirements of the Health Authority Having Jurisdiction.

Precipitation Rate: The sprinkler head application rate of water applied to landscape irrigation zone, measured as inches (millimeters) per hour. Precipitation rates of sprinkler heads are calculated according to the flow rate, pattern and spacing of the sprinkler heads.

Pre-Rinse Spray Valve: A handheld device for use with commercial dishwashing and ware washing equipment that sprays water on dishes, flatware, and other food service items for the purpose of removing food residue before cleaning and sanitizing the items.

Public Water System: A system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least fifteen service connections or regularly serves an average of twenty-five individuals daily for at least 60 days per year.

G.2.19 **-Q-**

Quick-Disconnect Device: A hand-operated device that provides a means for connecting and disconnecting a hose to a water supply and that is equipped with a means to shut off the water supply when the device is disconnected.

G.2.20 **-R-**

Rainwater: Natural precipitation that lands on a man-made, impervious above ground surface and can be collected on-site for beneficial uses.

Rainwater Catchment System: A system that collects and stores rainwater for the intended purpose of beneficial use. Also known as Rainwater Harvesting System.

Recirculation System: A system of hot water supply and return piping with shutoff valves, balancing valves, circulating pumps, and a method of controlling the circulating system.

Reclaimed (Recycled) Water: Nonpotable water provided by a water/wastewater utility that, as a result of treatment of domestic wastewater, meets requirements of the Authority Having Jurisdiction for its intended uses.

Reference Evapotranspiration (ET_o): Numeric value, expressed in inches/hr., calculated as the water necessary to produce maximum biomass based upon a cool-season turf grass 4-6 inches tall. Common sources for obtaining local reference evapotranspiration rates are local agriculture extension services, state departments of agriculture, water agencies, irrigation professionals, the United States Geological Survey, and internet websites.

Registered Design Professional: An individual who is registered or licensed by the laws of the state to perform such design work in the jurisdiction.

Reverse Osmosis Reject Water: Water that does not pass through a membrane of a reverse osmosis system.

Roof Washer: A device or method for removal of sediment and debris from a collection surface by diverting initial rainfall from entry into the cistern(s). Also known as a first flush device.

Run Out: The developed length of pipe that extends away from the circulating loop system to a fixture(s).

G.2.21 **-S-**

Secondary Composting: Additional retention and continued decomposition of humus removed from compost processors in order to meet a safe retention time.

Self Closing Faucet: A faucet that closes itself after the actuation or control mechanism is deactivated. The actuation or control mechanism can be mechanical or electronic.

Single Occupant Spaces: Private offices, workstations in open offices, reception workstations, and ticket booths.

Site-Built: Constructed at the site of use.

Soil Absorption Rate: The rate of the soil's ability to allow water to percolate or infiltrate the soil and be retained in the root zone of the soil, expressed as inches (millimeters) per hour.

Sprinkler Head: Landscape irrigation emission device discharging water in the form of sprays or rotating streams, not including Low Flow Emitters.

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

Stormwater Catchment System: A system that collects and stores stormwater for the intended purpose of beneficial use. Also known as Stormwater Harvesting System.

Submeter: A meter installed subordinate to a site meter. Also known as a dedicated meter.

Subsoil Irrigation Field: Gray water irrigation field installed in a trench within the layer of soil below the topsoil. This system is typically used for irrigation of deep rooted plants.

Subsurface Irrigation Field: Gray water irrigation field installed below finished grade within the topsoil.

Surge Tank: A reservoir to modify the fluctuation in flow rates to allow for uniform distribution of gray water to the points of irrigation.

G.2.22 **-T-**

Transfer: The controlled transfer of excreta or partially processed humus between commode and composting processor or between multi-stage composting processors.

G.2.23 **-U-**

Urine Diversion: Separation of urine from other excreta that occurs at the commode.

G.2.24 **-V-**

Vectors: An organism that has the potential to transmit disease.

G.2.25 **-W-**

WaterSense: A voluntary program of the U.S. Environmental Protection Agency designed to identify and promote water-efficient products and practices.

Water Closet: A fixture with a water-containing receptor that receives liquid and solid body waste and on actuation conveys the waste through an exposed integral trap into a drainage system. Also referred to as a toilet.

Water Factor (WF): A measurement and rating of appliance water efficiency, most often used for residential and light commercial clothes washers, as follows:

Clothes Washer (residential and commercial). The quantity of water in gallons used to complete a full wash and rinse cycle per measured cubic foot capacity of the clothes container.

Water/Wastewater Utility: A public or private entity which may treat, deliver or do both functions to reclaimed (recycled) water, potable water, or both to wholesale or retail customers.

G.2.26 **-X-**

No definitions.

G.2.27 **-Y-**

No definitions.

G.2.28 **-Z-**

No definitions.

G.3 WATER EFFICIENCY AND CONSERVATION

G.3.1 General

G.3.1.1 Scope

The provisions of this chapter establish the means of conserving potable and nonpotable water used in and around a building.

G.3.2 Water-Conserving Plumbing Fixtures and Fittings

G.3.2.1 General

The maximum water consumption of fixtures and fixture fittings shall comply with the flow rates specified in Table G.3.2.1 and Section G.3.2.2 through Section G.3.2.10.

G.3.2.2 Water Closets

No water closet shall have an effective flush volume exceeding 1.28 gallons (4.8 Lpf) per flush (gpf).

G.3.2.2.1 Gravity, Pressure Assisted and ElectroHydraulic Tank Type Water Closets

Gravity, pressure assisted, and electro-hydraulic tank typewater closets shall have a maximum effective flush volume of not more than 1.28 gallons (4.8 Lpf) of water per flush in accordance with ASME A112.19.2/CSA B45.1 or ASME A112.19.14 and shall also be listed to the EPA WaterSense Specification for Tank-Type Toilets. The effective flush volume for dual-flush toilets is defined as the composite, average flush volume of two reduced flushes and one full flush.

TABLE G.3.2.1 MAXIMUM FIXTURE AND FIXTURE FITTINGS FLOW RATES	
FIXTURE TYPE	FLOW RATE
Showerheads	2.0 gpm @ 80 psi ¹
Kitchen faucets residential ⁴	1.8 gpm @ 60 psi
Lavatory faucets residential	1.5 gpm @ 60 psi
Lavatory faucets other than residential	0.5 gpm @ 60 psi
Metering faucets	0.25 gallons/cycle
Metering faucets for wash fountains	One (1) 0.25 gal per cycle fixture fitting for each 20 inches rim space
Wash fountains	One (1) 2.2 gpm @ 60 psi fixture fitting 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 @ 60 psi

¹ For multiple showerheads serving one shower compartment see Section [G.3.2.6.1 402.6.1](#)

² Shall also be listed to EPA WaterSense [Specification for Tank-Type High Efficiency Toilets Specification](#).

³ Shall also be listed to EPA WaterSense [Specification for Flushing Urinals. Specification](#). Nonwater urinals shall meet the specifications listed in Section [G.3.2.3.1 402.3.1](#).

⁴ See Section [G.3.2.4 402.4](#).

G.3.2.2 Flushometer-Valve Activated Water Closets

Flushometer-valve activated water closets shall have a maximum flush volume of not more than 1.28 gallons (4.8 L) of water per flush in accordance with ASME A112.19.2/CSA B45.1 and shall be listed to the EPA WaterSense Specification for Flushometer-Valve Water Closets.

G.3.2.3 Urinals

Urinals shall have a maximum flush volume of not more than 0.50 gallons (1.9 L) of water per flush in accordance with ASME A112.19.2/CSA B45.1 or CSA B45.5/IAPMO Z124. Flushing urinals shall be listed to the EPA WaterSense Specification for Flushing Urinals.

G.3.2.3.1 Nonwater Urinals

Nonwater urinals shall comply with ASME A112.19.3/CSA B45.4, ASME A112.19.19 or CSA B45.5/IAPMO Z124. Nonwater urinals shall be cleaned and maintained in accordance with the manufacturer's instructions after installation. Where nonwater urinals are installed they shall have a water distribution line roughed-in to the urinal location at a height not less than 56 inches (1422 mm) above finished floor to allow for the installation of an approved backflow prevention device in the event of a retrofit. Such water distribution lines shall be installed with shutoff valves located as close as possible to the distributing main to prevent the creation of dead ends. Where nonwater urinals are installed, not less than one water supplied fixture rated at not less than 1 drainage fixture unit (DFU) shall be installed upstream on the same drain line to facilitate drainline flow and rinsing.

EXCEPTION: Nonwater urinals used as part of a composting toilet system.

G.3.2.4 Residential Kitchen Faucets

The maximum flow rate of residential kitchen faucets shall not exceed 1.8 gallons per minute (gpm) (6.8 L/m) at 60 pounds force per square inch (psi) (414 kPa). Kitchen faucets are permitted to temporarily increase the flow above the maximum rate, but not to exceed 2.2 gpm (8.3 L/m) at 60 psi (414 kPa), and must revert to a maximum flow rate of 1.8 gpm (6.8 L/m) at 60 psi (414 kPa) upon valve closure.

G.3.2.5 Lavatory Faucets

The maximum water flow rate of faucets shall be in accordance with Section G.3.2.5.1 and Section G.3.2.5.2.

G.3.2.5.1 Lavatory Faucets in Residences, Apartments, and Private Bathrooms in Lodging Facilities, Hospitals, and Patient Care Facilities

The flow rate for lavatory faucets installed in residences, apartments, and private bathrooms in lodging, hospitals, and patient care facilities (including skilled nursing and long-term care facilities) shall not exceed 1.5 gpm (5.7 L/m) at 60 psi (414 kPa) in accordance with ASME A112.18.1/CSA B125.1 and shall be listed to the U.S. EPA WaterSense High-Efficiency Lavatory Faucet Specification.

G.3.2.5.2 Lavatory Faucets in Other Than Residences, Apartments, and Private Bathrooms in Lodging Facilities

Lavatory faucets installed in bathrooms of buildings or occupancies other than those specified in Section G.3.2.5.1 shall be in accordance with Section G.3.2.5.2.1 or Section G.3.2.5.2.2.

G.3.2.5.2.1 Maximum Flow Rate

The flow rate shall not exceed 0.5 gpm (1.9 L/m) at 60 psi (414 kPa) in accordance with ASME A112.18.1/CSA B125.1.

G.3.2.5.2.2 Metering Faucets

Metering faucets shall deliver not more than 0.25 gallons (1.0 L) of water per cycle.

G.3.2.6 Showerheads

Showerheads shall not exceed a flow rate of 2.0 gpm (7.6 L/m) at 80 psi (552 kPa) and shall be listed to ASME A112.18.1/CSA B125.1 and the EPA WaterSense Specification for Showerheads.

G.3.2.6.1 Multiple Showerheads Serving One Shower Compartment

The total allowable flow rate of water from multiple showerheads flowing at any given time, with or without a diverter, including rain systems, waterfalls, bodysprays, and jets, shall not exceed 2.0 gpm (7.6 L/m) per shower compartment, where the floor area of the shower compartment is less than 1800 square inches (1.161 m²). For each increment of 1800 square inches (1.161 m²) of floor area thereafter or part thereof, additional showerheads are allowed, provided the total flow rate of water from all flowing devices shall not exceed 2.0 gpm (7.6 L/m) for each such increment.

EXCEPTIONS:

- (1) Gang showers in non-residential occupancies. Singular showerheads or multiple shower outlets serving one showering position in gang showers shall not have more than 2.0 gpm (7.6 L/m) total flow.
- (2) Where provided, shower compartments required for persons with disabilities [in accordance with Table 1201.1 of the WE-Standard](#) shall not have more than 4.0 gpm (15.0 L/m) total flow, where one outlet is the hand shower.

G.3.2.7 Bath and Shower Diverters

~~The rate of leakage out of the tub 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/CSAB125.1 perform with zero leakage.~~

G.3.2.8 Shower Valves

Shower valves shall meet the temperature control performance requirements of ASSE 1016/ASME A112.1016/CSA B125.16 when tested for the rated flow rate of the installed showerhead.

G.3.2.9 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 prior to 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.~~

G.3.2.10 Emergency Safety Showers and Eye Wash Stations

Emergency safety showers and emergency eye wash stations shall not be limited in their water supply flow rates.

G.3.2.11 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 drinking fountains shall be self closing.

G.3.2.12 Installation

Water-conserving fixtures and fixture fittings shall be installed in accordance with the manufacturer's instructions to maintain their rated performance.

G.3.3 Composting Toilet and Urine Diversion Systems

G.3.3.1 General

The provisions of this section shall apply to the design, construction, performance, alteration, and repair of composting toilet and urine diversion systems.

G.3.3.2 Design and Construction Requirements Composting toilets, composting toilet systems, and urine diversion systems shall meet the design, construction, and performance requirements of Section G.3.3.2.1 or Section G.3.3.2.2.

G.3.3.2.1 Listed Composting Toilets and Composting Toilet Systems

Composting toilets and composting toilet systems shall be listed to NSF 41.

G.3.3.2.2 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 G.3.3.3 through Section G.3.3.9.

G.3.3.3 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 standard and the plumbing code, and shall be free from defects. Unless otherwise provided for in this standard, 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.

G.3.3.4 System Design

Composting toilet and urine diversion systems complying with Section G.3.3.0 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.

G.3.3.5 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 premises without first obtaining a permit to do such work from the Authority Having Jurisdiction.

G.3.3.6 Maintenance and Inspection

Composting toilet and urine diversion systems and components shall be maintained and inspected in accordance with Section G.3.3.6.1 through Section G.3.3.6.3.

G.3.3.6.1 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 G.3.3.8.5.2 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.~~

G.3.3.6.2 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 G.3.3.7.

G.3.3.6.3 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 G.3.3.8.5 following repairs to alleviate dangerous or unsanitary conditions shall be provided at the owner's expense.

G.3.3.7 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 G.3.3.8.5.2.

G.3.3.8 Composting Toilet System Design Requirements

The design and installation of composting toilet systems shall be in accordance with Section G.3.3.8.1 through Section G.3.3.8.6.

G.3.3.8.1 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 G.3.3.8.2.

G.3.3.8.2 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 $\frac{1}{4}$ -inch per foot (2.0 percent slope). The flange of each sub-drain shall be set level.

G.3.3.8.3 Commodes.

~~G.3.3.8.3.1 Structure~~

~~Commodes shall be designed to support users.~~

G.3.3.8.3.2 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.

G.3.3.8.3.3 Contact

Commodes shall transport excreta into the compost processor or contain excreta for transfer as designed according to the owner's manual.

G.3.3.8.3.4 Vectors

Commodes shall limit vectors and prevent human contact except for regular maintenance as designed according to the owner's manual.

G.3.3.8.4 Compost Processors

Compost processors shall be designed in accordance with Sections G.3.3.8.4.1 through G.3.3.8.4.9 and shall maintain unsaturated aerobic composting conditions within the compost mass, through the drainage, absorption, or desiccation of leachate, and aeration of the processor.

G.3.3.8.4.1 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:~~ Section G.3.3.8.4.1.1 through Section G.3.3.8.4.1.7.

G.3.3.8.4.1.1 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 six inches above the flood level rim of the highest fixture. Vents extending to the outdoor shall terminate no less than 12 inches above grade. The vent terminal shall be directed downward and covered with a $\frac{3}{32}$ inch mesh screen to prevent the entry of vermin and insects.

G.3.3.8.4.1.1.1 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.

G.3.3.8.4.1.2 Overflow

Where storage tank overflows are installed they shall be connected to the plumbing drainage system.

G.3.3.8.4.1.2.1 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.

G.3.3.8.4.1.3 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 Section 178.274 Specifications for UN Portable Tanks.

G.3.3.8.4.1.4 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 visible high-water alarm. ~~The alarm shall report when 80 percent volume is reached.~~

G.3.3.8.4.1.5 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/ft²) (1465kg/m²) 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 visible high-water alarm.

G.3.3.8.4.1.6 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."

G.3.3.8.4.1.7 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.

G.3.3.8.4.2 Vectors

The compost processor shall be designed and installed to limit vector access through management as required in the owner's manual.

G.3.3.8.4.3 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.

G.3.3.8.4.4 Watertightness

Processors shall be constructed of watertight material in accordance with Section G.3.3.8.1.

G.3.3.8.4.5 Rodentproofing

The compost processor shall be protected to prevent the entrance of rodents, vermin, and insects, ~~birds, or rodents~~. No unsecured opening other than vents, drainage, or commode may exceed ½ inch (12.7 mm) in the least dimension.

G.3.3.8.4.6 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 (6°C).

EXCEPTION: Systems with shorter retention shall be permitted where either,

- (a) humus from the compost processor has been tested according to Section G.3.3.8.5.2 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
- (b) humus is removed off site for processing or disposal at an approved facility.

G.3.3.8.4.7 Secondary Composting

Humus to be transferred to secondary composting shall first be tested according to Section G.3.3.8.5.2. Secondary composting shall be labeled and protected from human contact. Contact with precipitation and surface waters is prohibited.

G.3.3.8.4.8 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.

G.3.3.8.4.8.1 Vent Terminals

Vent stacks shall terminate exterior ~~from~~ the building as required by the plumbing or mechanical code.

G.3.3.8.4.9 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 of material per person per year while allowing for the removal of the humus, or as specified by the system designer.

G.3.3.8.5 Testing

Composting toilet systems shall be tested in accordance with Section G.3.3.8.5.1 and Section G.3.3.8.5.2.

G.3.3.8.5.1 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.

G.3.3.8.5.2 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 G.3.3.7 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.

G.3.3.8.6 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.

G.3.3.9 Urine Diversion System Design Requirements

The design and installation of urine diversion systems shall be in accordance with Section G.3.3.9.1 through Section G.3.3.9.13.

G.3.3.9.1 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.

G.3.3.9.2 Material Requirements

Material used for urine diversion shall be ~~impermeable and resistant to corrosion from urine-stainless steel or non-metallic pipe. Concrete piping is prohibited.~~

G.3.3.9.3 Identification

All urine diversion piping shall be identified.

G.3.3.9.4 Change of Direction

Changes in direction of urine diversion piping shall be made by a long-sweep 90 degree fitting or other approved fittings of equivalent sweep.

G.3.3.9.5 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.

G.3.3.9.6 Traps

Fixtures discharging into urine diversion piping connected to the plumbing drainage system shall be trapped and vented according to the plumbing code.

G.3.3.9.7 Grade of Horizontal Piping

Urine diversion piping shall be installed at a minimum grade of ½ inch per foot, or 4 percent toward the point of disposal.

G.3.3.9.8 Cleanouts

A cleanout shall be provided at the upper terminal of each drain line, every 50 feet (15 m) and at an aggregate horizontal change of direction exceeding 135 degrees.

G.3.3.9.9 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.

G.3.3.9.10 Discharge

A urine-diversion system shall be diverted to a storage tank or discharge to an approved plumbing drainage system.

G.3.3.9.11 Urine Storage Tanks

Urine storage tanks shall be constructed and installed in accordance with Section G.3.3.9.11.1 through Section G.3.3.9.11.8.

G.3.3.9.11.1 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 above grade. The vent terminal shall be directed downward and covered with a 3/32 inch mesh screen to prevent the entry of vermin and insects.

G.3.3.9.11.1.1 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.

G.3.3.9.11.2 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.

G.3.3.9.11.3 Overflow

Where storage tank overflows are installed they shall be connected to a plumbing drainage system.

G.3.3.9.11.3.1 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.

G.3.3.9.11.4 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 Section 178.274 Specifications for UN Portable Tanks.

G.3.3.9.11.5 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. ~~The alarm shall report when 80 percent volume is reached.~~

G.3.3.9.11.6 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/ft²) (1465 kg/m²) 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. ~~The alarm shall report when 80 percent volume is reached.~~

G.3.3.9.11.7 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."

G.3.3.9.11.8 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.

G.3.3.9.12 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.

G.3.3.9.13 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.
- (5)

G.3.4 Appliances

G.3.4.1 Dishwashers

Residential and commercial dishwashers shall be in accordance with the Energy Star program requirements.

G.3.4.2 Clothes Washers

Residential clothes washers shall be in accordance with the Energy Star program requirements. Commercial clothes washers shall be in accordance with Energy Star program requirements, where such requirements exist.

G.3.5 Pressure Regulator

G.3.5.1 Installation

Pressure regulators shall be installed in accordance with the plumbing code.

G.3.6 Water Softeners and Treatment Devices

G.3.6.1 Water Softeners

Water softeners shall be listed to NSF 44. Water softeners shall have a rated salt efficiency exceeding 3400 grains (gr) (0.2200kg) of total hardness exchange per pound (lb) (0.5 kg) of salt, based on sodium chloride (NaCl) equivalency, and shall not generate more than 4 gallons (15.1 L) of water per 1000 grains (0.0647 kg) of hardness removed during the service cycle.

G.3.6.2 Water Softener Limitations

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

G.3.6.3 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 to meet~~ comply with NSF 58.

G.3.6.4 Drinking Water Treatment Systems

Drinking water treatment systems shall be listed to WQA/ ASPE S-803.

G.3.7 Commercial Food Service

G.3.7.1 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 (76 L) of water per 100 pounds (45 kg) of ice produced. Ice makers producing nugget and flake ice shall not exceed 14 gallons (53 L) of water per 100 pound (45 kg) of ice produced.

G.3.7.2 Food Steamers

Boilerless type steamers shall not consume more than 2.0 gallons (7.6 L) per compartment. Boiler type steamers shall not consume more than 1.5 gallons (5.7 L) per pan per hour.

G.3.7.3 Combination Ovens

Combination ovens shall not use water in the convection mode except when utilizing a moisture nozzle for food products in the oven. The total amount of water used by the moisture nozzle in the convection mode shall not exceed a half a gallon per hour per oven cavity. When operating in the steamer mode, combination ovens shall not use more than 1.5 gallons (5.7 L) per hour per pan.

G.3.7.4 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.

G.3.7.5 Dipper Well Faucets

Where dipper wells ~~with have~~ a permanent water supply ~~are installed~~, the faucet shall have metered or sensor activated flowwater 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 Section G.3.7.5.1 or Section G.3.7.5.2. 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 0.2 gpm (0.8 L/m) at a supply pressure of 60psi (414 kPa).

~~G.3.7.5.1 Maximum Continuous Flow~~

~~Water flow shall not exceed the water capacity of the dipper well in one minute at supply pressure of 60 psi (414 kPa), and the maximum flow shall not exceed 0.2 gpm (0.8 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.~~

~~G.3.7.5.2 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 60psi (414 kPa).~~

G.3.7.6 Food Waste Devices

Where installed food waste devices shall be in accordance with Section G.3.7.6.1 through Section G.3.7.6.5.

G.3.7.6.1 Pulpers and Mechanical Strainers

The water use for the pulpers or mechanical strainers shall not exceed 2 gpm (7.6 L/m). A flow restrictor shall be installed on the watersupply to limit the water flow.

G.3.7.6.2 Food Waste Disposers

The water use for the food waste grinder shall not exceed the 8 gpm under full load condition and 1 gpm (3.8 L/m) under no-load condition. Flow restrictors shall be installed on the water supply to limit the water flow rate to a maximum of 8 gpm (30 L/m). A load sensing device shall be installed to monitor current demand and regulate water flow.

G.3.7.6.3 Time Out and Shut Off

Pulpers, mechanical strainers, and food waste disposers shall have a time out system with push button to reactivate. The maximum allowable run time cycle shall be 10 minutes.

G.3.7.6.4 Sink Drain Outlets

Where a strainer or basket is installed they shall be readily removable.

G.3.7.6.5 Strainer Baskets

Strainer (scraper) baskets shall either fit over a sink compartment or be attached to a drain system. The strainer baskets shall be readily removable for emptying.

G.3.8 Medical and Laboratory Facilities

G.3.8.1 X-Ray Film Processing Units

Processors for X-ray film exceeding 6 inches (152 mm) in anydimension shall be equipped with water recycling units.

G.3.8.2 Exhaust Hood Liquid Scrubber Systems Liquid scrubber systems for exhaust hoods and ducts shall be of the recirculation type. Liquid scrubber systems for perchloric acid exhaust hoods and ducts shall be equipped with a timer-controlled water recirculation system. The collection sumpfor perchloric acid exhaust systems shall be designed to automatically drain after the wash down process has completed.

G.3.9 Leak Detection and Control

G.3.9.1 General

Where installed, leak detection and control devices shall comply with IAPMO IGC_115 or IAPMO IGC_349. Leak detection with control devices shall not be installed where they isolate fire sprinkler systems.

G.3.10 Fountains and Other Water Features

G.3.10.1 Use of Alternate Water Source for Special Water Features

Special water features such as ponds and water fountains shall be provided with reclaimed (recycled) water, rainwater, or onsite treated nonpotable water where the source and capacity is available on the premises and approved by the Authority Having Jurisdiction.

G.3.11 Meters

G.3.11.1 Required

A water meter shall be required for each building site connected to a public water system, including municipally supplied reclaimed (recycled) water. In other than single-family houses, a dedicated meter shall be installed in accordance to Table G.3.11.1.

G.3.11.2 Approval

Dedicated meters other than water utility meters used for billing purposes shall be approved by the Authority Having Jurisdiction for the intended use.

G.3.11.3 Remote Data Transfer Requirements

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.

G.3.12 HVAC Water Efficiency

G.3.12.1 Once-Through Cooling

Once-through cooling using potable water is prohibited.

G.3.12.2 Cooling Towers and Evaporative Coolers Cooling towers and evaporative coolers shall be equipped with makeup water and blow down meters, conductivity controllers and overflow alarms. Cooling towers shall be equipped with efficiency drift eliminators that achieve drift reduction to

0.002 percent of the circulated water volume for counterflow towers and 0.005 percent for cross-flow towers.

G.3.12.3 Cooling Tower Makeup Water

Water used for air-conditioning cooling towers shall not be discharged where the hardness of the basin water is less than 1500 mg/L.

EXCEPTION:

Where any of the following conditions of the basin water are present: total suspended solids exceed 25 ppm, CaCO₃ exceeds 600 ppm, chlorides exceed 250 ppm, sulfates exceed 250 ppm, or silica exceeds 150 ppm.

G.3.12.4 Evaporative Cooler Water Use

Evaporative cooling systems (also known as swamp coolers) shall use less than 3.5 gallons (13.2 L) of water per ton-hour of cooling when system controls are set to maximum water use. Water use, expressed in maximum water use per ton-hour of cooling, shall be marked on the device and included in product user manuals, product information literature, and installation instructions. Water use information shall be readily available at the time of code compliance inspection.

G.3.12.4.1 Overflow Alarm

Cooling systems shall be equipped with an overflow alarm to alert building owners, tenants, or maintenance personnel when the water refill valve continues to allow water to flow into the reservoir when the reservoir is already full. The alarm shall have a minimum sound pressure level rating of 85 dBA measured at a distance of ten feet.

G.3.12.4.2 Automatic Pump Shut-Off

Cooling systems shall automatically cease pumping water to the evaporation pads when airflow across evaporation pads ceases.

G.3.12.4.3 Cooler Reservoir Discharge

A water quality management system (either timer or water quality sensor) is required. Where timers are used, the time interval between discharge of reservoir water shall be set to 6 hours or greater of cooler operation. Where water quality sensors are used, the discharge of reservoir water shall be set for greater 800 ppm or greater of Total Dissolved Solids (TDS). Continuous discharge or continuous bleed systems are prohibited.

**TABLE G.3.11.1
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 843W) or greater of cooling capacity and where a makeup 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 sq. ft. (232 m ²), or 2. Total accumulated landscape area using an automatic irrigation controller exceeds 1500 sq. ft. (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 G.3.11.1 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 1/2", or 2. Water consumption within in the tenant space is estimated or expected to average greater than 1000 gallons/day (3 785L/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 G.3.11.1 do not apply, no additional dedicated meter is required.

G.3.12.4.4 Discharge Water Reuse

Discharge water shall be reused where appropriate applications exist on site. Where a nonpotable water source system exists on site, evaporative cooler discharge water shall be collected and discharged to such collection system.
EXCEPTION: Where the reservoir water adversely affects the quality of the nonpotable water supply making the nonpotable water unusable for its intended purposes.

G.3.12.4.5 Discharge Water to Drain

Where discharge water is not recovered for reuse, the sump overflow line shall not be directly connected to a drain. Where the discharge water is put into a sanitary drain, a minimum 6 inch (152 mm) air gap is required between the termination of the discharge line and the drain opening. The discharge line shall terminate in a location that is readily visible to the building owner, tenants, or maintenance personnel.

G.3.12.5 Use of Reclaimed (Recycled) and On-Site Treated Nonpotable Water for Cooling

Reclaimed (recycled) or on-site treated nonpotable water used for industrial and commercial cooling or air-conditioning shall be approved for use by the water/wastewater utility and the Authority Having Jurisdiction.

G.3.12.5.1 Drift Eliminator

A drift eliminator shall be utilized in a cooling system, utilizing alternate sources of water, where the aerosolized water may come in contact with employees or members of the public.

G.3.12.5.2 Disinfection

A biocide shall be used to treat the cooling system recirculation water where the recycled water may come in contact with employees or members of the public.

G.3.13 Condensate Recovery

G.3.13.1 General

Where condensate is used for on-site treated nonpotable water, it shall be collected, stored, and treated in accordance with Section G.4.4.

G.3.13.2 Condensate Drainage Recovery

Condensate from air-conditioning, boiler, and steam systems used to supply water for nonpotable water systems shall be in accordance with Section G.4.4.

G.3.14 Water-Powered Sump Pumps

G.3.14.1 General

Sump pumps powered by potable or reclaimed (recycled) water pressure shall only be used as an emergency backup pump. The water-powered pump shall be equipped with a battery powered alarm having a minimum rating of 85 dBA at 10 feet (3 m). Water-powered pumps shall have a water efficiency factor of pumping at least 1.4 gallons (5.3 L) of water to a height of 10 feet (3048 mm) for every gallon of water used to operate the pump, measured at a water pressure of 60 psi (414 kPa). Pumps shall be clearly labeled as to the gallons of water pumped per gallon of potable water consumed. Water-powered stormwater sump pumps shall be equipped with a reduced pressure principle backflow prevention assembly.

G.3.15 Landscape Irrigation Systems

G.3.15.1 General

Where landscape irrigation systems are installed, they shall comply with Sections G.3.15.2 through G.3.15.15. ~~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.~~

G.3.15.1.1 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.

G.3.15.2 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.

G.3.15.3 Backflow Protection

Potable water and reclaimed water supplies to landscape irrigation systems shall be protected from backflow in accordance with the plumbing code and Authority Having Jurisdiction.

G.3.15.4 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) complying with Appendix G.4 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 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.

G.3.15.4.1 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.

G.3.15.4.2 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, ~~and 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 Appendix G.4.

G.3.15.4.2.1 Additional Zones

Newly installed zones shall have purple pipe.

G.3.15.5 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 on-site sensors or remote weather data to inhibit or suspend irrigation when adequate soil moisture is present or during rainfall or freezing conditions.
- (3) Utilize either one or more on-site sensors or a weather-based irrigation controller listed to the US EPA WaterSense Weather Based Irrigation Controllers Specification to suspend irrigation when 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.
- (7) The site specific settings of the irrigation control system shall be posted at the control system location. The posted data, where applicable to the settings of the controller, shall include:
 - (1) Precipitation rate for each zone.
 - (2) Plant evapotranspiration coefficients for each zone.
 - (3) Soil type and basic intake rate.
 - (4) Rain sensor settings.
 - (5) Soil moisture setting.
 - (6) 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.

G.3.15.6 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.

G.3.15.7 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 be equipped with filters sized according to 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 meeting manufacturers' equipment requirements.

G.3.15.8 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).

G.3.15.9 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 offdrains into the same hydrozone without puddling.

G.3.15.10 Narrow or Irregularly Shaped Landscape Areas

Narrow or irregularly shaped landscape areas, less than 4 feet (1 m) in any direction across any opposing boundaries shall not be irrigated by any irrigation emission device except sub-surface or low flow emitters with flow rates not to exceed 6.3 gallons (24 L) per hour.

G.3.15.11 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 include-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.

G.3.15.12 Sprinkler Head Installations

All installed sprinkler heads shall comply with ASABE/ICC 802.

G.3.15.12.1 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 plus or minus 7 percent as labeled or delcared-declared in manufacturer's published performance data).

G.3.15.12.2 Sprinkler Head Pressure Regulation Sprinkler heads shall utilize pressure regulating devices (as part of irrigation system or integral to the sprinkler head) to maintain manufacturer's recommended operating pressure for each sprinkler and nozzle type.

G.3.15.12.3 Pop-up Type Sprinkler Heads

Where pop-up type sprinkler heads are installed, the sprinkler heads shall pop-up to a height above vegetation level and of not less than 4 inches (102 mm) above the soil level when emitting water.

G.3.15.13 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 503.9.

G.3.15.14 Depth of Irrigation Pipe

Irrigation pipe downstream from the backflow preventer shall be buried at a minimum depth according to Section G.3.15.14.1 and Section G.3.15.14.2.

G.3.15.14.1 Landscape Areas

Irrigated landscaped areas not exceeding 10,000 square feet (929 m²) shall have irrigation main lines buried a minimum of 12 inches (305 mm) and irrigation lateral lines buried a minimum of 8 inches (203 mm). Irrigated landscaped areas greater than 10,000 square feet (929 m²) shall have irrigation main lines buried a minimum of 18 inches (457 mm) and irrigation lateral lines buried a minimum of 12 inches (305 mm).

G.3.15.14.2 Vehicular Surfaces

Irrigation pipe installed under vehicular paving and pervious pavers, including landscaped fire lanes, shall be sleeved with a minimum of one 1-inch pipe (25 mm) size greater than the irrigation pipe and buried at a minimum depth of 24 inches (610 mm) in all cases.

G.3.15.15 Backfill

All excavation for irrigation pipe installation shall be backfilled in thin layers to 12 inches (305 mm) with clean earth, which shall not contain stones, boulders, cinderfill, frozen earth, construction debris, or other materials that would damage or break the piping. Fill shall be properly compacted. Suitable precautions shall be taken to ensure permanent stability for pipe laid in filled or made ground.

G.3.16 Trap Seal Protection

G.3.16.1 Water Supplied Trap Primers

Water supplied trap primers shall be electronic or pressure activated and shall use no more than 30 gallons (114 L) per year per drain. Where an alternate water source, as defined by this code, is used for fixture flushing or other uses in the same room, the alternate water source shall be used for the trap primer water supply.

EXCEPTION: Flushometer tailpiece trap primers complying with IAPMO PS 76 are exempted from the provisions of this section.

G.3.16.2 Drainage Type Trap Seal Primer Devices Drainage type trap seal primer devices shall not be limited in the amount of water they discharge.

G.3.17 Vehicle Wash Facilities

G.3.17.1 Automatic

The maximum make-up water use for automobile washing shall not exceed 40 gallons (151 L) per vehicle for in-bay automatic car washes and 35 gallons (132 L) for conveyor and express type car washes.

G.3.17.2

Self-Service

Spray wands and foamy brushes shall use no more than 3.0 gpm (11.36 L/m).

G.3.17.3 Reverse Osmosis

Spot-free reverse osmosis discharge (reject) water shall be recycled.

G.3.17.4 Towel Ringers

Towel ringers shall have a positive shut-off valve. Spray nozzles shall be replaced annually.

EXEMPTION-EXCEPTION: Bus and large commercial vehicles washes are exempt from the requirements in this section.

G.3.18 Swimming Pools, Spas, and Hot Tubs

G.3.18.1 Practices

The following sections outline common practices for reducing energy consumption in regards to pool, spa, and hot tub equipment.

G.3.18.2 On and Off Switch

Pool, spa, and hot tub heaters shall be equipped with a readily accessible 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]

G.3.18.3 Covers

Heated pools and inground permanently installed spas, and portable spas, shall be provided with a non-liquid vapor retardant cover.

EXCEPTION: Where more than 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 source.

G.3.18.3.1 Portable Spas

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

G.3.18.4 Time Switches

Time switches shall be installed on swimming pool, spa, and hot tub heaters and pumps.

EXCEPTIONS:

- (1) Where public health standards require 24-hour pump operation.
- (2) Where pumps are required to operate solar and waste heat recovery pool heating systems. [ASHRAE 90.1:7.4.5.3]

G.3.18.5 Pool Pumps and Replacement Pool Pump Motors

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

G.4 ALTERNATE WATER SOURCES FOR NONPOTABLE APPLICATIONS

G.4.1 General

G.4.1.1 Scope

The provisions of this chapter shall apply to the construction, alteration, and repair of alternate water source systems for nonpotable applications.

G.4.1.1.1 Allowable Use of Alternate Water

Where approved or required by the Authority Having Jurisdiction, alternate water sources (reclaimed (recycled) water, gray water and onsite treated nonpotable water) used in lieu of potable water shall be in accordance with the provisions of this chapter.

G.4.1.2 System Design

Alternate water source systems shall be designed in accordance with this chapter by a licensed plumbing contractor, Registered Design Professional, or a person who demonstrates competency to design the alternate water source system as required by the Authority Having Jurisdiction. Components, piping, and fittings used in any alternate water source system shall be listed.

EXCEPTIONS:

- (1) A person registered or licensed to perform plumbing design work is not required to design gray water systems having a maximum discharge capacity of 250 gallons per day (gal/d) (15.77 L/s) for single family and multi-family dwellings.
- (2) A person registered or licensed to perform plumbing design work is not required to design an on-site treated nonpotable water system for single family dwellings having a maximum discharge capacity of 250 gal/d (15.77 L/s).

G.4.1.3 Permit

It shall be unlawful for any person to construct, install, alter, or cause to be constructed, installed, or altered any 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 G.4.1.3.1. A written notification shall be provided to the Authority Having Jurisdiction in accordance with Section G.4.1.3.1.

G.4.1.3.1 Clothes Washer System

A clothes washer system in compliance with all of the following is exempt from the construction permit specified in Section

G.4.1.3 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.

G.4.1.4 Component Identification

System components shall be properly identified as to the manufacturer.

G.4.1.5 Maintenance and Inspection

Alternate water source systems and components shall be inspected and maintained in accordance with Section G.4.1.5.1 through Section G.4.1.5.3, the manufacturer's recommendations, or as required by the Authority Having Jurisdiction.

G.4.1.5.1 Frequency

Alternate water source systems and components shall be inspected and maintained in accordance with Table G.4.1.5.1 unless more frequent inspection and maintenance is required by the manufacturer.

TABLE G.4.1.5.1 MINIMUM ALTERNATE WATER SOURCE TESTING, INSPECTION, AND MAINTENANCE FREQUENCY	
DESCRIPTION	MINIMUM FREQUENCY
Inspect and clean filters and screens, and replace (if necessary)	Every 3 months
Inspect and verify that disinfection, filters and water quality treatment devices and systems are operational and maintaining minimum water quality requirements as determined by the Authority Having Jurisdiction	In accordance with manufacturer's instructions, and the Authority Having Jurisdiction
Inspect pumps and verify operation	After initial installation and every 12 months thereafter
Inspect valves and verify operation	After initial installation and every 12 months thereafter
Inspect pressure tanks and verify operation	After initial installation and every 12 months thereafter
Clear debris from and inspect storage tanks, locking devices, and verify operation	After initial installation and every 12 months thereafter

Inspect caution labels and marking	After initial installation and every 12 months thereafter
Inspect and maintain mulch basins for gray water irrigation systems	As needed to maintain mulch depth and prevent ponding and runoff
Cross-connection inspection and test*	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 Chapter.

G.4.1.5.2 Maintenance Log

A maintenance log for gray water and on-site treated nonpotable water systems is required to have a permit in accordance with Section G.4.1.3 and shall be maintained by the property owner and be available for inspection. The property owner or designated appointee shall ensure that a record of testing, inspection, and maintenance as required by Table G.4.1.5.1 is maintained in the log. The log will indicate the frequency of inspection and maintenance for each system.

G.4.1.5.3 Maintenance Responsibility

The required maintenance and inspection of alternate water source systems shall be the responsibility of the property owner, unless otherwise required by the Authority Having Jurisdiction.

G.4.1.6 Operation and Maintenance Manual

An operation and maintenance manual for gray water and onsite treated water systems required to have a permit in accordance with Section G.4.1.3 shall be supplied to the building owner by the system designer. The operating and maintenance manual shall include the following:

- (1) Diagram of the entire system and the location of system components.
- (2) Instructions on operating and maintaining the system.
- (3) Details on maintaining the required water quality for on-site nonpotable water systems.
- (4) Details on deactivating the system for maintenance, repair, or other purposes.
- (5) Applicable testing, inspection, and maintenance frequencies as required by Table G.4.1.5.1.
- (6) A method of contacting the manufacturer(s).
- (7) Directions to the owner or occupant that the manual shall remain with the building ~~throughout~~ throughout the life of the structure.

G.4.1.7 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 NSF 350 or the EPA/625/R-04/108 shall apply.

EXCEPTION: Water treatment is not required for gray water used for subsurface irrigation.

G.4.1.8 Material Compatibility

Alternate water source systems shall be constructed of materials that are compatible with the type of pipe and pipe fitting materials, water treatment, and water conditions in the system.

G.4.1.9 System Controls

Controls for pumps, valves, and other devices that contain mercury that come in contact with alternate water source water supply are prohibited.

G.4.1.10 Commercial, Industrial, and Institutional Restroom Signs

A sign shall be installed in all restrooms in commercial, industrial, and institutional occupancies using reclaimed (recycled) water and on-site treated water for water closets, urinals, or both. Each sign shall contain letters of a highly visible color on a contrasting background, and letters shall be at least 1/2 inch (12 mm) in height. The location of the sign(s) shall be such that the sign(s) shall be visible to all users. The location of the sign(s) shall be approved by the Authority Having Jurisdiction and shall contain the following text:

TO CONSERVE WATER, THIS BUILDING USES

* _____ * TO FLUSH TOILETS AND URINALS.

G.4.1.10.1 Equipment Room Signs

Each room containing reclaimed (recycled) water and on-site treated water, equipment shall have a sign posted in a location that is visible to anyone working on or near nonpotable water equipment with the following wording in 1 inch (25.4 mm) letters:

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

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

G.4.1.11 Inspection and Testing

Alternate water source systems shall be inspected and tested in accordance with Section G.4.1.11.1 and Section G.4.1.11.2. EXCEPTION: Non-pressurized **gray-water** or on-site nonpotable water systems without any connection to a potable water system.

G.4.1.11.1 Supply System Inspection and Test Alternate water source systems shall be inspected and tested in accordance with the plumbing code for testing of potable water piping.

G.4.1.11.2 Annual Cross-Connection Inspection and Testing

An initial and subsequent annual inspection and test shall be performed on both the potable and alternate water source systems. The potable and alternate water source system shall be isolated from each other and independently inspected and tested to ensure there is no cross-connection in accordance with Section G.4.1.11.2.1 through Section G.4.1.11.2.4.

G.4.1.11.2.1 Visual System Inspection

Prior to commencing the cross-connection testing, a dual system inspection shall be conducted by the Authority Having Jurisdiction as follows:

- (1) Meter locations of the alternate water source and potable water lines shall be checked to verify that no modifications were made, and that no cross-connections are visible.
- (2) Pumps and equipment, equipment room signs, and exposed piping in equipment room shall be checked.
- (3) Valves shall be checked to ensure that valve lock seals are still in place and intact. Valve control door signs shall be checked to verify that no signs have been removed.

G.4.1.11.2.2 Cross-Connection Test

The procedure for determining cross-connection shall be followed by the applicant in the presence of the Authority Having Jurisdiction to determine whether a cross-connection has occurred as follows:

- (1) The potable water system shall be activated and pressurized. The alternate water source system shall be shut down, depressurized, and drained.
- (2) The potable water system shall remain pressurized for a minimum period of time specified by the Authority Having Jurisdiction while the alternate water source system is empty. The minimum period the alternate water source system is to remain depressurized shall be determined on a case-by-case basis, taking into account the size and complexity of the potable and the alternate water source distribution systems, but in no case shall that period be less than 1 hour.
- (3) The drain on the alternate water source system shall be checked for flow during the test and all fixtures, potable and alternate water source, shall be tested and inspected for flow. Flow from any alternate water source system outlet indicates a cross-connection. No flow from a potable water outlet shall indicate that it is connected to the alternate water source system.
- (4) The potable water system shall then be depressurized and drained.
- (5) The alternate water source system shall then be activated and pressurized.
- (6) The alternate water source system shall remain pressurized for a minimum period of time specified by the Authority Having Jurisdiction while the potable water system is empty. The minimum period the potable water system is to remain depressurized shall be determined on a case-by-case basis, but in no case shall that period be less than 1 hour.
- (7) All fixtures, potable and alternate water source, shall be tested and inspected for flow. Flow from any potable

water system outlet indicates a cross-connection. No flow from an alternate water source outlet will indicate that it is connected to the potable water system.

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

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

G.4.1.11.2.3 Discovery of Cross-Connection

In the event that a cross-connection is discovered, the following procedure, in the presence of the Authority Having Jurisdiction, shall be activated immediately:

(1) The alternate water source piping to the building shall be shut down at the meter, and the alternate water source riser shall be drained.

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

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

(4) The building shall be retested following procedures listed in Section G.4.1.11.2.1 and Section G.4.1.11.2.2.

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

(6) The potable water system shall be flushed after 24 hours, and a standard bacteriological test shall be performed. If test results are acceptable, the potable water system shall be recharged.

G.4.1.11.2.4 Annual Inspection

An annual inspection of the alternate water source system, following the procedures listed in Section G.4.1.11.2.1 shall be required. Annual cross-connection testing, following the procedures listed in Section G.4.1.11.2.2 shall be required by the Authority Having Jurisdiction, unless site conditions do not require it. In no event shall the test occur less than once in 4 years. Alternate testing requirements shall be approved by the Authority Having Jurisdiction.

G.4.1.12 Separation Requirements

All underground alternate water source service piping other than gray water shall be separated from the building sewer in accordance with the plumbing code. Treated nonpotable water pipes run or laid in the same trench as potable water pipes shall have a 12 inch (305 mm) minimum vertical and horizontal separation when both pipe materials are approved for use within a building. Where horizontal piping materials do not meet this requirement the minimum separation shall be increased to 60 inches (1524 mm). The potable water piping shall be installed at an elevation above the treated nonpotable water piping.

G.4.1.13 Abandonment

All alternate water source systems that are no longer in use or fails to be maintained in accordance with Section G.4.1.5 shall be abandoned. Abandonment shall comply with Section 305.0.

G.4.1.14 Sizing

Unless otherwise provided for in this standard, alternate water source piping shall be sized in accordance with the plumbing code for sizing potable water piping.

G.4.2 Gray Water Systems

G.4.2.1 General

The provisions of this section shall apply to the construction, alteration, and repair of gray water systems.

G.4.2.2 Gray Water Collection Piping

New single-family dwellings shall have a separate waste piping system for all gray water fixtures per the Plumbing Code. The separate piping system shall be piped to outside the building and terminate into an approved Gray Water Diverter Valve per Section G.4.2.5 before connecting to the waste system from non-gray water fixtures.

EXCEPTION: Where ground conditions do not provide percolation or where prohibited by the plumbing code.

G.4.2.2.1 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.

G.4.2.2.2 Access

The diverter and sewer connection shall be readily accessible for connection, inspection, maintenance, and servicing.

G.4.2.2.3 Regulatory

Gray water reuse and irrigation system components shall meet local, and state code and regulatory requirements.

G.4.2.3 Discharge

Gray water diverted away from a sewer or private sewage disposal system of single family and multi-family dwellings, shall discharge to a subsurface irrigation or subsoil irrigation system, or to a mulch basin, or disposal field. Gray water shall not be used to irrigate root crops or food crops intended for human consumption that come in contact with soil.

G.4.2.4 Surge Capacity

Gray water systems shall be designed to have the capacity to accommodate flow rates entering the system and distribute the total amount of estimated gray water entering the system 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 G.4.2.12.1 or Section G.4.2.12.2. Systems that produce more gray water than needed by the landscape shall discharge excess water into the sewer or private sewage disposal system.

G.4.2.5 Diversion

The gray water system shall connect to the sanitary drainage system downstream of fixture traps and vent connections through a diverter valve(s) approved by the Authority Having Jurisdiction. The diverter shall be installed in an accessible location and clearly indicate the direction of flow.

EXCEPTION: A clothes washer system in compliance with Section G.4.1.3.1

G.4.2.6 Backwater Valves

Gray water drains subject to backflow shall be provided with a backwater valve so located as to be accessible for inspection and maintenance.

G.4.2.7 Connections to Potable and Reclaimed (Recycled) Water Systems

Gray water systems shall have no direct connection to any potable water supply, on-site treated nonpotable water supply, or reclaimed (recycled) water systems. Potable, on-site treated nonpotable, or reclaimed (recycled) water is permitted to be used as makeup water for a non-pressurized storage tank provided the connection is protected by an airgap in accordance with the plumbing code.

G.4.2.8 Location

No gray water system or part thereof shall be located on any lot other than the lot that is the site of the building or structure that discharges the gray water, nor shall any gray water system or part thereof be located at any point having less than the minimum distances indicated in Table G.4.2.8.

G.4.2.9 Plot Plan Submission

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

TABLE G.4.2.8 LOCATION OF GRAY WATER SYSTEM		
MINIMUM HORIZONTAL DISTANCE IN CLEAR REQUIRED FROM:	SURGE TANK (feet)	SUBSURFACE AND SUBSOIL IRRIGATION FIELD AND MULCH BED (feet)

Building structures ¹	5 ² , 9	2 ³ , 8
Property line adjoining private property	5	5 ⁸
Water supply wells ⁴	50	100
Streams and lakes ⁴	50	50 ⁵
Sewage pits or cesspools	5	5
Sewage disposal field	5	4 ⁶
Septic tank	0	5
On-site domestic water service line	5	5
Pressurized public watermain	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 driveways, 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 1 ½ feet (457 mm) for drip and mulch basin irrigation systems.

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

G.4.2.10 Prohibited Location

Gray water systems are prohibited where there is insufficient lot area or inappropriate soil conditions for adequate absorption to prevent the ponding, surfacing or runoff of the gray water, or on any property in a geologically sensitive area as determined by the Authority Having Jurisdiction.

G.4.2.11 Drawings and Specifications

The Authority Having Jurisdiction shall require any or all of the following information to be included with or in the plot plan before a permit is issued for a gray water system, or at anytime during the construction thereof:

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

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

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

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

EXCEPTION: The Authority Having Jurisdiction shall permit the use of Table G.4.2.14.1 in lieu of percolation tests.

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

G.4.2.12 Procedure for Estimating Gray Water Discharge

Gray water systems shall be designed to distribute the total amount of estimated gray water on a daily basis. The water discharge for gray water systems shall be determined in accordance with Section G.4.2.12.1 or Section G.4.2.12.2.

G.4.2.12.1 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, and bathtubs and lavatories	2513 gallons (9550 L) per day/occupant
<u>Lavatories</u>	<u>4</u> gallons (<u>15 L</u>) per day/occupant
Laundry	<u>4510</u> gallons (<u>5738</u> L) per day/occupant

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

G.4.2.12.2 Commercial, Industrial, and Institutional Occupancies

The gray water discharge for commercial, industrial, and institutional occupancies shall be calculated by utilizing the procedure in Section G.4.2.12.1, water use records, or other documentation to estimate gray water discharge.

G.4.2.13 Gray Water System Components

Gray water system components shall be in accordance with Section G.4.2.13.1 through Section G.4.2.13.7.

G.4.2.13.1 Surge Tanks

Where installed, surge tanks shall comply with the following:

(1) Surge tanks shall be constructed of solid, durable materials not subject to excessive corrosion or decay and shall be watertight. Surge tanks constructed of steel shall be approved by the Authority Having Jurisdiction, provided such tanks comply with approved applicable standards.

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

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

(4) Each surge tank shall have its rated capacity permanently marked on the unit. In addition, a sign stating GRAY WATER, DANGER — UNSAFE WATER shall be permanently marked on the holding tank.

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

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

(7) Surge tank shall be structurally designed to withstand anticipated earth or other loads. Surge tank covers shall be capable of supporting an earth load of not less than 300 pounds per square foot (lb/ft²) (1465 kg/m²) when the tank is designed for underground installation.

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

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

(10) Surge tanks shall be anchored to prevent against overturning when installed aboveground. 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 shall meet or exceed the buoyancy forces of the tank.

G.4.2.13.2 Gray Water Pipe and Fitting Materials Aboveground and underground building drainage and ventpipe and fittings for gray water systems shall comply with the requirements for aboveground and underground sanitary building drainage and vent pipe and fittings in the plumbing code. ~~These materials shall extend not less than 2 feet (610mm) outside the building.~~

G.4.2.13.3 Subsoil Irrigation Field Materials

Subsoil irrigation field piping shall be constructed of perforated high-density polyethylene pipe, perforated ABS pipe, perforated PVC pipe, or other approved materials, provided that sufficient openings are available for distribution of the gray water into the trench area. Material, construction, and perforation of the pipe shall be in compliance with the appropriate absorption field drainage piping standards and shall be approved by the Authority Having Jurisdiction.

G.4.2.13.4 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, 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.

G.4.2.13.5 Valves

Valves shall be accessible.

G.4.2.13.6 Trap

Gray water piping discharging into the surge tank or having a direct connection to the sanitary drain or sewer piping shall be downstream of an approved water seal type trap(s). If no such trap(s) exists, an approved vented running trap shall be installed upstream of the connection to protect the building from any possible waste or sewer gases.

G.4.2.13.7 Backwater Valve

A backwater valve shall be installed on all gray water drain connections to the sanitary drain or sewer.

G.4.2.14 Subsurface Irrigation System Zones

Each zone in an irrigation or disposal field having one or more valved zones shall be of adequate size to receive the gray water anticipated in that zone.

G.4.2.14.1 Required Area of Subsurface Irrigation Fields, Subsoil Irrigation Fields and Mulch Basins The minimum effective irrigation area of subsurface irrigation fields, subsoil irrigation fields, and mulch basins shall be determined by Table G.4.2.14.1 for the type of soil found in the excavation, based upon a calculation of estimated gray water discharge pursuant to Section G.4.2.12. For a subsoil irrigation field, the area shall be equal to the aggregate length of the perforated pipe sections within the valved zone multiplied by the width of the proposed subsoil irrigation field.

TABLE G.4.2.14.1 DESIGN OF SIX TYPICAL SOILS SOIL INFILTRATION <u>RATES</u>		
<u>TYPE OF SOIL</u> <u>SOIL CLASS AND TEXTURES</u>	<u>MINIMUM SQUARE FEET OF</u> <u>IRRIGATION AREA PER 100-</u> <u>GALLONS OF ESTIMATED GRAY</u> <u>WATER DISCHARGE PER DAY</u>	MAXIMUM ABSORPTION CAPACITY IN GALLONS PER SQUARE FOOT OF IRRIGATION/LEACHING AREA FOR A 24-HOUR PERIOD
Coarse sand or gravel Group A: Sandy Loam Textures: sand, loamy sand, sandy loam	20	5.0 11.9
Fine sand	25	4.0

<u>Group B: Loam</u> <u>Textures: loam, silt loam</u>		<u>4.5</u>
Sandy loam <u>Group C: Sandy Clay Loam Textures:</u> <u>Sandy clay loam</u>	40	2.5 <u>3.0</u>
Sandy clay <u>Group D: Clay Loam</u> <u>Textures: clay loam, silty clay loam,</u> <u>sandy clay, silty clay, clay</u>	60	1.7 <u>0.9</u>
Clay with considerable sand or gravel	90	1.1
Clay with small amounts of sand or gravel	120	0.8

For SI units: 1 square foot = 0.0929 m², 1 gallon per day = 0.000043 L/s

G.4.2.14.2 Determination of Maximum Absorption Capacity

The irrigation field and mulch basin size shall be based on the maximum absorption capacity of the soil and determined using Table G.4.2.14.1. For soils not listed in Table G.4.2.14.1, the maximum absorption capacity for the proposed site shall be determined by percolation tests or other method acceptable to the Authority Having Jurisdiction. A gray water system is prohibited where the percolation test shows the absorption capacity of the soil is unable to accommodate the maximum discharge of the proposed gray water irrigation system.

G.4.2.14.3 Groundwater Level

No excavation for an irrigation field, disposal field, or mulch basin shall extend within 3 feet (914 mm) vertical of the highest known seasonal groundwater level, nor to a depth where gray water contaminates the groundwater or surface water. The applicant shall supply evidence of groundwater depth to the satisfaction of the Authority Having Jurisdiction.

G.4.2.15 Subsurface and Subsoil Irrigation Field, and Mulch Basin Design and Construction

Subsurface and subsoil irrigation field, and mulch basin design and construction shall be in accordance with Section G.4.2.15.1 through Section G.4.2.15.3. Where a gray water irrigation system design is predicated on soil tests, the subsurface or subsoil irrigation field or mulch basin shall be installed at the same location and depth as the tested area.

G.4.2.15.1 Subsurface Irrigation Field

A subsurface irrigation field shall be in accordance with Section G.4.2.15.1.1 through Section G.4.2.15.1.6.

G.4.2.15.1.1 Minimum Depth

Supply piping, including drip feeders, shall be not less than 2 inches (51 mm) below finished grade and covered with mulch or soil.

G.4.2.15.1.2 Filter

Not less than 140 mesh (115 micron) filter with a capacity of 25 gallons per minute (gpm) (1.58 L/s), or equivalent shall be installed. Where a filter backwash is installed, the backwash and flush discharge shall discharge into the building sewer or private sewage disposal system. Filter backwash and flush water shall not be used for any purpose.

G.4.2.15.1.3 Emitter Size

Emitters shall be installed in accordance with the manufacturer's installation instructions.

G.4.2.15.1.4 Number of Emitters

The minimum number of emitters and the maximum discharge of each emitter in an irrigation field shall be in accordance with Table G.4.2.15.1.4.

G.4.2.15.1.5 Controls

The system design shall provide user controls, such as valves, switches, timers, and other controllers, to rotate the distribution of gray water between irrigation zones.

G.4.2.15.1.6 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 shall be installed downstream from the pump and before any emission device.

G.4.2.15.2 Mulch Basin

A mulch basin shall be in accordance with Section G.4.2.15.2.1 through Section G.4.2.15.2.3.

G.4.2.15.2.1 Size

Mulch basins shall be of sufficient size to accommodate peak flow rates and distribute the total amount of estimated gray water on a daily basis without surfacing, ponding or runoff. Mulch basins shall have a depth of not less than 10 inches (254 mm) below finished grade. The mulch basin size shall be based on the maximum absorption capacity of the soil and determined using Table G.4.2.14.1.

TABLE G.4.2.15.1.4 SUBSURFACE IRRIGATION DESIGN CRITERIA FOR SIX TYPICAL SOILS		
TYPE OF SOIL	MAXIMUM EMITTER DISCHARGE	MINIMUM NUMBER OF EMITTERS PER GALLON OF ESTIMATED GRAY WATER DISCHARGE PER DAY*
	gallon/day	gallon/day
Sand	1.8	0.6
Sandy loam	1.4	0.7
Loam	1.2	0.9
Clay loam	0.9	1.1
Silty clay	0.6	1.6
Clay	0.5	2.0

For SI units: 1 gallon per day = 0.000043 L/s

*The estimated gray water discharge per day shall be determined in accordance with Section G.4.2.8.

G.4.2.15.2.2 Minimum Depth

Gray water supply piping, including drip feeders, shall be a minimum 2 inches (51 mm) below finished grade and covered with mulch.

G.4.2.15.2.3 Maintenance

The mulch basin shall be maintained periodically to retain the required depth and area, and to replenish the required mulch cover.

G.4.2.15.3 Subsoil Irrigation Field

Subsoil irrigation fields shall be in accordance with Section G.4.2.15.3.1 through Section G.4.2.15.3.3.

G.4.2.15.3.1 Minimum Pipe Size

Subsoil irrigation field distribution piping shall be not less than 3 inches (80 mm) diameter.

G.4.2.15.3.2 Filter Material and Backfill

Filter material, clean stone, gravel, slag, or similar material acceptable to the Authority Having Jurisdiction, varying in size from $\frac{3}{4}$ of an inch (19.1 mm) to $2\frac{1}{2}$ inches (64 mm) shall be placed in the trench to the depth and grade in accordance with Table G.4.2.15.3.2. The perforated section of subsoil irrigation field distribution piping shall be laid on the filter material in an approved manner. The perforated section shall then be covered with filter material to the minimum depth in accordance with Table G.4.2.15.3.2. The filter material shall then be covered with porous material to prevent closure of voids with earth backfill. No earth backfill shall be placed over the filter material cover until after inspection and acceptance.

G.4.2.15.3.3 Subsoil Irrigation Field Construction Subsoil irrigation fields shall be constructed in accordance with Table G.4.2.15.3.2. Where necessary on sloping ground to prevent excessive line slopes, irrigation lines shall be stepped. The lines between each horizontal leaching sections shall be made with approved watertight joints and installed on natural or unfilled ground.

G.4.2.16 Gray Water System Color and Marking Information

Pressurized gray water distribution systems shall be identified as containing nonpotable water in accordance with the plumbing code.

G.4.2.17 Special Provisions

G.4.2.17.1 Other Collection and Distribution Systems

Other collection and distribution systems shall be approved by the local Authority Having Jurisdiction, [as allowed by Section 102.0 of the WE-Standard and the plumbing code.](#)

G.4.2.17.2 Higher Requirements

Nothing contained in this chapter shall be construed to prevent the Authority Having Jurisdiction from requiring compliance with higher requirements than those contained herein, where such higher requirements are essential to maintain a safe and sanitary condition.

G.4.2.18 Testing

Building drains and vents for gray water systems shall be tested in accordance with the plumbing code. Surge tanks shall be filled with water to the overflow line prior to and during inspection. Seams and joints shall be left exposed, and the tank shall remain watertight. A flow test shall be performed through the system to the point of gray water discharge. Lines and components shall be watertight up to the point of the irrigation perforated and drip lines.

G.4.2.19 Maintenance

Gray water systems and components shall be maintained in accordance with Table G.4.1.5.1.

G.4.3 Reclaimed (Recycled) Water Systems.

G.4.3.1 General

The provisions of this section shall apply to the installation, construction, alteration, and repair of reclaimed (recycled)

**TABLE G.4.2.15.3.2
SUBSOIL IRRIGATION FIELD
CONSTRUCTION**

DESCRIPTION	MINIMUM	MAXIMUM
Number of drain lines per valved zone	1	-
Length of each perforated line	-	100 feet
Bottom width of trench	12 inches	18 inches
Spacing of lines, center to center	4 feet	-
Depth of earth cover of lines	10 inches	-
Depth of filter material cover of lines	2 inches	-
Depth of filter material beneath lines	3 inches	-
Grade of perforated lines level	level	3 inches per 100 feet

For SI units: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 inch per foot = 83.3 mm/m

water and stormwater systems intended to supply uses such as water closets, urinals, trap primers for floor drains and floor sinks, aboveground and subsurface irrigation, industrial or commercial cooling or air conditioning and other uses approved by the Authority Having Jurisdiction.

G.4.3.2 Permit

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

G.4.3.2.1 Plumbing Plan Submission

No permit for any reclaimed (recycled) water system shall be issued until complete plumbing plans, with appropriate data satisfactory to the Authority Having Jurisdiction, have been submitted and approved.

G.4.3.3 System Changes

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

G.4.3.4 Connections to Potable or Reclaimed(Recycled) Water Systems

Reclaimed (recycled) water systems shall have no connection to any potable water supply or alternate water source system. Potable water is permitted to be used as makeup water for a reclaimed (recycled) water storage tank provided the water supply inlet is protected by an airgap or reduced-pressure principle backflow preventer complying with the plumbing code.

G.4.3.5 Initial Cross-Connection Test

A cross-connection test is required in accordance with Section G.4.1.11.2. 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.

G.4.3.6 Reclaimed (Recycled) Water System Materials

Reclaimed (recycled) water supply and distribution system materials shall comply with the requirements of the plumbing code for potable water supply and distribution systems, unless otherwise provided for in this section.

G.4.3.7 Reclaimed (Recycled) Water System Color and Marking Information

Reclaimed (recycled) water systems shall have a colored background in accordance with the plumbing code. Reclaimed

(recycled) water systems shall be marked or field-marked, in lettering in accordance with the plumbing code, with the words: "CAUTION: NONPOTABLE RECLAIMED (RECYCLED) WATER, DO NOT DRINK."

G.4.3.8 Valves

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

G.4.3.9 Hose Bibbs

Hose bibbs shall not be allowed on reclaimed (recycled) water piping systems located in areas accessible to the public. Access to reclaimed (recycled) water at points in the system accessible to the public shall be through a quick-disconnect device that differs from those installed on the potable water system. Hose bibbs supplying reclaimed (recycled) water shall be indicated by posted signs marked with the words: "CAUTION: NONPOTABLE RECLAIMED WATER, DO NOT DRINK," and the symbol in Figure G.4.3.9.



Figure G.4.3.9

G.4.3.10 Required Appurtenances

The reclaimed (recycled) water system and the potable water system within the building shall be provided with the required appurtenances (valves, air/vacuum relief valves, etc.) to allow for deactivation or drainage as required for cross-connection test in Section G.4.1.11.2.

G.4.3.11 Same Trench as Potable Water Pipes Reclaimed (recycled) water pipes run or laid in the same trench as potable water pipes shall have 12 inches (305 mm) minimum vertical and horizontal separation when both pipe materials are approved for use within a building. When piping materials do not meet this requirement the minimum horizontal separation shall be increased to 60 inches (1524 mm). The potable water piping shall be installed at an elevation above the reclaimed (recycled) water piping. Reclaimed (recycled) water pipes laid in the same trench or crossing building sewer or drainage piping shall be installed in accordance with the plumbing code for potable water piping.

G.4.3.12 Signs

Rooms and water closet tanks in buildings using reclaimed (recycled) water shall be in accordance with Section G.4.1.10.

G.4.3.13 Inspection and Testing

Reclaimed (recycled) water systems shall be inspected and tested in accordance with Section G.4.1.11.

G.4.4 On-Site Treated Nonpotable Water Systems

G.4.4.1 General

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

G.4.4.2 Plumbing Plan Submission

No permit for any on-site treated nonpotable water system shall be issued until complete plumbing plans, with appropriate data satisfactory to the Authority Having Jurisdiction, have been submitted and approved.

G.4.4.3 System Changes

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

G.4.4.4 Connections to Potable or Reclaimed (Recycled) Water Systems

On-site treated nonpotable water systems shall have no connection to any potable water supply or reclaimed (recycled) water source system. Potable or reclaimed (recycled) water is permitted to be used as makeup water for a non-pressurized storage tank provided the makeup water supply is protected by an airgap in accordance with the plumbing code.

G.4.4.5 Initial Cross-Connection Test

A cross-connection test is required in accordance with Section G.4.1.11.2. 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.

G.4.4.6 On-Site Treated Nonpotable Water System Materials

On-site treated nonpotable water supply and distribution system materials shall comply with the requirements of the plumbing code for potable water supply and distribution systems, unless otherwise provided for in this section.

G.4.4.7 On-Site Treated Nonpotable Water Devices and Systems

Devices or equipment used to treat on-site treated nonpotable water in order 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 water closet and urinal flushing, surface irrigation and similar applications shall be listed or labeled to IAPMO IGC207, NSF 350 or approved by the Authority Having Jurisdiction.

G.4.4.8 On-Site Treated Nonpotable Water System Color and Marking Information

On-site treated water systems shall have a colored background in accordance with the plumbing code. On-site treated water systems shall be marked or field-marked, in lettering in accordance with the plumbing code, with the words: "CAUTION: ON-SITE TREATED NONPOTABLE WATER, DO NOT DRINK."

G.4.4.9 Valves

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

G.4.4.10 Design and Installation

The design and installation of on-site treated nonpotable systems shall be in accordance with Section G.4.4.10.1 through Section G.4.4.10.5.

G.4.4.10.1 Listing Terms and Installation Instructions

On-site treated nonpotable water systems shall be installed in accordance with the terms of its listing and the manufacturer's installation instructions.

G.4.4.10.2 Minimum Water Quality

On-site treated nonpotable water supplied to toilets or urinals or for other uses in which it is sprayed or exposed shall be disinfected. Acceptable disinfection methods shall include chlorination, ultraviolet sterilization, ozone, or other methods as approved by the Authority Having Jurisdiction. The minimum water quality for on-site treated nonpotable water systems shall meet the applicable water quality requirements for the intended applications as determined by the Authority Having Jurisdiction.

G.4.4.10.3 Deactivation and Drainage

The on-site treated nonpotable water system and the potable water system within the building shall be provided with the required appurtenances (valves, air/vacuum relief valves, etc.) to allow for deactivation or drainage as required for cross-connection test in accordance with Section G.4.1.11.2.

G.4.4.10.4 Near Underground Potable Water Pipe

On-site treated nonpotable water pipes run or laid in the same trench as potable water pipes shall have 12 inches (305 mm) minimum vertical and horizontal separation when both pipe materials are approved for use within a building. Where piping materials do not meet this requirement the minimum separation shall be increased to 60 inches (1524 mm). The potable water piping shall be installed at an elevation above the on-site treated nonpotable water piping.

G.4.4.10.5 Required Filters

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

G.4.4.11 Signs

Signs in buildings using on-site treated nonpotable water shall be in accordance with Section G.4.1.10.

G.4.4.12 Inspection and Testing

On-site treated nonpotable water systems shall be inspected and tested in accordance with Section G.4.1.11.

G.5 NONPOTABLE RAINWATER CATCHMENT SYSTEMS

G.5.1 General

G.5.1.1 Scope

The provisions of this chapter shall apply to the construction, alteration, and repair of nonpotable rainwater catchment systems.

G.5.1.1.1 Allowable Use of Rainwater

Where approved or required by the Authority Having Jurisdiction, rainwater used in lieu of potable water shall be in accordance with the provisions of this chapter.

G.5.1.2 System Design

Rainwater catchment systems shall be designed in accordance with this chapter by a licensed plumbing contractor, Registered Design Professional, or a person who demonstrates competency to design rainwater catchment systems as required by the Authority Having Jurisdiction. Components, piping, and fittings used in any rainwater catchment systems shall be listed.

EXCEPTIONS:

- (1) Rainwater catchment systems used for irrigation with a maximum storage capacity of 5,000 gallons (18 927 L) where the tank is supported directly upon grade and the ratio of height to width (or diameter) does not exceed 2 to 1.
- (2) Rainwater catchment systems for single family dwellings where all outlets, piping, and system components are located on the exterior of the building.

G.5.1.3 Permit

It shall be unlawful for any person to construct, install, alter, or cause to be constructed, installed, or altered any rainwater catchment system in a building or on a premise without first obtaining a permit to do such work from the Authority Having Jurisdiction.

EXCEPTIONS:

- (1) A permit is not required for exterior rainwater catchment systems used for outdoor drip and subsurface irrigation with a maximum storage capacity of 5,000 gallons (18 927 L) where the tank is supported directly upon grade and the ratio of height to width (or diameter) does not exceed 2 to 1 and it does not require electrical power or a make-up water supply connection.
- (2) A plumbing permit is not required for rainwater catchment systems for single family dwellings where all outlets,

pipng, and system components are located on the exterior of the building. This does not exempt the need for permits if required for electrical connections, tank supports, or enclosures.

G.5.1.4 Component Identification

System components shall be properly identified as to the manufacturer.

G.5.1.5 Maintenance and Inspection

Rainwater catchment systems and components shall be inspected and maintained in accordance with Section G.5.1.5.1 through Section G.5.1.5.3.

G.5.1.5.1 Frequency

Rainwater catchment systems and components shall be inspected and maintained in accordance with Table G.5.1.5.1 unless more frequent inspection and maintenance is required by the manufacturer.

G.5.1.5.2 Maintenance Log

A maintenance log for rainwater catchment systems is required to have a permit in accordance with Section G.5.1.3 and shall be maintained by the property owner and be available for inspection. The property owner or designated appointee shall ensure that a record of testing, inspection and maintenance as required by Table G.5.1.5.1 is maintained in the log. The log will indicate the frequency of inspection and maintenance for each system.

G.5.1.5.3 Maintenance Responsibility

The required maintenance and inspection of rainwater catchment systems shall be the responsibility of the property owner, unless otherwise required by the Authority Having Jurisdiction.

G.5.1.6 Operation and Maintenance Manual

An operation and maintenance manual for rainwater catchment systems required to have a permit in accordance with Section G.5.1.3 shall be supplied to the building owner by the system designer. The operating and maintenance manual shall include the following:

- (1) Detailed diagram of the entire system and the location of system components.
- (2) Instructions on operating and maintaining the system.
- (3) Details on maintaining the required water quality as determined by the Authority Having Jurisdiction.
- (4) Details on deactivating the system for maintenance, repair, or other purposes.
- (5) Applicable testing, inspection, and maintenance frequencies as required by Table G.5.1.5.1.
- (6) A method of contacting the manufacturer(s).

TABLE G.5.1.5.1 MINIMUM ALTERNATE WATER SOURCE TESTING, INSPECTION, AND MAINTENANCE FREQUENCY	
DESCRIPTION	MINIMUM FREQUENCY
Inspect and clean filters and screens, and replace (if necessary)	Every 3 months
Inspect and verify that disinfection, filters and water quality treatment devices and systems are operational and maintaining minimum water quality requirements as determined by the Authority Having Jurisdiction	In accordance with manufacturer's instructions, and the Authority Having Jurisdiction
Inspect and clear debris from rainwater gutters, downspouts, and roof washers	Every 6 months
Inspect and clear debris from roof or other aboveground rainwater collection surfaces	Every 6 months
Remove tree branches and vegetation overhanging roof or other aboveground rainwater collection surfaces	As needed

Inspect pumps and verify operation	After initial installation and every 12 months thereafter
Inspect valves and verify operation	After initial installation and every 12 months thereafter
Inspect pressure tanks and verify operation	After initial installation and every 12 months thereafter
Clear debris from and inspect storage tanks, locking devices, and verify operation	After initial installation and every 12 months thereafter
Inspect caution labels and marking	After initial installation and every 12 months thereafter
<u>Inspect and maintain mulch basins for gray water irrigation systems</u>	<u>As needed to maintain mulch depth and prevent ponding and runoff</u>
Cross-connection inspection and test*	After initial installation and every 12 months thereafter
Test water quality of rainwater catchment systems required by Section G.5.3.4 to maintain a minimum water quality	Every 12 months. After system renovation or repair.

* The cross-connection test shall be performed in the presence of the Authority Having Jurisdiction in accordance with the requirements of this Chapter.

G.5.1.7 Minimum Water Quality Requirements

The minimum water quality for rainwater catchment systems shall meet the applicable water quality requirements for the intended application as determined by the Authority Having Jurisdiction. Water quality for nonpotable rainwater catchment systems shall comply with Section G.5.3.4.

EXCEPTIONS:

- (1) Water treatment is not required for rainwater catchment systems used for aboveground irrigation with a maximum storage capacity of 360 gallons (1363 L).
- (2) Water treatment is not required for rainwater catchment systems used for nonspray irrigation.

G.5.1.8 Material Compatibility

Rainwater catchment 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.

G.5.1.9 System Controls

Controls for pumps, valves, and other devices that contain mercury that come in contact with rainwater supply are prohibited.

G.5.1.10 Separation Requirements

All underground rainwater catchment service piping shall be separated from the building sewer in accordance with the plumbing code. Treated nonpotable water pipes run or laid in the same trench as potable water pipes shall have a 12 inch (305 mm) minimum vertical and horizontal separation when both pipe materials are approved for use within a building. Where horizontal piping materials do not meet this requirement the minimum separation shall be increased to 60 inches (1524 mm). The potable water piping shall be installed at an elevation above the treated nonpotable water piping.

G.5.1.11 Abandonment

All rainwater catchment systems that are no longer in use or fails to be maintained in accordance with Section G.5.1.5 shall be abandoned. Abandonment shall comply with Section 305.0 of the WE-Standard.

G.5.1.12 Sizing

Unless otherwise provided for in this standard, rainwater catchment piping shall be sized in accordance with the plumbing code for sizing potable water piping.

G.5.2 Nonpotable Rainwater Catchment Systems

G.5.2.1 General

The provisions of this section shall apply to the installation, construction, alteration, and repair of rainwater catchments

systems intended to supply uses such as water closets, urinals, trap primers for floor drains and floor sinks, irrigation, industrial processes, water features, cooling tower makeup and other uses approved by the Authority Having Jurisdiction. Additional design criteria can be found in the ARCSA/ASPE 63 Standard.

G.5.2.2 Plumbing Plan Submission

No permit for any rainwater catchment system requiring a permit shall be issued until complete plumbing plans, with appropriate data satisfactory to the Authority Having Jurisdiction, have been submitted and approved.

G.5.2.3 System Changes

No changes or connections shall be made to either the rainwater catchment system or the potable water system within any site containing a rainwater catchment system requiring a permit without approval by the Authority Having Jurisdiction.

G.5.2.4 Connections to Potable or Reclaimed(Recycled) Water Systems

Rainwater catchment systems shall have no direct connection to any potable water supply or alternate water source system. Potable or reclaimed (recycled) water shall be permitted to be used as makeup water for a rainwater catchment system provided the potable or reclaimed (recycled) water supply connection is protected by an airgap or reduced-pressure principle backflow preventer in accordance with the plumbing code.

G.5.2.5 Initial Cross-Connection Test

Where any portion of a rainwater catchment system is installed within a building, a cross-connection test is required in accordance with G.5.3.14.2. 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.

G.5.2.6 Sizing

The design and size of rainwater drains, gutters, conductors, and leaders shall be in accordance with the plumbing code.

G.5.2.7 Rainwater Catchment System Materials Rainwater catchment system materials shall be in accordance with Section G.5.2.7.1 through Section G.5.2.7.4.

G.5.2.7.1 Water Supply and Distribution Materials Rainwater catchment water supply and distribution materials shall comply with the requirements of the plumbing code for potable water supply and distribution systems, unless otherwise provided for in this section.

G.5.2.7.2 Rainwater Catchment System Drainage Materials

Materials used in rainwater catchment drainage systems, including gutters, downspouts, conductors, and leaders shall comply with the requirements of the plumbing code for storm drainage.

G.5.2.7.3 Storage Tanks

Rainwater storage tanks shall be in accordance with Section G.5.3.5.

G.5.2.7.4 Collections Surfaces

The collection surface shall be constructed of a hard, impervious material.

G.5.2.8 Rainwater Catchment Water System Color and Marking Information

Rainwater catchment systems shall have a colored background in accordance with the plumbing code. Rainwater catchment systems shall be marked or field-marked, in lettering in accordance with the plumbing code, with the words: "CAUTION: NONPOTABLE RAINWATER, DO NOT DRINK."

G.5.3 Design and Installation

G.5.3.1 Outside Hose Bibbs

Outside hose bibbs shall be allowed on rainwater piping systems. Hose bibbs supplying rainwater shall be indicated by posted signs marked with the words: "CAUTION: NONPOTABLE RAINWATER, DO NOT DRINK" and the symbol in Figure G.5.3.1.



Figure G.5.3.1

G.5.3.2 Deactivation and Drainage for Cross-Connection Test

Where any portion of a rainwater catchment system is installed within a building, the rainwater catchment system and the potable water system within the building shall be provided with the required appurtenances (e.g., valves, air or vacuum relief valves, etc.) to allow for deactivation or drainage as required for cross-connection test in Section G.5.3.14.2.

G.5.3.3 Rainwater Catchment Collection Surfaces Rainwater shall be collected from roof surfaces or other manmade, aboveground collection surfaces.

G.5.3.3.1 Other Surfaces

Natural precipitation collected from surface water runoff, vehicular parking surfaces or manmade surfaces at or below grade shall comply with the stormwater requirements for onsite treated nonpotable water systems in Section G.4.4.

G.5.3.3.2 Prohibited Discharges

Overflows and bleed-off pipes from roof-mounted equipment and appliances shall not discharge onto roof surfaces that are intended to collect rainwater without prior approval from the Authority Having Jurisdiction.

G.5.3.4 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 also comply with Table G.5.3.4.

EXCEPTION: No treatment is required for rainwater used for subsurface or nonsprinkled surface irrigation where the maximum storage volume is less than 360 gallons (1 363 L).

G.5.3.4.1 Treatment

If the quality of the tested water cannot consistently be maintained at the minimum levels specified in Table G.5.3.4, then the system shall be equipped with an appropriate treatment device meeting applicable NSF Standard referenced in Table 901.1.

G.5.3.5 Rainwater Storage Tanks

Rainwater storage tanks shall be constructed and installed in accordance with Section G.5.3.5.1 through Section G.5.3.5.8.

G.5.3.5.1 Construction

Rainwater storage shall be constructed of solid, durable materials not subject to excessive corrosion or decay and shall be watertight. Storage tanks shall be approved by the Authority Having Jurisdiction, provided such tanks comply with approved applicable standards.

G.5.3.5.2 Location

Rainwater storage tanks shall be installed above or below grade.

G.5.3.5.3 Above Grade

Above grade storage tanks shall be of an opaque material, approved for aboveground use in direct sunlight or shall be shielded from direct sunlight. Tanks shall be installed in an accessible location to allow for inspection and cleaning. The tank shall be installed on a foundation or platform that is constructed to accommodate all loads in accordance with the building code.

G.5.3.5.4 Below Grade

Rainwater storage tanks installed below grade shall be structurally designed to withstand all anticipated earth or other loads. Holding tank covers shall be capable of supporting an earth load of not less than 300 pounds per square foot (lb/ft²) (1465 kg/m²) when the tank is designed for underground installation. Below grade rainwater tanks installed underground shall be provided with manholes. The manhole opening shall not be less than 20 inches (508 mm) in diameter and located not less than 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.

**TABLE G.5.3.4
MINIMUM WATER QUALITY**

APPLICATION	MINIMUM TREATMENT	MINIMUM WATER QUALITY
Car washing	Debris excluder or other approved means in compliance with Section G.5.3.10, and 100 Micron (100 µm) in compliance with Section G.5.3.11 for drip irrigation.	N/A
Subsurface and drip irrigation	Debris excluder or other approved means in compliance with Section 5.3.10, and 100 Micron (100 µm) in compliance with Section G.5.3.11 for drip irrigation.	N/A
Spray irrigation where the maximum storage volume is less than 360 gallons (1363 L)	Debris excluder or other approved means in compliance with Section 5.3.10, and Disinfection in accordance with Section G.5.3.8.	N/A
Spray irrigation where the maximum storage volume is equal to or greater than 360 gallons (1363 L)	Debris excluder or other approved means in compliance with Section G.5.3.10.	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 compliance with Section G.5.3.10, and 100 Micron (100 µm) in compliance with Section G.5.3.11.	Escherichia coli: < 100 CFU/100 mL, and Turbidity: < 10 NTU
Ornamental fountains and other water features	Debris excluder or other approved means in compliance with Section G.5.3.10.	Escherichia coli: < 100 CFU/100 mL, and Turbidity: < 10 NTU
Cooling tower make up water	Debris excluder or other approved means in compliance with Section G.5.3.10, and 100 Micron (100 µm) in compliance with Section	Escherichia coli: < 100 CFU/100 mL, and

	G.5.3.11.	Turbidity: < 10 NTU
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G.5.3.5.5 Drainage and Overflow

Rainwater storage tanks shall be provided with a means of draining and cleaning. The overflow drain shall not be equipped with a shutoff valve. The overflow outlet shall discharge as required by the plumbing code for storm drainage systems. Where discharging to the storm drainage system, the overflow drain shall be protected from backflow of the storm drainage system by a backwater valve or other approved method.

G.5.3.5.5.1 Overflow Outlet Size

The overflow outlet shall be sized to accommodate the flow of the rainwater entering the tank and not less than the aggregate cross-sectional area of all inflow pipes.

G.5.3.5.6 Opening and Access Protection
G.5.3.5.6.1 Animals and Insects

Rainwater tank openings shall be protected to prevent the entrance of insects, birds, or rodents into the tank.

G.5.3.5.6.2 Human Access

Rainwater tank access openings exceeding 12 inches (305 mm) in diameter shall be secured to prevent tampering and unintended entry by either a lockable device or other approved method.

G.5.3.5.7 Marking

Rainwater tanks shall be permanently marked with the capacity and the language: "NONPOTABLE RAINWATER." Where openings are provided to allow a person to enter the tank, the opening shall be marked with the following language: "DANGER-CONFINED SPACE."

G.5.3.5.8 Storage Tank Venting

Where venting by means of drainage or overflow piping is not provided or is considered insufficient, a vent shall be installed on each tank. The vent shall extend from the top of the tank and terminate a minimum of 6 inches (152 mm) above grade and shall be a minimum of 1½ inches (38 mm) in diameter. The vent terminal shall be directed downward and covered with a 3/32 inch (2.4 mm) mesh screen to prevent the entry of vermin and insects.

G.5.3.6 Pumps

Pumps serving rainwater catchment systems shall be listed. Pumps supplying water to water closets, urinals, and trap primers shall be capable of delivering not less than 15 psi (103 kPa) residual pressure at the highest and most remote outlet served. Where the water pressure in the rainwater 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 all water outlets in the building shall be installed in accordance with the plumbing code.

G.5.3.7 Roof Drains

Primary and secondary roof drains, conductors, leaders, and gutters shall be designed and installed in accordance with the plumbing code.

G.5.3.8 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.

G.5.3.9 Freeze Protection

Tanks and piping installed in locations subject to freezing shall be provided with an adequate means of freeze protection.

G.5.3.10 Debris Removal

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.

G.5.3.11 Required Filters

A filter permitting the passage of particulates no larger than 100 microns (100 µm) shall be provided for rainwater supplied to water closets, urinals, trap primers, and drip irrigation system.

G.5.3.12 Roof Gutters

Gutters shall maintain a minimum slope and be sized in accordance with the plumbing code.

G.5.3.13 Signs

Signs in buildings using rainwater water shall be in accordance with Section G.5.3.13.1 and Section G.5.3.13.2.

G.5.3.13.1 Commercial, Industrial, and Institutional Restroom Signs

A sign shall be installed in all restrooms in commercial, industrial, and institutional occupancies using rainwater for water closets, urinals, or both. Each sign shall contain ½ inch (12.7 mm) letters of a highly visible color on a contrasting background. The location of the sign(s) shall be such that the sign(s) shall be visible to all users. The location of the sign(s) shall be approved by the Authority Having Jurisdiction and shall contain the following text: TO CONSERVE WATER, THIS BUILDING USES RAINWATER TO FLUSH TOILETS AND URINALS.

G.5.3.13.2 Equipment Room Signs

Each room containing nonpotable rainwater equipment shall have a sign posted in a location that is visible to anyone working on or near nonpotable water equipment with the following wording in 1 inch (25.4 mm) letters: CAUTION: NONPOTABLE RAINWATER, DO NOT DRINK. DO NOT CONNECT TO DRINKING WATER SYSTEM. NOTICE: CONTACT BUILDING MANAGEMENT BEFORE PERFORMING ANY WORK ON THIS WATER SYSTEM.

G.5.3.14 Inspection and Testing

Rainwater catchment systems shall be inspected and tested in accordance with Section G.5.3.14.1 and Section G.5.3.14.2. [Irrigation systems not connected to a potable water system shall be exempt from testing requirements in Section G.5.3.14.2.](#)

G.5.3.14.1 Supply System Inspection and Test Rainwater catchment systems shall be inspected and tested in accordance with the applicable provisions of the plumbing code for testing of potable water and storm drainage systems. Storage tanks shall be filled with water to the overflow opening for a period of 24 hours and during inspection or by other means as approved by the Authority Having Jurisdiction. All seams and joints shall be exposed during inspection and checked for water tightness.

G.5.3.14.2 Annual Cross-Connection Inspection and Testing

An initial and subsequent annual inspection and test shall be performed on both the potable and rainwater catchment system. The potable and rainwater catchment system shall be isolated from each other and independently inspected and tested to ensure there is no cross-connection in accordance with Section G.5.3.14.2.1 through Section G.5.3.14.2.4.

G.5.3.14.2.1 Visual System Inspection

Prior to commencing the cross-connection testing, a dual system inspection shall be conducted by the Authority Having Jurisdiction as follows:

- (1) Meter locations of the rainwater and potable water lines shall be checked to verify that no modifications were made and that no cross-connections are visible.
- (2) Pumps and equipment, equipment room signs, and exposed piping in equipment room shall be checked.
- (3) Valves shall be checked to ensure that valve lock seals are still in place and intact. Valve control door signs shall be checked to verify that no signs have been removed.

G.5.3.14.2.2 Cross-Connection Test

The procedure for determining cross-connection shall be followed by the applicant in the presence of the Authority Having Jurisdiction to determine whether a cross-connection has occurred as follows:

- (1) The potable water system shall be activated and pressurized. The rainwater catchment system shall be shut down, depressurized, and drained.
- (2) The potable water system shall remain pressurized for a minimum period of time specified by the Authority Having Jurisdiction while the rainwater catchment system is empty. The minimum period the rainwater catchment system is to remain depressurized shall be determined on a case-by-case basis, taking into account the size and complexity of the potable and the rainwater catchment distribution systems, but in no case shall that period be less than 1 hour.
- (3) The drain on the rainwater catchment system shall be checked for flow during the test and all fixtures, potable and alternate water source, shall be tested and inspected for flow. Flow from any rainwater catchment system outlet indicates a cross-connection. No flow from a potable water outlet shall indicate that it is connected to the rainwater catchment system.
- (4) The potable water system shall then be depressurized and drained.
- (5) The rainwater catchment system shall then be activated and pressurized.
- (6) The rainwater catchment system shall remain pressurized for a minimum period of time specified by the Authority Having Jurisdiction while the potable water system is empty. The minimum period the potable water system is to remain depressurized shall be determined on a case-by-case basis, but in no case shall that period be less than 1 hour.
- (7) All fixtures, potable and rainwater, shall be tested and inspected for flow. Flow from any potable water system outlet indicates a cross-connection. No flow from a rainwater outlet will indicate that it is connected to the potable water system.
- (8) The drain on the potable water system shall be checked for flow during the test and at the end of the test.
- (9) If there is no flow detected in any of the fixtures which would indicate a cross-connection, the potable water system shall be repressurized.

G.5.3.14.2.3 Discovery of Cross-Connection

In the event that a cross-connection is discovered, the following procedure, in the presence of the Authority Having Jurisdiction, shall be activated immediately:

- (1) The rainwater piping to the building shall be shut down at the meter, and the rainwater riser shall be drained.
- (2) Potable water piping to the building shall be shut down at the meter.
- (3) The cross-connection shall be uncovered and disconnected.
- (4) The building shall be retested following procedures listed in Section G.5.3.14.2.1 and Section G.5.3.14.2.2.
- (5) The potable water system shall be chlorinated with 50 parts-per-million (ppm) chlorine for 24 hours.
- (6) The potable water system shall be flushed after 24 hours, and a standard bacteriological test shall be performed. If test results are acceptable, the potable water system shall be recharged.

G.5.3.14.2.4 Annual Inspection

An annual inspection of the rainwater catchment system, following the procedures listed in Section G.5.3.14.2.1 shall be required. Annual cross-connection testing, following the procedures listed in Section G.5.3.14.2.2 shall be required by the Authority Having Jurisdiction, unless site conditions do not require it. In no event shall the test occur less than once in 4 years. Alternate testing requirements shall be approved by the Authority Having Jurisdiction.

G.6 WATER HEATING DESIGN, EQUIPMENT, AND INSTALLATION

G.6.1 General

G.6.1.1 Scope

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

G.6.1.2 Insulation

Hot water supply and return piping shall be thermally insulated. The wall thickness of the insulation shall be equal to the nominal diameter of the pipe up to 2 inches (50 mm). The wall thickness shall be not less than 2 inches (50 mm) for nominal pipe diameters exceeding 2 inches (50 mm). The conductivity of the insulation [k-factor (Btu·in/(h·ft²·°F))], measured radially, shall be less than or equal to 0.28 [Btu·in/(h·ft²·°F)] [0.04 W/(m·K)]. Hot water piping to be insulated

shall be installed such that insulation is continuous. Pipe insulation shall be installed to within ¼ inch (6.4 mm) of all appliances, appurtenances, fixtures, structural members, or a wall where the pipe passes through to connect to a fixture within 24 inches (610 mm).

EXCEPTIONS:

- (1) Where the hot water pipe is installed in a wall that is not of sufficient width to accommodate the pipe and insulation, the insulation thickness shall be the maximum thickness that the wall can accommodate and not less than ½ inch (12.7 mm) thick.
- (2) Hot water supply piping exposed under sinks, lavatories, and similar fixtures.
- (3) Where hot water distribution piping is installed within attic, crawlspace, or wall insulation.

G.6.1.2.1 Pipe Supports

Pipe supports shall be installed on the outside of the pipe insulation.

EXCEPTION: Vertical supports, and horizontal and vertical anchors shall be installed on the pipe inside the pipe insulation.

G.6.1.2.2 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.

G.6.2 Recirculation Systems

G.6.2.1 Pump Operation

G.6.2.1.1 For Low-Rise Residential Buildings Circulating hot water systems shall be arranged so that the circulating pump(s) can be turned off (automatically or manually) when the hot water system is not in operation. [ASHRAE 90.2:7.2-2007]

G.6.2.1.2 For Pumps Between Boilers and Storage Tanks

When used to maintain storage tank water temperature, recirculating pumps shall be equipped with controls limiting operation to a period from the start of the heating cycle to a maximum of 5 minutes after the end of the heating cycle. [ASHRAE 90.1:7.4.4.4]

G.6.2.2 Recirculation Pump Controls

Pump controls shall include on-demand activation or time clocks combined with temperature sensing. Time clock controls for pumps shall not let the pump operate more than 15 minutes every hour. Temperature sensors shall stop circulation when the temperature set point is reached and shall be located on the circulation loop at or near the last fixture. The pump, pump controls and temperature sensors shall be accessible. Pump operation shall be limited to the building's hours of operation.

G.6.2.3 Temperature Maintenance Controls

For other than low-rise residential buildings, systems designed to maintain usage temperatures in hot-water pipes, such as recirculating hot-water systems or heat trace, shall be equipped with automatic time switches or other controls that can be set to switch off the usage temperature maintenance system during extended periods when hot water is not required. [ASHRAE 90.1:7.4.4.2]

G.6.2.4 System Balancing

Systems with multiple recirculation zones shall be balanced to uniformly distribute hot water, or they shall be operated with a pump for each zone. The circulation pump controls shall comply with the provisions of Section G.6.2.2.

G.6.2.5 Flow Balancing Valves

Flow balancing valves shall be a factory preset automatic flow control valve, a flow regulating valve, or a balancing valve with memory stop.

G.6.2.6 Air Elimination

Provision shall be made for the elimination of air from the return system.

G.6.2.7 Gravity or Thermosyphon Systems

Gravity or thermosyphon systems are prohibited.

G.6.3 Service Hot Water – Low-Rise Residential Buildings

G.6.3.1 General

The service water heating system for single-family houses, multi-family structures of three stories or fewer above grade, and modular houses shall be in accordance with Section G.6.3.2 through Section G.6.3.7. The service water heating system of all other buildings shall be in accordance with Section G.6.4.

G.6.3.2 Water Heaters and Storage Tanks

Residential-type water heaters, pool heaters, and unfired water heater storage tanks shall meet the minimum performance requirements specified by federal law.

Unfired storage water heating equipment shall have a heat loss through the tank surface area of less than 6.5 British thermal units per hour per square foot (Btu/h•ft²) (20.5 W/m²). **[ASHRAE 90.2:7.1-2007]**

G.6.3.3 Recirculation Systems

Recirculation systems shall meet the provisions in Section G.6.2.

G.6.3.4 Central Water Heating Equipment

Service water heating equipment (central systems) that does not fall under the requirements for residential-type service water heating equipment addressed in Section G.6.3 shall meet the applicable requirements for service water-heating equipment found in Section G.6.4. **[ASHRAE 90.2:7.3-2007]**

G.6.3.5 Insulation

Insulation for hot water and return piping shall comply with the provisions of Section G.6.1.2.

G.6.3.6 Hard Water

Where water has hardness equal to or exceeding 9 grains per gallon (gr/gal) (154 mg/L) measured as total calcium carbonate equivalents, the water supply line to water heating equipment in new one- and two-family dwellings shall be roughed-in to allow for the installation of water treatment equipment.

G.6.3.7 Maximum Volume and Length of Hot Water The maximum volume of water contained in a hot water branch shall comply with Section G.6.3.7.1. The maximum length per volume of piping shall comply with Section G.6.3.7.2.

G.6.3.7.1 Maximum Volume of Hot Water in a Branch The water volume per foot of piping shall be calculated using Table G.6.3.7.1. 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. **(0.7 L)** where a single branch serves a single fixture.
- (2) 40 oz. **(1.2 L)** where a series branch incorporating one or more Flow-Through Design configurations that serves two or more fixtures.
- (3) 60 oz. **(1.8 L)** 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. **(1.2 L)**.
- (2) The maximum volume of a single branch to a stand-alone tub shall not contain more than 80 oz. **(2.4 L)**.

G.6.3.7.2 Maximum Length per Volume of Water in a Branch

For fixture branches in accordance with Section G.6.3.7.1, the maximum length of piping shall be calculated using *2021 National Standard Plumbing Code Illustrated*

Table G.6.3.7.2(1) through Table G.6.3.7.2(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).

G.6.3.7.3 Hot Water System Submeters

Where a hot water pipe from a circulation loop or electric heat trace line is equipped with a submeter, the hot water distribution system downstream of the submeter shall have either an end-of-line hot water circulation pump or shall be electrically heat traced. The maximum volume of water in any branch from the circulation loop or electric heat trace line downstream of the submeter shall not exceed 16 oz (473 mL).

If there is no circulation loop or electric heat traced line downstream of the submeter, the submeter shall be located within 2 feet (610 mm) of the central hot water system; or the branch line to the submeter shall be circulated or heat traced to within 2 feet of the submeter. The maximum volume from the submeter to each fixture shall not exceed 32 oz (946 mL). The circulation pump controls shall comply with the provisions of Section G.6.2.2.

TABLE G.6.3.7.1 WATER VOLUME (OZ/FT) FOR DISTRIBUTION PIPING MATERIALS														
NOMINAL SIZE (inch)	COPPER M	COPPER L	COPPER K	CPVC SDR 11	CPVC SCH 40	PEX-ALP EX	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	0.68	1.17	0.59	0.59	0.85	0.64	0.64	0.85	1.02	NA	1.48
1/2	1.69	1.55	1.45	1.23	1.89	1.22	1.22	1.44	1.18	1.18	1.35	1.64	NA	2.33
3/4	3.43	3.22	2.90	2.52	3.38	3.28	3.28	2.72	2.35	2.35	2.14	2.54	NA	3.68
1	5.81	5.49	5.17	4.24	5.53	5.37	5.37	4.58	3.88	3.88	3.46	4.22	NA	5.83
1-1/4 1 1/4	8.70	8.36	8.09	6.38	9.66	8.65	8.65	8.23	5.80	5.80	5.47	6.59	NA	9.35
1-1/2 1 1/2	12.18	11.83	11.45	8.95	13.20	13.91	13.91	11.38	8.08	8.08	8.64	10.27	NA	12.27
2	21.50	20.58	20.04	15.38	21.88	23.16	23.16	19.11	13.86	13.86	13.64	16.42	NA	19.19

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

TABLE G.6.3.7.2(1) LENGTH (FT) PER VOLUME OF PIPING									
NOMINAL SIZE (inch)	COPPER TYPE M			COPPER TYPE L			COPPER TYPE K		
	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
1-1/4 1 1/4	2.8	4.6	6.9	2.9	4.8	7.2	3.0	4.9	7.4
1-1/2 1 1/2	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 G.6.3.7.2(2) LENGTH (FT) PER VOLUME OF PIPING												
NOMINAL SIZE (inch)	CPVC CTS SDR 11			CPVC SCH 40 PIPE			CPVC SCH 80 PIPE			CPVC SDR 11 PIPE		
	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
1-1/4 1 1/4	3.8	6.3	9.4	2.5	4.1	6.2	2.9	4.9	7.3	2.6	4.3	6.4
1-1/2 1 1/2	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 G.6.3.7.2(3) LENGTH (FT) PER VOLUME OF PIPING									
NOMINAL SIZE, inches (DN) ¹	PEX & PE-RT CTS SDR 9			PEX-AL-PEX (DN)			PE-AL-PE (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
1-1/4 1 1/4 (40)	4.1	6.9	10.3	2.8	4.6	6.9	2.8	4.6	6.9
1-1/2 1 1/2 (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

¹ DN is outside diameter

TABLE G.6.3.7.2(4) LENGTH (FT) PER VOLUME OF PIPING									
NOMINAL SIZE, Inches (DN) ²	PP SDR 6 (DN)			PP SDR 7.3 (DN)			PP SDR 11 (DN) ¹		
	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
1- ¹ / ₄ -1- ¹ / ₄ (40)	4.4	7.3	11.0	3.6	6.1	9.1	NA	NA	NA
1- ¹ / ₂ -1- ¹ / 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

¹ PP SDR 11 products are not typically used or rated at 180°F

² DN is outside diameter

G.6.4 Service Hot Water – Other Than Low-Rise Residential Buildings

G.6.4.1 General

The service hot water, other than single-family houses, multi-family structures of three stories or fewer above grade, and modular houses, shall comply with Section G.6.4 through Section G.6.7.

G.6.4.2 New Buildings

Service water heating systems and equipment shall comply with the requirements of this section as described in Section G.6.4.5. [ASHRAE 90.1:7.1.1.1]

G.6.4.3 Additions to Existing Buildings

Service water heating systems and equipment shall comply with the requirements of this section.

EXCEPTION: When the service water heating to an addition is provided by existing service water heating systems and equipment, such systems and equipment shall not be required to comply with this standard. However, any new systems or equipment installed must comply with specific requirements applicable to those systems and equipment. [ASHRAE 90.1:7.1.1.2]

G.6.4.4 Alterations to Existing Buildings

Building service water heating equipment installed as a direct replacement for existing building service water heating equipment shall comply with the requirements of Section G.6.4 applicable to the equipment being replaced. New and replacement piping shall comply with Section G.6.5.3.

EXCEPTION: Compliance shall not be required where there is insufficient space or access to meet these requirements. [ASHRAE 90.1:7.1.1.3]

G.6.4.5 Compliance Path(s)

Compliance shall be achieved by meeting the requirements of Section G.6.4.1, General; Section G.6.5, Mandatory Provisions; Section G.6.6, Prescriptive Path; and Section G.6.7, Submittals. [ASHRAE 90.1:7.2.1]

G.6.4.6 Energy Cost Budget Method

Projects using the Energy Cost Budget Method (Section 11 of ASHRAE 90.1) for demonstrating compliance with the standard shall meet the requirements of Section G.6.5, Mandatory Provisions, in conjunction with Section 11 of ASHRAE 90.1, Energy Cost Budget Method. [ASHRAE 90.1:7.2.2]

G.6.5 Mandatory Provisions

G.6.5.1 Load Calculations

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

G.6.5.2 Equipment Efficiency

Water heating equipment, hot-water supply boilers used solely for heating potable water, pool heaters, and hot-water storage tanks shall meet the criteria listed in Table G.6.5.2. Where multiple criteria are listed, all criteria shall be met. Omission of minimum performance requirements for certain classes of equipment does not preclude use of such equipment where appropriate. Equipment not listed in Table G.6.5.2 has no minimum performance requirements.

TABLE G.6.5.2 PERFORMANCE REQUIREMENTS FOR WATER HEATING EQUIPMENT [ASHRAE 90.1: TABLE 7.8]				
EQUIPMENT TYPE	SIZE CATEGORY (INPUT)	SUBCATEGORY OR RATING CONDITION	PERFORMANCE REQUIRED ¹	TEST PROCEDURE ^{2,3}
Electric Table Top Water Heaters	≤12 kW	Resistance ≥20 gal	See footnote 7	
Electric water heaters	≤12 kW ⁵	Resistance ≥20 gal	See footnote 7	
	>12 kW ⁵	Resistance ≥20 gal	0.3 + 27/Vm %h	Section G.2 of ANSI Z21.10.3
	≤24 Amps and ≤250 Volts	Heat Pump	See footnote 7	
Gas storage water heaters	≤75 000 Btu/h	≥20 gal	See footnote 7	
	>75 000 Btu/h ⁶	<4000 (Btu/h)/gal	80% E _t (Q/800 + 100√V)SL, Btu/h	Sections G.1 and G.2 of ANSI Z21.10.3
Gas instantaneous water heaters	>50 000 Btu/h and <200 000 Btu/h	≥4000 (Btu/h)/gal and <2 gal	See footnote 7	
	≥200 000 Btu/h ^{4,6}	≥4000 (Btu/h)/gal and <10 gal	80% E _t	Sections G.1 and G.2 of ANSI Z21.10.3
	≥200 000 Btu/h	≥4000 (Btu/h)/gal and ≥10 gal	80% E _t (Q/800 + 100√V)SL, Btu/h	
Oil storage water heaters	≤105 000 Btu/h	≥20 gal	See footnote 7	
	>105 000 Btu/h	<4000 (Btu/h)/gal	80% E _t (Q/800 + 100√V)SL, Btu/h	Sections G.1 and G.2 of ANSI Z21.10.3
Oil instantaneous water heaters	≤210 000 Btu/h	≥4000 (Btu/h)/gal and <2 gal	See footnote 7	
	>210 000 Btu/h	≥4000 (Btu/h)/gal	80% E _t	Sections G.1 and G.2 of

		and <10 gal		ANSIZ21.10.3
	>210 000 Btu/h	≥4000 (Btu/h)/gal and ≥10 gal	78% E _t (Q/800 + 100√V)SL, Btu/h	
Hot-water supply boilers, gas and oil ⁶	≥300 000 Btu/h and <12 500 000 Btu/h	≥4000 (Btu/h)/gal and <10 gal	80% E _t	Sections G.1 and G.2 of ANSIZ21.10.3
Hot-water supply boilers, gas ⁶	————	≥4000 (Btu/h)/gal and ≥10 gal	80% E _t (Q/800 + 100√V)SL, Btu/h	
Hot-water supply boilers, oil ⁶	————	≥4000 (Btu/h)/gal and ≥10 gal	78% E _t (Q/800 + 100√V)SL, Btu/h	
Pool heaters, oil and gas	All	————	See footnote 7	ASHRAE 146
Heat pump pool heaters	All	50°F db 44.2°F wb Outdoor air 80.0°F entering water	4.0 COP	AHRI 1160
Unfired storage tanks	All		R-12.5	(none)

For SI units: 1 gallon = 3.785 L, 1000 British thermal units per hour = 0.293 kW, °C = (°F-32)/1.8

¹ Thermal efficiency (E_t) is a minimum requirement, while standby loss (SL) is maximum Btu/h based on a 70°F temperature difference between stored water and ambient requirements. In the SL equation, V is the rated volume in gallons and Q is the nameplate input rate in Btu/h. V_m is the measured volume in the tank in gallons.

² ASHRAE 90.1 Section 12 contains a complete specification, including the year version, of the referenced test procedure.

³ Section G1 is titled “Test Method for Measuring Thermal Efficiency” and Section G2 is titled “Test Method for Measuring Standby Loss.”

⁴ Instantaneous water heaters with input rates below 200 000 Btu/h (58.6 kW) must comply with these requirements if the water heater is designed to heat water to temperatures of 180°F (82°C) or higher.

⁵ Electric water heaters with input rates less than 40 946 Btu/h (12 kW) shall be in accordance with these requirements where the water heater is designed to heat water to temperatures of 180°F (82°C) or higher.

⁶ Refer to ASHRAE 90.1 Section 7.5.3 for additional requirements for gas storage and instantaneous water heaters and gas hot-water supply boilers.

⁷ In the U.S., the efficiency requirements for water heaters or gas pool heaters in this category or subcategory are specified by the U.S. Department of Energy. Those requirements and applicable test procedures are found in the Code of Federal Regulations 10 CFR Part 430.

Informative Note: See ASHRAE 90.1 Informative Appendix F for the U.S. Department of Energy efficiency requirements applicable to these water heaters and pool heaters.

EXCEPTIONS: Water heaters and hot-water supply boilers having more than 140 gallons (530 L) of storage capacity are not required to meet the standby loss (SL) requirements of Table G.6.5.2 when:

- (1) The tank surface is thermally insulated to R-12.5.
- (2) A standing pilot light is not installed.
- (3) Gas-or oil-fired storage water heaters have a flue damper or fan-assisted combustion. [ASHRAE 90.1:7.4.2]

G.6.5.3 Insulation

Insulation of hot water and return piping shall meet the provisions in Section G.6.1.2.

G.6.5.4 Hot Water System Design

G.6.5.4.1 Recirculation Systems

Recirculation systems shall meet the provisions in Section G.6.2.

G.6.5.4.2 Maximum Volume of Hot Water

The maximum volume of water contained in hot water distribution lines between the water heater and the fixture stop or connection to showers, kitchen faucets, and lavatories shall be determined in accordance with Section G.6.3.7.

G.6.5.5 Service Water Heating System Controls.

G.6.5.5.1 Storage Temperature Controls

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

EXCEPTION: When the manufacturers' installation instructions specify a higher minimum thermostat setting to minimize condensation and resulting corrosion. [ASHRAE 90.1:7.4.4.1]

G.6.5.5.2 Outlet Temperature Controls

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

G.6.5.6 Heat Traps

Vertical pipe risers serving storage water heaters and storage tanks not having integral heat traps and serving a nonrecirculating system shall have heat traps on both the inlet and outlet piping as close as practical to the storage tank. A heat trap is a means to counteract the natural convection of heated water in a vertical pipe run. The means is either a device specifically designed for the purpose or an arrangement of tubing that forms a loop of 360 degrees (6.28 rad) or piping that from the point of connection to the water heater (inlet or outlet) includes a length of piping directed downward before connection to the vertical piping of the supply water or hot-water distribution system, as applicable. [ASHRAE 90.1:7.4.6]

G.6.6 Prescriptive Path

G.6.6.1 Space Heating and Water Heating

The use of a gas-fired or oil-fired space-heating boiler system otherwise complying with Section G.6.4 to provide the total space heating and water heating for a building is allowed when one of the following conditions is met:

- (1) The single space-heating boiler, or the component of a modular or multiple boiler system that is heating the service water, has a standby loss in Btu/h (kW) not exceeding $(13.3 \times \text{pmd} + 400)/n$, where (pmd) is the probable maximum demand in gallons per hour, determined in accordance with the procedures described in generally accepted engineering standards and handbooks, and (n) is the fraction of the year when the outdoor daily mean temperature is greater than 64.9°F (18.28°C).

The standby loss is to be determined for a test period of 24 hours duration while maintaining a boiler water temperature of at least 90°F (32.5°C) above ambient, with an ambient temperature between 60°F (16°C) and 90°F (32°C). For a boiler with a modulating burner, this test shall be conducted at the lowest input.

- (2) It is demonstrated to the satisfaction of the Authority Having Jurisdiction that the use of a single heat source will consume less energy than separate units.
- (3) The energy input of the combined boiler and water heater system is less than 150,000 Btu/h (44 kW). [ASHRAE 90.1:7.5.1]

G.6.6.2 Service Water Heating Equipment

Service water heating equipment used to provide the additional function of space heating as part of a combination (integrated) system shall satisfy all stated requirements for the service water heating equipment. [ASHRAE 90.1:7.5.2]

G.6.6.3 Heat Recovery for Service Water Heating.

G.6.6.3.1 Condenser

Condenser heat recovery systems shall be installed for heating or preheating of service hot water provided all of the following are true:

- (1) The facility operates 24 hours a day.
- (2) The total installed heat rejection capacity of the water-cooled systems exceeds 6,000,000 Btu/h (1758 kW) of heat rejection.
- (3) The design service water heating load exceeds 1,000,000 Btu/h (293 kW). [ASHRAE 90.1:6.5.6.2.1]

G.6.6.3.2 Capacity

The required heat recovery system shall have the capacity to provide the smaller of:

- (1) Sixty percent of the peak heat rejection load at design conditions.
- (2) Preheat of the peak service hot water draw to 85°F (29°C). [ASHRAE 90.1:6.5.6.2.2]

EXCEPTIONS:

- (a) Facilities that employ condenser heat recovery for space heating with a heat recovery design exceeding 30 percent of the peak water-cooled condenser load at design conditions.
- (b) Facilities that provide 60 percent of their service water heating from site-solar or site-recovered energy or from other sources.

G.6.7 Submittals

G.6.7.1 General

The Authority Having Jurisdiction shall require submittal of compliance documentation and supplemental information, in accordance with Section [ADM 4.9.2-103.0 of the WE-Standard and the applicable mechanical and building codes](#).

G.6.8 Hard Water

G.6.8.1 Softening and Treatment

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

G.6.9 Drain Water Heat Exchangers

G.6.9.1 General

Drain water heat exchangers shall comply with IAPMO PS-92. The heat exchanger shall be accessible.

G.6.10 Heat Recovery from Steam Boiler Blowdown

G.6.10.1 General

Where heat recovery can be used beneficially to heat boiler makeup water or for other purposes, boiler blowdown from steam boilers exceeding 15 psi and 3.4 million BTU's per hour (100 HP) shall be directed to a heat recovery system that reduces the temperature of the blowdown discharge to below 140°F ([60°C](#)) without using tempering water.

G.7 POTABLE RAINWATER CATCHMENT SYSTEMS

G.7.1 General

G.7.1.1 Scope

The provisions of this appendix shall apply to the installation, construction, alteration, and repair of potable rainwater catchment systems.

G.7.1.2 System Design

Potable rainwater catchment systems complying with this appendix shall be designed by a person registered, licensed, or deemed competent by the Authority Having Jurisdiction to perform potable rainwater catchment system design work.

G.7.1.3 Permit

It shall be unlawful for any person to construct, install, or alter, or cause to be constructed, installed, or altered any potable rainwater catchment systems in a building or on a premise

without first obtaining a permit to do such work from the Authority Having Jurisdiction.

G.7.1.3.1 Plumbing Plan Submission

No permit for any rainwater catchment system requiring a permit shall be issued until complete plumbing plans, with appropriate data satisfactory to the Authority Having Jurisdiction, have been submitted and approved. No changes or connections shall be made to either the rainfall catchment or the potable water system within any site containing a

rainwater catchment water system without approval by the Authority Having Jurisdiction.

G.7.1.3.2 System Changes

No changes or connections shall be made to either the rainwater catchment system or the potable water system within any site containing a rainwater catchment system requiring a permit without approval by the Authority Having Jurisdiction.

G.7.1.4 Product and Material Approval

G.7.1.4.1 Component Identification

System components shall be properly identified as to the manufacturer.

G.7.1.4.2 Plumbing Materials and Systems

Pipe, pipe fittings, traps, fixtures, material, and devices used in a potable rainwater system shall be listed or labeled (third-party certified) by a listing agency (accredited conformity assessment body) and shall comply with the approved applicable recognized standards referenced in this standard and the plumbing code, and shall be free from defects. Unless otherwise provided for in this standard, all 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. ~~UPC:301.2~~

G.7.1.5 Maintenance and Inspection

Potable rainwater catchment systems and components shall be inspected and maintained in accordance with Section G.7.1.5.1 through Section G.7.1.5.3.

G.7.1.5.1 Frequency

Potable rainwater catchment systems and components shall be inspected and maintained in accordance with Table G.7.1.5.1 unless more frequent inspection and maintenance is required by the manufacturer.

G.7.1.5.2 Maintenance Log

A maintenance log for potable rainwater catchment systems shall be maintained by the property owner and be available for inspection. The property owner or designated appointee shall ensure that a record of testing, inspection and maintenance as required by Table G.7.1.5.1 is maintained in the log. The log will indicate the frequency of inspection, and maintenance for each system. A record of the required water quality tests shall be retained for not less than 2 years.

TABLE G.7.1.5.1 MINIMUM POTABLE RAINWATER CATCHMENT SYSTEM TESTING, INSPECTION AND MAINTENANCE FREQUENCY	
DESCRIPTION	MINIMUM FREQUENCY
Inspect and clean filters and screens, and replace (if necessary)	Every 3 months
Inspect and verify that disinfection, filters and water quality treatment devices and systems are operational. Perform any water quality tests as required by the Authority Having Jurisdiction.	In accordance with the manufacturer's instructions, and the Authority Having Jurisdiction.
Perform applicable water quality tests to verify compliance with Section G.7.4.2.	Every 3 months
Perform a water quality test for E. Coli , Total Coliform, and Heterotrophic bacteria . <u>If total coliform test is positive, perform test for E. Coli.</u> For a system where 25 different people consume water from the system over a 60 day period, a water quality test for cryptosporidium shall also be performed.	After initial installation and every 12 months thereafter, or as directed by the Authority Having Jurisdiction.

Inspect and clear debris from rainwater gutters, downspouts, and roof washers.	Every 6 months
Inspect and clear debris from roof or other aboveground rainwater collection surface.	Every 6 months
Remove tree branches and vegetation overhanging roof or other aboveground rainwater collection surface.	As needed
Inspect pumps and verify operation.	After initial installation and every 12 months thereafter.
Inspect valves and verify operation.	After initial installation and every 12 months thereafter.
Inspect pressure tanks and verify operation.	After initial installation and every 12 months thereafter.
Clear debris and inspect storage tanks, locking devices, and verify operation.	After initial installation and every 12 months thereafter.
Inspect caution labels and marking.	After initial installation and every 12 months thereafter.

G.7.1.5.3 Maintenance Responsibility

The required maintenance and inspection of potable rainwater catchment systems shall be the responsibility of the property owner, unless otherwise required by the Authority Having Jurisdiction.

G.7.1.6 Operation and Maintenance Manual

An operation and maintenance manual for potable rainwater catchment systems shall be supplied to the building owner by the system designer. The operating and maintenance manual shall include the following:

- (1) Detailed diagram of the entire system and the location of all system components.
- (2) Instructions on operating and maintaining the system.
- (3) Details on maintaining the required water quality as determined by the Authority Having Jurisdiction.
- (4) Details on deactivating the system for maintenance, repair, or other purposes.
- (5) Applicable testing, inspection and maintenance frequencies as required by Table G.7.1.5.1.
- (6) A method of contacting the manufacturer(s).

G.7.1.7 Minimum Water Quality Requirements

The minimum water quality for all potable rainwater catchment systems shall meet the applicable water quality requirements as determined by the Authority Having Jurisdiction for private wells. ~~In the absence of water quality requirements, the guidelines EPA/625/R-04/108 contains recommended water reuse guidelines to assist regulatory agencies develop, revise, or expand alternate water source water quality standards.~~

G.7.1.8 Material Compatibility

In addition to the requirements of this appendix, potable rainwater catchment systems shall be constructed of materials that are compatible with the type of pipe and fitting materials and water conditions in the system.

G.7.1.9 System Controls

Controls for pumps, valves, and other devices that contain mercury that come in contact with the water supply are prohibited.

G.7.2 Connection

G.7.2.1 General

No water piping supplied by a potable rainwater catchment 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. [\[UPC:602.4\]](#)

G.7.2.2 Connections to Public or Private Potable Water Systems

Potable rainwater catchment systems shall have no direct connection to any public or private potable water supply or alternate water source system. Potable water from a public or private potable water system shall be permitted to be

used as makeup water to the rainwater storage tank provided the public or private potable water supply connection is protected by an airgap or reduced-pressure principle backflow preventer in accordance with the plumbing code.

G.7.2.3 Backflow Prevention

The potable rainwater catchment system shall be protected against backflow in accordance with the plumbing code.

G.7.3 Potable Rainfall Catchment System Materials

G.7.3.1 Collections Surfaces

The collection surface for potable applications shall be constructed of a hard, impervious material and shall be approved for potable water use. Roof coatings, paints, and liners shall comply with NSF Protocol P151.

G.7.3.1.1 Prohibited.

Roof paints and coatings with lead, chromium, or zinc are prohibited. Wood roofing material and lead flashing are prohibited.

G.7.3.2 Rainwater Catchment System Drainage Materials

Gutters and downspouts used in rainwater catchment drainage systems shall comply with NSF Protocol P151, and leaders and conductors shall be listed to NSF 61.

G.7.3.3 Storage Tanks

Rainwater storage shall be in accordance with Section G.7.4.5.

G.7.3.4 Water Supply and Distribution Materials Potable rainwater supply and distribution materials shall be in accordance with the requirements of the plumbing code for potable water supply and distribution systems.

G.7.4 Design and Installation

G.7.4.1 Collection Surfaces

Rainwater shall be collected from roof or other cleanable aboveground surfaces specifically designed for rainwater catchment. Rainwater catchment system shall not collect rainwater from:

- (1) Vehicular parking surfaces.
- (2) Surface water runoff.
- (3) Bodies of standing water.

G.7.4.1.1 Prohibited Discharges

Overflows, condensate, and bleed-off pipes from roof-mounted equipment and appliances shall not discharge onto roof surfaces that are intended to collect rainwater.

G.7.4.2 Minimum Water Quality

Upon initial system startup, the quality of the water for the intended applications shall be verified at the point(s) of use, as determined by the Authority Having Jurisdiction in accordance with Section G.7.4.2.1 and Section G.7.4.2.2. Water quality maintenance shall be according to Section G.7.4.2.3.

G.7.4.2.1 Private Potable Water System

In the absence of water quality requirements determined by the Authority Having Jurisdiction, the minimum water quality for a private potable water system at the point of use shall comply with Table G.7.4.2.1.

TABLE G.7.4.2.1 MINIMUM WATER QUALITY	
Escherichia coli (fecal coliform):	Non-detectable

Protozoan Cysts:	Non-detectable
Viruses:	Non-detectable
Turbidity:	<0.3 NTU

G.7.4.2.2 Public Use Occupancies

The minimum water quality for a potable water system for public use occupancies at the point of use and testing procedures shall comply with the Environmental Protection Agency (EPA) Safe Drinking Water Act for a public water system

G.7.4.2.3 Maintenance

Normal system maintenance shall require system testing for Escherichia coli (fecal coliform) and turbidity every 3 months in accordance with Table G.7.4.2.3. Upon failure of the fecal coliform test, system shall be re-commissioned involving cleaning, and retesting in accordance with Section G.7.4.2. ~~Testing for viruses and cysts shall occur once after 3 months of initial operation and once every 12 months thereafter.~~
~~EXCEPTION: Upon failure of the virus or cyst test, the tests will be repeated every 3 months until the tests results are negative for two consecutive tests.~~

TABLE G.7.4.2.3 MINIMUM SYSTEM MAINTENANCE REQUIREMENTS	
Escherichia coli (fecal coliform):	Non-detectable
Turbidity:	<0.3 NTU

G.7.4.3 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.

G.7.4.3.1 Filtration Devices

Potable water filters shall comply with NSF 53 and shall be installed in accordance with manufacturer’s instructions.

G.7.4.3.2 Disinfection Devices

Chlorination, ozone, and ultraviolet or other disinfection methods shall be approved by an Authority Having Jurisdiction, or the product shall be listed according to a microbiological reduction performance standard for drinking water used to treat harvested rainwater to meet the required water quality permitted. The disinfection devices and systems shall be installed in accordance with the manufacturer’s installation instructions and the conditions of listing. Disinfection devices and systems shall be located downstream of the water storage tank.

G.7.4.3.3 Filtration and Disinfection Systems Filtration and disinfection systems shall be located after the water storage tank. Where a chlorination system is installed, it shall be installed upstream of filtration systems. Where ultraviolet disinfection system is installed, a minimum of 2 inline filters, one filter not greater than 5 microns (5 µm) filter followed by one 0.5-1 micron (0.5-1 µm) filter, shall be installed upstream of prior to the disinfection system.

G.7.4.4 Overhanging Tree Branches and Vegetation Tree branches and vegetation shall not be located over the roof or other aboveground rainwater collection surface. Where existing tree branch and vegetation growth extends over the rainwater collection surface, it shall be removed as required in Section G.7.1.5.

G.7.4.5 Rainwater Storage Tanks

Rainwater storage tanks shall be installed in accordance with Section G.7.4.5.1 through Section G.7.4.5.7.

G.7.4.5.1 Construction

Rainwater storage tanks shall be constructed of solid, durable materials not subject to excessive corrosion or decay and shall be watertight. Storage tanks or storage tank liners and coatings shall be listed to NSF 61 and approved by the Authority Having Jurisdiction for potable water applications, provided such tanks comply with approved applicable standards.

G.7.4.5.2 Location

Rainwater storage tanks shall be installed above or below grade.

G.7.4.5.2.1 Above Grade

Above grade storage tanks shall be of an opaque material, approved for aboveground use in direct sunlight, or shall be shielded from direct sunlight. Tanks shall be installed in an accessible location to allow for inspection and cleaning. The tank shall be installed on a foundation or platform that is constructed to accommodate all loads in accordance with the building code.

G.7.4.5.2.2 Below Grade

Rainwater storage tanks installed below grade shall be structurally designed to withstand all anticipated earth or other loads. Holding tank covers shall be capable of supporting an earth load of not less than 300 pounds per square foot (lb/ft²) (1465 kg/m²) when the tank is designed for underground installation. Below grade rainwater tanks installed underground shall be provided with manholes. The manhole opening shall be a minimum diameter of 20 inches (508 mm) and located not less than 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.

G.7.4.5.3 Drainage and Overflow

Rainwater storage tanks shall be provided with a means of draining and cleaning. The overflow drain shall not be equipped with a shutoff valve. The overflow outlet shall discharge as required by the plumbing code for storm drainage systems. Where discharging to the storm drainage system, the overflow drain shall be protected from backflow of the storm drainage system by a backwater valve or other approved method.

G.7.4.5.3.1 Overflow Outlet Size

The overflow outlet shall be sized to accommodate the flow of the rainwater entering the tank and not less than the aggregate cross-sectional area of the inflow pipes.

G.7.4.5.4 Opening and Access Protection

G.7.4.5.4.1 Animals and Insects

Rainwater tank openings to the atmosphere shall be protected to prevent the entrance of insects, birds, or rodents into the tank.

G.7.4.5.4.2 Human Access

Rainwater tank access openings exceeding 12 inches (305 mm) in diameter shall be secured to prevent tampering and unintended entry by either a lockable device or other approved method.

G.7.4.5.4.3 Exposure to Sunlight

Rainwater tank openings shall not be exposed to direct sunlight.

G.7.4.5.5 Inlets

A device or arrangement of fittings shall be installed at the inlet of the tank to prevent rainwater from disturbing sediment as it enters the tank.

G.7.4.5.6 Primary Tank Outlets

The primary tank outlet shall be located not less than 4 inches (102 mm) above the bottom of the tank, or shall be

provided with floating inlet to draw water from the cistern just below the water surface.

G.7.4.5.7

Storage Tank Venting

Where venting by means of drainage or overflow piping is not provided or is considered insufficient, a vent shall be installed on each tank. The vent shall extend from the top of the tank and terminate a minimum of 6 inches (152 mm) above grade and shall be a minimum of 1½" (38 mm) in diameter. The vent terminal shall be directed downward and covered with a 3/32 inch (2.4 mm) mesh screen to prevent the entry of vermin and insects.

G.7.4.6 Pumps

Pumps serving rainwater catchment systems shall be listed for potable water use. Pumps supplying water to water closets, urinals, and trap primers shall be capable of delivering not less than the minimum residual pressure required by the highest and most remote outlet served. Where the water pressure in the rainwater 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 in accordance with the plumbing code.

G.7.4.7 Roof Drains

Primary and secondary roof drains, conductors, leaders, overflows, and gutters shall be designed and installed as required by the plumbing code.

G.7.4.8 Freeze Protection

Tanks and piping installed in locations subject to freezing shall be provided with an adequate means of freeze protection.

G.7.4.8.1 Roof Washer or Pre-Filtration System

Collected rainwater shall pass through a roof washer or pre-filtration system before the water enters the rainwater storage tank. Roof washer systems shall comply with Section G.7.4.9.1 through Section G.7.4.9.4.

G.7.4.9.1 Size

The roof washer shall be sized to direct a sufficient volume of rainwater containing debris that has accumulated on the collection surface away from the storage tank. The ARCSA/ ASPE 63 Standard contains additional guidance on acceptable methods of sizing roof washers.

G.7.4.9.2 Debris Screen

The inlet to the roof washer shall be provided with a debris screen or other approved means that protects the roof washer from the intrusion of debris and vermin. Where the debris screen is installed, the debris screen shall be corrosion resistant and shall have openings no larger than ½ of an inch (12.7 mm).

G.7.4.9.3 Drain Discharge

Water drained from the roof washer or pre-filter shall be diverted away from the storage tank and discharged to a disposal area that does not cause property damage or erosion. Roof washer drainage shall not drain over a public way.

G.7.4.9.4 Automatic Drain

Roof washing systems shall be provided with an automatic means of self draining between rain events.

G.7.4.9 Roof Gutters

Gutters shall maintain a minimum slope and be sized in accordance with the plumbing code.

G.7.4.10 Drains, Conductors, and Leaders

The design and size of rainwater drains, conductors, and leaders shall be in accordance with the plumbing code.

G.7.4.11 Size of Potable Water Piping

Potable rainwater system distribution piping shall be sized in accordance with the plumbing code for sizing potable water piping.

G.7.5 Cleaning

G.7.5.1 General

The interior surfaces of tanks and equipment shall be clean before they are put into service.

G.7.6 Supply System Inspection and Test.

G.7.6.1 General

Rainwater catchment systems shall be inspected and tested in accordance with the applicable provisions of the plumbing code for testing of potable water and storm drainage systems. Storage tanks shall be filled with water to the overflow opening for a period of 24 hours and during inspection or by other means as approved by the Authority Having Jurisdiction. All seams and joints shall be exposed during inspection and checked for water tightness.

G.8 PEAK WATER DEMAND CALCULATOR

(This Appendix is based on the technical paper entitled “PeakWater Demand Study.” A copy of the paper is available for download at: www.iapmo.org/WE-Stand/)

G.8.1 General

G.8.1.1 Applicability

This appendix provides a method for estimating the demand load for the building water supply and principal branches for single- and multi-family dwellings with water-conserving plumbing fixtures, fixture fittings, and appliances.

G.8.2 Demand Load

G.8.2.1 Water-Conserving Fixtures

Plumbing fixtures, fixture fittings, and appliances shall not exceed the design flow rate in Table G.8.2.1.

TABLE G.8.2.1 DESIGN FLOW RATE FOR WATER-CONSERVING PLUMBING FIXTURES AND APPLIANCES IN RESIDENTIAL OCCUPANCIES	
FIXTURE AND APPLIANCE	MAXIMUM DESIGN FLOW RATE (gallons per minute)
Bar Sink	1.5
Bathtub	5.5
Bidet	2.0
Clothes Washer ¹	3.5
Combination Bath/Shower	5.5
Dishwasher ¹	1.3
Kitchen Faucet	2.2
Laundry Faucet (with aerator)	2.0
Lavatory Faucet	1.5
Shower, per head	2.0
Water Closet, 1.28 GPF Gravity Tank	3.0

G.8.2.2

Water Demand Calculator

The estimated design flow rate for the building supply and principal branches and risers shall be determined by the IAPMO Water Demand Calculator available for download at:
www.iapmo.org/WEStand/Pages/WaterDemandCalculator.aspx

G.8.2.3 Meter and Building Supply

To determine the design flow rate for the water meter and building supply, enter the total number of indoor plumbing fixtures and appliances for the building in Column [B] of the Water Demand Calculator and run Calculator. See Table G.8.2.3 for an example.

G.8.2.4 Fixture Branches and Fixture Supplies

To determine the design flow rate for fixture branches and risers, enter the total number of plumbing fixtures and appliances for the fixture branch or riser in Column [B] of the Water Demand Calculator and run Calculator. The flow rate for one fixture branch and one fixture supply shall be the design flow rate of the fixture according to Table G.8.2.1.

For SI units: 1 gallon per minute = 0.06 L/s

¹ Clothes washers and dishwashers shall have an Energy Star label.

G.8.2.5 Continuous Supply Demand

Continuous supply demands in gallons per minute (gpm) for lawn sprinklers, air conditioners, hose bibbs, etc., shall be added to the total estimated demand for the building supply as determined by Section G.8.2.3. Where there is more than

TABLE G.8.2.3 WATER DEMAND CALCULATOR EXAMPLE					
	[A] FIXTURE	[B] ENTER NUMBER OF FIXTURES	[C] PROBABILIT Y OF USE (%)	[D] ENTER FIXTURE FLOW RATE (GPM)	[E] MAXIMUM RECOMMENDED FIXTURE FLOW RATE (GPM)
1	Bar Sink	0	2.0	1.5	1.5
2	Bathtub	0	1.0	5.5	5.5
3	Bidet	0	1.0	2.0	2.0
4	Clothes Washer	1	5.5	3.5	3.5
5	Combination Bath/Shower	1	5.5	5.5	5.5
6	Dishwasher	1	0.5	1.3	1.3
7	Kitchen Faucet	1	2.0	2.2	2.2
8	Laundry Faucet	0	2.0	2.0	2.0
9	Lavatory Faucet	1	2.0	1.5	1.5
10	Shower, per head	0	4.5	2.0	2.0
11	Water Closet, 1.28 GPF Gravity Tank	1	1.0	3.0	3.0
12	Other Fixture 1	0	0.0	0.0	6.0
13	Other Fixture 2	0	0.0	0.0	6.0
14	Other Fixture 3	0	0.0	0.0	6.0
Total Number of Fixtures		6			
99th Percentile Demand Flow =		8.5 GPM		RESET	RUN WATER DEMAND CALCULATOR

one hose bibb installed on the plumbing system, the demand for only one hose bibb shall be added to the total estimated demand for the building supply. Where a hose bibb is installed on a fixture branch, the demand of the hose bibb shall be added to the design flow rate for the fixture branch as determined by Section G.8.2.4.

G.8.2.6 Other Fixtures

Fixtures not included in Table G.8.2.1 shall be added in Rows 12 through 14 in the Water Demand Calculator as Other Fixture. The probability of use and flow rate for Other Fixtures shall be added by selecting a comparable probability of use and flow rate from Columns [C] and [E].

G.8.2.7 Size of Water Piping

Except as provided in Section G.8.2.0 When determining the size of the water piping, procedures set forth in Appendix B shall be used except for when estimating the demand load for single- and multi-family dwellings, Section G. 8 shall be used in lieu of subsection B.5. the size of each water piping system shall be determined in accordance with the procedure set forth in Appendix A of the 2015 UPC.

After determining the permissible friction loss per 100 feet of pipe in accordance with Section A 104.0 and the demand flow in accordance with the Water Demand Calculator, the diameter of the building supply pipe, branches and risers shall be obtained from Chart A 105.1(1), Chart A 105.1(2), Chart A 105.1(3), or Chart A 105.1(4), whichever is applicable, in accordance with Section A 105.0 and Section A 106.0. Velocities shall be in accordance with Section A 107.0. Appendix I of the 2015 UPC, Figure 3 and Figure 4 shall be permitted when sizing PEX systems.

G.8.2.8 Examples Illustrating Use of Water Demand Calculator

For examples on how to use the WDC, download the Concise User Guide at <https://www.iapmo.org/we-stand/water-demand-calculator>

Example 1: Indoor Water Use Only — Use the information given below to find the pipe size for the building supply to a residential building with six indoor fixtures as shown in Figure 1 [Pipe Section 4].

Given Information:	
Type of construction:	Residential, one bathroom
Type of pipe material:	Copper
Fixture number/type:	1 combination bath/shower
	1 lavatory faucet 1 WC
Friction loss per 100-ft:	15 psi
Maximum velocity:	10 ft/s
	1 kitchen faucet 1 dishwasher 1 clothes washer

Figure 1 RESIDENTIAL BUILDING WITH SIX INDOOR FIXTURES

Solution: Step 1 of 2 — Find Demand Load for the Building Supply

The Water Demand Calculator [WDC] in Figure 2 is used to determine the demand load expected from indoor water use. The WDC has white-shaded cells and gray-shaded cells. The values in the gray cells are derived from a national survey of indoor water use at homes with efficient fixtures and cannot be changed.

The white-shaded cells accept input from the designer. For instance, fixture counts from the given information are entered in Column [B]; the corresponding recommended fixture flow rates are already provided in Column [D]. The flow rates in Column [D] may be reduced only if the manufacturer specifies a lower flow rate for the fixture. Column [E] establishes the upper limits for the flow rates entered into Column [D]. Clicking the Run Water Demand Calculator button gives 8.5 gpm as the estimated indoor water demand for the whole building. This result appears in the dark gray box of the WDC in Figure 2.

	[A] FIXTURE E	[B] ENTER NUMBER OF FIXTURES	[C] PROBABILIT Y OF USE (%)	[D] ENTER FIXTURE FLOW RATE (GPM)	[E] MAXIMUM RECOMMENDED FIXTURE FLOW RATE (GPM)
4	Bar Sink	0	2.0	1.5	1.5

2	Bathtub	0	1.0	5.5	5.5
3	Bidet	0	1.0	2.0	2.0
4	Clothes Washer	4	5.5	3.5	3.5
5	Combination Bath/Shower	4	5.5	5.5	5.5
6	Dishwasher	4	0.5	1.3	1.3
7	Kitchen Faucet	4	2.0	2.2	2.2
8	Laundry Faucet	0	2.0	2.0	2.0
9	Lavatory Faucet	4	2.0	1.5	1.5
10	Shower, per head	0	4.5	2.0	2.0
11	Water Closet, 1.28-GPF Gravity Tank	4	1.0	3.0	3.0
12	Other Fixture 1	0	0.0	0.0	6.0
13	Other Fixture 2	0	0.0	0.0	6.0
14	Other Fixture 3	0	0.0	0.0	6.0
Total Number of Fixtures		6			
99th Percentile Demand Flow =		8.5 GPM		RESET	RUN WATER-DEMAND-CALCULATOR

Figure 2
WATER DEMAND CALCULATOR FOR INDOOR USE AT HOME WITH SIX EFFICIENT FIXTURES (EXAMPLE 1)

Solution: Step 2 of 2 – Determine the Pipe Size of the Building Supply

Chart A 105.1(1) for copper piping systems (from Appendix A of the UPC, shown in Figure 3) is used to determine the pipe size, based on given friction loss, given maximum allowable pipe velocity, given pipe material and the demand load computed in Step 1. In Figure 3, the intersection of the given friction loss (15 psi) and the maximum allowable pipe velocity (10 ft/s) is labeled point A. The vertical line that descends

from point A to the base of the chart, intersects four nominal sizes for L-copper pipe. These intersection points are labeled B, C, D, E and correspond to pipe sizes of 1 inch, ¾ inch, ½ inch and ⅜ inch, respectively. A horizontal line from points B, C, D, E to the right hand side of the chart gives maximum flowrates of 24 gpm, 12 gpm, 4.5 gpm, and 2.3 gpm, respectively. These results are summarized in Table 1 which shows that a ¾ inch L-copper line is the minimum size that can convey the peak water demand of 8.5 gpm.

TABLE 1			
PIPE SIZE OPTIONS FOR BUILDING SUPPLY			
POINT IN FIGURE-3	PIPE-DIAMETER (INCH)	MAXIMUM FLOW (GPM)	OK FOR-BUILDING SUPPLY¹
E	3/8	2.3	No
D	1/2	4.5	No
C	3/4	12	Yes
B	1	24	Yes

¹For Building in Examples 1, 2, 3, and 4.

CHART

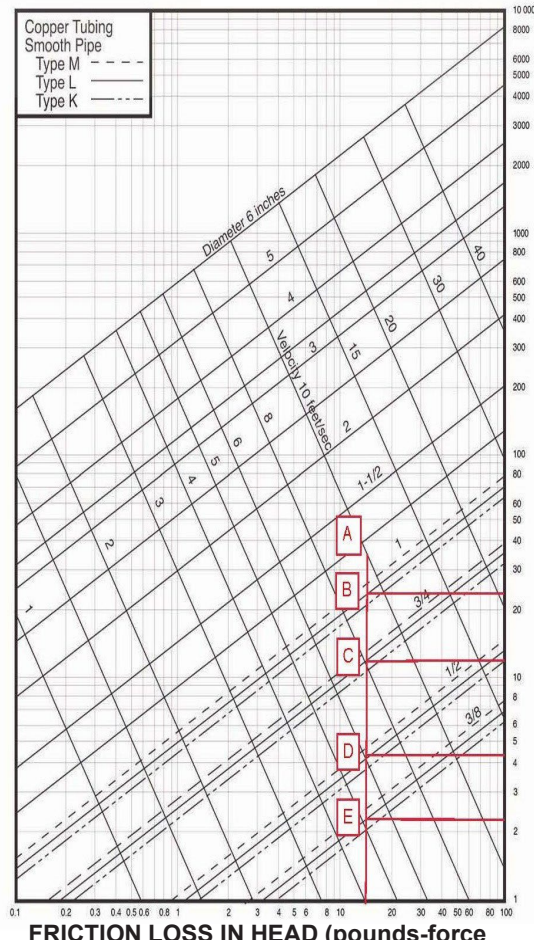


Figure 3
CHART A 105.1(1) FOR FINDING PIPE SIZE

Example 2: Indoor and Outdoor Water Use— Find the pipe size for the building supply [Figure 1, Pipe Section 4] if the building in Example 1 adds two outdoor fixtures (hose bibbs, each with a fixture flow of 2.0 gpm).

Solution: Step 1 of 2 – Find Demand Load for the Building Supply

The WDC has been developed exclusively for peak indoor water use which can be viewed as a high frequency short duration

process. Because fixtures for outdoor water use may operate continuously for very long periods, they are not included in the WDC. To account for water use from one or more outdoor fixtures, add the demand of the single outdoor fixture with the highest flowrate to the calculated demand for indoor water use. With two hose bibbs, the demand of only one hose bibb is included. Hence, in this example, the total demand for the whole house is 8.5 gpm + 2.0 gpm = 10.5 gpm.

Solution: Step 2 of 2 – Determine the Pipe Size of the Building Supply

Table 1 shows that at 10.5 gpm the building supply shall be 3/4 inch in diameter.

Example 3: Indoor, Outdoor and Other Fixture Water Use

— Find the pipe size for the water supply [Figure 1, Pipe Section 4] if the building in Example 2 adds a kitchen pot filler
2021 National Standard Plumbing Code Illustrated

and a dog bath each with a faucet flow rate of 5.5 gpm.

Solution: Step 1 of 2 – Find Demand Load for the Building Supply

The kitchen pot filler and dog bath are not listed in Column [A] of the WDC. To accommodate cases such as this, the WDC provides up to three additional rows for “Other Fixtures”. Enter the kitchen pot filler and dog bath in Column [A] of the WDC and enter the fixture count for each in Column [B]. Find an indoor fixture that has a similar probability of use in Column [C] and add that to the column. Finally, enter the flow rate of the kitchen pot filler and dog bath in Column [D]. The estimated indoor water demand for the whole building is 14 gpm, as shown in the WDC in Figure 4. As illustrated in Example 2, the hose bibb will increase the total demand for the whole house to 13 gpm.

Note that a reset button is provided to clear any numbers in Column [B] from a previous calculation.

Solution: Step 2 of 2 – Determine the Pipe Size of the Building Supply

Table 1 shows that at 13 gpm the building supply shall be 1-inch in diameter.

Example 4: Sizing Branches and Risers

For individual hot and cold branches, repeat Steps 1 and 2. For example, for the hot water branch at the water heater [Figure 1, Pipe Section 3], enter all the fixtures and appliances that use hot water into the Water Demand Calculator (toilets will be excluded) as seen in Figure 5. Use the calculated demand load to find the pipe size in Step 2. Table 1 shows that at 7.7 gpm, the hot water branch shall be ¾ inch in diameter.

For each additional hot and cold branch [Figure 1, Pipe Sections 1 and 2], enter the number of fixtures and appliances served by that branch into the WDC and use that demand in Step 2 to determine the branch size. If the branch serves a hose bibb, add the demand of the hose bibb to the calculated demand flow for the branch. As discussed in Example 2, the hose bibb is not to be entered into WDC, since the Calculator is for indoor uses only.

When there is only one fixture or appliance served by a fixture branch, the demand flow shall not exceed the fixture flow rate in Column [E] of the Water Demand Calculator. The fixture flow rate would be used in Step 2 to determine the size of the fixture branch and supply.

	[A] FIXTURE	[B] ENTER NUMBER OF FIXTURES	[C] PROBABILIT Y OF USE (%)	[D] ENTER FIXTURE FLOW RATE (GPM)	[E] MAXIMUM RECOMMENDED FIXTURE FLOW RATE (GPM)
1	Bar Sink	0	2.0	1.5	1.5
2	Bathtub	0	1.0	5.5	5.5
3	Bidet	0	1.0	2.0	2.0
4	Clothes Washer	1	5.5	3.5	3.5
5	Combination Bath/Shower	1	5.5	5.5	5.5
6	Dishwasher	1	0.5	1.3	1.3
7	Kitchen Faucet	1	2.0	2.2	2.2
8	Laundry Faucet	0	2.0	2.0	2.0
9	Lavatory Faucet	1	2.0	1.5	1.5
10	Shower, per head	0	4.5	2.0	2.0
11	Water Closet, 1.28- GPF Gravity Tank	1	1.0	3.0	3.0
12	Kitchen Pot Filler	1	2.0	5.5	6.0
13	Dog Bath	1	1.0	5.5	6.0
14	Other Fixture 3	0	0.0	0.0	6.0
	Total Number of Fixtures	68			

99th Percentile Demand Flow =	11.0 GPM		RESET	RUN WATER- DEMAND CALCULATOR
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Figure 4
WATER DEMAND CALCULATOR TO ACCOMMODATE OTHER FIXTURES (EXAMPLE 3)

	{A} FIXTURE	{B} ENTER- NUMBER OF FIXTURES	{C} PROBABILIT Y OF USE (%)	{D} ENTER- FIXTURE FLOW- RATE (GPM)	{E} MAXIMUM- RECOMMENDED- FIXTURE FLOW- RATE (GPM)
1	Bar Sink	0	2.0	1.5	1.5
2	Bathtub	0	1.0	5.5	5.5
3	Bidet	0	1.0	2.0	2.0
4	Clothes Washer	1	5.5	3.5	3.5
5	Combination Bath/Shower	1	5.5	5.5	5.5
6	Dishwasher	1	0.5	1.3	1.3
7	Kitchen Faucet	1	2.0	2.2	2.2
8	Laundry Faucet	0	2.0	2.0	2.0
9	Lavatory Faucet	1	2.0	1.5	1.5
10	Shower, per head	0	4.5	2.0	2.0
11	Water Closet, 1.28- GPF Gravity Tank	0	1.0	3.0	3.0
12	Other Fixture 1	0	0.0	0.0	6.0
13	Other Fixture 2	0	0.0	0.0	6.0
14	Other Fixture 3	0	0.0	0.0	6.0
Total Number of Fixtures		5			
99th Percentile Demand Flow =		7.7 GPM		RESET	RUN WATER- DEMAND CALCULATOR

Figure 5
WATER DEMAND CALCULATOR FOR THE HOT WATER BRANCH (EXAMPLE 4)

**National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: April 1, 2022**

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IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

Amend section with this editorial change

Change subsection to read as follows

Delete subsection and substitute as follows

Add new subsection to read as follows

Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: Add new Appendix on: Impact of Water Temperature on The Potential For Scalding and Legionella Growth

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. Where required by the Authority Having Jurisdiction, Legionella risk management shall be in accordance with ASHRAE 188 and ASHRAE Guideline 12.

Note: 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.

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

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.

Cold Water. Water at a temperature less than 77°F (25°C).

Control. The management of the operating conditions to maintain compliance with established criteria. [ASHRAE 188:3]

Disinfection. The process of killing or inactivating microorganism. [ASHRAE 188:3]

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.

Hot Water. Water at a temperature not less than 130°F (54°C) and less than 140°F (60°C).

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 for harm to humans resulting from exposure to Legionella. [ASHRAE 188:3]

Scald Potential. The likelihood of burning the skin.

Tempered Hot Water. Water at a temperature not less than 120°F (49°C) and less than 130°F (54°C).

Tepid Cold Water. Water at a temperature not less than 77°F (25°C) and less than 85°F (29°C).

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.

Very Hot Water. Water at a temperature not less than 140°F (60°C) and less than 160°F (71°C).

Warm Water. Water at a temperature not less than 110°F (43°C) and less than 120°F (49°C).

Water Management Plan. A plan to reduce the risk of Legionella growth and spread.

N 103.0 Building Water System Design Documentation.

N 103.1 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.

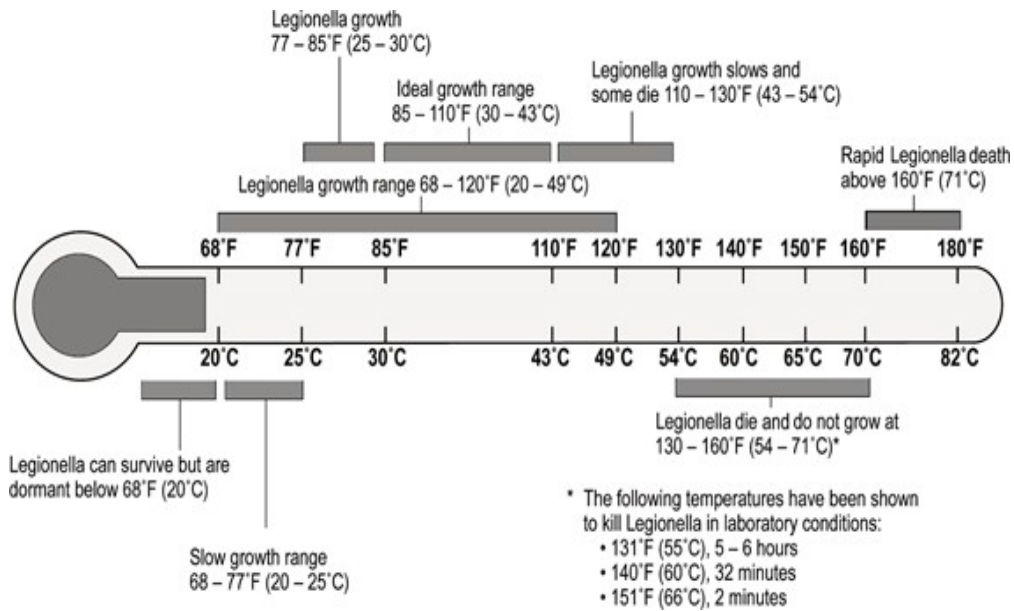
N 104.0 Potential Exposure.

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 Figure N 104.1 that pose a Legionella growth potential.

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

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 104.2, protection shall be provided in accordance with Chapter 4.

TABLE N 104.2
WATER TEMPERATURE RANGES AND SCALD POTENTIAL

<u>WATER DESCRIPTIO</u> <u>N</u>	<u>TEMPERATURE (°</u> <u>F)</u>	<u>SCALD POTENTIAL*</u>
<u>Cold</u>	<u><77</u>	<u>None</u>
<u>Tepid Cold</u>	<u>=77 and <85</u>	<u>None</u>
<u>Tepid</u>	<u>=85 and <110</u>	<u>None</u> <u>Hyperthermia is possible after long exposure i</u> <u>n a bathtub or whirlpool tub.</u>
<u>Warm</u>	<u>=110 and <120</u>	<u>Minimal</u> <u>At 111°F, greater than 220 minutes for second</u> <u>-degree burn.</u>
<u>Tempered Hot</u>	<u>=120 and <130</u>	<u>Low</u> <u>At 120°F, greater than 5 minutes for second-</u> <u>degree burn, and 10 minutes to third-degree</u> <u>burn;</u>

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		<u>At 124°F, two minutes for second-degree burn, and 4 minutes, 10 seconds for third-degree burn.</u>
<u>Hot</u>	<u>=130 and <140</u>	<u>Moderate to High</u> <u>At 130°F, 18 seconds for second-degree burn, and 30 seconds for third-degree burn.</u>
<u>Very Hot</u>	<u>=140 and <160</u>	<u>High</u> <u>At 140°F, three seconds for second-degree burn, and 5 seconds for third-degree burn;</u> <u>At 150°F, instant for second-degree burn, and less than two seconds for third-degree burn;</u> <u>At 158°F, instant for second-degree burn, and less than a second for third-degree burn.</u>
<u>Disinfecting Hot</u>	<u>=160</u>	<u>Immediate</u>

For SI units: °C = (°F-32)/1.8

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

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.

N 105.1.1 Copper-Silver Ionization. Copper-silver ionization methods and procedures shall include the following documentation.

- (1) Copper and silver ionization concentrations.
- (2) Methods and documentation for monitoring ion levels.
- (3) Electrode cleaning cycles and methods.

N 105.1.2 Ultraviolet Light. Ultraviolet light methods shall include the following documentation:

- (1) Locations of ultraviolet light units.
- (2) Cleaning cycles and methods of the quartz sleeves and housing.

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, or as required by the Authority Having Jurisdiction.
- (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/ANSI/CAN 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

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minutes shall be permitted in accordance with applicable guidelines.

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 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.

N 202.0 Emergency Disinfection Procedure.

N 202.1 General. An emergency disinfection procedure shall be provided in accordance with Table N 201.1.

TABLE N 201.1
LEGIONELLA REMEDIATION ACTIONS DOMESTIC WATER SYSTEMS

<u>PERCENTAGE OF POSITIVE LEGIONELLA TEST SITES</u>	<u>REMEDIAL ACTION¹</u>
<u>< 30</u>	<ul style="list-style-type: none">• <u>Maintain environmental assessment and Legionella monitoring in accordance with the water management plan.</u>
<u>= 30</u>	<ul style="list-style-type: none">• <u>Immediately institute short-term control measures in accordance with the direction of a qualified professional,² and notify the Authority Having Jurisdiction, if required.</u>• <u>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.</u>• <u>For persistent results, as determined by the Authority Having Jurisdiction, showing = 30 percent positive sites, long-term control measures shall be implemented in accordance with the direction of a qualified professional² and the Authority Having Jurisdiction.</u>• <u>Retreat and retest. If retest is = 30 percent positive, repeat short-term control measures.</u>• <u>With receipt of results < 30 percent positive, resume monitoring in accordance with the water management plan.</u>• <u>For persistent results, as determined by the Authority Having Jurisdiction, showing = 30 percent positive sites, long-term control measures shall be implemented in accordance with the direction of a qualified professional² and the Authority Having Jurisdiction.</u>

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 Authority Having Jurisdiction.

² Control measures shall be included in the water management plan.

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ADD STANDARD

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

Basis/Reason for Change:

This is a very important subject matter and Task Groups have worked extremely hard to develop the best language for the Appendix. The Task Groups cannot stress enough the importance of this information and the need to add such requirements to the code. While the proposed Appendix is not mandatory, it can be adopted by a jurisdiction, and the task group made a conscious effort to use enforceable language.

Within the Appendix are definitions for the terms used to describe water (cold, warm, hot, etc.). Each term is defined with a temperature range. Since plumbing systems operate within these temperature ranges, the public needs to have a document that identifies such temperature ranges and the “potential” dangers within these temperature ranges. The appendix addresses Legionella growth potential and scald potential within these ranges.

The temperatures under the “Water Temperature Ranges and Scald Potential” table originate from a report on hot water scalding from Drs. Moritz and Henriques of Harvard Medical School, published in 1947. While this report is old, testing since 1947 has consistently validated the temperatures and burn times published in this report. Some of the updates from the 1947 data have been made through published peer reviewed papers and include time and temperature differences for infants, the elderly, and the infirmed. This has been addressed with a note (*) to Table N 104.2.

Additionally Included, in the recommendation is Figure N 104.1 that is specifically scaled for Legionella growth potential. Figure N 104.1 and Table N 104.2 simplify 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 appendix also includes a distinction between chemical and non-chemical disinfection and treatment criteria, remediation guidelines for domestic water, and an emergency disinfection procedure.

This appendix has been reviewed for accuracy and to assure that the provisions are enforceable. This appendix is not intended to supersede ASHRAE 188 and Guideline 12. This appendix will be well received by Jurisdictions looking for the correlation between water temperature, percentage, and Legionella risk. Jurisdictions can obtain such provisions with this appendix, along with using ASHRAE 188 and Guideline 12 if they chose to do so.

Vote: Accept Accept as Amended
 Accept in Part Accept in Principle Accept in Part and Principle
 Defeated Failed Lack of Second Tabled Withdrawn Other

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC. *Rev.2.28.22*
 2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

National Standard Plumbing Code 2024 Proposed Code Change Form Deadline: April 1, 2022

24 - 66

Proponent: Enrique Gonzalez
Representing: IAPMO

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IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

Amend section with this editorial change

Change subsection to read as follows

Delete subsection and substitute as follows

Add new subsection to read as follows

Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: New appendix: Non-Sewered Sanitation Systems

APPENDIX O NON-SEWERED SANITATION SYSTEMS

O 101.0 General.

O 101.1 Applicability. The provisions of this appendix 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 the purpose of this appendix, 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

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

Rev.2.28.22

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

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.

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.

ADD STANDARD

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

1) Proposed Code Changes gaining acceptance will appear in the 2024 NSPC.

2) Proponent must submit, upon committee request, 20 copies of Supporting Data for review by the NSPC Committee.

Basis/Reason for Change:

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.

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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.

Vote: Accept Accept as Amended

 Accept in Part Accept in Principle Accept in Part and Principle

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**National Standard Plumbing Code
2024 Proposed Code Change Form
Deadline: April 1, 2022**

24 - 67

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IMPORTANT: Please review the attached instruction sheet regarding proposed code changes.

Check All That Apply:

Amend section with this editorial change

Change subsection to read as follows

Delete subsection and substitute as follows

Add new subsection to read as follows

Delete subsection without substitution

Please submit changes to only one Code Section per Proposed Code Change Form

Code Section: New Appendix on Indoor Horticulture Facilities

APPENDIX T
INDOOR HORTICULTURE FACILITIES

T 101.0 Indoor Horticulture Facilities.

T 101.1 General. Plumbing for indoor horticulture facilities shall be in accordance with this code. This appendix shall apply to primary and secondary horticulture facilities.

T 201.0 Definitions.

T 201.1 General. For the purpose of this appendix, the following definitions shall apply:

Agricultural Water. Water used in indoor horticulture activities where water is intended to contact plants.

Cultivation Room. A room of any size where plants are grown under controlled conditions. Also known as a grow room.

Fertigation. The process of adding nutrients into the irrigation water.

Horticulture Facility. A business, facility, or establishment where indoor horticulture is grown, cultivated, dried, extracted, weighed, packaged, or processed.

Indoor Horticulture. The cultivation and processing of plants in an indoor space.

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Indoor Horticulture Water Distribution Systems. A system to supply water from its primary source to its point of use, including but not limited to pipes, sprinklers, irrigation equipment, pumps, valves, storage tanks, meters, and fittings.

Nutrient. Substances, chemicals, or ingredients used to promote growth, provide energy, and/or sustain plants.

Plant. A multicellular organism having cellulose cell walls intended for human consumption, ingestion, inhalation, or topical application.

Primary Horticulture Facility. A facility devoted to the growing and/or harvesting of plants. Cultivation rooms are located within these facilities.

Secondary Horticulture Facility. A facility devoted to harvesting (such as hulling or shelling), packing, and/or holding of plants.

T 301.0 Classification of Facilities.

T 301.1 General. Facilities used for indoor horticultural cultivation and processing shall be in accordance with the applicable codes as mandated by the Authority Having Jurisdiction.

T 301.2 Approved Locations. Facilities used for indoor horticultural cultivation and processing shall be located in accordance with the building code and the Authority Having Jurisdiction.

T 401.0 Documentation.

T 401.1 General. Documentation for permitting shall be provided in accordance with the requirements of ADM 1.9 and the Authority Having Jurisdiction. The documentation shall show compliance with this section and other requirements in accordance with the Authority Having Jurisdiction.

T 501.0 General.

T 501.1 Mechanical Systems. Indoor horticulture mechanical systems shall be in accordance with the Mechanical Code.

T 501.2 Fire Suppression Systems. Fire suppression systems shall be in accordance with the building code and fire code.

T 501.3 Emergency Eyewash and Shower Equipment. Emergency shower and eyewash equipment shall be required in accordance with Section 7.24.

T 601.0 Water Supply.

T 601.1 General. Indoor horticulture water distribution systems shall be supplied with potable water in accordance with Chapter 10.

T 601.2 Materials. Pipe, tube, and fitting materials in contact with potable water, drinking water, or both shall be in accordance with Section 3.4.

T 601.3 Protection. Potable water piping used for irrigation purposes shall be equipped with an approved backflow prevention device or assembly in accordance with Table 10.5.10.

T 601.4 Alternate Water Supply. Where permitted, agricultural water may be used, or alternate water sources shall be approved by a regulating agency.

T 701.0 Storage Tanks.

T 701.1 Construction. Where storage tanks are used, they shall be approved by the Authority Having Jurisdiction. Potable water storage tanks shall comply with Section 17.5. Rainwater

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catchment storage tanks shall comply with Appendix G or in accordance with the Authority Having Jurisdiction.

T 801.0 Fertigation and Irrigation Equipment.

T 801.1 Installation. Nutrient tanks and irrigation equipment shall be installed in accordance with the manufacturer's instructions. When connected to the potable water supply, tanks and irrigation equipment shall be located downstream of water storage tank and be protected by an approved backflow device or method in accordance with Section 10.5.10.

T 801.2 Materials and Construction. The piping, components, and devices shall be compatible with the additives or nutrients used. Above grade storage tanks shall be of an opaque material, approved for aboveground use in direct sunlight, or shall be shielded from direct sunlight.

T 901.0 Sanitary Drainage and Indirect Wastes.

T 901.1 General. Sanitary drainage shall be in accordance with Chapter 11. Indirect wastes shall be in accordance with Chapter 9. The drainage system shall be compatible with the discharge liquid waste.

T 901.2 Hazardous Materials. Hazardous materials shall not be discharged into the sanitary sewer, storm drain, or on the ground.

T 901.3 Agricultural Water Waste. Agricultural water shall be discharged in accordance with the local, state, and federal regulations as approved by the Authority Having Jurisdiction. Where agricultural water discharges to the outdoors, and is not connected to the sanitary sewer, the piping shall be installed as to restrict rodents or vermin from entering the building.

T 901.4 Floor Drains, Floor Sinks, and Receptors. Wastewater shall discharge into an approved receptor. Receptors shall be compatible with the wastewater and installed in accordance with this code.

T 901.4.1 Plant Storage Areas. Where drains are provided in spaces where plants are stored, such drains shall be installed with indirect waste piping. Each indirect waste pipe from plant storage areas shall be separately piped to the indirect waste receptor and shall not combine with other indirect waste pipes.

T 1001.0 Facilities.

T 1001.1 Toilet Facilities. Toilet facilities shall be provided in accordance with the Occupancy Type.

T 1001.2 Location. Toilet facilities shall be located in such a manner to prevent contamination of plants during harvesting, holding, manufacturing/processing, and packing.

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Basis/Reason for Change:

This code change adds plumbing requirements for cannabis and horticulture facilities, including protection of water supply, alternate water sources and means of draining such systems. Growing plants transpire wastewater that may require special attention because of the necessities of cannabis which include water, nutrients, and a growing medium. To maximize public health and safety, potable water protection, and protection of the plumbing system, such requirements must be maintained.

A Task Group was formed to generate important provisions for plumbing systems. The number one focus of the task group is to protect the health and safety of the public. The Task Group agrees that the recommendation be placed in an appendix and agreed on the term "horticulture facilities" as it may be applicable to other forms of indoor horticulture facilities.

The task group believed it was important to identify the different categories of "horticulture facilities" as they exist in current federal laws. This will minimize confusion and make the language standard throughout the industry.

Section T 301.0 (Classification of Facilities) will guide the end user in determining what is acceptable in their jurisdictions whether it be from the building code, fire code, or any other enforcement body. Additionally, Section T 401.0 (Documentation) guides the user to the appropriate sections for requesting permits.

The Task Group spent many hours researching and identifying water sources permitted for indoor horticulture facilities and added the appropriate language and provisions to protect the potable water supply. The language pertaining to water sources was based on research of existing sources such as Federal Regulation, technical research documents, standards, local laws, and regulations. The result was text that will unify with existing laws and regulations.

Section T1001.0 (Facilities) was added to ensure that these facilities are identified with an occupancy type in accordance the local jurisdiction.

In summary, the Indoor Horticulture Facilities Task Group has captured important minimum requirements that do not conflict with Federal Regulations and will ensure that local laws and guidelines are followed for the protection of the public.

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