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2018 GROUP A PROPOSED CHANGES TO THE I-CODES COLUMBUS COMMITTEE ACTION HEARINGS

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2018 GROUP A – PROPOSED CHANGES TO THE INTERNATIONAL PLUMBING CODE

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TENTATIVE ORDER OF DISCUSSION
2018 PROPOSED CHANGES TO THE
INTERNATIONAL PLUMBING CODE

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does not necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair. Note that some P code change proposals may not be included on this list, as they are being heard by another committee.

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P1-18 Part I

IPC: 202 (New)

Proponent: Pennie L Feehan, Pennie L. Feehan Consulting, representing Copper Development Association (penniefeehan@me.com)

THIS IS A 6 PART CODE CHANGE PROPOSAL. PARTS I and VI WILL BE HEARD BY THE IPC-IPSDC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. PART III WILL BE HEARD BY THE IMC COMMITTEE. PART IV WILL BE HEARD BY THE IFGC COMMITTEE. PART V WILL BE HEARD BY THE ISPSC COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Add new definition as follows:

COPPER ALLOY. A homogeneous mixture of not less than two metals where not less than 50% of the finished metal is copper.

Internal ID: 1595

P1-18 Part II

IRC: R202

Proponent: Pennie L Feehan, Pennie L. Feehan Consulting, representing Copper Development Association (penniefeehan@me.com)

2018 International Residential Code

Add new definition as follows:

COPPER ALLOY. A homogeneous mixture of not less than two metals where not less than 50% of the finished metal is copper.

Internal ID: 1599

P1-18 Part III

IMC: 202 (New)

Proponent: Pennie L Feehan, Pennie L. Feehan Consulting, representing Copper Development Association (penniefeehan@me.com)

2018 International Mechanical Code

Add new definition as follows:

COPPER ALLOY. A homogeneous mixture of not less than two metals where not less than 50% of the finished metal is copper.

Internal ID: 1590

P1-18 Part IV

IFGC: 202 (New)

Proponent: Pennie L Feehan, Pennie L. Feehan Consulting, representing Copper Development Association (penniefeehan@me.com)

2018 International Fuel Gas Code

Add new definition as follows:

COPPER ALLOY. A homogeneous mixture of not less than two metals where not less than 50% of the finished metal is copper.

Internal ID: 1587

P1-18 Part V

ISPSC: 202 (New)

Proponent: Pennie L Feehan, Pennie L. Feehan Consulting, representing Copper Development Association (penniefeehan@me.com)

2018 International Swimming Pool and Spa Code

Add new definition as follows:

COPPER ALLOY. A homogeneous mixture of not less than two metals where not less than 50% of the finished metal is copper.

Internal ID: 1602

P1-18 Part VI

IPSDC: 202 (New)

Proponent: Pennie L Feehan, representing Copper Development Association (penniefeehan@me.com)

2018 International Private Sewage Disposal Code

Add new definition as follows:

COPPER ALLOY. A homogeneous mixture of not less than two metals where not less than 50% of the finished metal is copper.

Reason:
It is important to understand that copper tube is an almost pure copper alloy, composed of 99.9% Cu + Ag combined with no greater than 0.04% P. Whereas, a copper alloy is a mixture of at least two metals in which copper is the primary component comprising no less than 50% and is combined with other elements to create different copper alloys. Therefore, brass, bronze, red brass, etc. are all forms of Copper Alloy.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

This change only clarifies the code and doesn't impact the costs of labor or materials of construction.

Internal ID: 3126

P2-18

IPC: 202

Proponent: Gary Klein, Gary Klein and Associates, Inc., representing Self (gsmklein@comcast.net)

2018 International Plumbing Code

Revise as follows:

PUBLIC OR PUBLIC UTILIZATION. In the classification of plumbing fixtures, ~~“~~"public~~”~~" applies to fixtures ~~in general toilet rooms of schools, gymnasiums, hotels, airports, bus and railroad stations, public buildings, bars, public comfort stations, office buildings, stadiums, stores, restaurants and other installations where a number of fixtures are installed so that their utilization is similarly unrestricted.~~with unrestricted exposure to walk-in traffic.

PRIVATE. In the classification of plumbing fixtures, ~~“~~"private~~”~~" applies to fixtures ~~in residences and apartments, and to fixtures in nonpublic toilet rooms of hotels and motels and similar installations in buildings where the plumbing fixtures are intended for utilization by a family or an individual.~~that are not public.

Reason:

The purpose of this code change proposal is to clarify the distinction between private and public or public utilization.

The current definitions of private and public or public utilization are confusing to many who are responsible for implementing the IPC. This proposal attempts to simplify the two definitions by clearly defining one category and then stating that the other one is everything else. We have chosen to define public or public utilization.

The word “unrestricted” comes from ASME 112.18.1-2005[1] The wording “exposure to walk-in traffic” comes from ASME 112.18.1-2012/CSA B125.1-12. That document, referenced in the IPC and other I-codes, has a definition for “**Public Lavatory Fitting**— a fitting intended to be installed in non-residential bathrooms that are exposed to walk-in traffic.”[2] ANSI/ASHRAE/IES Standard 90.1-2016 supports this concept with the following definition: “**Public facility restroom –** a restroom used by the transient public.”[3] Transient is used instead of walk-in traffic. We preferred “walk-in “ to “transient”, but either can work. It was our intent that using the same wording for a similar purpose helps to correlate the codes.

We believe that there are two key distinctions to make between public and private toilet facilities: level of access and frequency of use. “Public” toilet facilities are those with unrestricted access to anyone who enters the building. These toilet facilities are also likely to be used frequently throughout the hours of operation of each occupancy type. Some examples of these are: toilet facilities in airports, assembly occupancies such as stadiums and theaters, restaurants and other food service facilities, and in the lobbies of any non-residential building including public buildings, office buildings, manufacturing facilities, mercantile facilities and military facilities that have unrestricted access to walk-in traffic. Using both terms, “unrestricted” and “walk-in traffic” in the definition captures our intent for this code change proposal.

All other toilet facilities would then be considered private: those inside residences, hotel and motel rooms, patient rooms, and toilet facilities that are not in the lobbies of non-residential buildings. Their use is restricted to those who reside in or work in the occupancy. These toilet facilities are “private”.

The distinction is important because there are different requirements for public and private lavatories. Two such requirements come to mind: water temperature and flow rate. Currently, in the I-codes, private lavatories are required to be supplied with hot water; public lavatories are not. (See the table below) In addition, the flow rate for public lavatory faucets is limited to a maximum of 0.5 gpm or 0.25 gallons per cycle for metered faucets. (See Table 604.4 in the 2018 IPC. These values are taken from the Energy Policy Act (EPAct) and have been a federal requirement since the 1990s.) Distinguishing more clearly between public and private toilet facilities will make it easier to explain why public lavatory faucets get the flow rates they do.

Adopting the proposed change to these definitions protects health and safety at least as well as the current definitions.

What follows is the reason statement that supports several change proposals. There is one reason statement for these proposals because the topics are interrelated and a comprehensive discussion is most likely to result in the best outcome for protecting the public’s health and safety

Health and safety for public hand washing needs to include 1) scald prevention, 2) hand washing efficacy and 3) minimizing the risk of pathogen growth in the building’s water distribution system.

We do not want the temperature of the water at public sinks to be too hot. We want the temperature of the water to be comfortable for the users of public sinks so that people will scrub their hands long enough to get them clean. We want to reduce the likelihood that pathogens will grow in the water distribution system. And, we would like to accomplish all of these health and safety functions in the most cost effective and sustainable manner possible.

At present, we believe that there are a few provisions in the IPC that inadvertently create a public health risk. Changing the temperature limits in this definition is one part of resolving this problem.

When the provisions in the current definitions and the related sections were first codified, Legionella was not a significant concern to public health; many items known today were unknown then. Now Legionella in building water systems has become a major concern for public health with the incidence of Legionnaires' disease growing by 500% from 0.4 cases per 100,000 people in 2000 to 2.0 cases per 100,000 people in 2015.[1]

At the time these same provisions were codified, it used be thought that warm water was necessary for effective hand cleaning to control the spread of germs (bacteria). Science has since proven that the temperature of the water used for handwashing does not impact the efficacy of removing bacteria at all.[2, 3, 4] While each of these three papers are very clear the CDC sums it up best with "The temperature of the water does not appear to affect microbe removal; however, warmer water may cause more skin irritation and is more environmentally costly"[4] The most important variables for removing bacteria from ones hands are scrubbing and the use of soap. Neither of these criteria is within the purview of a building code.

When scald prevention was discussed as part of codifying these same provisions, the unintended consequences of lower water temperature on waterborne pathogen growth was not known. Accordingly temperature of 140°F originally proposed for scald control in home hot water heaters was lowered to 130°F and finally a recommendation of 120°F was made because if 140°F was OK it was thought that adding a huge safety margin would only be better, we now know that huge safety margin had serious and significant unintended consequences. A temperature of 120°F is considered an abundantly safe scald limit. However, setting water heaters this low results in much of the hot water distribution system being at temperatures that ideal for growing pathogens.

Since 1998 OSHA guidelines have stated that hot water should be stored at 140F and delivered at a temperature greater than 120F. In 2009, the CDC published a study documenting scalding cases resulting in hospital visits by the elderly from 2001-2006. The elderly are the highest risk population for Legionnaires' disease and one of the highest risk for scalding. They found that more than 80% of the scalding cases were due to cooking activities in the kitchen. Less than 3% (220 out of 8,620 cases) were plumbing related.[13]

We believe that it is time to use our current knowledge of these interrelated elements to improve health and safety by revising the a few of the temperature related provisions in the 2018 IPC and the 2018 IRC-P

In both the IPC and the IRC, hot water is required to be supplied to plumbing fixtures and plumbing appliances intended for bathing, washing, or culinary purposes. The 2018 IPC and IRC-P have two different maximum temperature thresholds, which some say are for scald prevention. The temperature at public hand washing sinks (lavatories), is limited to 110°F. With the exception of bidets and emergency fixtures, which are also limited to 110°F, all other fixtures are limited to 120°F. Please see the table below.

Water Temperature Provisions in the 2018 IPC and IRC-P

Fixture	Maximum Temperature	Section
Bidet	110F (43C)	IPC 408.3 IRC P2721.2
Emergency showers and eyewash stations	110F (43C)	IPC 411.1*
Individual shower valve	120F (49C)	IPC 412.3 IRC P2708.4
Multiple (gang) showers	120F (49C)	IPC 412.4
Temperature-actuated, flow-reduction devices for individual fixture fittings	120F (49C)	IPC 412.7
Public lavatories	110F (43C)	IPC 419.5
Bath tub and whirlpool tub	120F (49C)	IPC 412.5 IRC 2713.3
Head shampoo sink faucet	120F (49C)	IPC 412.10
Footbaths and pedicure baths	120F (49C)	IPC 423.3

* The maximum temperature is not shown in this IPC section, but rather in the referenced standard. This standard also has a minimum acceptable temperature of 60F for emergency fixtures. This lower number might be useful guidance for jurisdictions with cold incoming water temperatures that want to raise the temperature of cold water for hand washing during the winter months where only cold water is supplied to public lavatory faucets.

Bidets, emergency showers and eyewash stations and public lavatories are required to have tempered water supplied through a water temperature limiting device that conforms to the appropriate ASSE, ANSI or CSA standard. The upper limit of 110°F makes sense for bidets and emergency showers. It does not make sense for hand washing at pubic lavatories.

If 120°F is a safe temperature for showering, bathing, head shampooing, tubs, it is equally safe for hand washing at either public or private lavatory faucets. It does not make sense that the temperature is lower for hand washing than for tub bathing. If the water temperature rises quickly to an uncomfortably hot and unsafe number it is much easier to remove ones hands from the water coming out of the faucet than it is to get out of a bathtub or to get out of the way in a shower. There is no need to have a lower temperature supplied for hand washing than for showering or bathing. In fact this public lavatory temperature code is derived from ASHRAE 90.1 energy saving code, not safety.

In our research into this issue, we found that the 110°F temperature limitation for hand washing at public lavatories comes from an energy code, ASHRAE 90.1 (1989)[5] "Energy Standard for Buildings Except Low-Rise Residential Buildings." Section 11.4.5.2 presents the provisions for lavatories in public facility restrooms (such as those in service stations, airports, train terminals, and convention halls). These include the requirement for low flow rates (the document preceded the 1990's era EPACT rules concerning public lavatory faucet flow rates) and for limiting the temperature to a maximum of 110°F.

In the very high use public toilets detailed in 90.1 (1989) the sinks are used many times per hour, and the combination of low temperature and low flow does not dramatically increase the health risks from waterborne pathogens; the very high turnover rates of the water in the piping brings in new disinfectant.

However, many toilet facilities currently classified as "public" are only used sporadically. The combination of low hot water temperature, low flow rate and infrequent usage, results in a very low turnover rate which in turn means that new disinfectant enters the piping very infrequently. This condition not only provides a localized incubation chamber for Legionella but once grown can result in contaminating the rest of the hot water system.

While the idea of establishing 85-110°F as a safe range for public hand washing seemed like a good idea at the time, it turns out this range is ideal for the growth of pathogens in the building's water distribution system. Pathogens that affect humans grow in temperatures that are found in our bodies: 85-110°F. For example, Legionella reproduces at the highest rates in the range of 85-110°F. Legionnaires' disease, caused by Legionella growth in building water systems has become a major public health concern.

Adding to the risk due to temperature is the complexity of the internal components of the mixing valves and the lack of maintenance these valves typically receive. Such maintenance is relatively time consuming and costly and is often ignored. By way of comparison, Australian codes for health and safety purposes require these local mixing valves to be disassembled and disinfected annually[6, 7, 8]

Conclusions and Recommendations:

If 120°F is safe enough to protect against scalding for bathing, it is safe enough for public hand washing. If this temperature is safe enough for Health Care Occupancies (IPC Section 609.3), it is safe enough for the other occupancies covered by the IPC.

Maintaining temperatures in the range of 85-110°F that is currently required in Section 419.5 is unsafe because it provides ideal conditions for the growth of pathogens, bacteria dangerous to humans. All Legionella guidelines including OSHA 1998[9] , ASHRAE 2000[10], CDC 2003[11], and CDC 2016[12] recommend maintaining hot water temperatures at fixtures and in hot water return lines at or above 120°F.

It is not necessary to specify the temperature range for supplying water for hand washing in public lavatories, only the maximum temperature to prevent scalding.

We recommend that the maximum safe temperature for the discharge of hot water into public hand washing sinks be raised to 120°F.
We recommend moving the break point between tempered and hot water from 110°F to 120°F. .
We recommend enabling the use of cold water only, or tempered water, or both at public hand washing sinks.

Bibliography:

1) Plumbing Supply Fittings, ASME A112.18.1-2005

2) Plumbing Supply Fittings, ASME A112.18.1-2012/CSA B125.1-12, page 5

3) ANSI/ASHRAE/IES Standard 90.1-2016, page 28,

4) US Centers for Disease Control (CDC) Atlanta, GA Chart titled, "Legionnaires' Disease is on the Rise 2000-2015*" National Notifiable Diseases Surveillance System
https://www.cdc.gov/legionella/downloads/fs-legionella-clinicians.pdf

5) Quantifying the Effects of Water Temperature, Soap Volume, Lather Time, and Antimicrobial Soap as Variables in the Removal of Escherichia coli ATCC 11229 from Hands Journal of Food Protection June 2017 Dane A. Jensen,[1] David R. Macinga,[2] David J. Shumaker,[2] Roberto Bellino,[2] James W. Arbogast,[2] and Donald W. Schaffner[1]
http://jfoodprotection.com/doi/full/10.4315/0362-028X.JFP-16-370?code=fopr-site
Above was in an article titled Cool Water as Effective as Hot for Removing Germs During Handwashing Infection Control Today May 30 2017

6) The environmental cost of misinformation: why the recommendation to use elevated temperatures for handwashing is problematic International Journal of Consumer Studies Volume 37, Issue 4 July 2013 Amanda R. Carrico, Micajah Spoden, Kenneth A. Wallston, Michael P. Vandenbergh
http://onlinelibrary.wiley.com/doi/10.1111/ijcs.12012/abstract

7) Show Me the Science - How to Wash Your Hands CDC Website
https://www.cdc.gov/handwashing/show-me-the-science-handwashing.html

8) ASHRAE 90.1 (1989) "Energy Standard for Buildings Except Low-Rise Residential Buildings"

9) Guidelines for the Control of Legionella in Manufactured Water Systems in South Australia, 2008 revised 2013
http://www.sahealth.sa.gov.au/wps/wcm/connect/d2f047804755f77e91f5d322c3ec38c5/LegionellaGuidelines+revised+2013.pdf?MOD=AJPERES

10) Department of Health & Human Services Victoria Australia Sept 2011 "Risk management plan for Legionella Control in health and aged care facilities"
https://www2.health.vic.gov.au/about/publications/policiesandguidelines/risk-management-plan-for-legionella-control-in-health-and-aged-care-facilities

11) Australian Standard. Water supply. Valves for the control of heated water supply temperatures Part 3: Requirements for field-testing, maintenance or replacement of thermostatic mixing valves, tempering valves and end-of-line temperature control devices
https://www.saiglobal.com/PDFTemp/Previews/OSH/as/as4000/4000/40323.pdf

12) Occupational Safety and Health Administration (OSHA) "Technical Manual Section III: Chapter 7 Legionnaires' Disease" 1998
https://www.osha.gov/dts/osta/otm/otm_iii/otm_iii_7.html

13) American Society of Heating, Refrigeration and Air-Conditioning Engineers, Inc. (ASHRAE) Guideline 12 "Minimizing the Risk of Legionellosis Associated with Building Water Systems" 2000

14) Centers for Disease Control and Prevention (CDC) Guidelines for Environmental Infection Control in Health-Care Facilities 2003
https://www.cdc.gov/infectioncontrol/pdf/guidelines/environmental-guidelines.pdf

15) Centers for Disease Control and Prevention (CDC) Developing a Water Management Program to Reduce Legionella Growth & Spread in Buildings
https://www.cdc.gov/legionella/downloads/toolkit.pdf

Cost Impact

The code change proposal will decrease the cost of construction .

Justification:

Limiting public restrooms to only those that have unrestricted access to the transient public will decrease the cost of construction. Only public restrooms are currently required to be supplied with tempered water. This requires the installation of a mixing valve that complies with ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3. These valves are relatively expensive. In addition these valves need regular service, which is also costly. Reducing the number of restrooms that are classified as public will reduce the number of such valves that are required to be installed.

Internal ID: 2284

P3-18

IPC: 202

Proponent: James Kendzel, representing American Supply Association (jkendzel@asa.net)

2018 International Plumbing Code

Revise as follows:

WATER DISPENSER. A plumbing fixture that is manually controlled by the user for the purpose of dispensing potable drinking water into a receptacle such as a cup, glass or bottle. Such fixture is connected to the potable water distribution system of the premises. ~~This definition includes a freestanding apparatus for the same purpose that is not connected to the potable water distribution system and that is supplied with potable water from a container, bottle or reservoir.~~

Reason:
The definition for water dispenser is being revised as it creates potential confusion and makes the provisions in Section 410.4 unenforceable. The definition of plumbing fixture is, a receptacle or device that is **connected to a water supply system** [emphasis added] or discharges to a drainage system or both. Such receptacles or devices require a supply of water; or discharge liquid waste or liquid-borne solid waste; or require a supply of water and discharge waste to a drainage system.

By definition, a water dispenser can not be both a plumbing fixture and a free standing device not connected to a potable water distribution system.

In addition, the general scope of the IPC is specifically related to the "the erection, installation, alteration, repairs, relocation, replacement, addition to, use or maintenance of **plumbing systems**..." [emphasis added]. A free standing device does not appear to be covered under the definition of **plumbing system** and therefore does not appear to fall within the scope of the IPC. Although a free standing device may fall under other regulations or agencies within a given jurisdiction, they do not appear to fall under the IPC.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

There should be no increase to construction since the proposed revision is only intended to provide consistency in the definition of terms and the use of those terms in the code.

Internal ID: 847

P4-18

202

Proponent: Jenifer Gilliland, City of Seattle, Washington, representing City of Seattle, Washington (jenifer.gilliland@seattle.gov)

2018 International Plumbing Code

SECTION 202 GENERAL DEFINITIONS

WATER COOLER. A drinking fountain that incorporates a means of reducing the temperature of the water supplied to it from the potable water distribution system.

Revise as follows:

WATER DISPENSER. A plumbing fixture that is manually controlled by the user for the purpose of dispensing potable drinking water into a receptacle such as a cup, glass or bottle. Such fixture is connected to the potable water distribution system of the premises. ~~This definition includes a freestanding apparatus for the same purpose that is not connected to the potable water distribution system and that is supplied with potable water from a container, bottle or reservoir.~~

SECTION 410 DRINKING FOUNTAINS

410.4 Substitution. Where restaurants provide drinking water in a container free of charge, drinking fountains shall not be required in those restaurants. In other occupancies where drinking fountains are required, *water dispensers* shall be permitted to be substituted for not more than 50 percent of the required number of drinking fountains.

Reason:

A freestanding apparatus should not be substituted for a drinking fountain. There is nothing to stop a building owner from discontinuing the service or removing the equipment.

Having access to drinking fountains where someone can get water or access to a water dispenser where someone can use their own cup or bottle is important for occupant's heath as well as helping our environment by reducing the number of plastic bottles going into the landfill. By eliminating the option to substitute a non-plumbed free standing apparatus containing a reservoir for a drinking fountain, we will also be saving the energy it would have taken to deliver the jugs or containers of water to supply the apparatus.

The water dispenser, which in many installations would be a water bottle filling station, could be plumbed as a separate fixture, combined with the traditional high-low drinking fountain in new equipment, or attached after-the-fact to existing drinking fountains.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

Where this option is chosen, a permanent fixture would need to be installed instead of allowing for a portable system. However, there are a variety of options to choose from so the cost to the building owner should be about the same.

Internal ID: 3408

P5-18

IPC: 308.2

Proponent: Kelly Cobeen, Wiss Janney Elstner Associates, Inc., representing Federal Emergency Management Agency/ Applied Technology Council Seismic Code Support Committee (KCobeen@wje.com); Michael Mahoney, Federal Emergency Management Agency, representing Federal Emergency Management Agency (mike.mahoney@fema.dhs.gov)

2018 International Plumbing Code

Revise as follows:

308.2 Piping seismic supports. Where earthquake loads are applicable in accordance with the building code, plumbing piping supports, anchorage, and bracing shall be designed and installed for ~~the~~ seismic forces in accordance with Chapter 16 of the International Building Code.

Reason:
The added text clarifies the IBC location where specific seismic requirements are defined. This is simply intended to make the seismic design provisions more easily used, consistent with the intent as stated in 2015 NEHRP Recommended Provisions Section 1.1.2, to preserve life safety by maintaining the position of components through anchorage, bracing and strength.

Bibliography:
NEHRP Recommended Seismic Provisions for New Buildings and Other Structures, 2015 Edition (FEMA P-1050-1).

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

The proposed wording clarifies the intent of the code and does not impose any new requirements that were not already in effect.

Internal ID: 1033

P6-18

IPC: TABLE 308.5

Proponent: Forest Hampton, Lubrizol Advanced Materials, Inc., representing Lubrizol Advanced Materials, Inc. (forest.hampton@lubrizol.com)

2018 International Plumbing Code

Revise as follows:

TABLE 308.5
HANGER SPACING

PIPING MATERIAL	MAXIMUM HORIZONTAL SPACING (feet)	MAXIMUM VERTICAL SPACING (feet)
Acrylonitrile butadiene styrene (ABS) pipe	4	10[b]
Aluminum tubing	10	15
Brass pipe	10	10
Cast-iron pipe	5[a]	15
Chlorinated polyvinyl chloride (CPVC) pipe and tubing, 1 inch and smaller	3[c]	10[b]
Chlorinated polyvinyl chloride (CPVC) pipe and tubing, $1^1/_4$ inches and larger	4[c]	10[b]
Copper or copper-alloy pipe	12	10
Copper or copper-alloy tubing, $1^1/_4$-inch diameter and smaller	6	10
Copper or copper-alloy tubing, $1^1/_2$-inch diameter and larger	10	10
Cross-linked polyethylene (PEX) pipe 1 inch and smaller	2.67 (32 inches)	10[b]
Cross-linked polyethylene (PEX) pipe $1^1/_4$ inch and larger	4	10[b]
Cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) pipe	2.67 (32 inches)	4
Lead pipe	Continuous	4
Polyethylene/aluminum/polyethylene (PE-AL-PE) pipe	2.67 (32 inches)	4
Polyethylene of raised temperature (PE-RT) pipe 1 inch and smaller	2.67 (32 inches)	10[b]
Polyethylene of raised temperature (PE-RT) pipe $1^1/_4$ inch and larger	4	10[b]
Polypropylene (PP) pipe or tubing 1 inch and smaller	2.67 (32 inches)	10[b]
Polypropylene (PP) pipe or tubing, $1^1/_4$ inches and larger	4	10[b]
Polyvinyl chloride (PVC) pipe	4	10[b]
Stainless steel drainage systems	10	10[b]
Steel pipe	12	15

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. The maximum horizontal spacing of cast-iron pipe hangers shall be increased to 10 feet where 10-foot lengths of pipe are installed.

b. For sizes 2 inches and smaller, a guide shall be installed midway between required vertical supports. Such guides shall prevent pipe movement in a direction perpendicular to the axis of the pipe.

c. For applications with lower use temperatures, piping support spacing shall be permitted to be in accordance with the manufacturer's installation instructions provided that such support spacing is approved.

Reason:

CPVC piping can use longer support spacing at lower temperatures, but additional tables would add complexity. Allowing a CPVC system to utilize specific manufacturer's instructions under specific conditions and with prior AHJ approval would be of use in some installations. A footnote seems sufficient in those cases.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This will not increase the cost of construction as it only adds an additional option for the installer.

Internal ID: 1216

P7-18 Part I

Part I IPC: 308.3

Part II IRC: P2605.1

Proponent: Brian Helms, Charlotte Pipe and Foundry, Plastics Division, representing Charlotte Pipe and Foundry (brian.helms@charlottepipe.com)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Revise as follows:

308.3 Materials. Hangers, anchors and supports shall support the piping and the contents of the piping. Hangers and strapping material shall be of *approved* material that will not promote galvanic action. <u>Hangers, anchors and supports shall be chemically compatible with the piping system.</u>

Internal ID: 1741

P7-18 Part II

IRC: P2605.1

Proponent: Brian Helms, Charlotte Pipe and Foundry, Plastics Division, representing Charlotte Pipe and Foundry (brian.helms@charlottepipe.com)

2018 International Residential Code

Revise as follows:

P2605.1 General. Piping shall be supported in accordance with the following:

1. Piping shall be supported to ensure alignment and prevent sagging, and allow movement associated with the expansion and contraction of the piping system.
2. Piping in the ground shall be laid on a firm bed for its entire length, except where support is otherwise provided.
3. Hangers and anchors shall be of sufficient strength to maintain their proportional share of the weight of pipe and contents and of sufficient width to prevent distortion to the pipe. Hangers and strapping shall be of *approved* material that will not promote galvanic action. <u>Hangers, anchors and supports shall be chemically compatible with the piping system.</u>
4. Where horizontal pipes 4 inches (102 mm) and larger convey drainage or waste, and where a pipe fitting changes the flow direction greater than 45 degrees (0.79 rad), rigid bracing or other rigid support arrangements shall be installed to resist movement of the upstream pipe in the direction of flow. A change of flow direction into a vertical pipe shall not require the upstream pipe to be braced.
5. Piping shall be supported at distances not to exceed those indicated in Table P2605.1.

Reason:
Some hangers and supports may be coated with vinyl, rubber or plastic materials. These materials may be chemically incompatible with some piping materials and their use could cause a failure of the piping system. Only hanger or support products determined to be chemically compatible with the piping systems being installed should be allowed to be used.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

This code change proposal will not increase or decrease the cost of construction because is is intended to clarify the existing requirements in regards to the compatibility of the products used.

Internal ID: 3495

P8-18 Part I

IPC: 305.8 (New)

Proponent: Brian Helms, Charlotte Pipe and Foundry, Plastics Division, representing Charlotte Pipe and Foundry (brian.helms@charlottepipe.com)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Add new text as follows:

305.8 Protection against UV exposure. Where installed in direct sunlight, ABS, PVC and CPVC piping systems shall be protected from exposure to ultraviolet radiation by an opaque tape wrap having a thickness of not less than 0.04 inch (1.02 mm) or by water-based latex paint.

Internal ID: 1747

P8-18 Part II

IRC: P2603.4 (New)

Proponent: Brian Helms, Charlotte Pipe and Foundry, Plastics Division, representing Charlotte Pipe and Foundry (brian.helms@charlottepipe.com)

2018 International Residential Code

Add new text as follows:

<u>**P2603.4** **Protection against UV exposure.** Where installed in direct sunlight, ABS, PVC and CPVC piping systems shall be protected from exposure to ultraviolet radiation by an opaque tape wrap having a thickness of not less than 0.04 inch (1.02 mm) or by water-based latex paint.</u>

Reason:

ABS, PVC and CPVC can suffer adverse effects from exposure to sunlight. Exposure to sunlight can cause surface discoloration and loss of impact strength to these piping systems. UV radiation affects PVC, CPVC and ABS when energy from the sun causes excitation of the molecular bonds in the plastic. The resulting reaction occurs only on the exposed surface of the pipe and to the extremely shallow depths of .001 to .003 inches. The effect does not continue when exposure to sunlight is terminated. A two-year study was undertaken to quantify the effects of UV radiation on the properties of PVC pipe (See Uni-Bell's UNI-TR-5). The study found that exposure to UV radiation results in a change in the pipe's surface color and a reduction in impact strength.

The presence of a solid surface between the sun and the pipe prevents UV degradation. One of the most common forms of UV protection is painting the pipe and fittings with a water based latex paint which has proven to be chemically compatible with these materials.

Bibliography:

[The Effects of Ultraviolet Radiation Radiation on PVC Pipe] [UNI-TR-5]

https://www.uni-bell.org/application/files/6014/5956/5837/The_Effects_of_Ultraviolet_Radiation_on_PVC_Pipe_.pdf

Cost Impact

The code change proposal will increase the cost of construction .

The cost of construction will increase slightly in certain applications because paint or tape material and the labor to apply will add minimal cost.

Internal ID: 3493

P9-18

IPC: 308.9

Proponent: Michael Cudahy, Plastic Pipe and Fittings Association (PPFA), representing Plastic Pipe and Fittings Association (mikec@cmservices.com)

2018 International Plumbing Code

Revise as follows:

308.9 Parallel water distribution systems. Piping bundles for manifold systems shall be supported in accordance with Table 308.5. Support at changes in direction shall be in accordance with the manufacturer's instructions. Where hot water piping is bundled with cold or hot water piping, ~~each~~ hot water ~~pipe~~ piping shall be insulated in accordance with Section 607.5.

Reason:
Energy code has specific insulation requirements for all piping, this proposal points to the correct section of the code. Maybe, these requirements should be moved or duplicated in the IPC.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

Requirements are already existing. The proposal points to the requirements.

Internal ID: 946

P10-18

IPC: 202, 310, 310.1, 310.3, TABLE 403.1 (IBC [P]2902.1), 403.3.2 (IBC [P]2902.3.2), 403.3.6 (IBC [P]2902.3.6), 405.3.2, 405.3.4, 405.3.5

Proponent: James Richardson Jr, representing City of Columbus Ohio (jarichardson@columbus.gov); Robert Schutz, representing City of Columbus, OH (RJSchutz@columbus.gov)

2018 International Plumbing Code

Revise as follows:

PRIVATE. In the classification of plumbing fixtures, ~~“~~ private ~~”~~ applies to fixtures in residences and apartments, and to fixtures in nonpublic toilet ~~rooms~~ facilities of hotels and motels and similar installations in buildings where the plumbing fixtures are intended for utilization by a family or an individual.

PUBLIC OR PUBLIC UTILIZATION. In the classification of plumbing fixtures, ~~“~~"public~~”~~" applies to fixtures in general toilet ~~rooms~~ facilities of schools, gymnasiums, hotels, airports, bus and railroad stations, public buildings, bars, public comfort stations, office buildings, stadiums, stores, restaurants and other installations where a number of fixtures are installed so that their utilization is similarly unrestricted.

SECTION 310 WASHROOM AND TOILET ~~ROOM~~ FACILITY REQUIREMENTS

310.1 Light and ventilation. Washrooms and toilet ~~rooms~~ facilities shall be illuminated and ventilated in accordance with the International Building Code and International Mechanical Code.

310.3 Interior finish. Interior finish surfaces of toilet ~~rooms~~ facilities shall comply with the International Building Code.

TABLE 403.1
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a] (See Sections 403.1.1 and 403.2)

NO.	CLASSIFICATION	DESCRIPTION	WATER CLOSETS (URINALS: SEE SECTION 424.2)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAIN (SEE SECTION 410)	OTHER
			MALE	FEMALE	MALE	FEMALE			
1	Assembly	Theaters and other buildings for the performing arts and motion pictures[d]	1 per 125	1 per 65	1 per 200		—	1 per 500	1 service sink
		Nightclubs, bars, taverns, dance halls and buildings for similar purposes[d]	1 per 40	1 per 40	1 per 75		—	1 per 500	1 service sink
		Restaurants, banquet halls and food courts[d]	1 per 75	1 per 75	1 per 200		—	1 per 500	1 service sink
		Gaming areas	1 per 100 for the first 400 and 1 per 250 for the remainder exceeding 400	1 per 50 for the first 400 and 1 per 150 for the remainder exceeding 400	1 per 250 for the first 750 and 1 per 500 for the remainder exceeding 750		—	1 per 1,000	1 service sink
		Auditoriums without permanent seating, art galleries, exhibition halls, museums, lecture halls, libraries, arcades and gymnasiums[d]	1 per 125	1 per 65	1 per 200		—	1 per 500	1 service sink
		Passenger terminals and transportation facilities[d]	1 per 500	1 per 500	1 per 750		—	1 per 1,000	1 service sink
		Places of worship and other religious services[d]	1 per 150	1 per 75	1 per 200		—	1 per 1,000	1 service sink
		Coliseums, arenas, skating rinks, pools and tennis courts for indoor sporting events and activities	1 per 75 for the first 1,500 and 1 per 120 for the remainder exceeding 1,500	1 per 40 for the first 1,520 and 1 per 60 for the remainder exceeding 1,520	1 per 200	1 per 150	—	1 per 1,000	1 service sink
		Stadiums, amusement parks, bleachers and grandstands for outdoor sporting events and activities[f]	1 per 75 for the first 1,500 and 1 per 120 for the remainder exceeding 1,500	1 per 40 for the first 1,520 and 1 per 60 for the remainder exceeding 1,520	1 per 200	1 per 150	—	1 per 1,000	1 service sink
2	Business	Buildings for the transaction of business, professional services, other services involving merchandise, office buildings, banks, light industrial and similar uses	1 per 25 for the first 50 and 1 per 50 for the remainder exceeding 50		1 per 40 for the first 80 and 1 per 80 for the remainder exceeding 80		—	1 per 100	1 service sink[e]
3	Educational	Educational facilities	1 per 50		1 per 50		—	1 per 100	1 service sink
4	Factory and industrial	Structures in which occupants are	1 per 100		1 per 100		—	1 per 400	1 service sink

		engaged in work fabricating, assembly or processing of products or materials					
5	Institutional	Custodial care facilities	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink
		Medical care recipients in hospitals and nursing homes	1 per room[c]	1 per room[c]	1 per 15	1 per 100	1 service sink per floor
		Employees in hospitals and nursing homes[b]	1 per 25	1 per 35	—	1 per 100	—
		Visitors in hospitals and nursing homes	1 per 75	1 per 100	—	1 per 500	—
		Prisons[b]	1 per cell	1 per cell	1 per 15	1 per 100	1 service sink
		Reformitories, detention centers, and correctional centers[b]	1 per 15	1 per 15	1 per 15	1 per 100	1 service sink
		Employees in reformitories, detention centers and correctional centers[b]	1 per 25	1 per 35	—	1 per 100	—
		Adult day care and child day care	1 per 15	1 per 15	1	1 per 100	1 service sink
6	Mercantile	Retail stores, service stations, shops, salesrooms, markets and shopping centers	1 per 500	1 per 750	—	1 per 1,000	1 service sink[e]
7	Residential	Hotels, motels, boarding houses (transient)	1 per sleeping unit	1 per sleeping unit	1 per sleeping unit	—	1 service sink
		Dormitories, fraternities, sororities and boarding houses (not transient)	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink
		Apartment house	1 per dwelling unit	1 per dwelling unit	1 per dwelling unit	—	1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per 20 dwelling units
		Congregate living facilities with 16 or fewer persons	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink
		One- and two-family dwellings and lodging houses with five or fewer guestrooms	1 per dwelling unit	1 per dwelling unit	1 per dwelling unit	—	1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per dwelling unit
		Congregate living facilities with 16 or fewer persons	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink
8	Storage	Structures for the storage of goods, warehouses, storehouse	1 per 100	1 per 100	—	1 per 1,000	1 service sink

		and freight depots. Low and Moderate Hazard.					

a.The fixtures shown are based on one fixture being the minimum required for the number of persons indicated or any fraction of the number of persons indicated. The number of occupants shall be determined by the International Building Code.

b.Toilet facilities for employees shall be separate from facilities for inmates or care recipients.

c.A single-occupant toilet ~~room~~ facility with one water closet and one lavatory serving not more than two adjacent patient sleeping units shall be permitted provided that each patient sleeping unit has direct access to the toilet ~~room~~ facility and provision for privacy for the toilet ~~room~~ facility user is provided.

d.The occupant load for seasonal outdoor seating and entertainment areas shall be included when determining the minimum number of facilities required.

e.For business and mercantile classifications with an occupant load of 15 or fewer, service sinks shall not be required.

f.The required number and type of plumbing fixtures for outdoor public swimming pools shall be in accordance with Section 609 of the International Swimming Pool and Spa Code.

403.3.2 Prohibited toilet ~~room~~ facility location. Toilet ~~rooms~~ facilities shall not open directly into a room used for the preparation of food for service to the public.

403.3.6 Door locking. Where a toilet ~~room~~ facility is provided for the use of multiple occupants, the egress door for the room shall not be lockable from the inside of the room. This section does not apply to family or assisted-use toilet ~~rooms.~~ facilities.

405.3.2 Public lavatories. In employee and *public* toilet ~~rooms~~facilities, the required lavatory shall be located in the same room as the required water closet.

405.3.4 Water closet compartment. Each water closet utilized by the *public* or employees shall occupy a separate compartment with walls or partitions and a door enclosing the fixtures to ensure privacy.

Exceptions:

1. Water closet compartments shall not be required in a single-occupant toilet room with a lockable door.
2. Toilet ~~rooms~~ facilities located in a child day care ~~facilities~~ and containing two or more water closets shall be permitted to have one water closet without an enclosing compartment.
3. This provision is not applicable to toilet areas located within Group I-3 housing areas.

405.3.5 Urinal partitions. Each urinal utilized by the *public* or employees shall occupy a separate area with walls or partitions to provide privacy. The horizontal dimension between walls or partitions at each urinal shall be not less than 30 inches (762 mm). The walls or partitions shall begin at a height not greater than 12 inches (305 mm) from and extend not less than 60 inches (1524 mm) above the finished floor surface. The walls or partitions shall extend from the wall surface at each side of the urinal not less than 18 inches (457 mm) or to a point not less than 6 inches (152 mm) beyond the outermost front lip of the urinal measured from the finished backwall surface, whichever is greater.

Exceptions:

1. Urinal partitions shall not be required in a singleoccupant or family/assisted-use toilet room with a lockable door.
2. Toilet ~~rooms~~ facilities located in a child day care ~~facilities~~ and containing two or more urinals shall be permitted to have one urinal without partitions.

Reason:
When toilet room was changed to toilet facility there were several instances in the code where the language wasn't changed. This proposal is just to clean up the language.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

This is just a cleanup for coordination of terminology that has no impact on costs.

Analysis: Duplicated text in the International Building Code is not shown for brevity.

P11-18 Part I

IPC: 312.3

Proponent: Robert Fuller, County of Roanoke, Virginia, representing R. G. Fuller (rfuller@roanokecountyva.gov)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Revise as follows:

312.3 Drainage and vent air test. Plastic piping shall not be tested using air <u>except where air is removed by an evacuation of the system with a vacuum type pump to achieve a uniform gauge pressure of -5 psi (-34.5 kPa) or to balance a 10-inch column of mercury.</u> An air test shall be made by forcing air into the system until there is a uniform gauge pressure of 5 psi (34.5 kPa) or sufficient to balance a 10-inch (254 mm) column of mercury. This pressure shall be held for a test period of not less than 15 minutes. Any adjustments to the test pressure required because of changes in ambient temperatures or the seating of gaskets shall be made prior to the beginning of the test period.

Internal ID: 1932

P11-18 Part II

IRC: P2503.5.1

Proponent: Robert Fuller, County of Roanoke, Virginia, representing R. G. Fuller (rfuller@roanokecountyva.gov)

2018 International Residential Code

Revise as follows:

P2503.5.1 Rough plumbing. DWV systems shall be tested on completion of the rough piping installation by water or, air for piping systems other than plastic or, by a vacuum of air for plastic piping systems, without evidence of leakage. ~~Either~~ The test shall be applied to the drainage system in its entirety or in sections after rough-in piping has been installed, as follows:

1. Water test. Each section shall be filled with water to a point not less than 5 feet (1524 mm) above the highest fitting connection in that section, or to the highest point in the completed system. Water shall be held in the section under test for a period of 15 minutes. The system shall prove leak free by visual inspection.
2. Air test. The portion under test shall be maintained at a gauge pressure of 5 pounds per square inch (psi) (34 kPa) or 10 inches of mercury column (34 kPa). This pressure shall be held without introduction of additional air for a period of 15 minutes.
3. Vacuum Test. The portion under test shall be evacuated of air by a vacuum type pump to achieve a uniform gauge pressure of -5 pounds per square inch or a negative 10-inches of mercury column (-34 kPa). This pressure shall be held without the removal of additional air for a period of 15 minutes.

Reason:

The code change allowance for this alternate test is a means for testing plastic piping systems when the ambient temperatures are below freezing where water cannot be used for the test. There is no safety hazard in testing with a vacuum such as that has occurred in the past with a positive pressure test which is no longer allowed for just concern.

There is no requirement to use this alternate method.

The equipment to perform the test is readily available on the market and many contractors have this equipment to perform the test among their tools at present.

This allowance will actually help to mitigate the cost of construction delays and prevent potential damage to plastic piping systems when water cannot be used while avoiding the dangerous, now disallowed use of air pressurizing the plastic piping system.

Cost Impact

The code change proposal will decrease the cost of construction .

The code already requires testing. This alternate test method doesn't require any more time or materials than other testing methods. This is just an option that can be used.

The equipment to perform the test is readily available on the market and many contractors already have this equipment to perform the test among their tools at present. The cost of contractor tooling doesn't add to the cost of construction of the building as the contractor has to remain competitive.

However, use of this method will help to mitigate the cost of construction delays (waiting for warmer weather to test with water) and the cost of repairing freeze damage where testing with water is attempted in freezing weather.

Internal ID: 3432

P12-18

IPC: 312.10.2, Chapter 15

Proponent: Brianne Hall, representing Self (bnhall@ftch.com)

2018 International Plumbing Code

Revise as follows:

312.10.2 Testing. Reduced pressure principle, double check, pressure vacuum breaker, reduced pressure detector fire protection, double check detector fire protection, and spill-resistant vacuum breaker backflow preventer assemblies and hose connection backflow preventers shall be tested at the time of installation, immediately after repairs or relocation and at least annually. The testing procedure shall be performed in accordance with one of the following standards: ASSE 5013, ASSE 5015, ASSE 5020, ASSE 5047, ASSE 5048, ASSE 5052, ASSE 5056, CSA B64.10 or CSA B64.10.1. <u>Test gauges shall comply with ASSE 1064.</u>

Add new standard(s) follows:

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448

<u>1064—2006 (R2011)</u>:

<u>Performance Requirements for Backflow Prevention Assembly Field Test Kits</u>

Reason:
Gauges that comply with ASSE 1064 are specifically designed for testing backflow devices describing the proper accuracy (linearity & repeatability) and precision, while compensating for varying operating conditions, EMI/FRI exposure, ambient temperatures, etc. Further, the gauges are required to be NIST-traceable, calibrated periodically, and are designed to be used in tandem with the current referenced standards in this section.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

No change to the cost of construction. Those that test backflow preventers may need to ensure that their gauge conforms with the standard.

Analysis: A review of the standard proposed for inclusion in the code, ASSE 1064-2006 (R2011), with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 1772

P13-18

IPC: TABLE 403.1 (IBC: [P] TABLE 2902.1)

Proponent: Don Davies, Salt Lake City Corporation, representing Utah Chapter of International Code Council (don.davies@slcgov.com)

2018 International Plumbing Code

Revise as follows:

TABLE 403.1
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a] (See Sections 403.1.1 and 403.2)

NO.	CLASSIFICATION	DESCRIPTION	WATER CLOSETS (URINALS: SEE SECTION 424.2)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAIN (SEE SECTION 410)	OTHER
			MALE	FEMALE	MALE	FEMALE			
1	Assembly	Theaters and other buildings for the performing arts and motion pictures[d]	1 per 125	1 per 65	1 per 200		—	1 per 500	1 service sink
		Nightclubs, bars, taverns, dance halls and buildings for similar purposes[d]	1 per 40	1 per 40	1 per 75		—	1 per 500	1 service sink
		Restaurants, banquet halls and food courts[d]	1 per 75	1 per 75	1 per 200		—	1 per 500	1 service sink
		Gaming areas	1 per 100 for the first 400 and 1 per 250 for the remainder exceeding 400	1 per 50 for the first 400 and 1 per 150 for the remainder exceeding 400	1 per 250 for the first 750 and 1 per 500 for the remainder exceeding 750		—	1 per 1,000	1 service sink
		Auditoriums without permanent seating, art galleries, exhibition halls, museums, lecture halls, libraries, arcades and gymnasiums[d]	1 per 125	1 per 65	1 per 200		—	1 per 500	1 service sink
		Passenger terminals and transportation facilities[d]	1 per 500	1 per 500	1 per 750		—	1 per 1,000	1 service sink
		Places of worship and other religious services[d]	1 per 150	1 per 75	1 per 200		—	1 per 1,000	1 service sink
		Coliseums, arenas, skating rinks, pools and tennis courts for indoor sporting events and activities	1 per 75 for the first 1,500 and 1 per 120 for the remainder exceeding 1,500	1 per 40 for the first 1,520 and 1 per 60 for the remainder exceeding 1,520	1 per 200	1 per 150	—	1 per 1,000	1 service sink
		Stadiums, amusement parks, bleachers and grandstands for outdoor sporting events and activities[f]	1 per 75 for the first 1,500 and 1 per 120 for the remainder exceeding 1,500	1 per 40 for the first 1,520 and 1 per 60 for the remainder exceeding 1,520	1 per 200	1 per 150	—	1 per 1,000	1 service sink
2	Business	Buildings for the transaction of business, professional services, other services involving merchandise, office buildings, banks, light industrial and similar uses	1 per 25 for the first 50 and 1 per 50 for the remainder exceeding 50		1 per 40 for the first 80 and 1 per 80 for the remainder exceeding 80		—	1 per 100	1 service sink[e]
3	Educational	Educational facilities	1 per 50		1 per 50		—	1 per 100	1 service sink
4	Factory and industrial	Structures in which occupants are engaged in work fabricating,	1 per 100		1 per 100		—	1 per 400	1 service sink

		assembly or processing of products or materials					
5	Institutional	Custodial care facilities	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink
		Medical care recipients in hospitals and nursing homes	1 per room[c]	1 per room[c]	1 per 15	1 per 100	1 service sink per floor
		Employees in hospitals and nursing homes[b]	1 per 25	1 per 35	—	1 per 100	—
		Visitors in hospitals and nursing homes	1 per 75	1 per 100	—	1 per 500	—
		Prisons[b]	1 per cell	1 per cell	1 per 15	1 per 100	1 service sink
		Reformitories, detention centers, and correctional centers[b]	1 per 15	1 per 15	1 per 15	1 per 100	1 service sink
		Employees in reformitories, detention centers and correctional centers[b]	1 per 25	1 per 35	—	1 per 100	—
		Adult day care and child day care	1 per 15	1 per 15	1	1 per 100	1 service sink
6	Mercantile	Retail stores, service stations, shops, salesrooms, markets and shopping centers	1 per 500	1 per 750	—	1 per 1,000	1 service sink[e]
7	Residential	Hotels, motels, boarding houses (transient)	1 per sleeping unit	1 per sleeping unit	1 per sleeping unit	—	1 service sink
		Hostels (transient)	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink
		Dormitories, fraternities, sororities and boarding houses (not transient)	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink
		Apartment house	1 per dwelling unit	1 per dwelling unit	1 per dwelling unit	—	1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per 20 dwelling units
		Congregate living facilities with 16 or fewer persons	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink
		One- and two-family dwellings and lodging houses with five or fewer guestrooms	1 per dwelling unit	1 per dwelling unit	1 per dwelling unit	—	1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per dwelling unit
7	Residential	Congregate living facilities with 16 or fewer persons	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink
8	Storage	Structures for the storage of goods, warehouses, storehouse and freight	1 per 100	1 per 100	—	1 per 1,000	1 service sink

		and freight depots. Low and Moderate Hazard.					

Reason:
Hostels are not addressed in the code and they are unique in that they operate like a hotel/motel for transient stay as an R-1 occupancy but the restrooms facilities provided resemble the requirements for R-2 boarding houses where restroom facilities are shared as opposed to hotels and motels where each sleep unit must be provided with its own water closet, lavatory and tub or shower.   This creates a problem when applying the provisions of I.B.C. Table 2902.1.
The resolution would be to create another R-1 occupancy designation with a description of Hostels and place the requirements for plumbing fixtures from R-2 boarding houses into that classification. A president has already been established with two R-2 classifications one for boarding houses and another for apartments which have different requirements . Arbitrarily placing hostels in an R-2 occupancy group would also subject that use to the more restrictive accessibility requirements of I.B.C. Section 1106.2.2.1. While hostels are not that common in the U.S. they are quite common elsewhere in the world and the I.B.C. is an international code so this issue should be addressed.

Cost Impact
The code change proposal will decrease the cost of construction .

As the code is written, the hostel would be required to be classified as an R-1 occupancy and would required to have restrooms in each sleeping room. With the proposed change, the hostel classification would still remain an R-1 occupancy but the number of restrooms would decrease.

Analysis: Duplicated text in the IBC is not shown for brevity.

Internal ID: 2116

P14-18

IPC: 403.1.1

Proponent: Josephine Ortega, representing University of California

2018 International Plumbing Code

Revise as follows:

403.1.1 Fixture calculations. To determine the occupant load of each sex, the total occupant load shall be divided in half. To determine the required number of fixtures, the fixture ratio or ratios for each fixture type shall be applied to the occupant load of each sex in accordance with Table 403.1. Fractional numbers resulting from applying the fixture ratios of Table 403.1 shall be rounded up to the next whole number. For calculations involving multiple *occupancies*, such fractional numbers for each *occupancy* shall first be summed and then rounded up to the next whole number.

~~Exception~~ Exceptions:

1. The total occupant load shall not be required to be divided in half where *approved* statistical data indicates a distribution of the sexes of other than 50 percent of each sex.
2. Where multi-user facilities are designed to serve all genders, the minimum fixture count shall be calculated 100%, based on total occupant load. In such multi-user user facilities, each fixture type shall be in accordance with ICC A117.1 and each urinal that is provided shall be located in a stall.

Reason:
This proposal will permit designers to design gender specific facilities using either the men or women category. The proposal will also bridge the gap of designing for facilities that elect to install all-inclusive bathroom/restrooms.

Bibliography:

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

This proposal simply offers a different way to design toilet facilities. No fixtures are being added or subtracted therefore, there is no impact to the cost of construction.

Internal ID: 2348

P15-18

IPC: 403.1.1 (IBC [P] 2902.1.1), 403.1.2 (IBC [P] 2902.1.2), 403.2 (IBC [P] 2902.2)

Proponent: David Collins, representing The American Institute of Architects (dcollins@preview-group.com)

2018 International Plumbing Code

Revise as follows:

403.1.1 Fixture calculations. To determine the occupant load of each sex, the total occupant load shall be divided in half. To determine the required number of fixtures, the fixture ratio or ratios for each fixture type shall be applied to the occupant load of each sex in accordance with Table 403.1. Fractional numbers resulting from applying the fixture ratios of Table 403.1 shall be rounded up to the next whole number. For calculations involving multiple *occupancies*, such fractional numbers for each *occupancy* shall first be summed and then rounded up to the next whole number.

~~Exception~~ Exceptions:

1. The total occupant load shall not be required to be divided in half where *approved* statistical data indicates a distribution of the sexes of other than 50 percent of each sex.
2. Distribution of the sexes is not required where single-user water closets and bathing room fixtures are provided in accordance with Section 403.1.2.

403.1.2 Single-user toilet ~~facility~~ and bathing room fixtures. The plumbing fixtures located in single-user toilet ~~facilities~~ and bathing rooms, including family or assisteduse toilet and bathing rooms that are required by Section 1109.2.1 of the International Building Code, shall contribute toward the total number of required plumbing fixtures for a building or tenant space. Single-user toilet ~~facilities~~ and bathing rooms, and family or assisted-use toilet rooms and bathing rooms shall be identified for use by either sex.

The total number of fixtures shall be permitted to be based on the required number of separate facilities or based on the aggregate of any combination of single-user or separate facilities.

403.2 Separate facilities. Where plumbing fixtures are required, separate facilities shall be provided for each sex.

Exceptions:

1. Separate facilities shall not be required for dwelling units and sleeping units.
2. Separate facilities shall not be required in structures or tenant spaces with a total occupant load, including both employees and customers, of 15 or fewer.
3. Separate facilities shall not be required in mercantile *occupancies* in which the maximum occupant load is 100 or fewer.
4. Separate facilities shall not be required in business occupancies in which the maximum occupant load is 25 or fewer.
5. Separate facilities shall not be required to be designated by sex where single-user toilets rooms are provided in accordance with Section 403.1.2.
6. Separate facilities shall not be required where rooms having both water closets and lavatory fixtures are designed for use by both sexes and privacy for water closets are installed in accordance with Section 405.3.4.

Reason:

As part of the changes to the 2018 code provisions were added to allow single user toileting features to be counted toward the total number of fixtures required despite their designation by sex or family. This change is proposed to clarify how toilet rooms that are configured in such a manner to allow use by either sex can also be used. Many communities have been asking to use these provisions in advance of full adoption of the 2018 codes because of their need to address significant issues of gender and equality for access.

The codes only require the installation of family or assisted-use facilities in a limited number of occupancies. With this change the codes will allow the design of facilities that are available to those needing assistance by other assistants that are of an opposite gender without causing any discomfort by anyone.

Cost Impact

The code change proposal will decrease the cost of construction .

This change would reduce the cost of construction because the duplication of areas used for single sex facilities can be eliminated saving unneeded floor area.

Analysis: Duplicated text in the International Building Code is not shown for brevity.

Internal ID: 1731

P16-18

IPC: 403.1.2 (IBC [P]2902.1.2)

Proponent: James P. Colgate, Esq., RA, CFM, Bryan Cave LLP, representing National Center for Transgender Equality (James.Colgate@bryancave.com); David Collins, representing The American Institute of Architects (dcollins@preview-group.com)

2018 International Plumbing Code

Revise as follows:

403.1.2 Single-user toilet facility and bathing room fixtures. The plumbing fixtures located in single-user toilet facilities and bathing rooms, including family or assisteduse toilet and bathing rooms that are required by Section 1109.2.1 of the International Building Code, shall contribute toward the total number of required plumbing fixtures for a building or tenant space. Single-user toilet facilities and bathing rooms, and family or assisted-use toilet rooms and bathing rooms shall be identified <u>as being available </u>for use by ~~either~~ <u>all persons regardless of their </u>sex.

Reason:

This proposal merely clarifies some of the ambiguous language in a previous change adopted by the Membership in the last code cycle. Pursuant to P40-15, Public Comment 2, Section 403.1.2 of the International Plumbing Code was revised to state that “toilet and bathroom facilities be identified for use by either sex.” The Membership’s stated reason for adopting Public Comment 2 was two-fold. First, the change allowed designers to adopt single-occupant toilet rooms, rather than grouped facilities. Second, and more importantly, the Membership adopted this change to alleviate some of the issues transgender individuals face.

Under the design scheme approved by P40-15, Public Comment 2, the same numbers of fixtures are provided, and waiting time is reduced by allowing either sex to use the toilet room. However, despite the Membership’s intention to alleviate some of the problems transgender people face, the adopted language “for use by either sex” remains vague and subject to competing interpretations. For example, a designer might interpret “identified for use by either sex” to mean that single-user, family, or assisted-use toilet facilities could be identified for use by men, or could be identified for use by women, but not necessarily be identified for use by both men and women.

In response to this ambiguity, the National Center for Transgender Equality urges the Committee to approve this code change proposal to clarify Section 403.1.2 of the International Plumbing Code by including language that bathroom identification be “available for use by all persons regardless of their sex.” This modification resolves the problem of ambiguous interpretations because it could not logically be construed that it is permissible for bathroom signage to exclude one gender over the other. In essence, this proposal more accurately reflects the Membership’s intention to permit certain facilities to be identified for use by any and all persons.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal has no cost impact. The Membership already adopted this proposal in the 2018 International Plumbing Code. Rather than impose additional design costs, this proposal merely seeks to make a clarification. This proposal would better reflect the Membership’s intention than the current code.

Analysis: Duplicated text in the International Building Code is not shown for brevity.

Internal ID: 1432

P17-18

IPC: 403.2 (IBC [P]2902.2)

Proponent: James P. Colgate, Esq., RA, CFM, Bryan Cave LLP, representing National Center for Transgender Equality (James.Colgate@bryancave.com); David Collins, representing The American Institute of Architects (dcollins@preview-group.com)

2018 International Plumbing Code

Revise as follows:

403.2 Separate facilities. Where plumbing fixtures are required, separate facilities shall be provided for each sex.

Exceptions:

1. Separate facilities shall not be required for dwelling units and sleeping units.
2. Separate facilities shall not be required in structures or tenant spaces with a total occupant load, including both employees and customers, of 15 or fewer.
3. Separate facilities shall not be required in mercantile *occupancies* in which the maximum occupant load is 100 or fewer.
4. Separate facilities shall not be required in business occupancies in which the maximum occupant load is 25 or fewer.
5. <u>Separate facilities shall not be required where all water closet compartments are provided with partitions, including the doors thereto, that extend to the floor and to the ceiling.</u>

Reason:

Colleges across the United States, private businesses, membership clubs, and many establishments throughout Europe have adopted an alternative design for bathroom and toilet facilities that removes the requirement that such facilities be designated for use by a specific sex. This design has proven to be useful, effective, and economical.

NCTE's proposal would give designers the option of group toilet rooms regardless of sex, as long as each stall has partitions on all four sides that extend to the floor. Partitions ensure that the user's privacy is maintained. This proposal is advantageous because the partitions remove the embarrassment that many people face in a shared restroom facility. Additionally, group toilet facilities promote shorter wait times for the restroom and waste less space on a general bathroom waiting area.

It should be noted that this proposal does not trigger compliance with Exception 3 of IBC Section 1109.2, which requires that 50% of single-user toilet or bathing rooms clustered in a single location be accessible. The water closet compartments in this proposal need not contain a lavatory, and thus do not constitute a "toilet room" as such term is used in IPC Section 405.3.4 and IBC Sections 1109.2.1.2, 1109.2.2, and 1109.2.3. Rather, such "water closet compartments" are subject to the 5% rule of IBC Section 1109.2.2.

It should be noted that this proposal does not trigger compliance with Exception 2 of Section 1109.2 of the International Building Code, which requires that 50% of single-user toilet or bathing rooms clustered in a single location be accessible. Section 1109.2.1.2 of the International Building Code defines "toilet room" to include a water closet and a lavatory. Under NCTE's proposed design scheme, the partitioned stalls need not contain sinks or wash basins, and would therefore be treated as ordinary toilet compartments and subject to the 5% rule of Section 1109.2.2 of the International Building Code.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The same numbers of fixtures are still required and waiting time will be reduced by allowing any sex to use any available water closet compartment. Further, the general waiting area and space required for two facilities will not be necessary in places with this design option. While that may save a small cost, an additional cost may be expended to create partitions on all four sides that extend to the floor.

Analysis: Duplicated text in the International Building Code is not shown for brevity.

Internal ID: 1426

P18-18

IPC: 403.2

Proponent: Josephine Ortega, representing University of California

2018 International Plumbing Code

Revise as follows:

403.2 Separate facilities. Where plumbing fixtures are required, separate facilities shall be provided for each sex.

Exceptions:

1. Separate facilities shall not be required for dwelling units and sleeping units.
2. Separate facilities shall not be required in structures or tenant spaces with a total occupant load, including both employees and customers, of 15 or fewer.
3. Separate facilities shall not be required in mercantile *occupancies* in which the maximum occupant load is 100 or fewer.
4. Separate facilities shall not be required in business occupancies in which the maximum occupant load is 25 or fewer.
5. <u>Where multi-user facilities are designed to serve all genders, the minimum fixture count shall be calculated 100% based on the total occupant load. In such facilities, each fixture type shall be in accordance with ICC A117.1. Urinals provided shall be located in a stall.</u>

Reason:

This proposal will permit designers to design gender specific facilities using either the men or women category. The proposal will also bridge the gap of designing for facilities that elect to install all-inclusive bathroom/restrooms.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal simply offers a different way to design toilet facilities. No fixtures are being added or subtracted therefore, there is no impact to the cost of construction.

Internal ID: 2349

P19-18

IPC: 403.3.1 (IBC [P] 2902.3.1), 403.5 (IBC [P] 2902.5)

Proponent: Dawn Anderson, representing self (gonedawning@yahoo.com); Dan Buuck, representing National Association of Home Builders (dbuuck@nahb.org); David Collins, representing the American Institute of Architects (dcollins@preview-group.com); Marsha Mazz, representing U.S. Access Board (mazz@Access-Board.gov); Dominic Marinelli, representing United Spinal Association (DMarinelli@accessibility-services.com)

2018 International Plumbing Code

Revise as follows:

403.3.1 Access. The route to the *public* toilet facilities required by Section 403.3 shall not pass through kitchens, storage rooms or closets. Access to the required facilities shall be from within the building or from the exterior of the building. ~~Routes shall comply with the accessibility requirements of the International Building Code.~~ The public shall have access to the required toilet facilities at all times that the building is occupied.

403.5 Drinking fountain location. Drinking fountains shall not be required to be located in individual tenant spaces provided that *public* drinking fountains are located within a distance of travel of 500 feet (152 m) of the most remote location in the tenant space and not more than one story above or below the tenant space. Where the tenant space is in a covered or open mall, such distance shall not exceed 300 feet (91 m). ~~Drinking fountains shall be located on an accessible route.~~

Reason:
Accessibility is addressed in Section 404 of the IPC, which includes specifics for accessible routes connecting accessible elements – including exceptions to the vertical route between levels that may contain toilets or drinking fountains. The language is redundant in Section 403.3.1 and is not needed. The language in Section 403.5 is also not consistent with 403.3.1 and could be interpreted to prohibit any drinking fountains to be installed on floors without elevator service. This is not the intent of the accessibility provisions.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

The proposal will eliminate possible conflicts between the IPC and accessibility requirements. The change is only correlative and contains, in itself, no substantive changes.

Analysis: Duplicated text in the International Building Code not shown for brevity.

Internal ID: 548

P20-18 Part I

IPC: 403.3.3 (IBC [P] 2902.3.3)

Proponent: Brian Tollisen, Division of Building Standards & Codes, New York State Dept. of State, representing Division of Building Standards and Codes, New York State Department of State (Brian.Tollisen@dos.ny.gov)

BOTH PARTS OF THIS PROPOSAL WILL BE HEARD BY THE IPC-IPSDC COMMITTEE. SEE HEARING AGENDA FOR THE IPC-IPSDC COMMITTEE.

2018 International Plumbing Code

Revise as follows:

403.3.3 Location of toilet facilities in occupancies other than malls.. In occupancies other than covered and open mall buildings, the required *public* and employee toilet facilities shall be located not more than one story above or below the space required to be provided with toilet facilities, and the path of travel to such facilities shall not exceed a distance of 500 feet (152 m).

> **Exception:** ~~The location and maximum distances of travel~~ The location(s) of required employee plumbing fixtures are allowed to be located in adjacent structures under the same ownership, lease or control. The maximum travel distance to required employee facilities in factory and industrial occupancies, storage buildings and kiosks are permitted to exceed that required by this section, provided ~~that~~ the ~~location and maximum distance of travel are *approved*.~~ travel distance is approved.

Analysis: Duplicated text in the IBC is not shown for brevity.

Internal ID: 1357

P20-18 Part II

IPMC: 503.3

Proponent: Brian Tollisen, Division of Building Standards & Codes, New York State Dept. of State, representing Division of Building Standards and Codes, New York State Department of State (Brian.Tollisen@dos.ny.gov)

2018 International Property Maintenance Code

Revise as follows:

[P] 503.3 Location of employee toilet facilities.. Toilet facilities shall have access from within the employees' working area. The required toilet facilities shall be located not more than one story above or below the employees' working area and the path of travel to such facilities shall not exceed a distance of 500 feet (152 m). Employee facilities shall either be separate facilities or combined employee and public facilities.

> **Exception:** ~~Facilities that are required for employees in storage structures or kiosks, which are~~ The location(s) of required employee plumbing fixtures are allowed to be located in adjacent structures under the same ownership, lease or ~~control, shall not exceed a travel distance of 500 feet (152 m) from the employees' regular working area to the facilities.~~ control. The maximum travel distance to required employee facilities in factory and industrial occupancies, storage buildings and kiosks are permitted to exceed that required by this section, provided the travel distance is approved.

Reason:
The code sections currently are not coordinated with regards to the locations of employee plumbing facilities. This proposal brings consistency between the IPC and IPMC for the locations of employee toilet facilities. The spaces listed in the exception; factory and industrial occupancies, storage buildings and kiosks, are traditionally not provided with plumbing facilities due to the proximity to available facilities and due to the nature of their use. This change should also remove unnecessary violations issued due to the discrepancy in the current code language.

Cost Impact
The code change proposal will decrease the cost of construction .

Construction costs will decrease for the applicable occupancies by not requiring plumbing fixtures when adjacent facilities are approved.

Internal ID: 3394

P21-18

IPC: 403.3.3 (IBC [P]2902.3.3)

Proponent: Andrew Klein, representing Self Storage Association (andrew@asklein.com)

2018 International Plumbing Code

Revise as follows:

403.3.3 Location of toilet facilities in occupancies other than malls. In occupancies other than covered and open mall buildings, the required *public* and employee toilet facilities shall be located not more than one story above or below the space required to be provided with toilet facilities, and the path of travel to such facilities shall not exceed a distance of 500 feet (152 m).

~~Exception~~ <u>Exceptions</u>:

<u>1.</u> The location and maximum distances of travel to required employee facilities in factory and industrial *occupancies* are permitted to exceed that required by this section, provided that the location and maximum distance of travel are *approved*.

<u>2.</u> <u>The location and maximum distances of travel to required public and employee facilities in Group S occupancies are permitted to exceed that required by this section, provided that the location and maximum distance of travel are approved</u>

Reason:

This proposal adds exception #2, which builds on the existing exception for employee toilet facilities in factory and other industrial occupancies when approved by the code official. Because these types of occupancies have extremely low occupancy rates, it is not a cost-effective use of space or resources to require the same number of independent restrooms when they will rarely be utilized. The new exception for Group S facilities recognizes that even though there may be members of the public present in some S occupancies, the overall use of the building is similar to that of an industrial facility, where occupancy rates and dwell times are extremely low.

This proposal provides the code official the authority to increase the number of floors between restrooms from every other floor to something more appropriate in parking garages with attendants, self storage facilities, and other similar Group S buildings with low occupancy rates and dwell times.

Cost Impact

The code change proposal will decrease the cost of construction .

This code change proposal has the potential to decrease the cost of construction if the code official approves a reduction in the number of toilet facilities.

Analysis: Duplicated text in the IBC is not shown for brevity.

Internal ID: 1674

P22-18 Part I

IBC: 1109.2.1.7

Proponent: Jason Phelps, representing Self (jason.phelps@hillsboro-oregon.gov)

THIS IS A TWO PART CODE CHANGE. BOTH PARTS OF THIS CODE CHANGE WILL BE HEARD BY THE PLUMBING CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

2018 International Building Code

Revise as follows:

1109.2.1.7 Privacy. Doors to family or assisted-use toilet and bathing rooms shall be securable from within the room and be provided with an "occupied" indicator.

Internal ID: 1436

P22-18 Part II

IPC: 403.3.7 (New); IBC: 2902.3.7 (New)

Proponent: Jason Phelps, representing Self (jason.phelps@hillsboro-oregon.gov)

2018 International Plumbing Code

Add new text as follows:

403.3.7 Privacy. Doors to single-user toilet and bathing rooms and family or assisted-use toilet and bathing rooms shall be securable from within the room and be provided with an "occupied" indicator.

2018 International Building Code

Add new text as follows:

2902.3.7 Privacy. Doors to single-user toilet and bathing rooms and family or assisted-use toilet and bathing rooms shall be securable from within the room and be provided with an "occupied" indicator.

Reason:

This code change proposal will alleviate privacy and safety concerns by requiring the occupied indicator for single user restrooms. Without an occupied indicator, the only way for someone to see if the room is in use is to turn the handle. This causes safety and privacy concerns for the user. This can cause severe discomfort, even fear, for children or people who have suffered trauma. This proposal will proactively provide increased comfort and safety for everyone.

It is the intent of this proposal to have the added coordinate section IBC 2902.3.7, later scoped by CCC as "[P]" as everything else in Chapter 29 is [P] scoped.

Cost Impact

The code change proposal will increase the cost of construction .

Adding the occupied indicator to the already required privacy lock increases the cost of the hardware by no more than a few dollars per door.

Internal ID: 3488

P23-18

IPC: 403.6 (New)

Proponent: Eirene Knott, BRR Architecture, representing Metropolitan Kansas City Chapter of the ICC (Eirene.Knott@brrarch.com)

2018 International Plumbing Code

Add new text as follows:

403.6 Service sink location. Service sinks shall not be required to be located in individual tenant spaces in a covered mall provided that service sinks are located within a distance of travel of 300 feet (91 m) of the most remote location in the tenant space and not more than one story above or below the tenant space. Service sinks shall be located on an accessible route.

Reason:

There were at least two attempts in the 2015/2016/2017 code development cycle to reduce or remove the requirement of a service sink. One proposal was to not require a service sink where the occupant load was 30 or less. The committee felt that raising the occupant threshold and applying that load across the board would result with some occupancies not having a sink but would need the sink for other regulations such as health code requirements.

The other proposed code changes came from the PMG CAC adding a new section for service sinks allowing for a service sink to be located in a central core of a building. The committee disapproved that code change because it called for a minimum outlet drain of 3 inches in diameter. The committee felt the 3-inch requirement was overkill and felt the proposed code change also superseded the requirements of Table 403.1.

Despite attempts during the public comment phase where both proposal were approved, both were disapproved in the final action process. Based on the action at the public comment phase, there is an understanding that some small tenant spaces, especially those within a mall, do not need to have the service sink in a readily accessible location. Since both drinking fountains and public toilets are allowed to be within 300 feet of a tenant space in a mall, the same travel distance seems reasonable for access to a service sink. I have opted to have this change apply only to tenants within a covered mall as in some parts of the country it may not be practical for tenants in an outdoor mall to push a mop bucket 300 feet in the snow.

For a small tenant that may not meet footnote e to Table 403.1, the addition of a service sink can take up much needed tenant space, let alone add an additional cost that can negatively impact the tenant space overall. Most small tenants do not need a service sink but knowing that one would be available to them, just like a public restroom and drinking fountain are available within the same travel distances, would provide a sense of security.

Cost Impact

The code change proposal will decrease the cost of construction .

This may reduce the cost of construction as each individual tenant would not be required to provide a service sink, reducing the cost of materials needed.

Internal ID: 112

P24-18

IPC: 404.1, 404.2, 404.3

Proponent: Dawn Anderson, representing self (gonedawning@yahoo.com); Dan Buuck, representing National Association of Home Builders (dbuuck@nahb.org); David Collins, representing the American Institute of Architects (dcollins@preview-group.com); Marsha Mazz, representing U.S. Access Board (mazz@Access-Board.gov); Dominic Marinelli, representing United Spinal Association (DMarinelli@accessibility-services.com)

2018 International Plumbing Code

Revise as follows:

404.1 Where required. Accessible plumbing facilities and fixtures shall be provided in accordance with the International Building Code and ICC A117.1.

Delete without substitution:

~~**404.2 Accessible fixture requirements.** Accessible plumbing fixtures shall be installed with the clearances, heights, spacings and arrangements in accordance with ICC A117.1.~~

~~**404.3 Exposed pipes and surfaces.** Water supply and drain pipes under accessible lavatories and sinks shall be covered or otherwise configured to protect against contact. Pipe coverings shall comply with ASME A112.18.9.~~

Reason:

Section 404.2 and 404.3 were added by P42-12. They should be removed for multiple reasons. The reference to IBC would also get a reference to ICC A117.1 in Section 1101.2, however, if there is a concern that this may be missed by plumbing inspectors, the reference can be added in Section 404.1.

In Section 404.2, the laundry list is incomplete on what is required in the A117.1 for accessible plumbing fixtures. Since standards are only referenced to the extent the code sends you there (Section 102.8), this could be misinterpreted as intending to limit requirements that would be applicable in the standard. The requirement for pipe protection is a technical requirement for accessible lavatories, address in A117.1 Section 606.6, so it should not be repeated here. The ASME A112.18.9 standard addresses the requirements for heat transfer, not cold, therefore it only addresses half the issue associated with water, and not all the issues associated with accidental contact. The test for hot water is substantially hotter than tempered water which is required for public lavatories. Also, if the pipes are protected from contact by some type of shield as indicated in the photo, there is no exception for compliance with the standard, even if there is no contact with the pipes. If ASME A112.18.9 should be referenced, this standard should be reviewed through the ICC A117.1 process for technical issues associated with accessibility requirements. It does not belong in the IPC.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The proposal is only clarification that will eliminate potential conflicts between the IPC and ICC A117.1.

Internal ID: 546

P25-18

IPC: 404.3, Chapter 15

Proponent: Howard Ahern, representing Plumberex Speciality Products

2018 International Plumbing Code

Revise as follows:

404.3 Exposed pipes and surfaces. Water supply and drain pipes under accessible lavatories and sinks shall be covered or otherwise configured to protect against contact. Pipe coverings shall comply with ASME A112.18.9 or ASTM C1822.

Add new standard(s) follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959
US

C1822-2015:

Standard Specification for Insulating Covers on Accessible Lavatory Piping

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Reason:
There is a new standard that has been developed specifically for insulating covers over water supply pipes and drain piping under accessible lavatories. The new standard is titled: ASTM C1822-2015 Standard Specification for Insulating covers on Accessible Lavatory Piping. The Standard was developed by the C16.40 Thermal Insulation Systems committee. The new standard covers all of ASME A112.18.9 requirements but is a more comprehensive standard than ASME A112.18.9 and has additional language covering requirements related to restrictions on cable tie fasteners associated with a Federal lawsuit.

This code modification allows both the ASME A112 18.9 standard and would also allow ASTM C1822 compliance. designers are able to comply with either standard . Both standards are needed for these products allowing compliance with either standard will help contractors and inspectors with compliance and identification, while also allowing greater compliance with Department of Justice 2010 Americans with Disability Act standard for Assessable Design Standard 606.5 and ANSI Standard A117.1.

Bibliography:
Howard Ahern representing Plumberex Speciality Products.

Member ASME A112. 18.9 standard

Chairman ASTM C1822 Standard Committee

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

No cost increase would be associated with this modification as there are many under sink Insulation products sold nationwide which already complying with this standard that are of no increased cost to the industry.

Analysis: A review of the standard proposed for inclusion in the code, ASTM C1822-2015, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 1982

P26-18

IPC: 404.3 (New)

Proponent: Richard Anderson, None, representing Oklahoma ADAPT

2018 International Plumbing Code

Add new text as follows:

<u>**404.3** **Accessible water closet personal hygiene device.** Each accessible water closet shall be provided with a personal hygiene device in compliance with Section 412.9.</u>

Reason:

Toilets with built in bidets are known to provide a cleaner and more hygienic experience after using the restroom. Many people install them in their homes because of the more soothing and comfortable wash they provide as opposed to dry toilet paper. However, bidet toilets can offer a lot more than just a more comfortable cleaning experience for those suffering from a variety of medical issues. Seniors and persons with disabilities have been known to have these in their homes (including me) to help with our bathroom usages due to the loss of muscle strength and gross motor skills.

Toilet bidets provides both physical and psychological relief, because it helps us go to the bathroom by ourselves again or for the first time in our life. However, this brilliant product that gives independence and a peace of mind for a lot of us hasn't made it to the ADA Guideline as far as public bathrooms are concern.

Personally, I'm scared of going out days, never knowing if you gonna have to go bad and if you are able to hold it til you get home. If you are able to transfer to the toilet, you shouldn't be thinking about how you going get clean when you can't wipe yourself (sorry to be blunt). It really amazes me the toilet bidets haven't already been added.

I would suggest hotels to have bidets in accessible rooms, any place that serves food, i.e. dinning in restaurants, stores that has dinning in restaurants in them, like wal-marts, malls which has restaurants in them, and concert/sporting venues be the major public bathrooms to have toilet with built-in bidets in accessible stalls

As you will notice, commercial bidet toilets costs a liittle more then a regular commercial toilets, but at the end, it will pay for itself and more, it will allow us to go on vacations, eat out, shop, etc. which puts more money back into the business, not to mention the economy.

Example
https://www.houzz.com/photos/47714905/OVE-Decors-Smart-Toilet-contemporary-toilets

Cost Impact

The code change proposal will increase the cost of construction .

As you will notice, commercial bidet toilets costs a liittle more then a regular commercial toilets, but at the end, **it will pay for itself and more**, it will allow us to go on vacations, eat out, shop, etc. which puts more money back into the business, not to mention the economy.

Internal ID: 583

P27-18

IPC: 405.3.1

Proponent: Daniel Gleiberman, SLOAN, representing SLOAN (dangleib@gmail.com)

2018 International Plumbing Code

Revise as follows:

405.3.1 Water closets, urinals, lavatories and bidets. A water closet, urinal, lavatory or bidet shall not be set closer than 15 inches (381 mm) from its center to any side wall, partition, vanity or other obstruction. ~~Where~~ For water closets, urinals, or bidets, where partitions or other obstructions do not separate adjacent fixtures, fixtures shall not be set closer than 30 inches (762 mm) center to center between adjacent fixtures. There shall be not less than a 21-inch (533 mm) clearance in front of a water closet, urinal, lavatory or bidet to any wall, fixture or door. Water closet compartments shall be not less than 30 inches (762 mm) in width and not less than 60 inches (1524 mm) in depth for floor-mounted water closets and not less than 30 inches (762 mm) in width and 56 inches (1422 mm) in depth for wall-hung water closets.

> **Exception:** An accessible children's water closet shall be set not closer than 12 inches (305 mm) from its center to the required partition or to the wall on one side.

Reason:
This code section is a subsection of Section 405 entitled "Installation of Fixtures". This code change proposal clarifies that lavatories must be installed to meet the 15 inch separation from the center of the fixture to any obstruction.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

The change only clarifies the current code requirement.

Internal ID: 1930

P28-18

IPC: 405.3.4

Proponent: Bruce Pitts, Self, representing Self (bhpbhp@yahoo.com)

2018 International Plumbing Code

Revise as follows:

405.3.4 Water closet compartment. Each water closet utilized by the public or employees shall occupy a separate compartment with <u>full-height</u> walls or partitions and a <u>solid</u> door <u>fully</u> enclosing the fixtures to ensure privacy. <u>The door shall close against seals on the top and sides, can be undercut up to 3/4 inches (19.05 mm) and shall not have a transfer grille.</u>

Exceptions:

1. Water closet compartments shall not be required in a single-occupant toilet room with a lockable door.
2. Toilet rooms located in child day care facilities and containing two or more water closets shall be permitted to have one water closet without an enclosing compartment.
3. This provision is not applicable to toilet areas located within Group I-3 housing areas.
4. <u>Door undercut height limitations are not required for exterior water closet compartments.</u>

Reason:
Full-height partitions can help the Paruresis community function in society.

Paruresis affects from 6.6% to 14.4% of the population who find it difficult or impossible to urinate in the presence of others. Restroom privacy is the issue.

Employment, commerce, productivity and well being are affected. Many cannot work in buildings with partial-partition group restrooms and can plan their days around facilities that have restroom privacy. Paruresis contributes to agoraphobia and even to suicide.

Expecting this many people to seek and pay for treatment, which may or may not help them, is not the way to remedy this matter. 21 million is the population of Florida. 46 million represents the combined populations of Florida, New York State and South Carolina.

A Study by Williams and Degenhart - Journal of General Psychology 51:19-29, 1954, found 14.4% of the population having Paruresis, equaling 46 million Americans, based upon the 2015 USA population of 320,098,857. A Harvard University Study - Social Phobia Subtypes in the National Comorbidity Study - American Journal of Psychiatry, 155:613-9, May 1998, found 6.6% of the population with Paruresis equalling 21 million Americans as of 2015.

Closing each full-height partition door against seals (and with minimal door undercut) provides privacy and sound attenuation.

A maximum door undercut is not required for exterior toilet compartments to avoid vagrancy.

In the attachment section, a cost differential is provided for partial versus full-height partitions.

Cost Impact
The code change proposal will increase the cost of construction .

The cost of full-height versus partial-height partitions (attached) is nominal in relation to improving the lives of millions of Americans.

Partial versus full height toilet partition cost differential
Quotes based upon Aiken, SC 29803, by Bruce Pitts 1/8/17

2 toilets men's
2 urinals men's (not applicable for these toilet partition enclosures) 4 toilets women's

Six partial height stall quantity and prices for both men's and women's rooms

	Quantity	Cost Each	Amount
ADA partial height toilet stall men's	1.0	$1,567.80	$1,568
Standard partial height toilet stall men's	1.0	$1,303.00	$1,303
ADA partial height toilet stall women's	1.0	$1,567.80	$1,568
Standard partial height toilet stall women's	3.0	$1,303.00	$3,909
Total cost partial height toilet stalls			**$8,348**

Six full-height stall quantity and prices for both men's and women's rooms

	Quantity	Cost Each	Amount
Full height partitions with full doors total cost, 2 ADA and 4 standard stalls (see Note 1)			14,384.00
Additional exhaust ductwork	9.0	$40.00	$360
	L.F.	cost per L.F.	
Additional exhaust duct takeoff per grille	4.0	$13.52	$54
Additional ceiling exhaust grille	4.0	$15.54	$62
Total cost full height toilet stalls			**$14,860**
Additional cost multiplier for the full height stalls			**1.78**

Note

1) Basic grade full height partition, floor to 8' ceiling sides and fronts with 3/4" undercut doors for exhaust make-up air and 4" vertical floor bases. Full height partition estimate per manufacturer's quote times 1.25 for installation, includes 2 full height ADA toilet stalls and 4 standard full height toilet stalls.

Internal ID: 1789

P29-18

IPC: 405.3.6 (New)

Proponent: Gary Schenk, City of SeaTac, WA, representing Washington Association of Building Officials (gschenk@ci.seatac.wa.us); Gary Lampella, City of Seatac WA, representing Washington Association of Building Officials TDC (garyl@nwcodeprofessionals.com)

2018 International Plumbing Code

Add new text as follows:

405.3.6 Privacy. Public restrooms shall be visually screened from outside entry or exit doors to ensure user privacy within the restroom. This provision shall also apply where mirrors would compromise personal privacy.

Exception: Visual screening shall not be required for single-occupant toilet rooms with lockable doors.

Reason:
Although this section currently has provisions for sidewall or partition privacy within the restrooms, it does not address privacy from viewing the user at the fixture from outside the restroom. It also addresses the placement of mirror reflection viewing from the outside.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

This is a minor design consideration that is typically addressed at the design stage. The change doesn't impact costs as the designers have been already considering this feature for a long time.

Internal ID: 2131

P30-18

IPC: 405.4.3, Chapter 15

Proponent: Angel Guzman Rodriguez, ASME, representing The American Society of Mechanical Engineers (ASME)

2018 International Plumbing Code

Revise as follows:

405.4.3 Securing wall-hung water closet bowls. Wall-hung water closet bowls shall be supported by a concealed metal carrier that is attached to the building structural members so that strain is not transmitted to the ~~closet~~ fixture connector or any other part of the plumbing system. The carrier shall conform to ASME A112.6.1M or ASME A112.6.2.

Add new standard(s) follows:

ASME

American Society of Mechanical Engineers
Two Park Avenue
New York NY 10016-5990

A112.6.1M-1997 (R2017):

Floor Affixed Supports for Off-the-Floor Plumbing Fixtures for Public Use

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Reason:
The ASME A112.6.1 Standard includes requirements for floor-affixed supports that can be used to secure off the floor water closets and urinals

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

This proposal is only adding an optional type of carrier that can be used for securing a water closet bowl to a wall.

Analysis: A review of the standard proposed for inclusion in the code, ASME A112.6.1M-1997 (R2017), with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 1403

P31-18

IPC: 407.2

Proponent: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2018 International Plumbing Code

Revise as follows:

407.2 Bathtub waste outlets and overflows. Bathtubs shall be equipped with a waste outlet ~~and an overflow outlet. The outlets shall be connected to waste tubing or piping~~ that is not less than $1^1/_2$ inches (38 mm) in diameter. The waste outlet shall be equipped with a water-tight stopper. Where an overflow is installed, the overflow shall be not less than $1^1/_2$ inches (38mm) in diameter.

Reason:

This proposal will coordinate the IRC requirements and IPC requirements for outlets from tubs. There are many bathtub designs that do not have overflow openings and the plumbing fixture standards do not require an overflow.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances or devices are mandated beyond what is currently required by the code.

Internal ID: 562

P32-18

IPC: 408.1

Proponent: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2018 International Plumbing Code

Revise as follows:

408.1 Approval. Bidets shall conform to ASME A112.19.2/CSA B45.1~~.~~ or ASME A112.19.3/CSA B45.4.

Reason:
The current standard reference is only for ceramic plumbing fixture. The additional standard addresses stainless steel plumbing fixtures. The standard is already referenced in the IPC for other fixtures.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

The addition of the standard provides more flexibility in choice of fixtures. A stainless steel bidet is not required to be installed; it is a choice that the designer can make.

Internal ID: 492

P33-18 Part I

IPC: 408.3

Proponent: William Chapin, Professional Code Consulting, LLC, representing Professional Code Consulting, LLC (bill@profcc.us)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Revise as follows:

408.3 Bidet water temperature. The discharge water temperature from a bidet fitting shall be limited to not greater than 110°F (43°C) by a water-temperature-limiting device conforming to ASSE 1070/ASME A112.1070/CSA B125.70 ~~or CSA B125.3.~~

Internal ID: 2237

P33-18 Part II

IRC: P2721.2

Proponent: William Chapin, Professional Code Consulting, LLC, representing Professional Code Consulting, LLC (bill@profcc.us)

2018 International Residential Code

Revise as follows:

P2721.2 Bidet water temperature. The discharge water temperature from a bidet fitting shall be limited to not greater than 110°F (43°C) by a water-temperature-limiting device conforming to ASSE 1070/ASME A112.1070/CSA B125.70 ~~or CSA B125.3~~.

Reason:
In June of 2017, the CSA B125 Committee completed the project that removed the automatic compensating valve requirements from CSA B125.3. The reason for this was the publication of harmonized ASSE 1070/ASME A112.1070/CSA B125.70 standard.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

Proposal on removes a referenced standard from the code section.

Internal ID: 3436

P34-18

IPC: 408.3, 412.3, 412.4, 412.5, 412.7

Proponent: James Kendzel, representing American Supply Association (jkendzel@asa.net)

2018 International Plumbing Code

Revise as follows:

408.3 Bidet water temperature. The discharge water temperature from a bidet fitting shall be limited to not greater than 110°F (43°C) by a water-temperature-limiting device conforming to ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3. <u>The water heater thermostat shall not be used to control the bidet fitting outlet water temperature.</u>

412.3 Individual shower valves. Individual shower and tubshower combination valves shall be balanced-pressure, thermostatic or combination balanced-pressure/thermostatic valves that conform to the requirements of ASSE 1016/ASME A112.1016/CSA B125.16 or ASME A112.18.1/CSA B125.1 and shall be installed at the point of use. Shower and tub-shower combination valves required by this section shall be equipped with a means to limit the maximum setting of the valve to 120°F (49°C), which shall be field adjusted in accordance with the manufacturer's instructions. In-line thermostatic valves shall not be utilized for compliance with this section. <u>The water heater thermostat shall not be used to control the shower control outlet water temperature.</u>

412.4 Multiple (gang) showers. Multiple (gang) showers supplied with a single-tempered water supply pipe shall have the water supply for such showers controlled by an *approved* automatic temperature control mixing valve that conforms to ASSE 1069 or CSA B125.3, or each shower head shall be individually controlled by a balanced-pressure, thermostatic or combination balanced-pressure/thermostatic valve that conforms to ASSE 1016/ASME A112.1016/CSA B125.16 or ASME A112.18.1/CSA B125.1 and is installed at the point of use. Such valves shall be equipped with a means to limit the maximum setting of the valve to 120°F (49°C), which shall be field adjusted in accordance with the manufacturers' instructions. <u>The water heater thermostat shall not be used to control the shower outlet water temperature.</u>

412.5 Bathtub and whirlpool bathtub valves. The *hot water* supplied to bathtubs and whirlpool bathtubs shall be limited to not greater than 120°F (49°C) by a water-temperature limiting device that conforms to ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3, except where such protection is otherwise provided by a combination tub/shower valve in accordance with Section 412.3. <u>The water heater thermostat shall not be used to control the tub fixture fitting outlet water temperature.</u>

412.7 Temperature-actuated, flow-reduction devices for individual fixture fittings. Temperature-actuated, flow-reduction devices, where installed for individual fixture fittings, shall conform to ASSE 1062. A temperature-actuated, flow-reduction device shall be an *approved* method for limiting the water temperature to not greater than 120° F (49° C) at the outlet of a faucet or fixture fitting. Such devices shall not be used alone as a substitute for the balanced-pressure, thermostatic or combination shower valves required in Section 412.3 or as a substitute for bathtub or whirlpool tub watertemperature-limiting valves required in Section 412.5. <u>The water heater thermostat shall not be used to control the outlet water temperature from any fixture fitting.</u>

Reason:
Added statement is intended to emphasize that a water heater thermostat is not a product covered by the referenced standards and is not intended for tempering water at the fixture.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

Added language is to ensure proper interpretations of the sections and as it is a clarification statement only there is no cost associated with the revision.

Internal ID: 840

P35-18

IPC: 408.3, Chapter 15

Proponent: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing Bradley Corporation (JBEngineer@aol.com)

2018 International Plumbing Code

Revise as follows:

408.3 Bidet water temperature. The discharge water temperature from a bidet fitting shall be limited to not greater than 110°F (43°C). The water temperature shall be regulated by a water ~~temperature~~ heater conforming to ASSE 1084 or by a limiting device conforming to either ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3.

Add new standard(s) follows:

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448

1084-2018:

Performance Requirements for Water Heaters used as Temperature Limiting Devices

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Reason:
A new standard, ASSE 1084, was developed for water heaters that limit the temperature of hot water similar to an ASSE1070 valve. The standard is comparable to ASSE 10710/ASME A112.1070/CSA B125.7. The water heater cannot produce a temperature of hot water exceeding 120° F. The water heater must be capable of shutting off the supply of hot water when the temperature exceeds the set limit. These water heaters may be installed in the close proximity of the fixtures they serve.

Cost Impact
The code change proposal will decrease the cost of construction .

The availability of more options to achieve code compliance usually results in lower construction costs.

Analysis: A review of the standard proposed for inclusion in the code, ASSE 1084 2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 1162

P36-18

IPC: 410.1

Proponent: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2018 International Plumbing Code

Revise as follows:

410.1 Approval. Drinking fountains shall conform to ASME A112.19.1/CSA B45.2 or ASME A112.19.2/CSA B45.1, or ASME A112.19.3/CSA B45.4 and *water coolers* shall conform to ASHRAE 18. Drinking fountains, *water coolers* and *water dispensers* shall conform to NSF 61, Section 9. Electrically operated, refrigerated drinking *water coolers* and *water dispensers* shall be listed and labeled in accordance with UL 399.

Reason:

The current standards reference ceramic, enameled cast iron and enameled steel plumbing fixtures. The additional standard addresses stainless steel plumbing fixtures. The standard is already referenced in the IPC for other fixtures.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The addition of the standard provides more flexibility in choice of fixtures. A stainless steel drinking fountain is not required to be installed; it is a choice that the designer can make.

Internal ID: 493

P37-18

IPC: 410.2, 410.4, TABLE 403.1

Proponent: James Kendzel, American Supply Association, representing American Supply Association (jkendzel@asa.net)

2018 International Plumbing Code

Revise as follows:

410.2 ~~Small occupancies.~~Number of drinking fountains. ~~Drinking~~ The number of drinking fountains required shall ~~not be required for an occupant load of 15 or fewer.~~be in accordance with Table 403.1.

Delete without substitution:

~~**410.4 Substitution.**~~. ~~Where restaurants provide drinking water in a container free of charge, drinking fountains shall not be required in those restaurants. In other occupancies where drinking fountains are required, *water dispensers* shall be permitted to be substituted for not more than 50 percent of the required number of drinking fountains.~~.

Revise as follows:

TABLE 403.1
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a] (See Sections 403.1.1 and 403.2)

NO.	CLASSIFICATION	DESCRIPTION	WATER CLOSETS (URINALS: SEE SECTION 424.2)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAIN[g] ~~(SEE SECTION 410)~~	OTHER
			MALE	FEMALE	MALE	FEMALE			
1	Assembly	Theaters and other buildings for the performing arts and motion pictures[d]	1 per 125	1 per 65	1 per 200		—	1 per 500	1 service sink
		Nightclubs, bars, taverns, dance halls and buildings for similar purposes[d]	1 per 40	1 per 40	1 per 75		—	1 per 500	1 service sink
		Restaurants, banquet halls and food courts[d]	1 per 75	1 per 75	1 per 200		—	1 per 500	1 service sink
		Casino gaming areas	1 per 100 for the first 400 and 1 per 250 for the remainder exceeding 400	1 per 50 for the first 400 and 1 per 150 for the remainder exceeding 400	1 per 250 for the first 750 and 1 per 500 for the remainder exceeding 750		—	1 per 1,000	1 service sink
		Auditoriums without permanent seating, art galleries, exhibition halls, museums, lecture halls, libraries, arcades and gymnasiums[d]	1 per 125	1 per 65	1 per 200		—	1 per 500	1 service sink
		Passenger terminals and transportation facilities[d]	1 per 500	1 per 500	1 per 750		—	1 per 1,000	1 service sink
		Places of worship and other religious services[d]	1 per 150	1 per 75	1 per 200		—	1 per 1,000	1 service sink
		Coliseums, arenas, skating rinks, pools and tennis courts for indoor sporting events and activities	1 per 75 for the first 1,500 and 1 per 120 for the remainder exceeding 1,500	1 per 40 for the first 1,520 and 1 per 60 for the remainder exceeding 1,520	1 per 200	1 per 150	—	1 per 1,000	1 service sink
		Stadiums, amusement parks, bleachers and grandstands for outdoor sporting events and activities[f]	1 per 75 for the first 1,500 and 1 per 120 for the remainder exceeding 1,500	1 per 40 for the first 1,520 and 1 per 60 for the remainder exceeding 1,520	1 per 200	1 per 150	—	1 per 1,000	1 service sink
2	Business	Buildings for the transaction of business, professional services, other services involving merchandise, office buildings, banks, light industrial, ambulatory care and similar uses	1 per 25 for the first 50 and 1 per 50 for the remainder exceeding 50		1 per 40 for the first 80 and 1 per 80 for the remainder exceeding 80		—	1 per 100	1 service sink[e]
3	Educational	Educational facilities	1 per 50		1 per 50		—	1 per 100	1 service sink
4	Factory and industrial	Structures in which occupants are engaged in work fabricating, assembly or processing of products or	1 per 100		1 per 100		—	1 per 400	1 service sink

		products of materials					
5	Institutional	Custodial care facilities	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink
		Medical care recipients in hospitals and nursing homes	1 per room[c]	1 per room[c]	1 per 15	1 per 100	1 service sink per floor
		Employees in hospitals and nursing homes[b]	1 per 25	1 per 35	—	1 per 100	—
		Visitors in hospitals and nursing homes	1 per 75	1 per 100	—	1 per 500	—
		Prisons[b]	1 per cell	1 per cell	1 per 15	1 per 100	1 service sink
		Reformitories, detention centers, and correctional centers[b]	1 per 15	1 per 15	1 per 15	1 per 100	1 service sink
		Employees in reformitories, detention centers and correctional centers[b]	1 per 25	1 per 35	—	1 per 100	—
		Adult day care and child day care	1 per 15	1 per 15	1	1 per 100	1 service sink
6	Mercantile	Retail stores, service stations, shops, salesrooms, markets and shopping centers	1 per 500	1 per 750	—	1 per 1,000	1 service sink[e]
7	Residential	Hotels, motels, boarding houses (transient)	1 per sleeping unit	1 per sleeping unit	1 per sleeping unit	—	1 service sink
		Dormitories, fraternities, sororities and boarding houses (not transient)	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink
		Apartment house	1 per dwelling unit	1 per dwelling unit	1 per dwelling unit	—	1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per 20 dwelling units
		Congregate living facilities with 16 or fewer persons	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink
		One- and two-family dwellings and lodging houses with five or fewer guestrooms	1 per dwelling unit	1 per dwelling unit	1 per dwelling unit	—	1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per dwelling unit
8	Storage	Structures for the storage of goods, warehouses, storehouse and freight depots. Low and Moderate Hazard.	1 per 100	1 per 100	—	1 per 1,000	1 service sink

a.The fixtures shown are based on one fixture being the minimum required for the number of persons indicated or any fraction of the number of persons indicated. The number of occupants shall be determined by the International Building Code.

b. Toilet facilities for employees shall be separate from facilities for inmates or care recipients.

c. A single-occupant toilet room with one water closet and one lavatory serving not more than two adjacent patient sleeping units shall be permitted provided that each patient sleeping unit has direct access to the toilet room and provision for privacy for the toilet room user is provided.

d. The occupant load for seasonal outdoor seating and entertainment areas shall be included when determining the minimum number of facilities required.

e. For business and mercantile classifications with an occupant load of 15 or fewer, service sinks shall not be required.

f. The required number and type of plumbing fixtures for outdoor public swimming pools shall be in accordance with Section 609 of the International Swimming Pool and Spa Code.

g. Drinking fountains shall not be required for an occupant load of 15 or fewer. Where drinking fountains are required, water dispensers shall be permitted to be substituted provided that not more than 50 percent of the required number of drinking fountains are substituted with water dispensers.

Reason:

Table 403.1 provides the minimum requirements for plumbing fixtures, including drinking fountains. The proposed changes move requirements and exceptions for drinking water fountains currently provided in section 410 and place them directly into the table.

Section 410.4 has been placed as a footnote in table 403.1 however, the first sentence of section 410.4, "Where restaurants provide drinking water in a container free of charge, drinking fountains shall not be required in those restaurants." This requirement does not appear to be enforceable and may change due to change of ownership over time and no requirement is in place to ensure that the consumer is aware that free water shall be provided by those restaurants not complying with the minimum number of drinking fountain requirements.

Cost Impact

The code change proposal will increase the cost of construction .

There is the potential for a minor increase in cost for restaurant construction due to the proposed elimination of the exception for restaurants that serve water in a container for free. However, the elimination of the exception ensures that drinking water is available in all restaurants prior to opening.

Internal ID: 1354

P38-18 Part I

IBC: 202, 1109.5, 2902.7 (New)

Proponent: Jenifer Gilliland, City of Seattle, Washington, representing City of Seattle, Washington (jenifer.gilliland@seattle.gov)

THIS IS A 2 PART CODE CHANGE. PART I AND PART II WILL BE HEARD BY THE PLUMBING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

2018 International Building Code

Add new definition as follows:

WATER DISPENSER. A plumbing fixture that is manually controlled by the user for the purpose of dispensing potable drinking water into a receptacle such as a cup, glass or bottle. Such fixture is connected to the potable water distribution system of the premises. This definition includes a freestanding apparatus for the same purpose that is not connected to the potable water distribution system and that is supplied with potable water from a container, bottle or reservoir.

Revise as follows:

1109.5 ~~Drinking~~ High and low drinking fountains. Where drinking fountains are provided on an exterior site, on a floor or within a secured area, the drinking fountains shall be provided in accordance with Sections 1109.5.1 and 1109.5.2.

1109.5.1 Minimum number. Not fewer than two drinking fountains shall be provided. One drinking fountain shall comply with the requirements for people who use a wheelchair and one drinking fountain shall comply with the requirements for standing persons.

Exceptions:

1. A single drinking fountain with two separate spouts that complies with the requirements for people who use a wheelchair and standing persons shall be permitted to be substituted for two separate drinking fountains.
2. Where drinking fountains are primarily for children's use, drinking fountains for people using wheelchairs shall be permitted to comply with the children's provisions in ICC A117.1 and drinking fountains for standing children shall be permitted to provide the spout at 30 inches (762 mm) minimum above the floor.

1109.5.2 More than the minimum number. Where more than the minimum number of drinking fountains specified in Section 1109.5.1 is provided, 50 percent of the total number of drinking fountains provided shall comply with the requirements for persons who use a wheelchair and 50 percent of the total number of drinking fountains provided shall comply with the requirements for standing persons.

Exceptions:

1. Where 50 percent of the drinking fountains yields a fraction, 50 percent shall be permitted to be rounded up or down, provided that the total number of drinking fountains complying with this section equals 100 percent of the drinking fountains.
2. Where drinking fountains are primarily for children’s use, drinking fountains for people using wheelchairs shall be permitted to comply with the children’s provisions in ICC A117.1 and drinking fountains for standing children shall be permitted to provide the spout at 30 inches (762 mm) minimum above the floor.

[P] 2902.6 Small occupancies. Drinking fountains shall not be required for an occupant load of 15 or fewer.

Add new text as follows:

2902.7 Substitution. Where restaurants provide drinking water in a container free of charge, drinking fountains shall not be required in those restaurants. In other occupancies where more than two drinking fountains are required, water dispensers shall be permitted to be substituted for not more than 50 percent of the required number of drinking fountains.

Staff Note: In Part I, the intent is for the text in the IPC for the definition of water dispenser and Section 410.4 to be copied verbatim into the IBC as a new definition and new Section 2902.7. The Code Correlation Committee will decide,prior to publication of the codes, whether a scoping designation will be applied to this new definition and new section in the IBC. The title change of IBC Section 1109.5 is only editorial.

Internal ID: 1172

P38-18 Part II

IPC: 410.3 (New), [BE]410.3, 410.3.2(New), 410.4

Proponent: Jenifer Gilliland, City of Seattle, Washington, representing City of Seattle, Washington (jenifer.gilliland@seattle.gov)

2018 International Plumbing Code

SECTION 202 GENERAL DEFINITIONS

WATER DISPENSER. A plumbing fixture that is manually controlled by the user for the purpose of dispensing potable drinking water into a receptacle such as a cup, glass or bottle. Such fixture is connected to the potable water distribution system of the premises. This definition includes a freestanding apparatus for the same purpose that is not connected to the potable water distribution system and that is supplied with potable water from a container, bottle or reservoir.

SECTION 410 DRINKING FOUNTAINS

410.2 Small occupancies. Drinking fountains shall not be required for an occupant load of 15 or fewer.

Add new text as follows:

410.3 High and low drinking fountains. Where drinking fountains are provided on an exterior site, on a floor or within a secured area, the drinking fountains shall be provided in accordance with Sections 410.3.1 and 410.3.2.

Revise as follows:

[BE] ~~410.3~~ 410.3.1 ~~High and low drinking fountains~~ Minimum number. ~~Where drinking fountains are required, not~~ Not fewer than two drinking fountains shall be provided. One drinking fountain shall comply with the requirements for people who use a wheelchair and one drinking fountain shall comply with the requirements for standing persons.

Exceptions:

1. A single drinking fountain with two separate spouts that complies with the requirements for people who use a wheelchair and standing persons shall be permitted to be substituted for two separate drinking fountains.
2. Where drinking fountains are primarily for children's use, the drinking fountains for people using wheelchairs shall be permitted to comply with the children's provisions in ICC A117.1 and drinking fountains for standing children shall be permitted to provide the spout at 30 inches (762 mm) minimum above the floor.

Add new text as follows:

410.3.2 More than the minimum number. Where more than the minimum number of drinking fountains specified in Section 1109.5.1 is provided, 50 percent of the total number of drinking fountains provided shall comply with the requirements for persons who use a wheelchair and 50 percent of the total number of drinking fountains provided shall comply with the requirements for standing persons.

Exceptions:

1.Where 50 percent of the drinking fountains yields a fraction, 50 percent shall be permitted to be rounded up or down, provided that the total number of drinking fountains complying with this section equals 100 percent of the drinking fountains.

2.Where drinking fountains are primarily for children's use, drinking fountains for people using wheelchairs shall be permitted to comply with the children's provisions in ICC A117.1 and drinking fountains for standing children shall be permitted to provide the spout at 30 inches (762 mm) minimum above the floor.

Revise as follows:

410.4 Substitution. Where restaurants provide drinking water in a container free of charge, drinking fountains shall not be required in those restaurants. In other occupancies where more than two drinking fountains are required, *water dispensers* shall be permitted to be substituted for not more than 50 percent of the required number of drinking fountains.

Reason:
It is important for both the building official and the plumbing inspector to fully understand the requirements for drinking fountains including when they can be eliminated, switched out, and when high/low drinking fountains are required. Currently, only a portion of the information is available in the IPC and IBC.

The IPC does not have language addressing two important points needed for accessible drinking fountains:

1) The IPC doesn’t include the requirements found in the IBC that are based on where the fountain is being provided - per floor, per secure area, or outside.

2) The IPC doesn’t address high/low requirements for three or more drinking fountains.

This proposal adds the relevant sections currently found in IBC to IPC. The changes to the language are editorial for coordination only. Current IPC Section 410.3 has additional words at the beginning which are not in the IBC and are not correct. Accessibility provisions apply to drinking fountains where provided, not only where required.

There also appears to be a conflict between the IPC allowing half of the drinking fountains to be switched out starting at two drinking fountains, and the accessibility requirement requiring at least two. Adding “two or more” to the IPC Section 410.4 will eliminate that conflict. This information should be repeated in IBC Chapter 29 along with the information that small occupancies do not have to have drinking fountains.

There is another change proposal to change the definition in the IPC for water dispensers. This proposal is totally separate, but it is the intent for the revised definition to be in the IBC if that change is successful.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

This is a coordination/clarification of existing requirements in the IBC and the IPC.

Staff note: In Part 2, the intent is for the text in the IBC Section 1109.5, 1109.5.1 and 1109.5.2 to be copied verbatim into the IPC as Sections 410.3, 410.3.1 and 410.3.2 . A [BE] is shown in front of the text to indicate this, however, code committee scoping will be officially determined at a later date. There is a revision to IPC Section 410.4.

Internal ID: 3452

P39-18

IPC: 410.4

Proponent: Dawn Anderson, representing self (gonedawning@yahoo.com); Dan Buuck, representing National Association of Home Builders (dbuuck@nahb.org); David Collins, representing the American Institute of Architects (dcollins@preview-group.com); Marsha Mazz, representing U.S. Access Board (mazz@Access-Board.gov); Dominic Marinelli, representing United Spinal Association (DMarinelli@accessibility-services.com)

2018 International Plumbing Code

Revise as follows:

410.4 Substitution. Where restaurants provide drinking water in a container free of charge, drinking fountains shall not be required in those restaurants. In other occupancies where <u>three or more</u> drinking fountains are required, *water dispensers* shall be permitted to be substituted for not more than 50 percent of the required number of drinking fountains.

[BE] 410.3 High and low drinking fountains. Where drinking fountains are required, not fewer than two drinking fountains shall be provided. One drinking fountain shall comply with the requirements for people who use a wheelchair and one drinking fountain shall comply with the requirements for standing persons.

Exceptions:

1. A single drinking fountain with two separate spouts that complies with the requirements for people who use a wheelchair and standing persons shall be permitted to be substituted for two separate drinking fountains.
2. Where drinking fountains are primarily for children's use, the drinking fountains for people using wheelchairs shall be permitted to comply with the children's provisions in ICC A117.1 and drinking fountains for standing children shall be permitted to provide the spout at 30 inches (762 mm) minimum above the floor.

Reason:

IPC 410.4 allows up to 50% of required drinking fountains to be substituted with water dispensers, which could be water bottle fillers or bottled water. This change attempts to remove a “gotcha” situation—using the tradeoff for where only two drinking fountains would be required without considering the requirements for high/low drinking fountains. Allowing for such a tradeoff is in conflict with high/low requirements in the IPC 410.3 and IBC Section 1109.5.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The proposal will eliminate possible conflicts between the IPC and accessibility requirements. The change is only correlative and contains, in itself, no substantive changes.

Internal ID: 542

P40-18

IPC: 411, 411.1, 411.2, 411.3

Proponent: Ronald George, representing Self (Ron@Plumb-TechLLC.com)

2018 International Plumbing Code

Revise as follows:

411.2 Waste connection. Waste connections ~~shall not be required~~ <u>or floor drains of adequate size and capacity shall be provided for</u> for emergency showers and ~~eyewash stations.~~ <u>eye/facewash stations.</u>

> <u>**Exception:** Waste connections or floor drains shall not be required where the code official determines that the flushing fluid will not cause structural damage and there will be no spread of chemicals or contaminants in the run-off.</u>

SECTION 411 EMERGENCY SHOWERS AND ~~EYEWASH~~ <u>EYE/FACE WASH</u> STATIONS

411.1 Approval. Emergency showers and ~~eyewash~~ <u>eye/facewash</u> stations shall conform to ISEA Z358.1.

411.3 Water supply. Where hot and cold water is supplied to an emergency shower or ~~eyewash~~ <u>eye/facewash</u> station, the temperature of the water supply shall only be controlled by a temperature actuated mixing valve complying with ASSE 1071.

Reason:
Emergency fixtures will flow a minimum of 24 gallons per minute when a combination unit is activated. The units are required by the Industry Standard to flow for a minimum of 15 minutes. 15 minutes x 24 gallons per minute = 360 gallons of water or flushing fluid (that is equal to about seven, 55-gallon drums of liquid and chemicals spilling over for each fixture activated). 360 gallons of flushing fluid (water and chemicals) could cause significant damage to a building and in some cases it could be flushing of radioactive waste or other harmful chemicals that are in the run-off. If there are no drains provided for an emergency fixture, it also makes it difficult for a building owner to properly flush the fluid in the emergency fixture piping system on a weekly basis as recommended in the industry standard to eliminate stagnant water and bacteria from the piping system. Hospital utilize emergency fixtures in decontamination areas near the emergency room entrances, upstairs in the hospital labs they generally have emergency fixtures and research labs have them throughout. Those type of building could suffer significant damage and disruption for an emergency fixture activation when there is no waste connection or floor drain. Industrial facilities or warehouses, however typically have concrete floors and curbed containment ares which may not require a waste connection or floor drain. This code change allows the code official to make the decision of whether to allow an industrial facility to omit waste connections or drains when it is deemed not to be a structural damage hazard or chemical spread hazard for the building.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

This proposal simply clarifies what the industrial safety community already understands about the need for capture/containment of flush water from an emergency eye/face wash unit. Typically, the default is to provide a waste connection or floor drain for convenience of testing and easy cleanup after a actual event. However, in some circumstances, a waste connection or floor drain is not appropriate because the wastewater is "hazardous" to the drainage piping system or waste treatment processes downstream. In jurisdictions where code officials have forced waste connections or floor drains on every unit where the industrial safety experts don't want those connections, the exception allows for a cost decrease. In jurisdictions where where code officials don't see drainage provisions at a specific application and the industrial safety experts indicate that the wastewater is not hazardous to the typical drainage system, there will be a cost increase to add drainage means. On average, the overall industry-wide cost of construction is neither plus or minus because most builder designers are already doing the right thing.

Internal ID: 1869

P41-18

IPC: 411.3

Proponent: Ronald George, representing Self (Ron@Plumb-TechLLC.com)

2018 International Plumbing Code

Revise as follows:

411.3 Water supply. Where hot and cold water is supplied to an emergency shower or ~~eyewash~~ eye/facewash station, the temperature of the water supply shall only be controlled by a temperature actuated mixing valve complying with ASSE 1071. The maximum temperature of the flushing fluid used for an eye/facewash station shall be 100º F (37.7ºC)

Reason:
Medical experts say the maximum water temperature of water or flushing fluid flowing from and eyewash or eye/facewash is 100 F. Any higher temperature could damage the eyes. This should be included a maximum temperature limit imposed upon combination emergency showers and washes or eye/facewashes. There are many new technologies for either water heaters or emergency fixture mixing valves being installed together in various combinations of heating equipment and tempering valves that can be installed and many of these combinations are untested. By placing this temperature limit in the code it allows the code official to test the fixtures for a maximum temperature.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

This is just a temperature setting for the valve that is already required by the code.

Internal ID: 2363

P42-18

IPC: 411.3, Chapter 15

Proponent: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing Bradley Corporation (JBEngineer@aol.com)

2018 International Plumbing Code

Revise as follows:

411.3 Water supply. Where hot and cold water is supplied to an emergency shower or eyewash station, the temperature of the water supply shall only be controlled by a temperature actuated mixing valve complying with ASSE 1071. <u>Where water is supplied directly to an emergency shower or eyewash station from a water heater, the water heater shall comply with ASSE 1085.</u>

Add new standard(s) follows:

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448

<u>1085-2018</u>:

<u>Performance Requirements for Water Heaters for Emergency Equipment</u>

Reason:
A new standard, ASSE 1085, was developed for water heaters specifically designed for emergency fixtures. The standard is comparable to the valve standard, ASSE 1071. The water heater cannot produce a temperature of hot water exceeding 100° F. The water heater produces water within a minute at the tepid temperature range required for emergency fixtures. These water heaters are typically installed within the close proximity of the emergency fixture. This is an alternative methods for meeting the high flow rates for emergency showers without the need for adding to the hot water demand of the plumbing within the building.

Cost Impact
The code change proposal will decrease the cost of construction .

The availability of more options to achieve code compliance usually results in lower construction costs.

Analysis: A review of the standard proposed for inclusion in the code, ASSE 1085-2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 1165

P43-18

IPC: 412.2 (New)

Proponent: James Kendzel, American Supply Association, representing American Supply Association (jkendzel@asa.net)

2018 International Plumbing Code

Add new text as follows:

412.2 Pre-rinse spray valves. Pre-rinse spray valves for commercial food service shall conform to ASME A112.18.1/CSA B125.1

Reason:
New section is being added to clarify that pre-rinse spray valves fall under the definition of fixture fitting and are covered under Section 412.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

New section is being added only to clarify the existing requirements of the IPC.

Internal ID: 911

P44-18 Part I

IPC: 412.3, 412.4, 412.5

Proponent: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Revise as follows:

412.3 Individual shower valves. Individual shower and tubshower combination valves shall be balanced-pressure, thermostatic or combination balanced-pressure/thermostatic valves that conform to the requirements of ASSE 1016/ASME A112.1016/CSA B125.16 or ASME A112.18.1/CSA B125.1 ~~and~~ . Such valves shall be installed at the point of use. Shower and tub-shower combination valves required by this section shall be equipped with a means to limit the maximum setting of the valve to 120°F (49°C), which shall be field adjusted in accordance with the manufacturer's instructions to provide water at a temperature not to exceed 120ºF. In-line thermostatic valves shall not be utilized for compliance with this section.

412.4 Multiple (gang) showers. Multiple (gang) showers supplied with a single-tempered water supply pipe shall have the water supply for such showers controlled by an *approved* automatic temperature control mixing valve that conforms to ASSE 1069 or CSA B125.3, or each shower head shall be individually controlled by a balanced-pressure, thermostatic or combination balanced-pressure/thermostatic valve that conforms to ASSE 1016/ASME A112.1016/CSA B125.16 or ASME A112.18.1/CSA B125.1 and that is installed at the point of use. Such valves shall be equipped with a means to limit the maximum setting of the valve to 120°F (49°C), which shall be field adjusted in accordance with the manufacturers' instructions to provide water at a temperature not to exceed 120ºF. Access shall be provided to a ASSE 1069 or CSA B125.3 valve..

412.5 Bathtub and whirlpool bathtub valves. ~~The *hot water* supplied to bathtubs~~ Bathtubs and whirlpool ~~bathtubs~~ bathtub valves shall ~~be limited to not greater than 120°F (49°C)~~ have or be supplied by a water-temperature limiting device that conforms to ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3, except where such ~~protection is otherwise provided by a~~ valves are combination tub/shower ~~valve~~ valves in accordance with Section 412.3. The water temperature3 limiting device required by this section shall be equipped with a means to limit the maximum setting of the device to 120ºF (49ºC), and, where adjustable, shall be field adjusted in accordance with the manufacturer's instructions to provide hot water at a temperature not to exceed (120ºF (49ºC). Access shall be provided to water temperature limiting devices that conform to ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3.

> **Exception:** Access is not required for non-adjustable water temperature limiting devices that conform to ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3 and are integral with a fixture fitting, provided that the fixture fitting itself can be accessed for replacement...

Internal ID: 525

P44-18 Part II

IRC: P2708.4, P2713.3

Proponent: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2018 International Residential Code

Revise as follows:

P2708.4 Shower control valves. Individual shower and ~~tub/shower~~ tubshower combination valves shall be ~~equipped with control valves of the pressure-balance~~balanced-pressure, thermostatic ~~mixing~~ or combination balanced-pressure~~-balance/thermostatic mixing valve types with a high limit stop in accordance with~~ /thermostatic valves that conform to the requirements of ASSE 1016/ASME A112.1016/CSA B125.16~~. The high limit stop shall be set to limit the water temperature to not greater than 120°F (49°C).~~ or ASME A112.18.1/CSA B125.1. Such valves shall be installed at the point of use. Shower and tub-shower combination valves required by this section shall be equipped with a means to limit the maximum setting of the valve to 120°F (49°C), which shall be field adjusted in accordance with the manufacturer's instructions to provide water at a temperature not to exceed 120ºF. In-line thermostatic valves shall not be ~~used~~ utilized for compliance with this section.

P2713.3 Bathtub and whirlpool bathtub valves. ~~Hot water supplied to bathtubs~~ Bathtubs and whirlpool ~~bathtubs~~ bathtub valves shall ~~be limited to a temperature of not greater than 120°F (49°C)~~ have or be supplied by a water-temperature limiting device that conforms to ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3, except where such ~~protection is otherwise provided by a~~ valves are combination tub/shower ~~valve~~ valves in accordance with Section ~~P2708.4.~~412.3. The water temperature3 limiting device required by this section shall be equipped with a means to limit the maximum setting of the device to 120ºF (49ºC), and, where adjustable, shall be field adjusted in accordance with the manufacturer's instructions to provide hot water at a temperature not to exceed (120ºF (49ºC). Access shall be provided to water temperature limiting devices that conform to ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3.

> **Exception:** Access is not required for non-adjustable water temperature limiting devices that conform to ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3 and are integral with a fixture fitting, provided that the fixture fitting itself can be accessed for replacement.

Reason:

These three sections were not specific about actually requiring field adjustment of the temperature limiting devices to a not-to-exceed temperature. The language only required that the device had to have the capability of being adjusted and that field adjustment is required. The revised language makes the intent clear.

Neither Section 412.4 or 412.5 required access for the temperature limiting devices. Although it would seem that installers would intuitively understand the need for access, too often these devices end up being concealed in a wall or behind a permanently installed tub apron. The revised language makes the need for access clear.

The language of Section 412.5 needs updated to recognize some newer designs of tub valves that have integral water temperature limiting devices that comply with ASSE 1070/ASME A112.1070/CSA B125.70. These new designs of tub valves are factory-adjusted to limit the discharge water temperature to 120^{0}F(49°C). These valves are not field-adjustable and require entire valve replacement should the temperature limiting device fail to work as intended.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances or devices are mandated beyond what is currently required by the code.

Internal ID: 3470

P45-18 Part I

IPC: 412.3, 412.4, Chapter 15

Proponent: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing Bradley Corporation (JBEngineer@aol.com)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Revise as follows:

412.3 Individual shower valves. Individual shower and tub-shower combination valves shall be balanced-pressure, thermostatic or combination balanced-pressure/thermostatic valves that conform to the requirements of ASSE 1016/ASME A112.1016/CSA B125.16 or ASME A112.18.1/CSA B125.1 and shall be installed at the point of use. Shower and tub-shower combination valves required by this section shall be equipped with a means to limit the maximum setting of the valve to 120°F (49°C)~~, which shall be field adjusted. In-line thermostatic valves shall not be utilized for compliance with this section.~~. The means for regulating the maximum temperature shall be by one of following:

1 A field adjustment and setting of the maximum temperature limit means of the shower or tub-shower combination valve in accordance with the manufacturer's instructions.

2. A limiting device conforming to either ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3.

3. A thermostatic mixing valve conforming to ASSE 1017.

4. A water heater conforming to ASSE 1082.

5 A water heater conforming to ASSE 1084.

6. A temperature actuated flow reduction device conforming to ASSE 1062.

412.4 Multiple (gang) showers. Multiple (gang) showers supplied with a single-tempered water supply pipe shall have the water supply for such showers controlled by an *approved* automatic temperature control mixing valve that conforms to ASSE 1069 or CSA B125.3, or each shower head shall be individually controlled by a balanced-pressure, thermostatic or combination balanced-pressure/thermostatic valve that ~~conforms to ASSE 1016/ASME A112.1016/CSA B125.16 or ASME A112.18.1/CSA B125.1 and is installed at the point of use. Such valves shall be equipped with a means to limit the maximum setting of the valve to 120°F (49°C), which shall be field adjusted in accordance with the manufacturers' instructions.~~complies with Section 412.3.

Add new standard(s) follows:

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448

1082-18:

Performance Requirements for Water Heaters used as Temperature Control Devices for Hot Water Distribution Systems

1084-2018:

Performance Requirements for Water Heaters used as Temperature Limiting Devices

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Analysis: A review of the standards proposed for inclusion in the code, ASSE 1084-2018 and ASSE1082-2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 1132

P45-18 Part II

IRC: P2708.4, Chapter 44

Proponent: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing Bradley Corporation (JBEngineer@aol.com)

2018 International Residential Code

Revise as follows:

P2708.4 Shower control valves. Individual shower and tub/shower combination valves shall be equipped with control valves of the pressure-balance, thermostatic-mixing or combination pressure-balance/thermostatic-mixing valve types with a high limit stop in accordance with ASSE 1016/ASME A112.1016/CSA B125.16. ~~The high limit stop~~ <u>A means</u> shall be ~~set~~ <u>provided</u> to limit the water temperature to not greater than 120°F (49°C). ~~In-line thermostatic valves shall not be used for compliance with this section.~~<u>The means for regulating the maximum temperature shall be by one of the following:</u>

1. <u>A field adjustment and setting of the maximum temperature limit means of the shower or tub-shower combination valve in accordance with the manufacturer's instructions.</u>
2. <u>A limiting device conforming to either ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3.</u>
3. <u>A thermostatic mixing valve conforming to ASSE 1017.</u>
4. <u>A water heater conforming to ASSE 1082.</u>
5. <u>A water heater conforming to ASSE 1084.</u>
6. <u>A temperature actuated flow reduction device conforming to ASSE 1062.</u>

Add new standard(s) follows:

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448

<u>1082-2018</u>:

<u>Performance Requirements for Water Heaters Used as Temperature Control Devices for Hot Water Distribution Systems.</u>

<u>1084-2018</u>:

<u>Performance Requirements for Water Heaters used as Temperature Limiting Devices</u>

Reason:
The scald prevention requirements for a shower valve are by the requirement for a balanced-pressure, thermostatic or combination balanced-pressure/thermostatic valves. The high temperature limit was originally added to protect children that play hot and cold while taking a shower. This was extended to protecting people who inadvertently turn up the temperature of the shower valve.

The current code only stipulates the setting of the limit stop on the fixture fitting or shower valve, however, other viable means are available for setting the maximum temperature. The other viable means are often superior to setting the limit stop on the fixture fitting.

When the limit stop is adjusted, it is based on the temperature setting of the water heater and the cold water temperature. If the cold water temperature drops, which happens in some areas during the winter months, the setting temperature drops. If the water heater is increased in temperature, the setting temperature rises. This phenomena does not occur when other means are used to regulate the high temperature.

Section 412.7 already permits the use of a TAFR complying with ASSE 1062 for controlling the water temperature discharging from a faucet. Hence, the identification of the standard in this section complements the requirements in Section 412.7.

A thermostatic mixing valve is an effective method of regulating the maximum temperature. The temperature is maintained within a few degrees depending on the flow rate. Scalding temperatures are in excess of this temperature. Other viable means of maintaining the water temperature to a maximum of 120° F are water heater meeting one of the two new standards.

The two new standard for water heaters are ASSE 1082 and ASSE 1084. These water heaters are equivalent to ASSE 1017 and ASSE 1070 respectively. As such, they have the capability of providing an equivalent level of performance as the corresponding mixing valve.

For Section 412.4, there is no need to repeat all of the requirements in Section 412.3. If an individual shower valve is installed in gang showers, the requirements of Section 412.3 automatically apply. The revision merely emphasizes this requirement.

The changes to the Residential Code will make the requirements consistent with the Plumbing Code.

Cost Impact

The code change proposal will decrease the cost of construction .

The availability of more options to achieve code compliance usually results in lower construction costs.

Analysis: A review of the standard proposed for inclusion in the code, ASSE 1082-2018 and ASSE 1084-2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 3497

P46-18 Part I

IPC: 412.3, 412.4

Proponent: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Revise as follows:

412.3 Individual shower valves. Individual shower and tubshower combination valves shall be balanced-pressure, thermostatic or combination balanced-pressure/thermostatic valves that conform to the requirements of ASSE 1016/ASME A112.1016/CSA B125.16 or ASME A112.18.1/CSA B125.1 and shall be installed at the point of use. Shower <u>control valves shall be rated for the flow rate of the installed showerhead. Shower </u>and tub-shower combination valves required by this section shall be equipped with a means to limit the maximum setting of the valve to 120°F (49°C), which shall be field adjusted in accordance with the manufacturer's instructions. In-line thermostatic valves shall not be utilized for compliance with this section.

412.4 Multiple (gang) showers. Multiple (gang) showers supplied with a single-tempered water supply pipe shall have the water supply for such showers controlled by an *approved* automatic temperature control mixing valve that conforms to ASSE 1069 or CSA B125.3, or each shower head shall be individually controlled by a balanced-pressure, thermostatic or combination balanced-pressure/thermostatic valve that conforms to ASSE 1016/ASME A112.1016/CSA B125.16 or ASME A112.18.1/CSA B125.1 and is installed at the point of use. <u>Where a showerhead is individually controlled, shower control valves shall be rated for the flow rate of the installed showerhead.</u> Such valves shall be equipped with a means to limit the maximum setting of the valve to 120°F (49°C), which shall be field adjusted in accordance with the manufacturers' instructions.

Internal ID: 577

P46-18 Part II

IRC: P2708.4

Proponent: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2018 International Residential Code

Revise as follows:

P2708.4 Shower control valves. Individual shower and tub/shower combination valves shall be equipped with control valves of the pressure-balance, thermostatic-mixing or combination pressure-balance/thermostatic-mixing valve types with a high limit stop in accordance with ASSE 1016/ASME A112.1016/CSA B125.16. <u>Shower control valves shall be rated for hte flow rate of the installed showerhead.</u> The high limit stop shall be set to limit the water temperature to not greater than 120°F (49°C). In-line thermostatic valves shall not be used for compliance with this section.

Reason:

The thermal protection afforded by shower valves can be compromised if the flow rate of the showerhead is less than the flow rate for which the protective components of the valve have been designed. The proposed text is consistent with similar requirements found in ASSE 1016/ASME A112.1016/CSA B125.16 and ASME A112.18.1/CSA B125.1. As manufacturers continue to innovate with more water- and energy-efficient showerheads, this proposal is needed to ensure that new buildings built to the code will safely accommodate the showerheads selected by the designer or builder. Note that this language does not require that the showerhead itself have a flow rate of less than 2.5 gpm, but simply that the flow rating of the shower valve matches the flow rate of the installed showerhead to provide the scald and thermal shock protection required by the recognized standard when the valve model is tested.

Note that the 2012 Uniform Plumbing Code, Section 408.3, contains a similar requirement for 'matching' the valve and showerhead flow rates as follows:

"Showers and tub-shower combinations shall be provided with individual control valves of the pressure balance, thermostatic, or combination pressure balance/thermostatic mixing valve type that provide scald and thermal shock protection for the rated flow of the installed showerhead."

The IPC and IRC should be no less protective of health and safety than the UPC.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

Adoption of this proposal will have no effect on the cost of construction, because it calls for the installation of showerheads and shower mixing valves that are compatible, rather than calling for the installation of a particular showerhead or shower control valve that might carry a cost premium. Care in specification and installation is required, not a special product or special installation technique. As noted above, the proposal does not require that the showerhead itself have a flow rate of less than 2.5 gpm, and compliance can be achieved with minimally compliant valves and showerheads. If an architect or builder chooses to install a more efficient showerhead with a lower flow rate, there are control valves available at moderate price points that can accommodate the builder's decision.

Internal ID: 3428

P47-18 Part I

IPC: 412.5

Proponent: William Chapin, Professional Code Consulting, LLC, representing Professional Code Consulting, LLC (bill@profcc.us)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Revise as follows:

412.5 Bathtub and whirlpool bathtub valves. The *hot water* supplied to bathtubs and whirlpool bathtubs shall be limited to not greater than 120°F (49°C) by a water-temperature limiting device that conforms to ASSE 1070/ASME A112.1070/CSA B125.70 ~~or CSA B125.3~~, except where such protection is otherwise provided by a combination tub/shower valve in accordance with Section 412.3.

Internal ID: 2245

P47-18 Part II

IRC: P2713.3

Proponent: William Chapin, Professional Code Consulting, LLC, representing Professional Code Consulting, LLC (bill@profcc.us)

2018 International Residential Code

Revise as follows:

P2713.3 Bathtub and whirlpool bathtub valves. Hot water supplied to bathtubs and whirlpool bathtubs shall be limited to a temperature of not greater than 120°F (49°C) by a water-temperature limiting device that conforms to ASSE 1070/ASME A112.1070/CSA B125.70 ~~or CSA B125.3~~, except where such protection is otherwise provided by a combination tub/shower valve in accordance with Section P2708.4.

Reason:

In June of 2017, the CSA B125 Committee completed the project that removed the automatic compensating valve requirements from CSA B125.3. The reason for this was the publication of harmonized ASSE 1070/ASME A112.1070/CSA B125.70 standard.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

Proposal only removes a referenced standard from the code section.

Internal ID: 3434

P48-18 Part I

IPC: 412.5, Chapter 15

Proponent: Misty Guard, representing Bradley Corporation (Misty.Guard@bradleycorp.com)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Revise as follows:

412.5 Bathtub and whirlpool bathtub valves. The *hot water* supplied to bathtubs and whirlpool bathtubs shall be limited to not greater than 120°F (49°C) by a water-temperature limiting device that conforms to ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3 <u>or by a water heater complying with ASSE 1082 or ASSE 1084</u>, except where such protection is otherwise provided by a combination tub/shower valve in accordance with Section 412.3.

Add new standard(s) follows:

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448

<u>**1084-2018**</u>**:**

<u>**Performance Requirements for Water Heaters used as Temperature Limiting Devices**</u>

<u>**1082-2018**</u>**:**

<u>**Performance Requirements for Water Heaters Used as Temperature Control Devices for Hot Water Distribution Systems.**</u>

Analysis: A review of the standards proposed for inclusion in the code, ASSE 1084-2018 and ASSE1082-2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 1854

P48-18 Part II

IRC: P2713.3, Chapter 44

Proponent: Misty Guard, representing Bradley Corporation (Misty.Guard@bradleycorp.com)

2018 International Residential Code

Revise as follows:

P2713.3 Bathtub and whirlpool bathtub valves. Hot water supplied to bathtubs and whirlpool bathtubs shall be limited to a temperature of not greater than 120°F (49°C) by a water-temperature limiting device that conforms to ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3 <u>or by a water heater complying with ASSE 1082 or ASSE 1084</u>, except where such protection is otherwise provided by a combination tub/shower valve in accordance with Section P2708.4.

Add new standard(s) follows:

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448

<u>1084-2018</u>:

<u>Performance Requirements for Water Heaters used as Temperature Limiting Devices</u>

<u>1082-2018</u>:

<u>Performance Requirements for Water Heaters Used as Temperature Control Devices for Hot Water Distribution Systems.</u>

Reason:
There are two new standards for water heaters, ASSE 1082 and ASSE 1084. These water heaters are equivalent to ASSE 1017 and ASSE 1070 respectively. As such, they have the capability of providing an equivalent level of performance as the currently listed water-temperature limiting device.

Water heaters complying with either one of these standards can provide tempered water within a range of a few degrees depending on the flow rate. The temperature range is similar to the allowable temperature range for an ASSE 1070/ASME A112.1070/CSA B125.70 device.The two new standard for water heaters are ASSE 1082 and ASSE 1084. These water heaters are equivalent to ASSE 1017 and ASSE 1070 respectively. As such, they have the capability of providing an equivalent level of performance as the corresponding mixing valve.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

There is no cost associated with this change since the code change will merely provide other options for complying with the current requirements. There are no new mandatory requirements being added.

Analysis: A review of the standards proposed for inclusion in the code, ASSE 1084-2018 and ASSE1082-2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 1856

P49-18

IPC: 412.10, Chapter 15

Proponent: Misty Guard, representing Bradley Corporation (Misty.Guard@bradleycorp.com)

2018 International Plumbing Code

Revise as follows:

412.10 Head shampoo sink faucets. Head shampoo sink faucets shall be supplied with hot water that is limited to not more than 120°F (49°C) by a water-temperature-limiting device that conforms to ASSE 1070/ASME A112.1070/CSA B125.70 <u>or by a water heater complying with ASSE 1082 or ASSE 1084.</u> Each faucet shall have integral check valves to prevent crossover flow between the hot and cold water supply connections.

Add new standard(s) follows:

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448

<u>**1084-2018**</u>**:**

<u>**Performance Requirements for Water Heaters used as Temperature Limiting Devices**</u>

<u>**1082-2018**</u>**:**

<u>**Performance Requirements for Water Heaters Used as Temperature Control Devices for Hot Water Distribution Systems.**</u>

Reason:
There are two new standards for water heaters, ASSE 1082 and ASSE 1084. These water heaters are equivalent to ASSE 1017 and ASSE 1070 respectively. As such, they have the capability of providing an equivalent level of performance as the currently listed water-temperature limiting device.

Water heaters complying with either one of these standards can provide tempered water within a range of a few degrees depending on the flow rate. The temperature range is similar to the allowable temperature range for an ASSE 1070/ASME A112.1070/CSA B125.70 device.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

There is no cost associated with this change since the code change will merely provide other options for complying with the current requirements. There are no new mandatory requirements being added.

Analysis: A review of the standards proposed for inclusion in the code, ASSE 1084-2018 and ASSE1082-2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 2250

P50-18 Part I

IPC: 412.5, Chapter 15

Proponent: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing Bradley Corporation (JBEngineer@aol.com)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Revise as follows:

412.5 Bathtub and whirlpool bathtub valves. The *hot water* supplied to bathtubs and whirlpool bathtubs shall be limited to not greater than 120°F (49°C) ~~by a~~ The water ~~temperature limiting device that conforms~~ temperature shall be regulated by one of the following:

1. A limiting device conforming to ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3,
2. A thermostatic mixing valve conforming to ASSE 1017.
3. A water heater conforming to ASSE 1082.
4. A water heater conforming to ASSE 1084.

Exception: ~~except~~ Water temperature regulation by one of the items indicated in this section shall not be required where such regulation is ~~Where such protection~~ is ~~otherwise~~ provided by a combination tub/shower valve in accordance with Section 412.3.

Add new standard(s) follows:

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448

1084-2018:

Performance Requirements for Water Heaters used as Temperature Limiting Devices

1082-2018:

Performance Requirements for Water Heaters Used as Temperature Control Devices for Hot Water Distribution Systems.

Analysis: A review of the standards proposed for inclusion in the code, ASSE 1084-2018 and ASSE1082-2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 1150

P50-18 Part II

IRC: P2713.3, Chapter 44

Proponent: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing Bradley Corporation (JBEngineer@aol.com)

2018 International Residential Code

Revise as follows:

P2713.3 Bathtub and whirlpool bathtub valves. *Hot water* supplied to bathtubs and whirlpool bathtubs shall be limited to not greater than 120°F (49°C) ~~by a~~ The water ~~temperature limiting device that conforms~~ temperature shall be regulated by one of the following:

1. A limiting device conforming to ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3.
2. A thermostatic mixing valve conforming to ASSE 1017.
3. A water heater conforming to ASSE 1082.
4. A water heater conforming to ASSE 1084.

Exception: ~~except~~ Water temperature regulation by one of the items indicated in this section shall not be required where such regulation is ~~Where such protection~~ is ~~otherwise~~ provided by a combination tub/shower valve in accordance with Section 412.3.

Add new standard(s) follows:

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448

1082-2018:

Performance Requirements for Water Heaters used as Temperature Control Devices for Hot Water Distribution Systems

1084-2018:

Performance Requirements for Water Heaters used as Temperature Limiting Devices

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Reason:
The requirement for regulating the maximum temperature of water for bathtubs and whirlpool bathtub is a scald prevention requirement. The current code allows the use of a device complying with ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3. This change identifies other viable methods of controlling the temperature of the hot water. The identification of the standard in this section complements the requirements in Section 412.7.

A thermostatic mixing valve is an effective method of regulating the maximum temperature. The temperature is maintained within a few degrees depending on the flow rate. Scalding temperatures are in excess of this temperature. Other viable means of maintaining the water temperature to a maximum of 120° F are water heater meeting one of the two new standards.

The two new standard for water heaters are ASSE 1082 and ASSE 1084. These water heaters are equivalent to ASSE 1017 and ASSE 1070 respectively. As such, they have the capability of providing an equivalent level of performance as the corresponding mixing valve.

The change to the Residential Code will make the requirements consistent with the Plumbing Code.

Cost Impact
The code change proposal will decrease the cost of construction .

The availability of more options to achieve code compliance usually results in lower construction costs.

Internal ID: 3499

P51-18

IPC: 412.10, Chapter 15

Proponent: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing Bradley Corporation (JBEngineer@aol.com)

2018 International Plumbing Code

Revise as follows:

412.10 Head shampoo sink faucets. Head shampoo sink faucets shall be supplied with hot water that is limited to not more than 120°F (49°C) ~~by a water-temperature-limiting device that conforms to ASSE 1070/ASME A112.1070/CSA B125.70.~~ . Each faucet shall have integral check valves to prevent crossover flow between the hot and cold water supply connections. <u>The means for regulating the maximum temperature shall be one of the following:</u>

1. <u>A limiting device conforming to ASSE 1070/ASME A112.1070/CSA B125.70.</u>
2. <u>A thermostatic mixing valve conforming to ASSE 1017.</u>
3. <u>A water heater conforming to ASSE 1082.</u>
4. <u>A water heater conforming to ASSE 1084.</u>
5. <u>A temperature actuated flow reduction device conforming to ASSE 1062.</u>

Add new standard(s) follows:

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448

<u>1084-2018</u>:

<u>Performance Requirements for Water Heaters used as Temperature Limiting Devices</u>

<u>1082-2018</u>:

<u>Performance Requirements for Water Heaters Used as Temperature Control Devices for Hot Water Distribution Systems.</u>

Reason:
The scald prevention requirements for head shampoo sink faucets is similar to the upper limit requirement for shower valves. There other viable means are available for setting the maximum temperature besides a device complying with ASSE 1070/ASME A112.1070/CSA B125.70. The other viable means of meeting the high temperature limit.

Section 412.7 already permits the use of a TAFR complying with ASSE 1062 for controlling the water temperature discharging from a faucet. Hence, the identification of the standard in this section complements the requirements in Section 412.7.

A thermostatic mixing valve is an effective method of regulating the maximum temperature. The temperature is maintained within a few degrees depending on the flow rate. Scalding temperatures are in excess of this temperature. Other viable means of maintaining the water temperature to a maximum of 120° F are water heater meeting one of the two new standards.

The two new standard for water heaters are ASSE 1082 and ASSE 1084. These water heaters are equivalent to ASSE 1017 and ASSE 1070 respectively. As such, they have the capability of providing an equivalent level of performance as the corresponding mixing valve.

Cost Impact
The code change proposal will decrease the cost of construction .

The availability of more options to achieve code compliance usually results in lower construction costs.

Analysis: A review of the standards proposed for inclusion in the code, ASSE 1084-2018 and ASSE1082-2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 1154

P52-18

IPC: 412.11 (New)

Proponent: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2018 International Plumbing Code

Add new text as follows:

412.11 Pre-rinse spray valve. Pre-rinse spray valves for commercial food service shall conform to ASME A112.18.1/CSA B125.1

Reason:
Currently the IPC does not address pre-rinse spray valves but these are in wide spread use for rinsing off dirty dishes prior to putting them though a commercial dishwasher. IPC Section 412.6 is not sufficiently clear enough as to whether is applies to pre-rinse spray valves. Therefore, this new section is needed.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

Pre-rinse spray valves are not required to be installed. It is a choice by the designer. Requiring that these valves comply with a standard doesn't increase the cost because most manufacturers are making these valves to the standard so that interchangeability exists.

Internal ID: 498

P53-18

IPC: 413.5 (New)

Proponent: James Richardson Jr, representing City of Columbus Ohio (jarichardson@columbus.gov); Robert Schutz, representing City of Columbus, OH (RJSchutz@columbus.gov)

2018 International Plumbing Code

Add new text as follows:

413.5 Floor slope to floor and trench drains. The floor surface in the area or room served by a floor or trench drain shall have a slope to such drains at not less than one-fourth unit vertical in 12 units horizontal (2-percent slope).

Reason:
This is long overdue. Everyone has seen this issue at some point in their life. There is some emergency situation and although there is an emergency floor drain/trench drain in the room or area, some water remains on the surface (sometimes several inches) due to the fact there is no real requirement for the area to have slope to the drain. In many cases the highest point in the room or area is actually the inlet to the floor drain/trench drain. It does seem odd that it is covered in great detail when we look at the requirements for a shower liner, however, a floor surface somehow doesn't matter. What many have failed to realize by overlooking this issue is that even though the floor drain/trench drain may be located in a concrete floor (with or without floor covering of some type), there are other portions of the building that can be greatly impacted. For instance, the walls that make up the room. Some assume these would be CMU units, but construction would allow for many other materials. If the walls were metal studs with drywall for instance, the metal studs could be subjected to deterioration from rust caused by the water that remained at the base of the wall because the surface was not sloped correctly. The drywall often becomes a breading ground for mold as well.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

Sloping a floor to a floor or trench drain is simply a design call out for building drawings. The plumbing contractor already has to set the the top of the drains at the floor elevation called out on the drawings so there isn't any cost impact as no extra labor is necessary.

Internal ID: 2123

P54-18

IPC: 416.1

Proponent: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing InSinkErator (JBENGINEER@aol.com)

2018 International Plumbing Code

Revise as follows:

416.1 Approval. Domestic food waste disposers shall conform to ASSE 1008 and shall be listed and labeled in accordance with UL 430. <u>Commercial food waste disposers shall be listed and labeled in accordance with UL 430.</u> Food waste disposers shall not increase the *drainage fixture unit* load on the sanitary drainage system.

Reason:

The current code requires domestic food waste disposers to conform with UL 430. However, this standard applies to both domestic and commercial food waste disposers. A second sentence has been added to address commercial food waste disposers. It should be noted that ASSE 1008 only applies to domestic food waste disposers, hence the word “commercial” cannot be added to the first sentence.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

Commercial disposers are already required to be listed. This merely adds reference to the correct standard for testing and listing.

Internal ID: 883

P55-18

IPC: 202, 419.1, 419.3

Proponent: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing Bradley Corporation (JBENGINEER@aol.com); Daniel Gleiberman, SLOAN, representing SLOAN

2018 International Plumbing Code

Add new definition as follows:

GROUP WASH FIXTURE A type of lavatory that allows more than one person to utilize the fixture at the same time. The fixture has one or more drains and one or more faucets.

Revise as follows:

419.1 Approval. Lavatories shall conform to ASME A112.19.1/CSA B45.2, ASME A112.19.2/CSA B45.1, ASME A112.19.3/CSA B45.4 or CSA B45.5/IAPMO Z124. Group wash ~~-up equipment~~ fixtures shall conform to the requirements of Section 402. ~~Every~~ For determining the number of lavatories required by Table 403.1, every 20 inches (508 mm) of rim space of a group wash fixture shall be considered as one lavatory.

419.3 Lavatory waste outlets. Lavatories and group wash fixtures shall have a waste ~~outlets~~ outlet not less than $1^1/_4$ inches (32 mm) in diameter. A strainer, pop-up stopper, crossbar or other device shall be provided to restrict the clear opening of the waste outlet.

Reason:

The current code uses two terms to describe the same fixture. In Section 419.1 the term "group wash-up equipment" is used. In Section 419.5, the term "group wash fixture" is used. The proper term used in the plumbing industry is "group wash fixture."

Definitions of group wash fixture is being added. The group wash fixture definition identifies what the fixture is, including that there could be one or more drains and one or more faucets connected with the fixture.

The changes to the subsections in Section 419 become editorial in nature with the addition of the definitions. There is also clarification added that the 20 inches of rim space is only used for determining number of lavatories that are specified in Table 403.1. This is the only application of the 20 inches of rim space.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The change clarifies the current code requirement.

Internal ID: 1504

P56-18

IPC: 419.5

Proponent: Gary Klein, representing Self (gsmklein@comcast.net)

2018 International Plumbing Code

Revise as follows:

419.5 ~~Tempered water~~ Water for public hand-washing facilities. ~~*Tempered water* shall be delivered from lavatories~~ Lavatories and group wash fixtures ~~located~~ in public toilet facilities ~~provided for customers, patrons and visitors. *Tempered water* shall be delivered through an *approved* water-temperature limiting~~ shall be provided with cold water, tempered water, or both. Where tempered water is supplied to such fixtures, the temperature shall be limited to 125°F (52°C) by means of temperature control device that conforms to ASSE 1070/ASME A112.1070/CSA B125.70, CSA B125.3 or ASSE 1017.

Reason:

The purpose of this code change proposal is to address the requirement to provide tempered water to public hand-washing facilities, to change the temperature of water delivered to public hand-washing facilities to a maximum of 125°F and to enable the use of either cold water or tempered water at public hand-washing facilities.

Most of the reasons supporting this proposal are discussed below. In addition, we are proposing that where tempered water is supplied to public hand-washing facilities its temperature can be controlled by either a local mixing valve (ASSE1070) or by a master mixing valve (ASSE 1017), depending on the configuration of the hot water distribution system.

Raising the maximum temperature for hand washing to 125F is still safe for scald prevention since people can easily remove their hands from water that is getting too hot too rapidly. It is also a better temperature to control the growth of Legionella in the hot water distribution system.

What follows is the reason statement that supports several code change proposals. There is one reason statement for these proposals because the topics are interrelated and a comprehensive discussion is most likely to result in the best outcome for protecting the public's health and safety.

Health and safety for public hand washing needs to include 1) scald prevention, 2) hand washing efficacy and 3) minimizing the risk of pathogen growth in the building's water distribution system.

We do not want the temperature of the water at public sinks to be too hot. We want the temperature of the water to be comfortable for the users of public sinks so that people will scrub their hands long enough to get them clean. We want to reduce the likelihood that pathogens will grow in the water distribution system. And, we would like to accomplish all of these health and safety functions in the most cost effective and sustainable manner possible.

At present, we believe that there are a few provisions in the IPC that inadvertently create a public health risk. Changing the temperature limits in this definition is one part of resolving this problem.

When the provisions in the current definitions and the related sections were first codified, Legionella was not a significant concern to public health; many items known today were unknown then. Now Legionella in building water systems has become a major concern for public health with the incidence of Legionnaires' disease growing by 500% from 0.4 cases per 100,000 people in 2000 to 2.0 cases per 100,000 people in 2015.[1]

At the time these same provisions were codified, it used be thought that warm water was necessary for effective hand cleaning to control the spread of germs (bacteria). Science has since proven that the temperature of the water used for handwashing does not impact the efficacy of removing bacteria at all.[2, 3, 4] While each of these three papers are very clear the CDC sums it up best with "The temperature of the water does not appear to affect microbe removal; however, warmer water may cause more skin irritation and is more environmentally costly"[4] The most important variables for removing bacteria from ones hands are scrubbing and the use of soap. Neither of these criteria is within the purview of a building code.

When scald prevention was discussed as part of codifying these same provisions, the unintended consequences of lower water temperature on waterborne pathogen growth was not known. Accordingly temperature of 140°F originally proposed for scald control in home hot water heaters was lowered to 130°F and finally a recommendation of 120°F was made because if 140°F was OK it was thought that adding a huge safety margin would only be better, we now know that huge safety margin had serious and significant unintended consequences. A temperature of 120°F is considered an abundantly safe scald limit. However, setting water heaters this low results in much of the hot water distribution system being at temperatures that ideal for growing pathogens.

Since 1998 OSHA guidelines have stated that hot water should be stored at 140F and delivered at a temperature greater than 120F. In 2009, the CDC published a study documenting scalding cases resulting in hospital visits by the elderly from 2001-2006. The elderly are the highest risk population for Legionnaires' disease and one of the highest risk for scalding. They found that more than 80% of the scalding cases were due to cooking activities in the kitchen. Less than 3% (220 out of 8,620 cases) were plumbing related.[13]

We believe that it is time to use our current knowledge of these interrelated elements to improve health and safety by revising the a few of the temperature related provisions in the 2018 IPC and the 2018 IRC-P

In both the IPC and the IRC, hot water is required to be supplied to plumbing fixtures and plumbing appliances intended for bathing, washing, or culinary purposes. The 2018 IPC and IRC-P have two different maximum temperature thresholds, which some say are for scald prevention. The temperature at public hand washing sinks (lavatories), is limited to 110°F. With the exception of bidets and emergency fixtures, which are also limited to 110°F, all other fixtures are limited to 120°F. Please see the table below.

Water Temperature Provisions in the 2018 IPC and IRC-P

Fixture	**Maximum Temperature**	**Section**
Bidet	110F (43C)	IPC 408.3 IRC P2721.2
Emergency showers and eyewash stations	110F (43C)	IPC 411.1*
Individual shower valve	120F (49C)	IPC 412.3 IRC P2708.4
Multiple (gang) showers	120F (49C)	IPC 412.4
Temperature-actuated, flow-reduction devices		
for individual fixture fittings	120F (49C)	IPC 412.7
Public lavatories	110F (43C)	IPC 419.5
Bath tub and whirlpool tub	120F (49C)	IPC 412.5 IRC 2713.3
Head shampoo sink faucet	120F (49C)	IPC 412.10
Footbaths and pedicure baths	120F (49C)	IPC 423.3

* The maximum temperature is not shown in this IPC section, but rather in the referenced standard. This standard also has a minimum acceptable temperature of 60F for emergency fixtures. This lower number might be useful guidance for jurisdictions with cold incoming water temperatures that want to raise the temperature of cold water for hand washing during the winter months where only cold water is supplied to public lavatory faucets.

Bidets, emergency showers and eyewash stations and public lavatories are required to have tempered water supplied through a water temperature limiting device that conforms to the appropriate ASSE, ANSI or CSA standard. The upper limit of 110°F makes sense for bidets and emergency showers. It does not make sense for hand washing at pubic lavatories.

If 120°F is a safe temperature for showering, bathing, head shampooing, tubs, it is equally safe for hand washing at either public or private lavatory faucets. It does not make sense that the temperature is lower for hand washing than for tub bathing. If the water temperature rises quickly to an uncomfortably hot and unsafe number it is much easier to remove ones hands from the water coming out of the faucet than it is to get out of a bathtub or to get out of the way in a shower. There is no need to have a lower temperature supplied for hand washing than for showering or bathing. In fact this public lavatory temperature code is derived from ASHRAE 90.1 energy saving code, not safety.

In our research into this issue, we found that the 110°F temperature limitation for hand washing at public lavatories comes from an energy code, ASHRAE 90.1 (1989)[5] "Energy Standard for Buildings Except Low-Rise Residential Buildings." Section 11.4.5.2 presents the provisions for lavatories in public facility restrooms (such as those in service stations, airports, train terminals, and convention halls). These include the requirement for low flow rates (the document preceded the 1990's era EPACT rules concerning public lavatory faucet flow rates) and for limiting the temperature to a maximum of 110°F.

In the very high use public toilets detailed in 90.1 (1989) the sinks are used many times per hour, and the combination of low temperature and low flow does not dramatically increase the health risks from waterborne pathogens; the very high turnover rates of the water in the piping brings in new disinfectant.

However, many toilet facilities currently classified as "public" are only used sporadically. The combination of low hot water temperature, low flow rate and infrequent usage, results in a very low turnover rate which in turn means that new disinfectant enters the piping very infrequently. This condition not only provides a localized incubation chamber for Legionella but once grown can result in contaminating the rest of the hot water system.

While the idea of establishing 85-110°F as a safe range for public hand washing seemed like a good idea at the time, it turns out this range is ideal for the growth of pathogens in the building's water distribution system. Pathogens that affect humans grow in temperatures that are found in our bodies: 85-110°F. For example, Legionella reproduces at the highest rates in the range of 85-110°F. Legionnaires' disease, caused by Legionella growth in building water systems has become a major public health concern.

Adding to the risk due to temperature is the complexity of the internal components of the mixing valves and the lack of maintenance these valves typically receive. Such maintenance is relatively time consuming and costly and is often ignored. By way of comparison, Australian codes for health and safety purposes require these local mixing valves to be disassembled and disinfected annually[6, 7, 8]

Conclusions and Recommendations:

If 120°F is safe enough to protect against scalding for bathing, it is safe enough for public hand washing. If this temperature is safe enough for Health Care Occupancies (IPC Section 609.3), it is safe enough for the other occupancies covered by the IPC.

Maintaining temperatures in the range of 85-110°F that is currently required in Section 419.5 is unsafe because it provides ideal conditions for the growth of pathogens, bacteria dangerous to humans. All Legionella guidelines including OSHA 1998[9] , ASHRAE 2000[10], CDC 2003[11], and CDC 2016[12] recommend maintaining hot water temperatures at fixtures and in hot water return lines at or above 120°F.

It is not necessary to specify the temperature range for supplying water for hand washing in public lavatories, only the maximum temperature to prevent scalding.

We recommend that the maximum safe temperature for the discharge of hot water into public hand washing sinks be raised to 120°F.

We recommend moving the break point between tempered and hot water from 110°F to 120°F. .

We recommend enabling the use of cold water only, or tempered water, or both at public hand washing sinks.

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Quantifying the Effects of Water Temperature, Soap Volume, Lather Time, and Antimicrobial Soap as Variables in the Removal of Escherichia coli ATCC 11229 from Hands Journal of Food Protection June 2017 Dane A. Jensen,[1] David R. Macinga,[2] David J. Shumaker,[2] Roberto Bellino,[2] James W. Arbogast,[2] and Donald W. Schaffner[1] http://jfoodprotection.com/doi/full/10.4315/0362-028X.JFP-16-370?code=fopr-site Above was in an article titled Cool Water as Effective as Hot for Removing Germs During Handwashing Infection Control Today May 30 2017

The environmental cost of misinformation: why the recommendation to use elevated temperatures for handwashing is problematic International Journal of Consumer Studies Volume 37, Issue 4 July 2013 Amanda R. Carrico, Micajah Spoden, Kenneth A. Wallston, Michael P. Vandenbergh http://onlinelibrary.wiley.com/doi/10.1111/ijcs.12012/abstract

Show Me the Science - How to Wash Your Hands CDC Website https://www.cdc.gov/handwashing/show-me-the-science-handwashing.html

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Department of Health & Human Services Victoria Australia Sept 2011 "Risk management plan for Legionella Control in health and aged care facilities" https://www2.health.vic.gov.au/about/publications/policiesandguidelines/risk-management-plan-for-legionella-control-in-health-and-aged-care-facilities

Australian Standard. Water supply. Valves for the control of heated water supply temperatures Part 3: Requirements for field-testing, maintenance or replacement of thermostatic mixing valves, tempering valves and end-of-line temperature control deviceshttps://www.saiglobal.com/PDFTemp/Previews/OSH/as/as4000/4000/40323.pdf

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Centers for Disease Control and Prevention (CDC) MMWR Weekly September 18, 2009 / 58(36);993-996 "Nonfatal Scald-Related Burns Among Adults Aged ≥65 Years --- United States, 2001—2006"https://www.cdc.gov/mmwr/preview/mmwrhtml/mm5836a1.htm

Cost Impact

The code change proposal will decrease the cost of construction .

Justification:

This proposal enables the use of cold water, tempered water, or both to public hand-washing facilities. If only cold water is supplied, it will decrease construction costs by eliminating the installation of a hot water distribution system to these faucets and by eliminating the installation of the associated ASSE 1070 mixing valves, reducing or eliminating the water heater for this hot water and eliminating the mechanical space used by this piping and equipment. It will also eliminate the costs of operations and maintenance by reducing expenditures on hot water and on the maintenance of the mixing valves.

In places where city cold water is above 60°F year round, allowing only cold water to be supplied to public lavatories will eliminate much if not all the hot water piping and associated equipment in many buildings.

By virtue of raising the allowable maximum temperature to 120F it will now be possible to use a master-mixing valve (ASSE 1017) for temperature control instead of installing ASSE 1070 valves at every faucet. One valve costs less than many valves. Having fewer valves also dramatically reduces operating and maintenance costs.

Internal ID: 2306

P57-18

IPC: 419.5

Proponent: William Chapin, Professional Code Consulting, LLC, representing Professional Code Consulting, LLC (bill@profcc.us)

2018 International Plumbing Code

Revise as follows:

419.5 Tempered water for public hand-washing facilities. *Tempered water* shall be delivered from lavatories and group wash fixtures located in public toilet facilities provided for customers, patrons and visitors. *Tempered water* shall be delivered through an *approved* water-temperature limiting device that conforms to ASSE 1070/ASME A112.1070/CSA B125.70 ~~or CSA B125.3.~~.

Reason:
In June of 2017, the CSA B125 Committee completed the project that removed the automatic compensating valve requirements from CSA B125.3. The reason for this was the publication of harmonized ASSE 1070/ASME A112.1070/CSA B125.70 standard.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

Proposal only removes a referenced standard from the code section.

Internal ID: 2249

P58-18 Part I

IPC: 202, 419.5

Proponent: Tim Keane, self, representing self (timke@verizon.net)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Revise as follows:

419.5 ~~Tempered water~~ Water for public hand-washing facilities.
~~*Tempered water* shall be delivered from lavatories~~ Lavatories and group wash fixtures ~~located~~ in public toilet facilities ~~provided for customers, patrons and visitors. *Tempered water* shall be delivered through an *approved* water-temperature limiting~~ shall be provided with cold water, tempered water, or both. Where tempered water is supplied to such fixtures, the temperature shall be limited to not greater than 120°F (49°C) by means of temperature control device that conforms to ASSE 1017, ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3.

HOT WATER. Water at a temperature greater than or equal to ~~110°F~~ 120°F (~~43°C~~49°C)~~.~~

TEMPERED WATER. Water ~~having a temperature range between 85°F (29°C) and 110°F (43°C~~that is heated or blended with hot water to a temperature that is not greater than 120°F (49°C).

Internal ID: 1490

P58-18 Part II

IRC: R202

Proponent: Tim Keane, representing self (timke@verizon.net)

2018 International Residential Code

Revise as follows:

[MP] HOT WATER. Water at a temperature greater than ~~or equal to 110°F (43°C~~120°F (49°C).

Reason:

The purpose of this code change proposal is to address the requirement to provide tempered water to public hand-washing facilities, to change the temperature of water delivered to public hand-washing facilities to a maximum of 120°F and to enable the use of either cold water or tempered water at public hand-washing facilities.

Most of the reasons supporting this proposal are discussed below. In addition, we are proposing that where tempered water is supplied to public hand-washing facilities its temperature can be controlled by either a local mixing valve (ASSE1070) or by a master mixing valve (ASSE 1017), depending on the configuration of the hot water distribution system.

What follows is the reason statement that supports several code change proposals. There is one reason statement for these proposals because the topics are interrelated and a comprehensive discussion is most likely to result in the best outcome for protecting the public's health and safety.

Health and safety for public hand washing needs to include 1) scald prevention, 2) hand washing efficacy and 3) minimizing the risk of pathogen growth in the building's water distribution system.

We do not want the temperature of the water at public sinks to be too hot. We want the temperature of the water to be comfortable for the users of public sinks so that people will scrub their hands long enough to get them clean. We want to reduce the likelihood that pathogens will grow in the water distribution system. And, we would like to accomplish all of these health and safety functions in the most cost effective and sustainable manner possible.

At present, we believe that there are a few provisions in the IPC that inadvertently create a public health risk. Changing the temperature limits in this definition is one part of resolving this problem.

When the provisions in the current definitions and the related sections were first codified, Legionella was not a significant concern to public health; many items known today were unknown then. Now Legionella in building water systems has become a major concern for public health with the incidence of Legionnaires' disease growing by 500% from 0.4 cases per 100,000 people in 2000 to 2.0 cases per 100,000 people in 2015.[1]

At the time these same provisions were codified, it used be thought that warm water was necessary for effective hand cleaning to control the spread of germs (bacteria). Science has since proven that the temperature of the water used for handwashing does not impact the efficacy of removing bacteria at all.[2, 3, 4] While each of these three papers are very clear the CDC sums it up best with "The temperature of the water does not appear to affect microbe removal; however, warmer water may cause more skin irritation and is more environmentally costly"[4] The most important variables for removing bacteria from ones hands are scrubbing and the use of soap. Neither of these criteria is within the purview of a building code.

When scald prevention was discussed as part of codifying these same provisions, the unintended consequences of lower water temperature on waterborne pathogen growth was not known. Accordingly temperature of 140°F originally proposed for scald control in home hot water heaters was lowered to 130°F and finally a recommendation of 120°F was made because if 140°F was OK it was thought that adding a huge safety margin would only be better, we now know that huge safety margin had serious and significant unintended consequences. A temperature of 120°F is considered an abundantly safe scald limit. However, setting water heaters this low results in much of the hot water distribution system being at temperatures that ideal for growing pathogens.

Since 1998 OSHA guidelines have stated that hot water should be stored at 140F and delivered at a temperature greater than 120F. In 2009, the CDC published a study documenting scalding cases resulting in hospital visits by the elderly from 2001-2006. The elderly are the highest risk population for Legionnaires' disease and one of the highest risk for scalding. They found that more than 80% of the scalding cases were due to cooking activities in the kitchen. Less than 3% (220 out of 8,620 cases) were plumbing related.[13]

We believe that it is time to use our current knowledge of these interrelated elements to improve health and safety by revising the a few of the temperature related provisions in the 2018 IPC and the 2018 IRC-P

In both the IPC and the IRC, hot water is required to be supplied to plumbing fixtures and plumbing appliances intended for bathing, washing, or culinary purposes. The 2018 IPC and IRC-P have two different maximum temperature thresholds, which some say are for scald prevention. The temperature at public hand washing sinks (lavatories), is limited to 110°F. With the exception of bidets and emergency fixtures, which are also limited to 110°F, all other fixtures are limited to 120°F. Please see the table below.

Water Temperature Provisions in the 2018 IPC and IRC-P

Fixture	**Maximum Temperature**	**Section**
Bidet	110F (43C)	IPC 408.3 IRC P2721.2
Emergency showers and eyewash stations	110F (43C)	IPC 411.1*
Individual shower valve	120F (49C)	IPC 412.3 IRC P2708.4
Multiple (gang) showers	120F (49C)	IPC 412.4
Temperature-actuated, flow-reduction devices for individual fixture fittings	120F (49C)	IPC 412.7
Public lavatories	110F (43C)	IPC 419.5
Bath tub and whirlpool tub	120F (49C)	IPC 412.5 IRC 2713.3
Head shampoo sink faucet	120F (49C)	IPC 412.10
Footbaths and pedicure baths	120F (49C)	IPC 423.3

* The maximum temperature is not shown in this IPC section, but rather in the referenced standard. This standard also has a minimum acceptable temperature of 60F for emergency fixtures. This lower number might be useful guidance for jurisdictions with cold incoming water temperatures that want to raise the temperature of cold water for hand washing during the winter months where only cold water is supplied to public lavatory faucets.

Bidets, emergency showers and eyewash stations and public lavatories are required to have tempered water supplied through a water temperature limiting device that conforms to the appropriate ASSE, ANSI or CSA standard. The upper limit of 110°F makes sense for bidets and emergency showers. It does not make sense for hand washing at pubic lavatories.

If 120°F is a safe temperature for showering, bathing, head shampooing, tubs, it is equally safe for hand washing at either public or private lavatory faucets. It does not make sense that the temperature is lower for hand washing than for tub bathing. If the water temperature rises quickly to an uncomfortably hot and unsafe number it is much easier to remove ones hands from the water coming out of the faucet than it is to get out of a bathtub or to get out of the way in a shower. There is no need to have a lower temperature supplied for hand washing than for showering or bathing. In fact this public lavatory temperature code is derived from ASHRAE 90.1 energy saving code, not safety.

In our research into this issue, we found that the 110°F temperature limitation for hand washing at public lavatories comes from an energy code, ASHRAE 90.1 (1989)[5] "Energy Standard for Buildings Except Low-Rise Residential Buildings." Section 11.4.5.2 presents the provisions for lavatories in public facility restrooms (such as those in service stations, airports, train terminals, and convention halls). These include the requirement for low flow rates (the document preceded the 1990's era EPACT rules concerning public lavatory faucet flow rates) and for limiting the temperature to a maximum of 110°F.

In the very high use public toilets detailed in 90.1 (1989) the sinks are used many times per hour, and the combination of low temperature and low flow does not dramatically increase the health risks from waterborne pathogens; the very high turnover rates of the water in the piping brings in new disinfectant.

However, many toilet facilities currently classified as "public" are only used sporadically. The combination of low hot water temperature, low flow rate and infrequent usage, results in a very low turnover rate which in turn means that new disinfectant enters the piping very infrequently. This condition not only provides a localized incubation chamber for Legionella but once grown can result in contaminating the rest of the hot water system.

While the idea of establishing 85-110°F as a safe range for public hand washing seemed like a good idea at the time, it turns out this range is ideal for the growth of pathogens in the building's water distribution system. Pathogens that affect humans grow in temperatures that are found in our bodies: 85-110°F. For example, Legionella reproduces at the highest rates in the range of 85-110°F. Legionnaires' disease, caused by Legionella growth in building water systems has become a major public health concern.

Adding to the risk due to temperature is the complexity of the internal components of the mixing valves and the lack of maintenance these valves typically receive. Such maintenance is relatively time consuming and costly and is often ignored. By way of comparison, Australian codes for health and safety purposes require these local mixing valves to be disassembled and disinfected annually[6, 7, 8]

Conclusions and Recommendations:

If 120°F is safe enough to protect against scalding for bathing, it is safe enough for public hand washing. If this temperature is safe enough for Health Care Occupancies (IPC Section 609.3), it is safe enough for the other occupancies covered by the IPC.

Maintaining temperatures in the range of 85-110°F that is currently required in Section 419.5 is unsafe because it provides ideal conditions for the growth of pathogens, bacteria dangerous to humans. All Legionella guidelines including OSHA 1998[9] , ASHRAE 2000[10], CDC 2003[11], and CDC 2016[12] recommend maintaining hot water temperatures at fixtures and in hot water return lines at or above 120°F.

It is not necessary to specify the temperature range for supplying water for hand washing in public lavatories, only the maximum temperature to prevent scalding.

We recommend that the maximum safe temperature for the discharge of hot water into public hand washing sinks be raised to 120°F.
We recommend moving the break point between tempered and hot water from 110°F to 120°F. .
We recommend enabling the use of cold water only, or tempered water, or both at public hand washing sinks.

Bibliography:

US Centers for Disease Control (CDC) Atlanta, GA Chart titled, “Legionnaires’ Disease is on the Rise 2000-2015*” National Notifiable Diseases Surveillance System https://www.cdc.gov/legionella/downloads/fs-legionella-clinicians.pdf
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Cost Impact

The code change proposal will decrease the cost of construction .

This proposal enables the use of cold water, tempered water, or both to public hand-washing facilities. If only cold water is supplied, it will decrease construction costs by eliminating the installation of a hot water distribution system to these faucets and by eliminating the installation of the associated ASSE 1070 mixing valves, reducing or eliminating the water heater for this hot water and eliminating the mechanical space used by this piping and equipment. It will also eliminate the costs of operations and maintenance by reducing expenditures on hot water and on the maintenance of the mixing valves.

In places where city cold water is above 60°F year round, allowing only cold water to be supplied to public lavatories will eliminate much if not all the hot water piping and associated equipment in many buildings.

By virtue of raising the allowable maximum temperature to 120F it will now be possible to use a master-mixing valve (ASSE 1017) for temperature control instead of installing ASSE 1070 valves at every faucet. One valve costs less than many valves. Having fewer valves also dramatically reduces operating and maintenance costs.

Internal ID: 1494

P59-18

IPC: 419.5, Chapter 15

Proponent: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing Bradley Corporation (JBENGINEER@aol.com)

2018 International Plumbing Code

Revise as follows:

419.5 Tempered water for public hand-washing facilities. *Tempered water* shall be delivered from lavatories and group wash fixtures located in public toilet facilities provided for customers, patrons and visitors. *Tempered water* shall be delivered through an *approved* water-temperature limiting device that conforms to ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3 <u>or from a water heater complying with ASSE 1082 or ASSE 1084</u>.

Add new standard(s) follows:

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448

<u>1084-2018</u>:

<u>Performance Requirements for Water Heaters used as Temperature Limiting Devices</u>

<u>1082-2018</u>:

<u>Performance Requirements for Water Heaters Used as Temperature Control Devices for Hot Water Distribution Systems.</u>

Reason:
There are two new standards for water heaters, ASSE 1082 and ASSE 1084. These water heaters are equivalent to ASSE 1017 and ASSE 1070 respectively. As such, they have the capability of providing an equivalent level of performance as the currently listed water-temperature limiting device.

Water heaters complying with either one of these standards can provide tempered water within a range of a few degrees depending on the flow rate. The temperature range is similar to the allowable temperature range for an ASSE 1070/ASME A112.1070/CSA B125.70 device.

Cost Impact
The code change proposal will decrease the cost of construction .

This change could lower the cost by the allowance of a water heater without the need for an additional valve.

Analysis: A review of the standards proposed for inclusion in the code, ASSE 1084-2018 and ASSE1082-2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 1128

P60-18

IPC: 419.5, Chapter 15

Proponent: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing Bradley Corporation (JBEngineer@aol.com)

2018 International Plumbing Code

Revise as follows:

419.5 Tempered water for public hand-washing facilities. *Tempered water* shall be delivered from lavatories and group wash fixtures located in public toilet facilities provided for customers, patrons and visitors. ~~Tempered~~ The tempered water shall be ~~delivered through an *approved* water-temperature limiting device that conforms to~~ controlled by one of the following:

1. A temperature limiting device conforming to either ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3.
2. A thermostatic mixing valve conforming to ASSE 1017.
3. A water heater conforming to ASSE 1082.
4. A water heater conforming to ASSE 1084.
5. A temperature actuated flow reduction device conforming to ASSE 1062.

Add new standard(s) follows:

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448

1084-2018:

Performance Requirements for Water Heaters used as Temperature Limiting Devices

1082-2018:

Performance Requirements for Water Heaters Used as Temperature Control Devices for Hot Water Distribution Systems.

Reason:
The requirements for public lavatories is out of date based on the changes made to the standard. Previously, ASSE 1070 was considered a thermostatic mixing valve standard with safety features. The standard was revised to be a safety standard without performance requirements for thermostatic mixing. Some valves are adjustable, while others are not.

The requirement for tempered water for public lavatories is a comfort requirement as well as a scald prevention requirement. However, comfort overrides the safety requirement since tempered water is limited to a maximum temperature of 110° F. Scalding temperatures are in excess of this temperature. Other viable means of tempering water to 110° F or less are an ASSE 1017 valve or a water heater meeting one of the two new standards.

The two new standard for water heaters are ASSE 1082 and ASSE 1084. These water heaters are equivalent to ASSE 1017 and ASSE 1070 respectively. As such, they have the capability of providing an equivalent level of performance as the corresponding mixing valve.

The last device listed is a TAFR complying with ASSE 1062. Section 412.7 already permits the use of these devices for controlling the water temperature discharging from a faucet. Hence, the identification of the standard in this section complements the requirements in Section 412.7.

Cost Impact
The code change proposal will decrease the cost of construction .

The availability of more options to achieve code compliance usually results in lower construction costs.

Analysis: A review of the standards proposed for inclusion in the code, ASSE 1084-2018 and ASSE1082-2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

P61-18

IPC: 419.5, Chapter 15

Proponent: Misty Guard, representing Bradley Corporation (Misty.Guard@bradleycorp.com)

2018 International Plumbing Code

Revise as follows:

419.5 Tempered water for public hand-washing facilities. *Tempered water* shall be delivered from lavatories and group wash fixtures located in public toilet facilities provided for customers, patrons and visitors. *Tempered water* shall be delivered through an *approved* water-temperature limiting device that conforms to ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3 or from a water heater complying with ASSE 1082 or ASSE 1084.

Add new standard(s) follows:

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448

1084-2018:

Performance Requirements for Water Heaters used as Temperature Limiting Devices

1082-2018:

Performance Requirements for Water Heaters Used as Temperature Control Devices for Hot Water Distribution Systems.

Reason:
There are two new standards for water heaters, ASSE 1082 and ASSE 1084. These water heaters are equivalent to ASSE 1017 and ASSE 1070 respectively. As such, they have the capability of providing an equivalent level of performance as the currently listed water-temperature limiting device.

Water heaters complying with either one of these standards can provide tempered water within a range of a few degrees depending on the flow rate. The temperature range is similar to the allowable temperature range for an ASSE 1070/ASME A112.1070/CSA B125.70 device.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

There is no cost associated with this change since the code change will merely provide other options for complying with the current requirements. There are no new mandatory requirements being added.

Analysis: A review of the standards proposed for inclusion in the code, ASSE 1084-2018 and ASSE1082-2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 2251

P62-18

IPC: 421.1

Proponent: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2018 International Plumbing Code

Revise as follows:

421.1 Approval. Prefabricated showers and shower compartments shall conform to ASME A112.19.1/CSA B45.2, ASME A112.19.2/CSA B45.1, ASME A112.19.3/CSA B45.4 or CSA B45.5/IAPMO Z124. Shower valves for individual showers shall conform to the requirements of Section 412.3.

Reason:

The current standards are only for ceramic and plastic type plumbing fixtures. Including standards for enameled cast iron, enameled steel plumbing fixtures and stainless steel fixtures provides for more flexibility in fixture selection. The added standards are already in the IPC.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The addition of the standards provides more flexibility in choice of fixtures. Enameled cast iron, enameled steel and stainless steel plumbing fixtures and stainless steel fixtures are not required to be installed; they are a choice that the designer can make.

Internal ID: 499

P63-18 Part I

IPC: 421.3.1 (New)

Proponent: Angel Guzman Rodriguez, ASME, representing The American Society of Mechanical Engineers (ASME)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Add new text as follows:

421.3.1 Waste Fittings. Waste fittings shall conform to ASME A112.18.2/CSA B125.2.

Internal ID: 1407

P63-18 Part II

IRC: P2708.2.1 (New)

Proponent: Angel Guzman Rodriguez, ASME, representing The American Society of Mechanical Engineers (ASME)

2018 International Residential Code

Add new text as follows:

P2708.2.1 **Waste Fittings.** Waste fittings shall conform to ASME A112.18.2/CSA B125.2

Reason:
Section 421.3 discusses the waste outlet requirements for showers but there is no mention of waste fittings. Waste fittings are only mentioned in 412.1.2 for faucets or 412 for floor and trench drain types. The latest version of ASME A112.18.2/CSA B125.2 contains specific requirements for typical shower drains and also linear type drains which are different from trench type. This standard also includes requirements for built up shower drain systems which are normally used in field fabricated shower systems.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

This proposal only identifies the standard that the industry is already making these waste fittings comply with and be certified to. Thus, there will be no impact to material (or labor) cost because of this added requirement.

Internal ID: 1453

P64-18

IPC: 421.5.2

Proponent: James Richardson Jr, representing City of Columbus Ohio (jarichardson@columbus.gov); Robert Schutz, representing City of Columbus, OH (RJSchutz@columbus.gov)

2018 International Plumbing Code

Revise as follows:

421.5.2 Shower ~~lining.~~<u>linings.</u> Floors under shower compartments, except where prefabricated receptors have been provided, shall be lined and made water tight utilizing material complying with Sections 421.5.2.1 through 421.5.2.6. Such liners shall turn up on all sides not less than 2 inches (51 mm) above the finished threshold level. Liners shall be recessed and fastened to an *approved* backing so as not to occupy the space required for wall covering, and shall not be nailed or perforated at any point less than 1 inch (25 mm) above the finished threshold. Liners shall be pitched one-fourth unit vertical in 12 units horizontal (2-percent slope) and shall be sloped toward the fixture drains and be securely fastened to the waste outlet at the seepage entrance, making a water-tight joint between the liner and the outlet. <u>For showers that are designed with a zero height threshold, a trench drain shall be provided that runs 2 inches beyond the full width of the shower compartment opening on both sides. The trench drain shall have a flashing clamp and the shower liner material shall be securely fastened to the waste outlet at the seepage entrance, making a water-tight joint between the liner and the outlet. The shower liner shall also be required to extend 2 inches above the floor level and 1 inch beyond the edges of the trench drain. If for some reason the trench drain cannot be accommodated, the entire room the shower is located in shall be considered part of the shower compartment and provided with a liner for the entire floor surface.</u>

The completed liner shall be tested in accordance with Section 312.9.

Exceptions:

1. Floor surfaces under shower heads provided for rinsing laid directly on the ground are not required to comply with this section.
2. Where a sheet-applied, load-bearing, bonded, waterproof membrane is installed as the shower lining, the membrane shall not be required to be recessed.

Reason:
The plumbing code has not yet dealt with site built zero height threshold showers. These continue to be a problem for jurisdictions since the code provides no direction or parameters for how these should be constructed. We have seen installations end up causing substantial damage to a structure due to water migration between the floor covering and the sub floor. This proposal provides two possibilities which should result in adaquate protection for the structure.

Cost Impact
The code change proposal will increase the cost of construction .

There will be the added material and labor cost of a trench drain or the added material and labor cost for a liner for the entire floor area of the room with the zero threshold shower.

Internal ID: 2207

P65-18

IPC: 423.3, Chapter 15

Proponent: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing Bradley Corporation (JBEngineer@aol.com)

2018 International Plumbing Code

Revise as follows:

423.3 Footbaths and pedicure baths. The water supplied to specialty plumbing fixtures, such as pedicure chairs having an integral foot bathtub and footbaths, shall be limited to not greater than 120°F (49°C) ~~by a~~ . The water ~~temperature-limiting device that conforms~~ temperature shall be regulated by one of the following:

1. A limiting device conforming to ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3.
2. A thermostatic mixing valve conforming to ASSE 1017.
3. A water heater conforming to ASSE 1082.
4. A water heater conforming to ASSE 1084.
5. A temperature actuated flow reduction device conforming to ASSE 1062.

Add new standard(s) follows:

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448

1082-2018:

Water Heaters Used as Temperature Control Devices for Hot Water Distribution Systems.

1084-2018:

Performance Requirements for Water Heaters used as Temperature Limiting Devices

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Reason:
The requirement for regulating the maximum temperature of water for pedicure chairs having an integral foot bathtub, footbaths, and head shampoo sinks is a scald prevention requirement. The current code allows the use of a device complying with ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3.

Section 412.7 already permits the use of a TARF complying with ASSE 1062 for controlling the water temperature discharging from a faucet. Hence, the identification of the standard in this section complements the requirements in Section 412.7.

A thermostatic mixing valve is an effective method of regulating the maximum temperature. The temperature is maintained within a few degrees depending on the flow rate. Scalding temperatures are in excess of this temperature. Other viable means of maintaining the water temperature to a maximum of 120° F are water heater meeting one of the two new standards.

The two new standard for water heaters are ASSE 1082 and ASSE 1084. These water heaters are equivalent to ASSE 1017 and ASSE 1070 respectively. As such, they have the capability of providing an equivalent level of performance as the corresponding mixing valve.

Cost Impact
The code change proposal will decrease the cost of construction .

The availability of more options to achieve code compliance usually results in lower construction costs.

Analysis: A review of the standard proposed for inclusion in the code, ASSE 1082-2018 and ASSE 1084-2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 1161

P66-18

IPC: 423.3, Chapter 15

Proponent: Misty Guard, representing Bradley Corporation (Misty.Guard@bradleycorp.com)

2018 International Plumbing Code

Revise as follows:

423.3 Footbaths and pedicure baths. The water supplied to specialty plumbing fixtures, such as pedicure chairs having an integral foot bathtub and footbaths, shall be limited to not greater than 120°F (49°C) by a water-temperature-limiting device that conforms to ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3 <u>or from a water heater complying with ASSE 1082 or ASSE 1084.</u>

Add new standard(s) follows:

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448

<u>1084-2018</u>:

<u>Performance Requirements for Water Heaters used as Temperature Limiting Devices</u>

<u>1082-2018</u>:

<u>Performance Requirements for Water Heaters Used as Temperature Control Devices for Hot Water Distribution Systems.</u>

Reason:
There are two new standards for water heaters, ASSE 1082 and ASSE 1084. These water heaters are equivalent to ASSE 1017 and ASSE 1070 respectively. As such, they have the capability of providing an equivalent level of performance as the currently listed water-temperature limiting device.

Water heaters complying with either one of these standards can provide tempered water within a range of a few degrees depending on the flow rate. The temperature range is similar to the allowable temperature range for an ASSE 1070/ASME A112.1070/CSA B125.70 device.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

There is no cost associated with this change since the code change will merely provide other options for complying with the current requirements. There are no new mandatory requirements being added.

Analysis: A review of the standards proposed for inclusion in the code, ASSE 1084-2018 and ASSE1082-2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 2253

P67-18

IPC: 423.3

Proponent: William Chapin, Professional Code Consulting, LLC, representing Professional Code Consulting, LLC (bill@profcc.us)

2018 International Plumbing Code

Revise as follows:

423.3 Footbaths and pedicure baths. The water supplied to specialty plumbing fixtures, such as pedicure chairs having an integral foot bathtub and footbaths, shall be limited to not greater than 120°F (49°C) by a water-temperature-limiting device that conforms to ASSE 1070/ASME A112.1070/CSA B125.70 ~~or CSA B125.3.~~.

Reason:
In June of 2017, the CSA B125 Committee completed the project that removed the automatic compensating valve requirements from CSA B125.3. The reason for this was the publication of harmonized ASSE 1070/ASME A112.1070/CSA B125.70 standard.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

Proposal only removes a referenced standard from the code section.

Internal ID: 2252

P68-18

IPC: 202, 425.1, 425.1.1 (New), 425.1.2 (New), 425.1.3 (New)

Proponent: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2018 International Plumbing Code

Revise as follows:

425.1 Approval. Water closets shall conform to the water consumption requirements of Section 604.4 and shall conform to ASME A112.19.2/CSA B45.1, ASME A112.19.3/CSA B45.4 or CSA B45.5/IAPMO Z124. ~~Water closets shall conform to the hydraulic performance requirements of ASME A112.19.2/CSA B45.1. Water closet tanks shall conform to ASME A112.19.2/CSA B45.1, ASME A112.19.3/CSA B45.4 or CSA B45.5/IAPMO Z124. Electro-hydraulic water closets shall comply with ASME A112.19.2/CSA B45.1. Water closets equipped with a dual flushing device shall comply with ASME A112.19.14.~~

Add new text as follows:

425.1.1 Hydraulic performance. Water closets shall conform to the hydraulic performance requirements of ASME A112.19.2/CSA B45.1.

425.1.2 Water closet tanks. Water closet tanks shall conform to ASME A112.19.2/CSA B45.1, ASME A112.19.3/CSA B45.4 or CSA B45.5/IAPMO Z124.

425.1.3 Dual flush water closets. Water closets equipped with a dual flushing device shall comply with ASME A112.19.14.

Add new definition as follows:

DUAL FLUSHING DEVICE. A feature that allows the user to flush a water closet with either a reduced or full volume of water depending upon bowl contents.

Reason:
This proposal revises Section 425.1 so that it is more user friendly. Adding specific requirements to the IPC will assist the end user to know which standards apply to what fixture. The definition for dual flushing device is being added as code does not have a definition. The definition is consistent with the definition found in ASME A112.19.14.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

This proposal is a clarification of existing requirements. No new materials or labor are required by this proposal thus, there is not a cost increase.

Internal ID: 502

P69-18

IPC: 501.2

Proponent: James Kendzel, American Supply Association, representing American Supply Association (jkendzel@asa.net)

2018 International Plumbing Code

Revise as follows:

501.2 Water heater as space heater. Where a combination potable water heating and space heating system requires water for space heating at temperatures greater than 140°F (60°C), a master thermostatic mixing valve complying with ASSE 1017 shall be provided to limit the water supplied to the potable *hot water* distribution system to a temperature of 140°F (60°C) or less. The potability of the water shall be maintained throughout the system. <u>Requirements for combination potable water heating and space heating systems shall be in accordance with the International Mechanical Code.</u>

Reason:
There are requirements in the International Mechanical Code for combination water heating and space heating systems that are covered in the IMC and not covered in the IPC. The 2018 IMC provides a reference back to the IPC related to water heating and space heating systems and there should also be a link from the IPC back to the IMC.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

Proposed change is not substantive and does not change existing requirements.

Internal ID: 1350

P70-18

IPC: 501.2

Proponent: Ronald George, representing Self (Ron@Plumb-TechLLC.com)

2018 International Plumbing Code

Revise as follows:

501.2 Water heater as space heater. Where a combination potable water heating and space heating system requires water for space heating at temperatures greater than 140°F (60°C), a master thermostatic mixing valve complying with ASSE 1017 shall be provided to limit the water supplied to the potable *hot water* distribution system to a temperature of 140°F (60°C) or less. The ~~potability of the water~~ water for the space heating system shall be ~~maintained throughout the system.~~separated from the potable water system by use of a double wall heat exchanger.

Reason:
This code change still allows a single heating appliance to provide both the heating and domestic hot water for a building, however it requires a heat exchanger to separate the two fluid systems. This is because heating hot water systems can sit idle for up to 8 or 9 months per year in southern climates. This causes the water to sit stagnate for many months when the thermostat does not call for heat. This stagnant period is when bacteria grows in a biofilm to very high numbers until the thermostat calls for heat. Then the bacteria is pumped into the water heater where it is transmitted to people from showers and other aerosolizing fixtures. The potential for Legionellosis or Legionnaires' disease is very high. The control valve or zone circulating pump remains off and allows water treatment chemicals to dissipate and bacteria can growth to very high levels in an uncirculated heating circuit. In systems where they cycle the zone valve or circulating pump, it wastes energy and overheats the spaces during summer months. There are other issues that are outlined below.

Combined systems require someone very familiar with how both systems are supposed to operate to properly operate and maintain the system. Proper maintenance of the system can be a comfort or Legionella bacteria growth issue when the temperatures are low and a serious safety and scald issue when temperatures are high. A combined system is a hybrid system that utilizes a boiler or boilers to heat water for heating the building environment and it uses boiler water to heat the domestic hot water for bathing, washing and cleaning uses. There are two applications for these combined systems. One application is heating the building environment with heating hot water which generally needs to be at a very high temperature around 180F to 210F without using oversized heating coils. The other application is for bathing, showering and domestic hot water uses which generally use a lower temperature around 85F to 120F. If the water gets too hot, there are scalding dangers, so proper controls (thermostatic mixing valves) are very important for these types of systems. I have been investigating scald incidents with combined systems since the mid-1990s and I have seen a significant number of these combined systems involved in scald litigation cases because these systems are generally not designed, installed, operated or maintained properly. The following is a list of problems or pitfalls that I have found over the years that are related to combined heating hot water and domestic hot water systems.

Codes: There is very little code language on Combines heating hot water and domestic hot water systems. There are only two plumbing code sections in the model codes that mention these combined systems and they give important, but often overlooked requirements. One section calls for the piping and components in a combined system to be approved for use in potable water systems. The other code section calls for a thermostatic mixing valve if the system temperature exceeds 140 degrees Fahrenheit.

There are many more issues that need to be addressed to have a safe and properly designed system. If you can avoid these pitfalls you will have a much safer system:

Pitfall Number 1: Open System vs Closed System "Open systems" are systems with domestic hot water flowing from the city water supply through the heating hot water system components such as pumps, control valves and heating coils. Open systems introduce a lot of oxygen and minerals into the heating coil of the boiler and can cause corrosion and scale build-up issues on heating surfaces. Open systems often have scale build-up on the boiler heating surfaces in hard water areas. High Flue gas temperatures are a sign of scale build-up which minimizes heat transfer into the water and therefore the flue temperatures rise. "Closed Systems" are systems with a double wall heat exchanger separating the fluid of the heating hot water system and the domestic hot water. The boiler loop can be chemically treated and mineral build-up on heating surfaces is minimized. Closed loop systems generally require a double wall heat exchanger when boiler chemicals are used. Open systems provide a significant challenge because the fluid in the system must be potable water and it is difficult to circulate domestic hot water through many hydronic components without having scale, corrosion, build-up of air pockets and oxidation problems. Most hydronic systems have pumps, valves, coils and components that are not approved for drinking water service. Closed systems allow the heating hot water to be chemically treated to prevent corrosion and scale build-up on heating surfaces. Closed hydronic heating systems are the preferred type of combined systems because it eliminates a lot of opportunities for systems problems. There are water heaters with hot water coils in the tank that can be used for this application or a plate and frame or shell and tube heat exchanger can be used for this application. Open systems often see corrosion problems in the components that are not compatible for domestic water systems.

Pitfall Number 2: System Operating Temperatures The next challenge is with the system operating temperatures. Heating hot water systems are generally designed to operate between 180 degrees Fahrenheit and 210 degrees Fahrenheit. Domestic hot water systems are designed to operate between 85 degrees Fahrenheit for the lowest temperature of tempered water to 140 degrees Fahrenheit the highest hot water temperature for kitchens or laundries. “Tempered Water” is water having a temperature range between 85°F (29°C) and 110°F (43°C). “Hot Water” is water at a temperature greater than or equal to 110°F (43°C) and generally domestic hot water for bathing and showering is limited to a maximum of 120 degrees Fahrenheit in code language related to showers and bathtub facilities. Domestic hot water for dishwashing and laundries can be higher. Generally, domestic hot water systems operate at a maximum of 140 degrees Fahrenheit and heating hot water Systems operate best around 190 to 200 degrees Fahrenheit. If the combined-open heating hot water system is set to 120 degrees F the building will be cold in winter months because there will not be enough heat coming out of the heating units. If the system temperature is set to a higher temperature to satisfy the heating coils or baseboard heater requirements then there is a significant scald risk on the domestic hot water side of the system unless thermostatic mixing valves are used to limit hot water temperatures.

Pitfall Number 3 - Not including all of the required components in the combined systems A combined system has many components that are required for it to operate properly. If all of the components are not installed in the proper location, then the system will experience problems. These components include but are not limited to: The boiler, and expansion tank, isolation valves, unions, dielectric waterways, circulating pumps, air eliminators or air vents, control valves, relief valves, balancing valves, heating coils, fin tube radiators, thermostats, pressure gauges, temperature gauges, flushing connections, plumbing fixtures, drains, etc. All of these components must work in concert and be designed to work together as a system. If any one or several of the components are not installed, or if they are undersized, adjusted or installed improperly the problems and safety issues can occur.

Pitfall Number 4 - Seasonal Pumping and Pump Sizing In large centrally piped systems, when the winter heating season occurs all of the components in a combined heating hot water and domestic hot water system will require a simultaneous peak demand in the morning when it is showering time. So the circulating pump must be sized for the simultaneous peak heating and showering loads. During the winter months, it does not make sense to circulate a large quantity of water, so often I see a smaller circulating pump that is piped around the large circulating pump so it can be used in the winter months when the large circulators are not needed for building heating. This creates a large dead leg in the hot water piping where Legionellae bacteria can grow when the heating hot water pumps are shut down.

Pitfall Number 5 - Dead legs During the summer months the fan coil units and branches to baseboard heating units are shut off with a solenoid valve or the circulating pump on these branches does not run all summer long. It is not unusual for heating system to sit idle for over six months in southern climates. When the first call for heating is made there is usually a slug of brackish and foul tasting water that is high in debris, metals and bacteria content. Combined systems are by design creating very large dead legs which is a plumbing code violation in many plumbing codes. Controls on combined systems need to incorporate a periodic flushing of the zones by operating the solenoid valves and circulators on each zone on at least a bi-weekly basis if not more often. Chlorine dissipates in the domestic water over time and when heated. So dead legs are more susceptible to bacteria growth. In combined systems where a significant portion of the system is used seasonally for heating and the remainder of the system is being used year round for domestic hot water, combined systems are open systems that are susceptible to bacteria growth in stagnant sections of heating coil piping. Heating coils in the summer season are an area with huge potential for bacterial amplification when hydronic systems are coupled with domestic hot water systems and there is no physical barrier or heat exchanger to separate the fluids between the two systems.

Pitfall Number 6 - Peak load problems - Space heating and Shower loads simultaneously The early morning is the generally coldest time of day and it is also when guests at a hotel or an apartment building or condominium take their morning showers. Equipment, piping, pumps and valves must be sized to handle this simultaneous peak load. If the heating coils, pipe and pump equipment is not sized big enough the temperature of the space will drop and the shower water temperature will drop to an uncomfortable temperature. Either condition is likely to result in call and complaints about water temperatures or space temperatures being too low.

Pitfall Number 7 - Sizing Sizing problems can arise when engineers, owners or contractors try to be thrifty and save a few bucks by rounding down on their peak load calculations and downsizing pumps, piping, valves or coils. When this happens, you can bet the maintenance department phone will be ringing off the hook with complaints of spaces being too cold or not enough hot water for a shower during cold weather conditions. The maintenance men usually do what comes natural when they receive a call of not enough heat, they go to the boiler and turn the temperature up. When someone is scalded they always claim they never touched the thermostat. Turning up the temperature will not cause problems for the heating coils, but it does significantly increase the risk of scalding if the maintenance man does no go around and re-adjust all of the maximum temperature limit stops in the showers and tub/shower valves. If the shower has an old two-handle or single handle non-compensating type shower valve that cannot compensate for changes in incoming temperature or pressure, then the risk of scalding is even greater. The best solution is to have a Thermostatic mixing valve on the hot water supply to the bathing and washing fixtures to limit the hot water to a safe temperature. If the hot water and heating water piping are still separated, and the system uses one boiler then a temperature actuated master thermostatic mixing valve conforming to ASSE 1017 or the appropriate CSA B-125 mixing valve can be located at the water heater to lower the hot water to a safe delivery temperature. If the combined system utilizes he same piping for heating hot water and domestic hot water then, a temperature limiting valve conforming to ASSE 1070 should be used in-line to mix cold water with hot water to provide a safe temperature of hot water for bathing or showering fixtures locally.

Pitfall Number 8 - Maintenance The main problem with a combined system is the system includes components and controls for two different mechanical trade disciplines. Often if there is a service call on one of these systems, the service technician may only be familiar with one system or the other. If the system was designed with a specific operating temperature it is not uncommon for a service tech familiar with only one system to set the temperature of the system to what he is accustomed to setting the temperature to. There are also many components in the system that one trade or the other may be unfamiliar with. For example in one case the owner called an HVAC technician to work on his combined system. The HVAC technician was used to setting hydronic system for building heating at 190 to 200 degrees Fahrenheit. The technician set the temperature to 190 degrees and later a woman was scalded when she got in her shower. The HVAC technician did not know about he needed to reset the maximum temperature limit stop on all of the ASSE 1016 shower valves when he readjusted the boiler set point temperature. There are maintenance technicians that are trained and fully capable of working on combined systems, but they would need to have the design drawings, design operating temperatures and sequence of operations in order to properly maintain the system.

Pitfall Number 9 – Cast Iron Boiler on an Open System I have seen Cast iron boilers used on an open combined heating hot water and domestic hot water system. Cast iron boilers do not perform well with open systems because of the large quantities of water that introduces oxygen and minerals which cause rust stains, oxidation and fouling of the heating surfaces. This mistake does not take long to find because of the rust stains that appear in the sinks, bathtubs & showers. Cast iron boiler can work nicely, but they must have a separate closed loop of boiler water that is treated with corrosion inhibitors and other boiler chemicals as needed. The boiler water can then be piped to a coil in a hot water tank or to a heat exchanger to provide domestic hot water.

Pitfall Number 10 - No Hot Water Tank with Copper Fin Tube Boilers I have seen installation where someone thought they could save a few bucks by eliminating the storage tank and using the heating hot water main as the storage tank. This does not work in motels, hotels, apartment buildings and condos with large peak loads. In facilities like these there needs to be a stored volume of water ready for use in a dump load such as a morning shower period. Copper fin-tube boilers can only raise the temperature of the water 20 – 40 degrees Fahrenheit as the water flows through the boiler. If the water flows too slow, through the boiler, it will scale up and if the water flows too fast (in excess of five feet per second) the copper will erode away. These types of boilers work fine, the just need to have a storage tank for plumbing applications with a dump load. In heating applications the BTU input is matched to the heating load calculations and the system works fine. In a large domestic hot water or a combined heating hot water/domestic hot water system, copper fin-tube boilers should have an adjacent storage tank in order to work properly. If there is no storage tank, the system temperatures will drop off drastically during peak winter showering and building heating periods. The usual result is the maintenance personnel turn up the temperature and higher temperatures increase the risk of scalding.

Pitfall Number 11 - No Thermal Expansion Tank/Proper Thermal Expansion Tank Materials All heating hot water system and domestic hot water systems must have a thermal expansion tank. The thermal expansion tank should be sized for a system start-up from ambient to hot. Another problem I have encountered with these combined systems is usage of a hydronic expansion tank on a combined system. If the same water flows through the coils and to the plumbing fixtures, the system must have a thermal expansion tank rated for use in a potable water system. If the system has one boiler and two separate piping systems with a heat exchanger each piping system should have a thermal expansion tank.

Pitfall Number 12 - Scalding Injuries & Deaths Many designers, contractors and owners forget there are lives at stake when they design and build the combined heating hot water and domestic hot water systems. People have been scalded to death and people have been seriously injured when the systems are not designed, installed or maintained properly. This is more than just a savings on first-cost of an installation, it is a system that warrants serious attention because the public's safety is at stake. A properly sized and located thermostatic mixing valve conforming to ASSE 1017 or ASSE 1070 should be located in the combined system in accordance with the scoping requirements for each type of valve to prevent scalding. At shower locations an ASSE 1016 valve should be used and it should be properly set by the installer and/or the maintenance personnel to limit the maximum outlet temperature to 120 F or less.

Pitfall Number 13 - Litigation Combined systems are susceptible to problems. Problems can lead to injuries and injuries can lead to litigation. If an open combined heating hot water and domestic hot water system cannot be properly maintained for the entire life of the system, don't design it, don't install it or don't request that it be installed because problems will arise. Combined systems require an extensive amount of work and oversight by a person with knowledge of both the heating water requirements and domestic hot water requirements to make sure the system works properly and to make sure someone does not get injured. You must document everything when working on a combined system because when someone gets injured, everyone will be named in the lawsuit.

Pitfall Number 14 – Code Requirements for Thermostatic Mixing Valves The 2009 International Plumbing Code has the following Language dealing with combined systems: 501.2 Water heater as space heater. Where a combination potable water heating and space heating system requires water for space heating at temperatures higher than 140°F (60°C), a master thermostatic mixing valve complying with ASSE 1017 shall be provided to limit the water supplied to the potable hot water distribution system to a temperature of 140°F (60°C) or less. The potability of the water shall be maintained throughout the system. The above code language limits the domestic hot water system to 140 degrees Fahrenheit, and in other code sections the temperature for showers and tub/shower combination units is limited to 120 degrees Fahrenheit. The 2009 International Plumbing code also has the following language addressing maximum water temperatures for instantaneous water heaters: 501.6 Water temperature control in piping from tankless heaters. The temperature of water from tankless water heaters shall be a maximum of 140°F (60°C) when intended for domestic uses. This provision shall not supersede the requirement for protective shower valves in accordance with Section 424.3.

Pitfall Number 15 - Engineered System vs Value Engineered systems I have seen where a value engineering option was offered by a contractor to combine the domestic hot water system with the heating hot water system. This was not a value to the owner and it was not engineered. During the evaluation process the owner decided to allow the contractor to combine the systems without the contractor providing engineered drawings. This decision gave the contractor the ability to use whatever he wanted to use since there were no engineered drawings. The owner got a system that did not work, and had black brackish water flushed out of the dead legs every fall when the heating system was turned on and the stagnant water was circulated through the domestic water piping. I submitted a report almost 200 pages long documenting the many problems in that system.

Pitfall Number 16 - Pipe Materials I have seen where a pipe material cost cutting option that was labeled as a value engineering option was given by a contractor. The option was accepted and the contractor simply eliminated the domestic hot water system and changed the hydronic system from black steel to galvanized steel piping. This was in a condominium building that had about 500 condos that sold in the neighborhood of 1 million dollars each. The galvanized pipe started to rust significantly within two years of service and rust stains were significant in all fixtures. The seasonal dead legs from the heating coils allowed rust barnacles to form until the first call for heat. When the flow in these dead leg branches would resume on the first call for heat in the fall it would flush rust, debris and iron oxide and stagnant water into the strainers of the control valves and into the domestic water system. Galvanized steel pipe should never be used on a domestic hot water system because domestic hot water in an open system connected to the city water main introduces a large quantity of oxygenated water into the system and causes rust. Oxygenated water will cause significant corrosion in ferrous metals such as black steel and galvanized pipe. All components of a combined system should be copper or another code approved non-ferrous material for domestic hot water service if they are in contact with the city water supply. Another thing I often see is iron valves installed in these combined systems. This is usually the result of a heating contractor installing or performing maintenance on the combined system and it is usually the result of the contractor not being familiar with the requirements in the code for all components to be all bronze and/or approved for domestic water use.

Pitfall Number 17 - Pumps When sizing pumps for a combined system there should be two separate systems. The closed system should have large circulating pumps designed for the heating hot water flows. The open system should have small circulator pumps to maintain hot water to the farthest fixture. It is also a good idea to split the load into two and use two smaller pumps to allow for some redundancy and allow for one pump to be maintained while the other is in service. It's a good idea to do this with the boilers also to provide some redundancy. The hydronic system should be a closed loop that can use large ductile iron bodied pumps. The domestic water system is an open system and should have an all bronze circulator. I have seen combined systems where it was an open system with large ductile iron pumps in the main piping before the boilers to provide an adequate flow of heating hot water in the winter months. Then because they did not want to run the large pumps just to maintain the domestic hot water temperature at the end of the system, a small bronze circulator was installed on a branch off of the main with check valves to prevent short circuiting the flow through the larger pumps. The problem with an open system is when the large pumps are shut down for sometimes over 6 months the pumps, and all hydronic circuits to heating coils and baseboard heaters become dead legs in the piping system. Dead legs are places where bacteria like Legionellae can grow and thrive. This is why there should be a separate closed piping circuit for the heating hot water system piping.

Pitfall Number 18 - Corrosion Ferrous piping in a domestic hot water system is not advisable. Although galvanized pipe is allowed by code for domestic hot water systems, it should never be used in a domestic hot water system if you intend for the building systems to last more than a couple of years. Hot water tends to accelerate corrosion in galvanized piping systems. All domestic hot water piping should be copper or another approved non-ferrous material. Another problem with combined systems is the use of large cast iron and ductile iron hydronic heating circulating pumps that are installed in combined systems that were not approved for domestic water systems. I have seen galvanized steel pipes and even black steel pipe nipples used in domestic hot water systems. When the systems were first turned on in the fall large slugs of iron oxide laden water is forced into the domestic hot water distribution system. This generally results in sinks and bathtubs filled with black and orange rusty looking water until the entire system get flushed out significantly. The ferrous materials in the combined system typically lead to other problems with plugged strainers on control valves and other components. The iron oxide can also provide a surface for bacteria to grow.

Pitfall Number 19 - Corrosion inhibitors and other boiler water treatment chemicals I visited one building on the east coast where the combined system consisted of 8 inch galvanized water pipes. The galvanized pipes were corroding to the point where the hot water was very cloudy and orange. The building maintenance personnel chose to add an injection pump to inject chemicals into the domestic water main entering the building to raise the PH of the water and to intentionally build up a layer of scale inside the piping to minimize the amount of corrosion in the galvanized piping. The problem was the scale also formed on the heating surfaces and in the control valves causing them to fail. Upon inspection of the barrel of chemicals being injected into the water supply there were warning labels that stated the materials were toxic to humans. I reported this to the building owner to correct the situation immediately. This was another case of a heating contractor working on a plumbing system and not being familiar with plumbing code requirements. The solution he came up with would be a possible option for a hydronic system, but in a domestic water system that was a code violation and a health and safety issue.

Pitfall Number 20 - Loss of Both Systems When There is a Problem Another problem with combined systems is when there is a problem with a combined system that causes the system to shut down, both the domestic hot water system and the heating hot water system is out of service. If it is a boiler problem or another major problem the entire building could be without both systems for a long period of time. Combined system should have separate piping loops and redundant equipment to allow for some usage if one system or the other requires service.

Pitfall Number 21 – Legionellae Bacteria A research report in 1988 authored by Al Steele who was the president of the ASPE Research foundation at the time recommended storing domestic hot water between 135 degrees Fahrenheit and 140 degrees Fahrenheit to kill Legionellae bacteria and utilizing a thermostatic mixing valve to mix the hot water down to a safe delivery temperature below 120 degrees Fahrenheit to minimize sccalding. The higher storage temperature around 140 degrees Fahrenheit was suggested because it is above the temperatures where Legionella bacteria can survive and multiply. With a storage temperature of 140 degrees Fahrenheit the Legionellae bacteria will die within 32 minutes.

Table -1 Legionellae Bacteria Growth and Disinfection Temperature Chart.

158 F and above F (70 C +): Legionellae Bacteria Disinfection range.

At 151 Degrees F (66 Degrees C): Legionellae die within 2 minutes.

At 140 Degrees F (60 Degrees C): Legionellae die within 32 minutes.

At 135 Degrees F (57.5 Degrees C) Legionellae die within 2 hours.

At 131 Degrees F (55 Degrees C): Legionellae die within 5 to 6 hours.

Above 122 Degrees F (50 Degrees C): They can survive but do not multiply.

95 to 115 Degrees F(35 to 46 Degrees C): Ideal Legionellae Bacteria growth range.

68 to 122 Degrees F (20 to 50 Degrees C): Legionellae Bacteria growth range.

Below 68 Degrees F (20 Degrees C): Legionellae can survive but are dormant.

The Legionellae bacteria cannot survive water temperatures above 131 degrees Fahrenheit (55 Degrees C) for more than five or six hours. The bacteria die instantly at temperatures above 158 degrees F (70 degrees C). General protection against the bacteria can be achieved by designing an operating water temperature of at least 140 degrees F (60 degrees C) or higher. As temperatures increase, so does the risk of scalding.

For system water temperatures below 140 Degrees F (60 Degrees C) special provisions are necessary to allow for cleaning and chemical treatment procedures for addressing the Legionellae Bacteria in the Domestic Hot Water System. Given a storage temperature of 140 degrees Fahrenheit that should be high enough to protect the water heater from the bacteria, but in open systems with Legionellae bacteria in the municipal water supply, it would continually re-seed the potable hot water system with high dosages of potentially Legionellae bacteria infested water. This is another reason why combined systems should have a closed loop for the heating hot water system.

Pitfall Number 22 – Leakage of Boiler Water. When boiler water is at a higher temperature than 140 degrees Fahrenheit, (180 to 210 degrees Fahrenheit) and it is allowed to leak through a faulty zone valve or solenoid valve if there is debris in the line or if the boiler water is allowed to flow by gravity circulation through a circulating pump that is de-energized, there is the potential for overheating the domestic hot water. In these cases a system can have a thermostat set to de-energize the circulating pumps or close the solenoid valve and if they leak, the domestic hot water can rise above the set point to a temperature close to the boiler water temperature. A thermostat that controls a solenoid valve or circulating pumps on the water heater should never be used to control the temperature in a domestic hot water system because thermostats allow too much of a temperature variation from when it senses the water to turn on or off the pump or solenoid valve and there is potential for leakage and temperature creep. The best way to address this is to provide a thermostatic mixing valve that conforms to ASSE 1017 on the domestic hot water line coming from the hot water tank to provide a safe hot water distribution temperature. If you are considering a combined system, avoiding these pitfalls listed above should help keep your building warm and the occupants in a safe temperature of hot water. If you don't avoid these pitfalls you could find yourself in hot water. Another option would be to keep life simple and keep the systems separate. Then you will not have to worry about someone coming along later and messing up your system design with system modifications or poor maintenance that can create scalding issues then steer clear of combined heating hot water and domestic hot water systems and you will steer clear of potential litigation also.

Cost Impact

The code change proposal will increase the cost of construction .

A combination water heater/space heater equipment will cost more.

Internal ID: 2380

P71-18 Part I

IPC: 501.2, 607.2.2

Proponent: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Revise as follows:

501.2 Water heater as space heater. Where a combination potable water heating and space heating system requires water for space heating at temperatures greater than 140°F (60°C), a ~~master thermostatic~~ temperature-actuated mixing valve complying with ASSE 1017 shall be provided to limit the water supplied to the potable *hot water* distribution system to a temperature of 140°F (60°C) or less. The potability of the water shall be maintained throughout the system.

607.2.2 Piping for recirculation systems having ~~master thermostatic~~ temperature-actuated mixing valves. Where a ~~thermostatic~~ temperature-actuated mixing valve is used in a system with a hot water recirculating pump, the *hot water* or *tempered water* return line shall be routed to the cold water inlet pipe of the water heater and the cold water inlet pipe or the hot water return connection of the ~~thermostatic~~ temperature-actuated mixing valve.

Internal ID: 528

P71-18 Part II

IRC: P2802.1, P2803.2

Proponent: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2018 International Residential Code

Revise as follows:

P2802.1 Water temperature control. Where heated water is discharged from a solar thermal system to a *hot water* distribution system, a ~~thermostatic~~ temperature-actuated mixing valve complying with ASSE 1017 shall be installed to temper the water to a temperature of not greater than 140°F (60°C). Solar thermal systems supplying *hot water* for both space heating and domestic uses shall comply with Section P2803.2. A temperature-indicating device shall be installed to indicate the temperature of the water discharged from the outlet of the mixing valve. The ~~thermostatic~~ temperature-actuated mixing valve required by this section shall not be a substitute for water-temperature limiting devices required by Chapter 27 for specific fixtures.

P2803.2 Temperature control. Where a combination water heater-space heating system requires water for space heating at temperatures exceeding 140°F (60°C), a ~~master thermostatic~~ temperature-actuated mixing valve complying with ASSE 1017 shall be installed to temper the water to a temperature of not greater than 140°F (60°C) for domestic uses.

Reason:

This proposal is almost editorial in nature as it is simply making the terminology (for the same component), consistent everywhere it is used in the code. The code currently uses different terminology to describe mixing valves complying with ASSE 1017: “master thermostatic valves” and “temper-actuated mixing valves”. There are also variations: “master thermostatic mixing valve,” “master thermostatic valves,” and “thermostatic mixing valve.” For consistency, the code needs to use the same terminology everywhere and that terminology should be aligned with title of the ASSE 1017 standard: “…. Temperature-Actuated Mixing Valves for Hot Water Distribution Systems.” Note that IPC Section 613.1 and IRC P2724.1 already use the proposed terminology. Those sections indicate the location for such valves: at the hot water source. This aligns with manufacturer’s instructions and the listing for ASSE 1017 valves. Thus, there is no need for the ambiguous term of “master” in the code.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal will not increase the cost of construction because no additional labor, materials, equipment, appliances or devices are mandated beyond what is currently required by the code.

Internal ID: 3426

P72-18

IPC: 501.8

Proponent: Ronald George, Plumb-Tech Design & Consulting Services LLC, representing Self (Ron@Plumb-TechLLC.com)

2018 International Plumbing Code

Revise as follows:

501.8 ~~Temperature~~ Water heater thermostat controls. ~~Hot water supply systems~~ Water heaters shall be equipped with automatic temperature controls capable of adjustments from the lowest to the highest acceptable temperature settings for the intended temperature operating range. The water heater thermostat shall not be used by itself for scald prevention or to limit the hot water temperatures being delivered to the plumbing fixtures as required in Chapter 4 of this code.

Reason:

The water heater thermostat should not be relied upon to accurately control the hot water system delivery temperature. The thermostat is located in the bottom of the water heater and is intended to only sense the incoming cold water and anticipate the need for hot water by turning the burner “ON” and “OFF”. There is no temperature sensor in the top of a storage type water heater and the combination gas control valve and thermostat cannot sense or control the temperature of the hot water in the top of the tank or the outlet temperature. When there are intermittent short draws of hot water, the short draws of cold water enter the bottom of the heater and cause the burner to cycle "ON". This creates a condition known as stacking where the already heated water in the top of the heater gets overheated with each consecutive intermittent burner cycle from a short draw of water. (2-3 gallons) The hot water can exceed the water heater thermostat setting and therefore, thermostat dial on the water heater cannot be relied upon to accurately control the outlet temperature of the water heater. In some cases the hot water temperature can be as much as 30 or more degrees hotter than the thermostat setting on a water heater. This is why the thermostat on the water heater should not be used as a system temperature controller. Water heater thermostats are not tested for accurate control of temperatures on the outlet of the water heater. There are some newer water heaters on the market with sophisticated controls, but there is currently no industry standard test for verifying the ability of a water heater to accurately control the outlet hot water temperature. At 120 F a person would have about 5 minutes to get out of harms way, but with the inaccuracy of 30 degrees you can have the heater set at 120 F and get 150 F or hotter water form the water heater. At 150 F a person would be scalded in about 1-1/2 seconds. That would not be enough time to realize what is happening, react and try to adjust the temperature or get out of harms way. Even if the temperature was readjusted, it would still flow out of a shower head at the current temperature for about 6-10 more seconds (depending on the shower head flow rate) at the scalding hot temperature before the cooler water flowed out of the shower head. This would surely lead to serious burn injuries. This is already a requirement in other parts of the code for specific applications. This code change is just clarifying the language and adding it to the water heater chapter. By changing the code here, it covers all fixtures where scalding can occur.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This is already a requirement in other parts of the code for specific applications. This code change is just clarifying the language and adding it to the water heater chapter.

Internal ID: 1992

P73-18

IPC: 502.4 (New), 502.4

Proponent: Richard Houle, Reliance Worldwide Corporation, representing Reliance Worldwide Corporation (rich.houle@rwc.com)

2018 International Plumbing Code

Add new text as follows:

502.4 Supports. Tank type water heaters shall be laterally supported to prevent the water heater from tipping over. The support shall be attached on the upper 1/3 of the tank. The support shall not compromise the outer shell of the tank and shall not violate the water heater manufacturer's installation requirements.

Revise as follows:

~~502.4~~ 502.4.1 **Seismic supports.** Where earthquake loads are applicable in accordance with the International Building Code, water heater supports shall be designed and installed for the seismic forces in accordance with the International Building Code.

Reason:
Heavy equipment, especially those with a high center of gravity such as is a storage water heater, can be knocked over accidentally. When they do:

a. There is the potential for bodily injury or death, should the equipment tip over onto a person

b. There is the potential for a fire and/or explosion, should a fuel gas line be damaged or ruptured due to the equipment's movement.

In the case of a water heater or similar large water containing vessel, a vital source of potable water storage can be lost if the tank tips over and drains out onto the ground. This code requirement currently exists in the building code for equipment weighing 400 lbs or more. A 40 gallon water heater will weigh close to 400 lbs when filled with water.

Cost Impact
The code change proposal will increase the cost of construction .

A restraint strap kit is only about $20 and takes about 15 minutes to install.

Internal ID: 1510

P74-18

IPC: 502.6 (New)

Proponent: Ronald George, representing Self (Ron@Plumb-TechLLC.com)

2018 International Plumbing Code

Add new text as follows:

502.6 Water Heater Replacement. When a water heater is replaced or repaired, all downstream hot water fixtures with temperature limit requirements, required in Chapter 4 of this code, shall be checked to make sure the maximum temperature limit-stops or other temperature limiting devices are properly adjusted to assure the maximum allowable temperature is not exceeded.

Where a downstream fixture has a non-code compliant shower or tub/shower valve, the valve shall be replaced with a code-compliant shower control, or other approved temperature control devices shall be installed to prevent scalding and thermal shock. The water heater thermostat shall not be used as a control for meeting this requirement.

Reason:

Many scald injuries are a result of a water heater replacement or water heater maintenance where the temperature is different upon completion of the work. It is a very important safety issue when a change has been made in the hot water distribution temperature to check all the maximum temperature limit-stop adjustments or temperature limiting devices downstream of the water heating equipment to prevent scalding incidents. Many scalding incidents occur even with code compliant shower valves or tempering valves when the incoming hot water temperature significantly changes to these devices. The American Society of Sanitary Engineering is working on a white paper addressing this issue. The white paper is intended to educate the industry about the issue, however, this code language is needed to mandate the checking and adjusting of the temperatures and allow enforcement of the issue. If this language is passed, an inspector can check fixtures downstream of a water heater after it is installed to assure the temperature limiting devices or temperature limit-stops have been adjusted properly in order to ensure a safe installation.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

There is no material cost associated with this code change. this is simply giving the installer direction and the code official the authority to check for this very important and potentially deadly safety issue.

Internal ID: 1964

P75-18

IPC: 504.7

Proponent: Ronald George, representing Code Study & Development Committee of Southeast Michigan (Ron@Plumb-TechLLC.com)

2018 International Plumbing Code

Revise as follows:

504.7 Required pan. Where a ~~storage tank-type~~ water heater or a hot water storage tank is installed in a location where water leakage ~~from the tank~~ will cause damage, the ~~tank~~ <u>water heater</u> shall be installed in a pan constructed of one of the following:

1. Galvanized steel or aluminum of not less than 0.0236 inch (0.6010 mm) in thickness.
2. Plastic not less than 0.036 inch (0.9 mm) in thickness.
3. Other *approved* materials.

A plastic pan shall not be installed beneath a gas-fired water heater.

> <u>**Exception:** Drain pans shall not be required under tankless water heaters installed under lavatories or sinks in rooms having water impervious floors and where any leaks from the heater would be readily observable.</u>

Reason:

During the last code change cycle, this section was changed to address drain pans for only tank-type water heaters. All water heaters can leak at some point and any water heater that can leak and cause water damage to a building structure should have a drain pan installed. The purpose of this section is to prevent water damage to the building. The code language as it currently is written does not provide protection for water heaters other than tank type heaters. Other types of water heaters, can fail and cause water damage to buildings, but the current code language only addresses tank type heaters. The proponent in the last code cycle tried to make tankless heaters exempt from drain pan and mentioned the intent was to not require drain pans under tankless water heaters in a bathroom. They should have proposed an exception addressing the tankless heaters. As written the section only applies to tank type water heater and does not distinguish a location. Tankless heaters, copper fin tube water heaters, instantaneous heaters, plate & frame heat exchangers and water tube boilers used as water heaters, and shell & tube heat exchangers used as water heaters are all not classified as tank type heaters. These larger style water heaters should have drain pans installed under them if they are installed in an attic or in another areas that could cause damage to the building from a leak. This code change proposal corrects this oversight and adds an exception for tankless heaters in bathrooms.

Cost Impact

The code change proposal will increase the cost of construction .

There will be the added cost and labor for some tankless water heater installations needing a pan (with a pan drain.)

Internal ID: 1109

P76-18

IPC: 202, 601.5

Proponent: Sidney Cavanaugh, representing LMK Technologies (sidneycavanaugh@yahoo.com)

2018 International Plumbing Code

SECTION 202 GENERAL DEFINITIONS

Add new definition as follows:

<u>**PRESSURE PIPING REHABILITATION.**</u> <u>The process of the scouring or cleaning the interior surface of pressure pipe or fittings followed by resurfacing with epoxy or epoxy resin to create a smooth interior service to restore the original performance to the pipes and fittings.</u>

Revise as follows:

601.5 Rehabilitation of <u>pressure</u> piping systems. ~~Where pressure piping systems are rehabilitated using an~~ <u>The</u> epoxy lining system ~~, such lining system~~ <u>for pressure piping rehabilitation</u> shall comply with ASTM F 2831.

Reason:
To add needed definition for rehabilitation as it relates to pressure piping systems to the IPC

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

This is simply a definition to clarify what rehabilitation of pressure piping is. Section 601.5 is only changed to make it agree with the new defined term.

Internal ID: 508

P77-18 Part I

IPC: 602.3.5

Proponent: Jeremy Brown, representing NSF International (brown@nsf.org)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Revise as follows:

602.3.5 Pumps. Pumps shall be rated for the transport of potable water. Pumps in an individual water supply system shall be constructed and installed so as to prevent contamination from entering a potable water supply through the pump units. Pumps <u>intended to supply drinking water shall conform to NSF 61. Pumps </u>shall be sealed to the well casing or covered with a water-tight seal. Pumps shall be designed to maintain a prime and installed such that ready *access* is provided to the pump parts of the entire assembly for repairs.

Internal ID: 145

P77-18 Part II

IRC: P2903.3.1 (New)

Proponent: Jeremy Brown, representing NSF International (brown@nsf.org)

2018 International Residential Code

Add new text as follows:

<u>**P2903.3.1**</u> <u>**Pumps handling drinking water.**</u> <u>Pumps intended to supply drinking water shall conform to NSF 61.</u>

Reason:

The code would be more protective of public health if it required pumps to meet requirements of NSF 61. NSF/ANSI Standard 61 Drinking Water System Components-Health Effects helps to ensure that products/materials will not contribute harmful levels of contaminants to drinking water. The current IPC and IRC already requires conformance to NSF 61 for pipes, fittings, faucets, valves and tanks intended to supply dirnking water. This requirement should also apply to pumps.

Pumps are within the scope of NSF 61 (as are virtually all drinking water system components).

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

Because of the wide variety of NSF 61 certified pumps and most specifications requiring NSF 61 already, this change is not expected to increase the cost of construction.

Internal ID: 3422

P78-18

IPC: 604.1, CHAPTER 15

Proponent: Connor Barbaree, ASHRAE, representing ASHRAE (cbarbaree@ashrae.org)

2018 International Plumbing Code

Revise as follows:

604.1 General. The design of the water distribution system shall be in accordance with ASHRAE 188 and shall conform to *accepted engineering practice*. Methods utilized to determine pipe sizes shall be *approved*.

Add new standard(s) follows:

ASHRAE

ASHRAE
1791 Tullie Circle NE
Atlanta GA 30329

ASHRAE 188-2018:

Legionellosis: Risk Management for Building Water Systems (ANSI/ASHRAE Approved)

Reason:

ASHRAE Standard 188 was developed with the intent of providing code officials and building operators information on how to manage the risk of legionellosis. . ASHRAE Standard 188 was published on June 26, 2015, and is now publicly available as a final, published ANSI Standard. ASHRAE Standard 188 (2018) has been in continuous maintenance, and several addenda have been approved and published, as well as improvements in code compatible language which will be incorporated into the published 2018 standard. There are many design considerations in the ASHRAE standard that will help minimize Legionella bacteria growth in building water systems which can lead to Legionnaires Disease when water droplets are aerosolized from shower heads, and other building water systems and fixtures that aerosolize water droplets. Following the ASHRAE Standard will minimize the risk of a Person contracting Legionnaires' disease.

For more information on the standard, go here: http://www.techstreet.com/ashrae/products/1897561

Bibliography:

www.LegionellaPrevention.org

www.Plumb-TechLLC.com

Cost Impact

The code change proposal will increase the cost of construction .

The cost of construction of the plumbing system to eliminate dead legs and provide other design concepts to address temperature and stagnation is estimated to be about 10 - 15 percent more to comply with this standard, however it will provide for hygienic system designs that will minimize legionella bacteria growth and help prevent Leginnaires Disease. See www.LegionellaPrevention.org.

Analysis: A review of the standard proposed for inclusion in the code, ASHRAE 188-2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 358

P79-18 Part I

IPC: 604.3, TABLE 604.3

Proponent: Donald Surrena, National Association of Home Builders, representing National Association of Home Builders (dsurrena@nahb.org)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Revise as follows:

604.3 Water distribution system design criteria. The water distribution system shall be designed, and ~~pipe sizes shall be selected such that under conditions of~~ sized for peak demand, ~~the capacities at the fixture supply pipe outlets shall be not less than~~ using the values shown in Table 604.3. The minimum flow rate and flow pressure provided to fixtures and appliances not listed in Table 604.3 shall be in accordance with the manufacturer's installation instructions.

TABLE 604.3

FLOW RATES AND PRESSURES FOR DESIGNING WATER DISTRIBUTION ~~SYSTEM DESIGN CRITERIA REQUIRED CAPACITY AT FIXTURE SUPPLY PIPE OUTLETS~~SYSTEMS

FIXTURE SUPPLY OUTLET SERVING	FLOW RATE[a] (gpm)	FLOW PRESSURE (psi)
Bathtub, balanced-pressure, thermostatic or combination balanced-pressure/thermostatic mixing valve	4	20
Bidet, thermostatic mixing valve	2	20
Combination fixture	4	8
Dishwasher, residential	2.75	8
Drinking fountain	0.75	8
Laundry tray	4	8
Lavatory, private	0.8	8
Lavatory, private, mixing valve	0.8	8
Lavatory, public	0.4	8
Shower	2.5	8
Shower, balanced-pressure, thermostatic or combination balanced-pressure/thermostatic mixing valve	2.5[b]	20
Sillcock, hose bibb	5	8
Sink, residential	1.75	8
Sink, service	3	8
Urinal, valve	12	25
Water closet, blow out, flushometer valve	25	45
Water closet, flushometer tank	1.6	20
Water closet, siphonic, flushometer valve	25	35
Water closet, tank, close coupled	3	20
Water closet, tank, one piece	6	20

For SI: 1 pound per square inch = 6.895 kPa, 1 gallon per minute = 3.785 L/m.

a. For additional requirements for flow rates and quantities, see Section 604.4.

b. Where the shower mixing valve manufacturer indicates a lower flow rating for the mixing valve, the lower value shall be applied.

Internal ID: 1351

P79-18 Part II

IRC: P2903.1, TABLE P2903.1

Proponent: Donald Surrena, National Association of Home Builders, representing National Association of Home Builders (dsurrena@nahb.org)

2018 International Residential Code

Revise as follows:

P2903.1 Water supply system design criteria. The water service and water distribution systems shall be designed and ~~pipe sizes shall be selected such that under conditions of~~ sized for peak demand, ~~the capacities at the point of outlet discharge shall be not less than~~ using values shown in Table P2903.1.

TABLE P2903.1
~~REQUIRED CAPACITIES AT POINT OF OUTLET DISCHARGE~~FLOW RATE AND PRESSURES FOR DESIGNING PIPING SYSTEMS

FIXTURE SUPPLY OUTLET SERVING	FLOW RATE (gpm)	FLOW PRESSURE (psi)
Bathtub, balanced-pressure, thermostatic or combination balanced-pressure/thermostatic mixing valve	4	20
Bidet, thermostatic mixing valve	2	20
Dishwasher	2.75	8
Laundry tray	4	8
Lavatory	0.8	8
Shower, balanced-pressure, thermostatic or combination balanced-pressure/thermostatic mixing valve	2.5[a]	20
Sillcock, hose bibb	5	8
Sink	1.75	8
Water closet, flushometer tank	1.6	20
Water closet, tank, close coupled	3	20
Water closet, tank, one-piece	6	20

For SI: 1 pound per square inch = 6.895 kPa, 1 gallon per minute = 3.785 L/m.

a. Where the shower mixing valve manufacturer indicates a lower flow rating for the mixing valve, the lower value shall be applied.

Reason:

The section and the table were intended to be used to set design capacities for the domestic water systems, not for field testing. With the emphasis on low flow fixtures and lower flow rating for mixing valves these numbers are causing confusion and misinterpretation in the field. Looking at the table what would be the health or safety reason for a bathtub to be required to flow at 4 gpm at 20 psi, or a water closet at 6 gpm at 20 psi or even 3 gpm at 20 psi as the table states? Balanced mixing valves are shown as 2.5 gpm at 20 psi or even lower if the manufacturer indicates. How does the inspector regulate the psi from 20 to 8 depending on the fixture being measured? These are all design specifications and not volumes to be measured at the fixture at differing psi.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This is a clarification change that will not impact the cost of construction.

Internal ID: 1344

P80-18

IPC: 604.3.1 (New), Chapter 15

Proponent: Ronald George, Plumb-Tech Design & Consulting Services LLC, representing Self (Ron@Plumb-TechLLC.com)

2018 International Plumbing Code

Add new text as follows:

604.3.1 **System design for building water safety.** Design of water distribution systems shall comply with Chapters 1 through 8 of ASHRAE 188.

Add new standard(s) follows:

ASHRAE

ASHRAE
1791 Tullie Circle NE
Atlanta GA 30329

188-2015:

Legionellosis: Risk Management for Building Water Systems.

Reason:
Since the last code cycle, ASHRAE completed standard 188 titled: Legionellosis: Risk Management for Building Water Systems. Chapter 8 covers items that need to be considered during the design stage of a domestic water system. This is especially important since the water flow from plumbing fixtures have been reduced to about 20% of the flows prior to the 1992 Energy Policy Act which established maximum flow rates for plumbing fixtures. These lower flow rates are allowing "Aging Water" which is allowing water treatment chemicals (like Chlorine, Monochlorine, etc.) to dissipate to levels that are not capable of controlling bacteria growth in buildings. As other water conservation programs are enacted to further reduce flow rates, there are more and more reported cases of Legionellosis or Legionnaires' disease. This code change includes design considerations to control the risk of Legionella bacteria growth.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

This proposal only offers direction to designers on how to better organize piping systems that are already required. Better piping organization doesn't cause any more or less cost for materials or labor.

Analysis: A review of the standard proposed for inclusion in the code, ASHRAE 188-2015, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 2081

P81-18

IPC: TABLE 604.4

Proponent: Anthony Floyd, City of Scottsdale, representing City of Scottsdale (afloyd@scottsdaleaz.gov)

2018 International Plumbing Code

Revise as follows:

TABLE 604.4
MAXIMUM FLOW RATES AND CONSUMPTION FOR PLUMBING FIXTURES AND FIXTURE FITTINGS

PLUMBING FIXTURE OR FIXTURE FITTING	MAXIMUM FLOW RATE OR QUANTITY[b]
Lavatory, private	2.2 gpm at 60 psi
Lavatory, public (metering)	0.25 gallon per metering cycle
Lavatory, public (other than metering)	0.5 gpm at 60 psi
Shower head[a]	2.5 gpm at 80 psi
Sink faucet	2.2 gpm at 60 psi
Urinal	~~1.0~~ 0.5 gallon per flushing cycle
Water closet	1.6 gallons per flushing cycle

For SI: 1 gallon = 3.785 L, 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.

a. A hand-held shower spray is a shower head.

b. Consumption tolerances shall be determined from referenced standards.

Reason:

Urinals account for a significant portion of indoor water usage in commercial and institutional settings. Manufacturers have responded with superior and better-performing urinals having a maximum flush rate of 0.5 gallons, without sacrificing performance.

All water flushing urinals produce calcite build-up in the urinal trapway and drain pipes caused by the bonding of the mineral ions in the flushing water with the sediment in urine. As such, build-up occurs in all water flushing urinals from 1.0 gpf down to 0.1 gpf and is not any greater for 0.5 gpf urinals.

Based on WaterSense product listings from January 2018, there are 160 models of flushing urinals from 20 brands and 239 models of urinal valves from 20 brands that meet the 0.5 gpf criterion, demonstrating widespread availability and commercial viability of more efficient urinals.

Bibliography:

EPA WaterSense - https://www.epa.gov/watersense/urinals

Considerations for Reduced Water Consumption Rates of Urinal Fixtures (Sloan Valve) - https://www.sloan.com/sites/default/files/2016-01/hybrid-urinal-whitepaper.pdf

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

There is no appreciable cost difference between urinal flush valves at 0.5gpf and 1.0 gpf .

Internal ID: 1530

P82-18 Part I

IPC: TABLE 604.4

Proponent: Anthony Floyd, City of Scottsdale, representing City of Scottsdale (afloyd@scottsdaleaz.gov)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Revise as follows:

TABLE 604.4
MAXIMUM FLOW RATES AND CONSUMPTION FOR PLUMBING FIXTURES AND FIXTURE FITTINGS

PLUMBING FIXTURE OR FIXTURE FITTING	MAXIMUM FLOW RATE OR QUANTITY[b]
Lavatory, private	2.2 gpm at 60 psi
Lavatory, public (metering)	0.25 gallon per metering cycle
Lavatory, public (other than metering)	0.5 gpm at 60 psi
Shower head[a,c]	2.5 gpm at 80 psi
Sink faucet	2.2 gpm at 60 psi
Urinal	1.0 gallon per flushing cycle
Water closet	1.6 gallons per flushing cycle

For SI: 1 gallon = 3.785 L, 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.

a. A hand-held shower spray is a shower head.

b. Consumption tolerances shall be determined from referenced standards.

c. Where a shower compartment is served by multiple shower heads, the concurrent discharge of all shower heads controlled by a single valve shall not exceed the maximum flow rate.

Internal ID: 556

P82-18 Part II

IRC: TABLE P2903.2

Proponent: Anthony Floyd, City of Scottsdale, representing City of Scottsdale (afloyd@scottsdaleaz.gov)

2018 International Residential Code

Revise as follows:

TABLE P2903.2
MAXIMUM FLOW RATES AND CONSUMPTION FOR PLUMBING FIXTURES AND FIXTURE FITTINGS[b]

PLUMBING FIXTURE OR FIXTURE FITTING	MAXIMUM FLOW RATE OR QUANTITY
Lavatory faucet	2.2 gpm at 60 psi
Shower head[a,c]	2.5 gpm at 80 psi
Sink faucet	2.2 gpm at 60 psi
Water closet	1.6 gallons per flushing cycle

For SI: 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.

a. A handheld shower spray shall be considered to be a shower head.

b. Consumption tolerances shall be determined from referenced standards.

c. Where a shower compartment is served by multiple shower heads, the concurrent discharge of all shower heads controlled by a single valve shall not exceed the maximum flow rate.

Reason:

This code change limits the combined shower head flow rate to 2.5 gpm where multiple heads are installed unless the shower is designed to allow only one shower head to operate at a time.

Multiple shower heads were not common when EPAct was enacted 25 years ago to limit the flow rate of shower heads. Since then, shower compartments have trended towards multiple shower heads and body sprays.

This code change ensures that where a shower compartment is served by multiple shower heads, the maximum flow rate is 1) controlled by a single valve for each shower head, 2) designed to allow only one shower head to be in operation at a time or 3) controlled by a single valve for the combined flow rate of multiple heads not exceeding the maximum flow rate.

Shower compartments with multiple showering stations are typically provided with a separate valve for each shower head. Shared shower compartments with separate valve controls are common features and meet the intent of this code change.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The code change is based on the shower compartment design and number of installed shower heads. It does not require any additional fixtures or valves to be installed.

Internal ID: 553

P83-18

IPC: TABLE 605.3, Chapter 15

Proponent: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2018 International Plumbing Code

Revise as follows:

TABLE 605.3
WATER SERVICE PIPE

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic pipe	ASTM D1527; ASTM D2282
Chlorinated polyvinyl chloride (CPVC) plastic pipe	ASTM D2846; ASTM F441; ASTM F442; CSA B137.6
Chlorinated polyvinyl chloride/aluminum/chlorinated polyvinyl chloride (CPVC/AL/CPVC)	ASTM F2855
Copper or copper-alloy pipe	ASTM B42; ASTM B302
Copper or copper-alloy tubing (Type K, WK, L, WL, M or WM)	ASTM B75; ASTM B88; ASTM B251; ASTM B447
Cross-linked polyethylene (PEX) plastic pipe and tubing	ASTM F876; AWWA C904; CSA B137.5
Cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) pipe	ASTM F1281; ASTM F2262; CSA B137.10
Cross-linked polyethylene/aluminum/high-density polyethylene (PEX-AL-HDPE)	ASTM F1986
Ductile iron water pipe	AWWA C151/A21.51; AWWA C115/A21.15
Galvanized steel pipe	ASTM A53
Polyethylene (PE) plastic pipe	ASTM D2239; ASTM D3035; AWWA C901; CSA B137.11
Polyethylene (PE) plastic tubing	ASTM D2737; AWWA C901; CSA B137.1
Polyethylene/aluminum/polethylene (PE-AL-PE) pipe	ASTM F1282; CSA B137.9
Polyethylene of raised temperature (PE-RT) plastic tubing	ASTM F2769; CSA B137.18
Polypropylene (PP) plastic pipe or tubing	ASTM F2389; CSA B137.11
Polyvinyl chloride (PVC) plastic pipe	ASTM D 1785; ASTM D2241; ASTM D2672; CSA B137.3
Stainless steel pipe (Type 304/304L)	<u>ASTM A269,</u> ASTM A312; ASTM A778
Stainless steel pipe (Type 316/316L)	<u>ASTM A269,</u> ASTM A312; ASTM A778

Add new standard(s) follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959
US

<u>A269/A269M-15a</u>:

<u>Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General</u>

Reason:

Adding another standard for stainless steel piping into the code increases flexibility in choices of piping.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal is a clarification of existing requirements. No new materials or labor are required by this proposal thus, there is not a cost increase.

Analysis: A review of the standard proposed for inclusion in the code, ASTM A269 / A269M - 15a, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 506

P84-18

IPC: TABLE 605.3

Proponent: Pennie L Feehan, Copper Development Association, representing Copper Development Association (penniefeehan@me.com)

2018 International Plumbing Code

Revise as follows:

TABLE 605.3
WATER SERVICE PIPE

	MATERIAL	STANDARD
	Acrylonitrile butadiene styrene (ABS) plastic pipe	ASTM D1527; ASTM D2282
	Chlorinated polyvinyl chloride (CPVC) plastic pipe	ASTM D2846; ASTM F441; ASTM F442; CSA B137.6
	Chlorinated polyvinyl chloride/aluminum/chlorinated polyvinyl chloride (CPVC/AL/CPVC)	ASTM F2855
	Copper or copper-alloy pipe	ASTM B42; <u>ASTM B43,</u> ASTM B302,
	Copper or copper-alloy tubing (Type K, WK, L, WL, M or WM)	ASTM B75; ASTM B88; ASTM B251; ASTM B447
	Cross-linked polyethylene (PEX) plastic pipe and tubing	ASTM F876; AWWA C904; CSA B137.5
	Cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) pipe	ASTM F1281; ASTM F2262; CSA B137.10
	Cross-linked polyethylene/aluminum/high-density polyethylene (PEX-AL-HDPE)	ASTM F1986
	Ductile iron water pipe	AWWA C151/A21.51; AWWA C115/A21.15
	Galvanized steel pipe	ASTM A53
	Polyethylene (PE) plastic pipe	ASTM D2239; ASTM D3035; AWWA C901; CSA B137.11
	Polyethylene (PE) plastic tubing	ASTM D2737; AWWA C901; CSA B137.1
	Polyethylene/aluminum/polethylene (PE-AL-PE) pipe	ASTM F1282; CSA B137.9
	Polyethylene of raised temperature (PE-RT) plastic tubing	ASTM F2769; CSA B137.18
	Polypropylene (PP) plastic pipe or tubing	ASTM F2389; CSA B137.11
	Polyvinyl chloride (PVC) plastic pipe	ASTM D 1785; ASTM D2241; ASTM D2672; CSA B137.3
	Stainless steel pipe (Type 304/304L)	ASTM A312; ASTM A778
	Stainless steel pipe (Type 316/316L)	ASTM A312; ASTM A778

Reason:
When combining copper and copper alloy sections, this Standard ASTM B43 was accidentally removed from IPC Water Service Pipe Table 605.3. It is in IPC Water Distribution Pipe Table 605.4. It is also in the IRC Water Service Pipe Table 2906.4 and Water Distribution Pipe Table 2906.5. The IRC and the IPC need to correlate.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

Only adding a standard reference to the table to clarify the code.

Internal ID: 450

P85-18

IPC: TABLE 605.4

Proponent: Ronald George, Plumb-Tech Design & Consulting Services LLC, representing Code Study & Development Committee of Southeast Michigan (Ron@Plumb-TechLLC.com)

2018 International Plumbing Code

Revise as follows:

TABLE 605.4
WATER DISTRIBUTION PIPE

	MATERIAL	STANDARD
	Chlorinated polyvinyl chloride (CPVC) plastic pipe and tubing	ASTM D2846; ASTM F441; ASTM F442; CSA B137.6
	Chlorinated polyvinyl chloride/aluminum/chlorinated polyvinyl chloride (CPVC/AL/CPVC)	ASTM F2855
	Copper or copper-alloy pipe	ASTM B42; ASTM B302; ASTM B43
	Copper or copper-alloy tubing (Type K, WK, L, WL, M or WM)	ASTM B75; ASTM B88; ASTM B251; ASTM B447
	Cross-linked polyethylene (PEX) plastic tubing	ASTM F876; CSA B137.5
	Cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) pipe	ASTM F1281; ASTM F2262; CSA B137.10
	Cross-linked polyethylene/aluminum/high-density polyethylene (PEX-AL-HDPE)	ASTM F1986
	Ductile iron pipe	AWWA C151/A21.51; AWWA C115/A21.15
	~~Galvanized steel pipe~~	~~ASTM A53~~
	Polyethylene/aluminum/polyethylene (PE-AL-PE) composite pipe	ASTM F1282
	Polyethylene of raised temperature (PE-RT) plastic tubing	ASTM F2769; CSA B137.158
	Polypropylene (PP) plastic pipe or tubing	ASTM F2389; CSA B137.11
	Stainless steel pipe (Type 304/304L)	ASTM A312; ASTM A778
	Stainless steel pipe (Type 316/316L)	ASTM A312; ASTM A778

Reason:
Galvanized piping corrodes and causes water quality issues when it is installed in a potable water system. Galvanized piping also provides a rough surface for biofilm to cling to and flourish. This proposal is to remove galvanized piping as a pipe material for potable water systems. I can still be used in process water and non-potable water systems.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

This proposed changes will reduce the life cycle cost of the system because a system installed with galvanized pipe will need to be replaced after about 15 years or so, which is much shorter than the life expectancy for a typical building.

Internal ID: 2152

P86-18

IPC: TABLE 605.5, Chapter 15

Proponent: Mark Fasel, representing Viega LLC (mark.fasel@viega.us)

2018 International Plumbing Code

Revise as follows:

TABLE 605.5
PIPE FITTINGS

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic	ASTM D2468
Cast iron	ASME B16.4
Chlorinated polyvinyl chloride (CPVC) plastic	ASSE 1061; ASTM D2846; ASTM F437; ASTM F 438; ASTM F439; CSA B137.6
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.26; ASME B16.51; ASSE 1061; ASTM F1476; ASTM F1548; ASTM F3226
Cross-linked polyethylene/aluminum/high-density polyethylene (PEX-AL-HDPE)	ASTM F1986
Fittings for cross-linked polyethylene (PEX) plastic tubing	ASSE 1061, ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2098, ASTM F2159; ASTM F2434; ASTM F2735; CSA B137.5
Fittings for polyethylene of raised temperature (PE-RT) plastic tubing	ASSE 1061, ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.18
Gray iron and ductile iron	ASTM F1476; ASTM F1548; AWWA C110/A21.10; AWWA C153/A21.53;
Insert fittings for polyethylene/aluminum/polyethylene (PE-AL-PE) and cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX)	ASTM F1974; ASTM F1281; ASTM F1282; CSA B137.9; CSA B137.10
Malleable iron	ASME B16.3
Metal (brass) insert fittings for polyethylene/aluminum/polyethylene (PE-AL-PE) and cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX)	ASTM F1974
Polyethylene (PE) plastic pipe	ASTM D2609; ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1
Polypropylene (PP) plastic pipe or tubing	ASTM F2389; CSA B137.11
Polyvinyl chloride (PVC) plastic	ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3
Stainless steel (Type 304/304L)	ASTM A312; ASTM A778; ASTM F1476; ASTM F1548; ASTM F3226

Stainless steel (Type 316/316L)	ASTM A312; ASTM A778; ASTM F1476; ASTM F1548; ASTM F3226
Steel	ASME B16.9; ASME B16.11; ASME B16.28; ASTM F1476; ASTM F1548

Add new standard(s) follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

F3226/F3226M-16:

Standard Specification for Metallic Press-Connect Fittings for Piping and Tubing

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Reason:
ASTM F3226-16 Standard Specification for Metallic Press-Connect Fittings for Piping and Tubing Systems is now published and includes Carbon Steel, Stainless Steel, Copper and Copper-Alloy material grades. By including this standard will provide a reference standard for Stainless Steel Press-Connect Fittings and provide an additional Press-connect standard for Copper and copper alloy fittings.

Bibliography:

ASTM F3226 Standard Specifiation for Metallic Press-Connect Fittings for Piping and Tubing Systems

ASTM International

2016 edition

www.astm.org

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

This standard is not the only standard that the pipe fittings can meet in accordance with the Pipe Fittings Table, this is just an alternative standard that some manufacturer's have tested their products to and would like to see recognized as an acceptable standard for pipe fittings. Testing to this standard is optional and no existing standards have been removed or replaced by the proposed addition of this standard.

Analysis: A review of the standard proposed for inclusion in the code, ASTM F3226/F3226M-16, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 744

P87-18 Part I

IPC: TABLE 605.5, Chapter 15

Proponent: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Revise as follows:

TABLE 605.5
PIPE FITTINGS

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic	ASTM D2468
Cast iron	ASME B16.4
Chlorinated polyvinyl chloride (CPVC) plastic	ASSE 1061; ASTM D2846; ASTM F437; ASTM F 438; ASTM F439; CSA B137.6
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.26; ASME B16.51; ASSE 1061; ASTM F1476; ASTM F1548; ASTM F3226
Cross-linked polyethylene/aluminum/high-density polyethylene (PEX-AL-HDPE)	ASTM F1986
Fittings for cross-linked polyethylene (PEX) plastic tubing	ASSE 1061, ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2098, ASTM F2159; ASTM F2434; ASTM F2735; CSA B137.5
Fittings for polyethylene of raised temperature (PE-RT) plastic tubing	ASSE 1061, ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.18
Gray iron and ductile iron	ASTM F1476; ASTM F1548; AWWA C110/A21.10; AWWA C153/A21.53;
Insert fittings for polyethylene/aluminum/polyethylene (PE-AL-PE) and cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX)	ASTM F1974; ASTM F1281; ASTM F1282; CSA B137.9; CSA B137.10
Malleable iron	ASME B16.3
Metal (brass) insert fittings for polyethylene/aluminum/polyethylene (PE-AL-PE) and cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX)	ASTM F1974
Polyethylene (PE) plastic pipe	ASTM D2609; ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1
Polypropylene (PP) plastic pipe or tubing	ASTM F2389; CSA B137.11
Polyvinyl chloride (PVC) plastic	ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3
Stainless steel (Type 304/304L)	ASTM A312; ASTM A778; ASTM F1476; ASTM F1548
Stainless steel (Type 316/316L)	ASTM A312;

Stainless steel (Type 316, 316L)	ASTM A312; ASTM A778; ASTM F1476; ASTM F1548
Steel	ASME B16.9; ASME B16.11; ASME B16.28; ASTM F1476; ASTM F1548

Add new standard(s) follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

F3226/F3226M—16e1:

Standard Specification for Metallic Press-Connect Fittings for Piping and Tubing Systems

Analysis: A review of the standard proposed for inclusion in the code, F3226/F3226M—16e1, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 517

P87-18 Part II

IRC: T ABLE P2906.6, Chapter 44

Proponent: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2018 International Residential Code

Revise as follows:

TABLE P2906.6
PIPE FITTINGS

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic	ASTM D2468
Cast-iron	ASME B16.4
Chlorinated polyvinyl chloride (CPVC) plastic	ASSE 1061; ASTM D2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.26; ASME B16.51; ASSE 1061; ASTM F3226
Cross-linked polyethylene/aluminum/high-density polyethylene (PEX-AL-HDPE)	ASTM F1986
Fittings for cross-linked polyethylene (PEX) plastic tubing	ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2098; ASTM F2159; ASTM F2434; ASTM F2735; CSA B137.5
Gray iron and ductile iron	AWWA C110/A21.10; AWWA C153/A21.53
Malleable iron	ASME B16.3
Insert fittings for Polyethylene/aluminum/polyethylene (PE-AL-PE) and cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX)	ASTM F1281; ASTM F1282; ASTM F1974; CSA B137.9; CSA B137.10
Polyethylene (PE) plastic	ASTM D 2609; CSA B137.1
Fittings for polyethylene of raised temperature (PE-RT) plastic tubing	ASSE 1061; ASTM D2683; ASTM D3261; ASTM F1055; ASTM F1807; ASTM F2098; ASTM F 2159; ASTM F2735; ASTM F2769; CSA B137.18
Polypropylene (PP) plastic pipe or tubing	ASTM F2389; CSA B137.11
Polyvinyl chloride (PVC) plastic	ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3
Stainless steel (Type 30^{4}/$_{30}$4L) pipe	ASTM A312; ASTM A778
Stainless steel (Type 31^{6}/$_{31}$6L) pipe	ASTM A312; ASTM A778
Steel	ASME B16.9; ASME B16.11; ASME B16.28

Add new standard(s) follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box
C700
West Conshohocken PA

F3226 F3226/F3226M—16e1:

Standard Specification for Metallic Press-Connect Fittings for Piping and Tubing Systems

Reason:
Press-connect joint fittings now have an ASTM standard that needs to be included in the code.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

Press-connect joints are not required to be used-it is a designer or installer decision. No new materials or labor are required by this proposal thus, there is not a cost increase.

Analysis: A review of the standard proposed for inclusion in the code, ASTM F3226/F3226M-16e1, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 3430

P88-18 Part I

IPC: 605.12.3, 605.13.6

Proponent: Jeremy Brown, representing NSF International (brown@nsf.org)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Revise as follows:

605.12.3 Solder joints. Solder joints shall be made in accordance with ASTM B828. Cut tube ends shall be reamed to the full inside diameter of the tube end. Joint surfaces shall be cleaned. A flux conforming to ASTM B813 shall be applied. The joint shall be soldered with a solder conforming to ASTM B32. The joining of water supply piping shall be made with *lead-free solder and fluxes*. "Lead free" shall mean a chemical composition equal to or less than 0.2-percent lead. <u>Solder and flux joining pipe or fittings intended to supply drinking water shall conform to NSF 61.</u>

605.13.6 Solder joints. Solder joints shall be made in accordance with the methods of ASTM B828. Cut tube ends shall be reamed to the full inside diameter of the tube end. Joint surfaces shall be cleaned. A flux conforming to ASTM B813 shall be applied. The joint shall be soldered with a solder conforming to ASTM B32. The joining of water supply piping shall be made with *lead-free solder and flux*. "Lead free" shall mean a chemical composition equal to or less than 0.2-percent lead. <u>Solder and flux joining pipe or fittings intended to supply drinking water shall conform to NSF 61.</u>

Internal ID: 1232

P88-18 Part II

IRC: P2906.15

Proponent: Jeremy Brown, representing NSF International (brown@nsf.org)

2018 International Residential Code

Revise as follows:

P2906.15 Soldered and brazed joints. Soldered joints in copper and copper alloy tubing shall be made with fittings *approved* for water piping and shall conform to ASTM B828. Surfaces to be soldered shall be cleaned bright. Fluxes for soldering shall be in accordance with ASTM B813. Brazing fluxes shall be in accordance with AWS A5.31M/A5.31. Solders and fluxes used in potable water-supply systems shall have a lead content of not greater than 0.2 percent. <u>Solder and flux joining pipe or fittings intended to supply drinking water shall conform to NSF 61.</u>

Reason:
NSF/ANSI Standard 61 Drinking Water System Components-Health Effects helps to ensure that products/materials will not contribute harmful levels of contaminants to drinking water. The current IPC and IRC already requires conformance to NSF 61 for pipes, fittings, faucets, valves and tanks intended to supply dirnking water. This requirement should also apply to solders and flux. The current requirements in this section address lead content only but do not address the potential for other chemical contaminants as NSF 61 does. The code would be more protective of public health if it required NSF 61.

Anyone wanting a copy of the standard for the purpose of reviewing this proposal may request a copy from brown@nsf.org.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

Because there are many products on the market meeting this requirement, this is not expected to increase the cost of construction.

Internal ID: 3420

P89-18 Part I

IPC: 202, 605.13.7

Proponent: William Chapin, Professional Code Consulting, LLC, representing Professional Code Consulting, LLC (bill@profcc.us)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Add new definition as follows:

SECTION 202 GENERAL DEFINITIONS

<u>PUSH-FIT FITTING</u>

<u>A mechanical fitting that joins pipes or tubes and achieves a seal by mating the pipe or tube into the fitting.</u>

Revise as follows:

605.13.7 Push-fit <u>fitting</u> joints. Push-fit <u>fitting</u> joints shall conform to ASSE 1061 and shall be installed in accordance with the manufacturer's instructions.

Internal ID: 2220

P89-18 Part II

IRC: R202, P2906.21

Proponent: William Chapin, Professional Code Consulting, LLC, representing Professional Code Consulting, LLC (bill@profcc.us)

2018 International Residential Code

Revise as follows:

P2906.21 Push-fit <u>fitting</u> joints. Push-fit <u>fitting</u> joints shall be used only on copper-tube-size outside diameter dimensioned CPVC, PEX and copper tubing. Push-fit joints shall conform to ASSE 1061 and shall be installed in accordance with the manufacturer's instructions.

Add new definition as follows:

SECTION R202 DEFINITIONS

<u>PUSH-FIT FITTING</u>

<u>A mechanical fitting that joins pipes or tubes and achieves a seal by mating the pipe or tube into the fitting.</u>

Reason:
Adding the definition from the ASSE 1061 standard for Push-fit fittings.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

Adding a definition does not affect the cost of construction.

Internal ID: 3438

P90-18

IPC: 605.23.1

Proponent: David Runnels, representing Select Ventures LLC (drunnels@selectventures.com)

2018 International Plumbing Code

Revise as follows:

605.23.1 Copper or copper-alloy tubing to ~~galvanized steel pipe.~~steel. Joints between copper pipe or tubing and ~~galvanized~~ steel pipe, steel fittings or steel appliance connections shall be made with a copper-alloy or dielectric fitting or a dielectric union conforming to ASSE 1079. The copper tubing shall be soldered to the fitting in an *approved* manner, and the fitting shall be screwed to the threaded ~~pipe~~steel connection.

Reason:

This section as written requires the isolation of copper pipe from iron pipe. Without the isolation, electrolytic action will destroy the copper pipe and deposit copper inside the iron.

However, all of this will also occur if the copper pipe is in contact with ANYTHING iron - it need not be a pipe.

For this reason I am suggesting that the word "pipe" is supplemented to also include iron fittings and iron pumps and other appliances.

Furthermore, I am suggesting removal of the word "galvanized" from the section title and from the text of the section. The meaning is more clear, and the presence or absence of galvanizing is immaterial.

In our area (Tulsa, Oklahoma) we have a number of houses which were built in the early 1990s with copper water pipes under the floor slab. Those copper pipes on the hot water side are connected to an iron re-circulating pump and an (iron) water heater. The result is that the copper pipe deteriorates and leaks and the copper is deposited within the water heater. Ultimately, it is necessary to remove the slab and replace the pipe. Eventually it is also necessary to replace the water heater. In my house, we went through this entire process five times before I figured out the nature of the problem. The plumber never did notice.

Note that in these cases there is no iron pipe and nothing is galvanized. Technically our installation complies with the code!

Cost Impact

The code change proposal will increase the cost of construction .

This change will add to the construction cost the cost of one fitting (< $10).

However, this change will reduce the cost of later repairs by approximately $100,000.

Internal ID: 1929

P91-18

IPC: 606.1

Proponent: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2018 International Plumbing Code

Revise as follows:

606.1 Location of full-open valves. Full-open valves shall be installed in the following locations:

1. On the building water service pipe from the public water supply near the curb.
2. On the water distribution supply pipe at the entrance into the structure.
   2.1 In multiple tenant buildings, where a common water supply piping system is installed to supply other than one and two family dwellings, a main shutoff valve shall be provided for each tenant.
3. On the discharge side of every water meter.
4. On the base of every water riser pipe in occupancies other than multiple-family residential occupancies that are two stories or less in height and in one- and two-family residential occupancies.
5. On the top of every water down-feed pipe in occupancies other than one- and two-family residential occupancies.
6. On the entrance to every water supply pipe to a dwelling unit, except where supplying a single fixture equipped with individual stops.
7. On the water supply pipe to a gravity or pressurized water tank.
8. On the water supply pipe to every water heater.

Reason:
It is a needless inconvenience to have to shut down an entire building when tenants need to work on their own water piping or in the case of emergencies. For the minimal cost of a valve, it makes sense to isolate tenant spaces just as what is done for gas piping. Opening the system causes air in pipes in other units that they might not be aware of and possibly causing a water hammer situation that can have a negative effect on the piping.

Cost Impact
The code change proposal will increase the cost of construction .

The increase will be the cost of the valve and the labor to install it.

Internal ID: 118

P92-18

IPC: 606.5 (New), 606.5.1 (New)

Proponent: Richard Houle, Reliance Worldwide Corporation, representing Reliance Worldwide Corporation (rich.houle@rwc.com)

2018 International Plumbing Code

Add new text as follows:

606.5 **Leak detection devices.** A leak detection device shall be installed after the main water shut off valve and after the pressure reducing valve, where installed. The leak detection device shall be capable of measuring water flow down to 0.25 gpm. All water contact components shall be third party certified for compliance with NSF 61 and NSF 372. Where the device includes an automatic flow control valve, the valve shall comply with one of the standards indicated in Table 605.7. The leak detection system shall include an integrated automatic notification system for alerting users of potential leaks.

606.5.1 **Automatic valves in fire suppression systems.** Where a fire suppression system is installed, the automatic flow control valve shall be installed after the branch to the fire suppression system. Where a multi-purpose fire suppression system is installed, an automatic flow control valve shall not be installed.

Reason:
Water leaks in homes account for a significant amount of wasted water, whether it is from a leaking toilet, dripping faucet or a breach in the plumbing system. Water damages in homes is the number 1 cause of insurance claims. A leak in a home, whether caused from a nail penetrating one of the water distribution pipes or a leaking toilet can be the source of significant damage in a home requiring mold remediation, and significant repairs to a home. By detecting potential leaks early, not only can damage be minimized but also save a significant amount of one of our most precious resources. This device can also save significant water damage when installed during construction. Breaches to the plumbing system can be identified the minute a breach is made during the construction process. A new home can be turned over to the new owners with proof that the plumbing system has not been compromised during construction.

Cost Impact
The code change proposal will increase the cost of construction .

This proposal will increase the cost of construction $200 - - $1500 per unit depending on the system installed. There are several different manufacturer's of this type of system. The added cost of construction is outweighed by the benefits of this type of device. Early detection saves water and significant water damage.

Internal ID: 1507

P93-18

IPC: 606.7

Proponent: Michael Cudahy, representing Plastic Pipe and Fittings Association (mikec@cmservices.com)

2018 International Plumbing Code

Delete without substitution:

~~**606.7 Labeling of water distribution pipes in bundles.** Where water distribution piping is bundled at installation, each pipe in the bundle shall be identified using stenciling or commercially available pipe labels. The identification shall indicate the pipe contents and the direction of flow in the pipe. The interval of the identification markings on the pipe shall not exceed 25 feet (7620 mm). There shall be not less than one identification label on each pipe in each room, space or story.~~

Reason:

Current text is an unnecessary mandatory practice for flexible piping system, not required for any other piping system. The piping is all water distribution piping, so why mark it so? Marking the direction of flow is also unnecessary. The stencilling is not described and the interval seems arbitrary.

Cost Impact

The code change proposal will decrease the cost of construction .

Where labeling had to be field applied, there will be a minor decrease in label materials and the labor to apply.

Internal ID: 948

P94-18

IPC: 607.1

Proponent: Duane Jonlin, representing City of Seattle (duane.jonlin@seattle.gov)

2018 International Plumbing Code

Revise as follows:

607.1 Where required. In residential *occupancies*, *hot water* shall be supplied to plumbing fixtures and equipment utilized for bathing, washing, culinary purposes, cleansing, laundry or building maintenance. In nonresidential *occupancies*, *hot water* shall be supplied for culinary purposes, cleansing, laundry or building maintenance purposes. In nonresidential *occupancies*, *hot water* or *tempered water* shall be supplied for bathing and washing purposes.

Exception: Where the water serving public lavatories that are not served by separate hot and cold water pipes is not heated, or is heated with a water heating system that is not capable of heating the water to a temperature above 80° F, this section shall not apply.

Reason:
Use of 120-degree water for handwashing increases the risk of disease transmission, as well as wasting energy and increasing the cost and complexity of construction. Room temperature water provides equal handwashing hygiene, while not supporting the growth of legionella. This proposal makes hot water optional for lavatories, and provides significant cost savings: the hot water piping, circulation pumps, pipe insulation, tempering valves, mixing valves and numerous other components would become unnecessary, and little if any water heating would be required. Operational savings and risk reduction persist for the life of the building, with dramatically decreased energy, maintenance, and equipment replacement costs, and no growth of legionella.

Owners can still provide hot water for handwashing, but this proposal allows those concerned with cost, safety and disease control to opt out if they so choose.

Bibliography:

Show Me the Science - How to Wash Your Hands, Centers for Disease Control and Prevention (2017), page 1, www.cdc.gov/handwashing/show-me-the-science-handwashing.html

The environmental cost of misinformation: why the recommendation to use elevated temperatures for handwashing is problematic, International Journal of Consumer Studies, Carrico, Amanda R., et al. (2013) page 2.

Cool Water as Effective as Hot for Removing Germs During Handwashing, Infection Control Today (2017) page 1

Water temperature as a factor in handwashing efficacy, Food Service Technology, Michaels, B, et al, (2002) pages 139-149

Cost Impact
The code change proposal will decrease the cost of construction .

This proposal makes hot water for lavatories optional.

For those who choose to provide hot water for lavatories, there is no cost change.

For those who choose not to provide hot water for lavatories, there are significant cost savings in materials, labor and space usage, due to the elimination of an entire system serving those lavatories. In addition, operational savings for energy, maintenance and equipment replacement are dramatically reduced and in some cases eliminated for the building's water heating and distribution system.

Internal ID: 1183

P95-18

IPC: 607.1

Proponent: Tim Keane, representing self (timke@verizon.net)

2018 International Plumbing Code

Revise as follows:

607.1 Where required. In residential and nonresidential *occupancies*, *hot water* or tempered water shall be supplied to plumbing fixtures and equipment utilized for bathing, washing, culinary purposes, cleansing, laundry or building maintenance. ~~In nonresidential *occupancies*, *hot water* shall be supplied for culinary purposes, cleansing, laundry or building maintenance purposes. In nonresidential *occupancies*, *hot water* or *tempered water* shall be supplied for bathing and washing purposes.~~

Reason:

The purpose of this code change proposal is to simplify the code by recognizing that all purposes for using heated water need the same temperatures in residential and nonresidential occupancies.

What follows is the reason statement that supports several change proposals. There is one reason statement for these proposals because the topics are interrelated and a comprehensive discussion is most likely to result in the best outcome for protecting the public's health and safety

Health and safety for public hand washing needs to include 1) scald prevention, 2) hand washing efficacy and 3) minimizing the risk of pathogen growth in the building's water distribution system.

We do not want the temperature of the water at public sinks to be too hot. We want the temperature of the water to be comfortable for the users of public sinks so that people will scrub their hands long enough to get them clean. We want to reduce the likelihood that pathogens will grow in the water distribution system. And, we would like to accomplish all of these health and safety functions in the most cost effective and sustainable manner possible.

At present, we believe that there are a few provisions in the IPC that inadvertently create a public health risk. Changing the temperature limits in this definition is one part of resolving this problem.

When the provisions in the current definitions and the related sections were first codified, Legionella was not a significant concern to public health; many items known today were unknown then. Now Legionella in building water systems has become a major concern for public health with the incidence of Legionnaires' disease growing by 500% from 0.4 cases per 100,000 people in 2000 to 2.0 cases per 100,000 people in 2015.[1]

At the time these same provisions were codified, it used be thought that warm water was necessary for effective hand cleaning to control the spread of germs (bacteria). Science has since proven that the temperature of the water used for handwashing does not impact the efficacy of removing bacteria at all.[2, 3, 4] While each of these three papers are very clear the CDC sums it up best with "The temperature of the water does not appear to affect microbe removal; however, warmer water may cause more skin irritation and is more environmentally costly"[4] The most important variables for removing bacteria from ones hands are scrubbing and the use of soap. Neither of these criteria is within the purview of a building code.

When scald prevention was discussed as part of codifying these same provisions, the unintended consequences of lower water temperature on waterborne pathogen growth was not known. Accordingly temperature of 140°F originally proposed for scald control in home hot water heaters was lowered to 130°F and finally a recommendation of 120°F was made because if 140°F was OK it was thought that adding a huge safety margin would only be better, we now know that huge safety margin had serious and significant unintended consequences. A temperature of 120°F is considered an abundantly safe scald limit. However, setting water heaters this low results in much of the hot water distribution system being at temperatures that ideal for growing pathogens.

Since 1998 OSHA guidelines have stated that hot water should be stored at 140F and delivered at a temperature greater than 120F. In 2009, the CDC published a study documenting scalding cases resulting in hospital visits by the elderly from 2001-2006. The elderly are the highest risk population for Legionnaires' disease and one of the highest risk for scalding. They found that more than 80% of the scalding cases were due to cooking activities in the kitchen. Less than 3% (220 out of 8,620 cases) were plumbing related.[13]

We believe that it is time to use our current knowledge of these interrelated elements to improve health and safety by revising the a few of the temperature related provisions in the 2018 IPC and the 2018 IRC-P

In both the IPC and the IRC, hot water is required to be supplied to plumbing fixtures and plumbing appliances intended for bathing, washing, or culinary purposes. The 2018 IPC and IRC-P have two different maximum temperature thresholds, which some say are for scald prevention. The temperature at public hand washing sinks (lavatories), is limited to 110°F. With the exception of bidets and emergency fixtures, which are also limited to 110°F, all other fixtures are limited to 120°F. Please see the table below.

Water Temperature Provisions in the 2018 IPC and IRC-P

Fixture	Maximum Temperature	Section
Bidet	110F (43C)	IPC 408.3 IRC P2721.2
Emergency showers and eyewash stations	110F (43C)	IPC 411.1*
Individual shower valve	120F (49C)	IPC 412.3 IRC P2708.4
Multiple (gang) showers	120F (49C)	IPC 412.4
Temperature-actuated, flow-reduction devices for individual fixture fittings	120F (49C)	IPC 412.7
Public lavatories	110F (43C)	IPC 419.5
Bath tub and whirlpool tub	120F (49C)	IPC 412.5 IRC 2713.3
Head shampoo sink faucet	120F (49C)	IPC 412.10
Footbaths and pedicure baths	120F (49C)	IPC 423.3

* The maximum temperature is not shown in this IPC section, but rather in the referenced standard. This standard also has a minimum acceptable temperature of 60F for emergency fixtures. This lower number might be useful guidance for jurisdictions with cold incoming water temperatures that want to raise the temperature of cold water for hand washing during the winter months where only cold water is supplied to public lavatory faucets.

Bidets, emergency showers and eyewash stations and public lavatories are required to have tempered water supplied through a water temperature limiting device that conforms to the appropriate ASSE, ANSI or CSA standard. The upper limit of 110°F makes sense for bidets and emergency showers. It does not make sense for hand washing at pubic lavatories.

If 120°F is a safe temperature for showering, bathing, head shampooing, tubs, it is equally safe for hand washing at either public or private lavatory faucets. It does not make sense that the temperature is lower for hand washing than for tub bathing. If the water temperature rises quickly to an uncomfortably hot and unsafe number it is much easier to remove ones hands from the water coming out of the faucet than it is to get out of a bathtub or to get out of the way in a shower. There is no need to have a lower temperature supplied for hand washing than for showering or bathing. In fact this public lavatory temperature code is derived from ASHRAE 90.1 energy saving code, not safety.

In our research into this issue, we found that the 110°F temperature limitation for hand washing at public lavatories comes from an energy code, ASHRAE 90.1 (1989)[5] "Energy Standard for Buildings Except Low-Rise Residential Buildings." Section 11.4.5.2 presents the provisions for lavatories in public facility restrooms (such as those in service stations, airports, train terminals, and convention halls). These include the requirement for low flow rates (the document preceded the 1990's era EPACT rules concerning public lavatory faucet flow rates) and for limiting the temperature to a maximum of 110°F.

In the very high use public toilets detailed in 90.1 (1989) the sinks are used many times per hour, and the combination of low temperature and low flow does not dramatically increase the health risks from waterborne pathogens; the very high turnover rates of the water in the piping brings in new disinfectant.

However, many toilet facilities currently classified as "public" are only used sporadically. The combination of low hot water temperature, low flow rate and infrequent usage, results in a very low turnover rate which in turn means that new disinfectant enters the piping very infrequently. This condition not only provides a localized incubation chamber for Legionella but once grown can result in contaminating the rest of the hot water system.

While the idea of establishing 85-110°F as a safe range for public hand washing seemed like a good idea at the time, it turns out this range is ideal for the growth of pathogens in the building's water distribution system. Pathogens that affect humans grow in temperatures that are found in our bodies: 85-110°F. For example, Legionella reproduces at the highest rates in the range of 85-110°F. Legionnaires' disease, caused by Legionella growth in building water systems has become a major public health concern.

Adding to the risk due to temperature is the complexity of the internal components of the mixing valves and the lack of maintenance these valves typically receive. Such maintenance is relatively time consuming and costly and is often ignored. By way of comparison, Australian codes for health and safety purposes require these local mixing valves to be disassembled and disinfected annually[6, 7, 8]

Conclusions and Recommendations:

If 120°F is safe enough to protect against scalding for bathing, it is safe enough for public hand washing. If this temperature is safe enough for Health Care Occupancies (IPC Section 609.3), it is safe enough for the other occupancies covered by the IPC.

Maintaining temperatures in the range of 85-110°F that is currently required in Section 419.5 is unsafe because it provides ideal conditions for the growth of pathogens, bacteria dangerous to humans. All Legionella guidelines including OSHA 1998[9] , ASHRAE 2000[10], CDC 2003[11], and CDC 2016[12] recommend maintaining hot water temperatures at fixtures and in hot water return lines at or above 120°F.

It is not necessary to specify the temperature range for supplying water for hand washing in public lavatories, only the maximum temperature to prevent scalding.

We recommend that the maximum safe temperature for the discharge of hot water into public hand washing sinks be raised to 120°F.
We recommend moving the break point between tempered and hot water from 110°F to 120°F. .
We recommend enabling the use of cold water only, or tempered water, or both at public hand washing sinks.

Bibliography:

US Centers for Disease Control (CDC) Atlanta, GA Chart titled, "Legionnaires' Disease is on the Rise 2000-2015*" National Notifiable Diseases Surveillance System https://www.cdc.gov/legionella/downloads/fs-legionella-clinicians.pdf
Quantifying the Effects of Water Temperature, Soap Volume, Lather Time, and Antimicrobial Soap as Variables in the Removal of Escherichia coli ATCC 11229 from Hands Journal of Food Protection June 2017 Dane A. Jensen,[1] David R. Macinga,[2] David J. Shumaker,[2] Roberto Bellino,[2] James W. Arbogast,[2] and Donald W. Schaffner[1] http://jfoodprotection.com/doi/full/10.4315/0362-028X.JFP-16-370?code=fopr-site Above was in an article titled Cool Water as Effective as Hot for Removing Germs During Handwashing Infection Control Today May 30 2017
The environmental cost of misinformation: why the recommendation to use elevated temperatures for handwashing is problematic International Journal of Consumer Studies Volume 37, Issue 4 July 2013 Amanda R. Carrico, Micajah Spoden, Kenneth A. Wallston, Michael P. Vandenbergh http://onlinelibrary.wiley.com/doi/10.1111/ijcs.12012/abstract
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Australian Standard. Water supply. Valves for the control of heated water supply temperatures Part 3: Requirements for field-testing, maintenance or replacement of thermostatic mixing valves, tempering valves and end-of-line temperature control devices https://www.saiglobal.com/PDFTemp/Previews/OSH/as/as4000/4000/40323.pdf
Occupational Safety and Health Administration (OSHA) "Technical Manual Section III: Chapter 7 Legionnaires' Disease" 1998 https://www.osha.gov/dts/osta/otm/otm_iii/otm_iii_7.html
American Society of Heating, Refrigeration and Air-Conditioning Engineers, Inc. (ASHRAE) Guideline 12 "Minimizing the Risk of Legionellosis Associated with Building Water Systems" 2000
Centers for Disease Control and Prevention (CDC) Guidelines for Environmental Infection Control in Health-Care Facilities 2003 https://www.cdc.gov/infectioncontrol/pdf/guidelines/environmental-guidelines.pdf
Centers for Disease Control and Prevention (CDC) Developing a Water Management Program to Reduce Legionella Growth & Spread in Buildings https://www.cdc.gov/legionella/downloads/toolkit.pdf

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal enables the use of cold water, tempered water, or both to public hand-washing facilities. If only cold water is supplied, it will decrease construction costs by eliminating the installation of a hot water distribution system to these faucets and by eliminating the installation of the associated ASSE 1070 mixing valves, reducing or eliminating the water heater for this hot water and eliminating the mechanical space used by this piping and equipment. It will also eliminate the costs of operations and maintenance by reducing expenditures on hot water and on the maintenance of the mixing valves.In places where city cold water is above 60°F year round, allowing only cold water to be supplied to public lavatories will eliminate much if not all the hot water piping and associated equipment in many buildings.By virtue of raising the allowable maximum temperature to 120F it will now be possible to use a master-mixing valve (ASSE 1017) for temperature control instead of installing ASSE 1070 valves at every faucet. One valve costs less than many valves. Having fewer valves also dramatically reduces operating and maintenance costs.

Internal ID: 1499

P96-18

IPC: 607.1.1, 607.1.2, Chapter15

Proponent: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing Bradley Corporation (JBEngineer@aol.com)

2018 International Plumbing Code

Revise as follows:

607.1.1 Temperature limiting means. A thermostat control for a water heater shall ~~not~~ only serve as the temperature limiting means for the purposes of complying with the requirements of this code for maximum allowable *hot* or *tempered water* delivery temperature at fixtures where the water heater complies with ASSE 1082, ASSE 1084, or ASSE 1085.

607.1.2 Tempered water temperature control. Tempered water shall be ~~supplied through a water temperature~~ controlled by one the following:

1. A limiting device ~~that conforms~~ conforming to ASSE 1070/ASME A112.1070/CSA B125.70 ~~and shall limit the *tempered water* to not greater than~~ set to a maximum of 110ºF (43ºC).
2. A thermostatic mixing valve conforming to ASSE 1017.
3. A water heater conforming to ASSE 1082.
4. A water heater conforming to ASSE 1084.

This provision shall not supersede the requirement for protective shower valves in accordance with Section 412.3.

Add new standard(s) follows:

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448

1085-2018:

Performance Requirements for Water Heaters for Emergency Equipment

1084-2018:

Performance Requirements for Water Heaters used as Temperature Limiting Devices

1082-2018:

Performance Requirements for Water Heaters Used as Temperature Control Devices for Hot Water Distribution Systems.

Reason:

The restriction on the use of the water heater thermostat for regulating water temperature is based on standard water heaters. There are three new water heater standards that regulate the outlet temperature of the water heater. Hence, it is appropriate to use reference these standards as the only water heaters in which the water heater thermostat can be used to regulate the upper temperature limit.

Tempered water is a comfort requirement, as well as, a scald prevention requirement. However, comfort overrides the safety requirement since tempered water is limited to a maximum temperature of 110° F. Scalding temperatures are in excess of this temperature. Other viable means of controlling tempered water to 110° F or less are available in addition to a limiting device that complies with ASSE 1070/ASME A112.1070/CSA B125.70. The most common means of controlling tempered water is with a thermostatic mixing valve that complies with ASSE 1017.

A thermostatic mixing valve is an effective method of regulating the maximum temperature. The temperature is maintained within a few degrees depending on the flow rate. Scalding temperatures are in excess of this temperature. Other viable means of maintaining the water temperature to a maximum of 110° F are water heater meeting one of the three new water heater standards.

The three new standard for water heaters are ASSE 1082, ASSE 1084, and ASSE 1085. These water heaters are equivalent to ASSE 1017, ASSE 1070, and ASSE 1071 respectively. As such, they have the capability of providing an equivalent level of performance as the corresponding mixing valve. While a water heater complying with ASSE 1071 is designed to supply tepid water for emergency fixtures, the tepid temperature range can also meet the tempered temperature range. Hence, an ASSE 1085 water heater is also a viable option.

Cost Impact

The code change proposal will decrease the cost of construction .

The availability of more options to achieve code compliance usually results in lower construction costs.

Analysis: A review of the standards proposed for inclusion in the code, ASSE 1085-2018, ASSE 1084-2018 and ASSE1082-2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 1156

P97-18 Part I

IPC: TABLE 608.1, 608.14.3, 608.17.2, Chapter 15

Proponent: Linda Soares, TACO COMFORT SOLUTIONS, Inc., representing Linda L. Soares (LinSoa@TacoComfort.com)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Revise as follows:

608.14.3 Backflow preventer with intermediate atmospheric vent. Backflow preventers with intermediate atmospheric vents shall conform to ASSE 1012, ASSE 1081, or CSA B64.3. These devices shall be permitted to be installed where subject to continuous pressure conditions. The relief opening shall discharge by *air gap* and shall be prevented from being submerged.

608.17.2 Connections to boilers. The potable supply to the boiler shall be equipped with a backflow preventer with an intermediate atmospheric vent complying with ASSE 1012, ASSE 1081, or CSA B64.3. Where conditioning chemicals are introduced into the system, the potable water connection shall be protected by an *air gap* or a reduced pressure principle backflow preventer, complying with ASSE 1013, CSA B64.4 or AWWA C511.

TABLE 608.1
APPLICATION OF BACKFLOW PREVENTERS

DEVICE	DEGREE OF HAZARD[a]	APPLICATION[b]	APPLICABLE STANDARDS
Backflow prevention assemblies:			
Double check backflow prevention assembly and double check fire protection backflow prevention assembly	Low hazard	Backpressure or backsiphonage Sizes $^{3}/_{8}$″–16″	ASSE 1015, AWWA C510, CSA B64.5, CSA B64.5.1
Double check detector fire protection backflow prevention assemblies	Low hazard	Backpressure or backsiphonage Sizes 2″–16″	ASSE 1048
Pressure vacuum breaker assembly	High or low hazard	Backsiphonage only Sizes $^{1}/_{2}$″–2″	ASSE 1020, CSA B64.1.2
Reduced pressure principle backflow prevention assembly and reduced pressureprinciple fire protection backflow assembly	High or low hazard	Backpressure or backsiphonage Sizes $^{3}/_{8}$″–16″	ASSE 1013, AWWA C511, CSA B64.4, CSA B64.4.1
Reduced pressure detector fire protection backflow prevention assemblies	High or low hazard	Backsiphonage or backpressure Fire sprinkler systems)	ASSE 1047
		Sizes $^{1}/_{4}$″–2″	
Backflow preventer plumbing devices:			
water closet flush tanks			
Backflow preventer for carbonated beverage machines	Low hazard	Backpressure or backsiphonage Sizes $^{1}/_{4}$″–$^{3}/_{8}$″	ASSE 1022
Backflow preventer with intermediate atmospheric vents	Low hazard	Backpressure or backsiphonage Sizes $^{1}/_{4}$″–$^{3}/_{4}$″	ASSE 1012, CSA B64.3
Backflow preventer with intermediate atmospheric vent and pressure reducing valve	Low hazard	Backpressure or backsiphonage Sizes $^{1}/_{4}$″–$^{3}/_{4}$″	ASSE 1081
Dual-check-valve-type backflow preventer	Low hazard	Backpressure or backsiphonage Sizes $^{1}/_{4}$″–1″	ASSE 1024, CSA B64.6
Hose connection backflow preventer	High or low hazard	Low head backpressure, rated working pressure, backpressure or backsiphonage Sizes $^{1}/_{2}$″–1″	ASME A112.21.3, ASSE 1052, CSA B64.2.1.1
Hose connection vacuum breaker	High or low hazard	Low head backpressure or backsiphonageSizes $^{1}/_{4}$″–$^{3}/_{4}$″–1″	ASME A112.21.3, ASSE 1011, CSA B64.2

		$^{1}/_{2}$″, $^{3}/_{4}$″, 1″	CSA B64.2, CSA B64.2.1
Laboratory faucet backflow preventer	High or low hazard	Low head backpressure and backsiphonage	ASSE 1035, CSA B64.7
Pipe-applied atmospheric-type vacuum breaker	High or low hazard	Backsiphonage only Sizes $^{1}/_{4}$″–4″	ASSE 1001, CSA B64.1.1
Vacuum breaker wall hydrants, frost-resistant, automatic-draining-type	High or low hazard	Low head backpressure or backsiphonageSizes $^{3}/_{4}$″, 1″	ASME A112.21.3, ASSE 1019, CSA B64.2.2
Other means or methods:			
Air gap	High or low hazard	Backsiphonage or backpressure	ASME A112.1.2
Air gap fittings for use with plumbing fixtures, appliances and appurtenances	High or low hazard	Backsiphonage or backpressure	ASME A112.1.3
Barometric loop	High or low hazard	Backsiphonage only	(See Section 608.14.4)

For SI: 1 inch = 25.4 mm.

a. Low hazard-See Pollution (Section 202).High hazard-See Contamination (Section 202).

b. See Backpressure, low head (Section 202).See Backsiphonage (Section 202).

Add new standard(s) follows:

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448

1081-2014:

Performance Requirements for Backflow Preventers with Integral Pressure Reducing Boiler Feed Valve and Intermediate Atmospheric Vent Style for Domestic and Light Commercial Water

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Analysis: A review of the standard proposed for inclusion in the code, ASSE 1081-2014, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 1573

P97-18 Part II

IRC: TABLE P2902.3, P2902.3.3, P2902.5.1, Chapter 44

Proponent: Linda Soares, TACO COMFORT SOLUTIONS, Inc., representing Linda L. Soares (LinSoa@TacoComfort.com)

2018 International Residential Code

Revise as follows:

P2902.3.3 Backflow preventer with intermediate atmospheric ~~vent~~vent. Backflow preventers with intermediate atmospheric vents shall conform to ASSE 1012, ASSE 1081, or CSA B64.3. These devices shall be permitted to be installed where subject to continuous pressure conditions. These devices shall be prohibited as a means of protection where any hazardous chemical additives are introduced downstream of the device. The relief opening shall discharge by *air gap* and shall be prevented from being submerged.

P2902.5.1 Connections to ~~boilers~~boilers. Where chemicals will not be introduced into a boiler, the potable water supply to the boiler shall be protected from the boiler by a backflow preventer with an intermediate atmospheric vent complying with ASSE 1012, ASSE 1081, or CSA B64.3. Where chemicals will be introduced into a boiler, the potable water supply to the boiler shall be protected from the boiler by an *air gap* or a reduced pressure principle backflow prevention assembly complying with ASSE 1013, CSA B64.4 or AWWA C511.

TABLE P2902.3
APPLICATION FOR BACKFLOW PREVENTERS

DEVICE	DEGREE OF HAZARD[a]	APPLICATION[b]	APPLICABLE STANDARDS
Backflow Prevention Assemblies			
Double-check backflow prevention assembly and double-check fire protection backflow prevention assembly	Low hazard	Backpressure or backsiphonage Sizes $^{3}/_{8}$″ – 16″	ASSE 1015, AWWA C510, CSA B64.5, CSA B64.5.1
Double-check detector fire protection backflow prevention assemblies	Low hazard	Backpressure or backsiphonage Sizes 2″ – 16″	ASSE 1048
Pressure vacuum breaker assembly	High or low hazard	Backsiphonage only Sizes $^{1}/_{2}$″ – 2″	ASSE 1020, CSA B64.1.2
Reduced pressure principle backflow prevention assembly and reduced pressure principle fire protection backflow prevention assembly	High or low hazard	Backpressure or backsiphonage Sizes $^{3}/_{8}$″ – 16″	ASSE 1013, AWWA C511, CSA B64.4, CSA B64.4.1
Reduced pressure detector fire protection backflow prevention assemblies	High or low hazard	Backsiphonage or backpressure (Fire sprinkler systems)	ASSE 1047
Spill-resistant vacuum breaker	High or low hazard	Backsiphonage only Sizes $^{1}/_{4}$″ – 2″	ASSE 1056, CSA B64.1.3
Backflow Preventer Plumbing Devices			
Antisiphon-type fill valves for gravity water closet flush tanks	High hazard	Backsiphonage only	ASSE 1002/ASME A112.1002/CSA B125.12, CSA B125.3
Backflow preventer with intermediate atmospheric vents	Low hazard	Backpressure or backsiphonage Sizes $^{1}/_{4}$″ – $^{3}/_{8}$″	ASSE 1012, CSA B64.3
Backflow preventer with intermediate atmospheric vents and pressure reducing valve	Low hazard	Backpressure or backsiphonage Sizes $^{1}/_{4}$″ – $^{3}/_{4}$″	ASSE 1081
Dual-check-valve-type backflow preventers	Low hazard	Backpressure or backsiphonage Sizes $^{1}/_{4}$″ – 1″	ASSE 1024, CSA B64.6
Hose-connection backflow preventer	High or low hazard	Low head backpressure, rated working pressure backpressure or backsiphonage Sizes $^{1}/_{2}$″ – 1″	ASSE 1052, CSA B64.2.1.1
Hose-connection vacuum breaker	High or low hazard	Low head backpressure or backsiphonage Sizes $^{1}/_{2}$″, $^{3}/_{4}$″, 1″	ASSE 1011, CSA B64.2, CSA B64.2.1
Laboratory faucet backflow preventer	High or low hazard	Low head backpressure and backsiphonage	ASSE 1035, CSA B64.7
Pipe-applied atmospheric-type vacuum breaker	High or low hazard	Backsiphonage only Sizes $^{1}/_{4}$″ – 4″	ASSE 1001, CSA B64.1.1
Vacuum breaker wall hydrants, frost-resistant, automatic-draining type	High or low hazard	Low head backpressure or backsiphonage Sizes $^{3}/_{4}$″ – 1″	ASSE 1019, CSA B64.2.2
Other Means Or Methods			
Air gap	High or low hazard	Backsiphonage only	ASME A112.1.2
Air gap fittings for use with plumbing fixtures, appliances and appurtenances	High or low hazard	Backsiphonage or backpressure	ASME A112.1.3

For SI: 1 inch = 25.4 mm.

a. Low hazard-See Pollution (Section R202). High hazard-See Contamination (Section R202).

b. See Backpressure (Section R202). See Backpressure, Low Head (Section R202). See Backsiphonage (Section R202).

Add new standard(s) follows:

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448
US

1081-2014:

Performance Requirements for Backflow Preventers with Integral Pressure Reducing Boiler Feed Valve and Intermediate Atmospheric Vent Style for Domestic and Light Commercial Water

Reason:
ASSE 1081 covers devices that have combined products compliant to both ASSE 1003 and ASSE 1012. These devices have different hydrodynamic needs, hence the new standard for the device. They can be used in lieu of an ASSE 1012-compliant device with respect to boiler feed applications.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

An ASSE 1081 device can be used interchangeably with an ASSE 1012 or CSA B64.3 device. Options for code compliance usually result in lower cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASSE 1081-2014, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 3424

P98-18 Part I

IPC: 608.15.2.1

Proponent: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing Self (JBEngineer@aol.com)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Revise as follows:

608.15.2.1 Relief port piping. The termination of the piping from the relief port or *air gap* fitting of a backflow preventer shall discharge to an *approved* indirect waste receptor or to the outdoors where it will not cause damage or create a nuisance. <u>The indirect waste receptor and drainage piping shall be sized to drain the maximum discharge flow rate from the relief port as published by the backflow preventer manufacturer.</u>

Internal ID: 1315

P98-18 Part II

IRC: P2902.6.3

Proponent: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing Self (JBEngineer@aol.com)

2018 International Residential Code

Revise as follows:

P2902.6.3 Relief port piping. The termination of the piping from the relief port or air gap fitting of the backflow preventer shall discharge to an *approved* indirect waste receptor or to the outdoors where it will not cause damage or create a nuisance. The indirect waste receptor and drainage piping shall be sized to drain the maximum discharge flow rate from the relief port as published by the backflow preventer manufacturer.

Reason:

It is not uncommon to find in the field a 4 inch reduced pressure principle backflow preventer reilef port discharging to a 2 inch floor drain. When the relief port opens at the full flow rate published by the manufacturer, the room where the backflow preventer is located will fill with water in a short period of time.

It is important that the indirect waste receptor and drain be properly sized to accommodate the maximum flow rate from a relief port. When multiple backflow preventers are located in the same room, the indirect waste receptor and drain only has to be sized for the largest backflow preventer. There is never an assumption of multiple relief ports opening at the same time. That would indicate a multiple failure scenario which is not how the Plumbing Code evaluates failures.

The manufacturers are required to publish the flow rates through the backflow preventer relief port in their specification sheets. This information is readily available. The drain can be easily sized for the discharge in the manufacturer's published data.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The manufacturers require drainage for the discharge from the relief port. This addition reinforces the requirements already stated in the manufacturer's literature.

Internal ID: 3501

P99-18

IPC: 609.2

Proponent: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2018 International Plumbing Code

Revise as follows:

609.2 Water service. Hospitals shall have two water service pipes installed in such a manner so as to minimize the potential for an interruption of the supply of water in the event of a water main or water service pipe failure. Each water service pipe shall enter the building independently and shall be sized in accordance with Section 603.1.

Reason:
This Section lacks some specificity and doesn't provide much guidance. The intent is to eliminate the possibility of water service interruption. There needs to be a separation distance for the two water lines that designers can employ based the the situation. No specific number has been submitted as each situation will require analysis by the designers

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

This is editorial in nature and isnt requiring anything in addition to whats already required.

Internal ID: 109

P100-18

IPC: 609.2

Proponent: John Williams, Chair, representing Healthcare Committee (AHC@iccsafe.org)

2018 International Plumbing Code

Revise as follows:

609.2 Water service for Group I-2, Condition 2. ~~Hospitals~~ Group I-2, Condition 2 facilities shall have a minimum of two water service pipes ~~installed in such a manner so as to minimize the potential for an interruption of the supply of water in the event of a water main or water service pipe failure.~~ sized such that with the loss of the largest service pipe, the remaining service pipes will meet the water demand for the entire facility. Each water service shall have a shut off valve in the building and a shut off valve at the utility-provided point of connection to the water main or other source of potable water.

Reason:

The existing language is not specific and could lead to several different required piping configurations. The proposed change provides needed clarity to the code and provides jurisdiction a reasonable means of enforcement. Existing language creates a overly burdensome requirement for hospitals on remote sites. The proposed language sets specific requirements for the service lines into the building, with directions for capacity redundancy. Also clarifies a design configuration that provides maximum flexibility in event of failure of a single service line.

This proposal is submitted by the ICC Committee on Healthcare (CHC). The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2017 the CHC held 2 open meetings and numerous conference calls, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at: https://www.iccsafe.org/codes-tech-support/cs/icc-committee-on-healthcare/.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The existing language is ambiguous to the degree that it is difficult to understand how facilities are consistently enforcing the section. If anything the proposal reduces cost for providers and purveyors.

Internal ID: 705

P101-18

IPC: 609.2.1 (New)

Proponent: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2018 International Plumbing Code

Add new text as follows:

609.2.1 Tracer. A yellow insulated copper tracer wire or a product designed for that purpose or other approved conductor shall be installed adjacent to underground nonmetalic piping serving as a water service for a hospital. Access shall be provided to the tracer wire or the tracer wire shall terminate above ground at each end of the nonmetalic piping. The tracer wire size shall be not less than 18 AWG and the wire insulation type shall be suitable for direct burial.

Reason:

It would be prudent for Hospitals to have the ability to locate their water service piping when utilizing non-metalic piping underground. This provides the ability to locate the pipes without having to excavate which can be an enormous cost savings. Locating the service pipes is critical to eliminate the possibility of damaging the pipes avoiding the usual methods of doing so.

Cost Impact

The code change proposal will increase the cost of construction .

The cost increase will be the cost of the wire itself and locating the ends of of the wire in a suitible fashon.

Internal ID: 117

P102-18

IPC: 202, 611, 611.1, 611.2, 611.3, 611.4 (New), 611.5 (New), Chapter 15

Proponent: Vincent Kent, Abendroth Water Conditioning, representing Abendroth Water Conditioning (vince@abendrothwater.com)

2018 International Plumbing Code

SECTION 202 GENERAL DEFINITIONS

Add new definition as follows:

POINT-OF-ENTRY (POE) WATER-CONDITIONING OR -TREATMENT DEVICE A water treatment device serving the water distribution system of a building for the purposes of altering, modifying, adding, or removing minerals, chemicals, contaminants, and suspended solids in the water that is distributed throughout the building. Outdoor hose bibbs are typically excluded from being served by conditioned or treated water.

POINT-OF-USE (POU) WATER-CONDITIONING OR -TREATMENT DEVICE A water treatment device installed to serve a single atmosperic outlet such as a faucet for the purposes of altering, modifying, adding, or removing any minerals, chemicals, contaminants, and suspended solids in water supplied to the outlet. POU treatment is often used to treat water only for drinking and cooking.

WATER CONDITIONING OR TREATMENT DEVICE. A point-of-use (POU) or point-of-entry (POE) original equipment appliance, appurtenance, fixture, or a combination thereof designed to treat potable water so as to alter, modify, add, or remove any minerals, chemicals, contaminants, and suspended solids contained in the source water. Example technologies include but are not limited to softeners, filters and reverse osmosis systems.

Revise as follows:

SECTION 611 ~~DRINKING~~ WATER-CONDITIONING or TREATMENT ~~UNITS~~DEVICES

611.1 ~~Design.~~General system approvals.. Point-of-use ~~reverse osmosis drinking water treatement units shall comply with NSF 58 or CSA B483.1. Drinking water treatment units shall meet the requirements of~~ and point-of-entry water-conditioning or -treatment systems shall comply with ASSE 1087, NSF 42, NSF 44, NSF 53, NSF 55, NSF 58, NSF 62 or NSF 401 ~~CSA 483.1~~.

611.2 ~~Reverse osmosis systems.~~Drain discharge.. The drain discharge from a ~~reverse osmosis drinking water treatment unit~~ water-conditioning or -treatment device shall enter the drainage system ~~through~~ by means of an air gap in accordance with Table 608.16.1, a backflow prevention device in accordance with ASSE 1087, an appropriate backflow prevention device in accordance with Table 608.1, or an air gap device that meets the requirements of NSF 58, CSA B483.1 or IAPMO PS 65.
The building drainage system shall be capable of handling the additional discharge load of the water-conditioning or -treatment device.

611.3 ~~Connection tubing.~~Plumbing connections. ~~The tubing~~ Pipe, tubing, and pipe fittings supplying water to and from ~~drinking water treatment units shall be of a size and material as recommended by the manufacturer. The tubing shall comply with NSF 14, NSF 42, NSF 44, NSF 53, NSF 58 or NSF 61.~~a point-of-use or point-of-entry water-conditioning or -treatment device shall comply with NSF 14 or NSF 61. The interconnection tubing within a device shall comply with the requirements of NSF 14, NSF 61 or Section 611.1.

Pipe, tubing, and pipe fittings used downstream of point-of-use and point-of entry water-conditioning or -treatment devices shall be compatible with the treated water. The manufacturer's instructions shall be followed for the recommended compatible materials for pipe, tubing, and pipe fittings for the treated water. Copper tubing shall not be used for water treated by a reverse osmosis device.

Add new text as follows:

611.4 Sizing of Point-of-Entry Water-Conditioning or Treatment Devices. Third-party certified pressure loss characteristics shall be provided with all devices. The pressure loss through such devices shall be included in the pressure loss calculations of the system, and the water supply pipe and meter shall be adequately sized to provide for such a pressure loss.

611.5 Sizing of Point-of-Use Water-Conditioning or Treatment Devices. Point-of-use water-conditioning or treatment devices that provide potable water to appliances, fittings, or appurtenances that require a minimum pressure and flow rate demand shall be sized, designed, and installed to meet the downstream appliance, fitting, or appurtenance manufacturer's specifications so as to not cause improper operation.

Add new standard(s) follows:

CHAPTER 15 REFERENCED STANDARDS

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448

ASSE 1087-2018:

Performance Requirements for Commercial and Food Service Water Treatment Utilizing Drinking Water

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IAPMO

IAPMO Group
4755 E. Philadelphia Street
Ontario CA 91761 USA

PS 65-2002:

Material and Property Standard for Airgap Units for Water Conditioning Equipment Installation

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NSF

NSF International
789 N. Dixboro Road P.O. Box 130140
Ann Arbor MI 48105

NSF/ANSI 401 - 2017:

Drinking Water Treatment Units - Emerging Compounds/Incidental Contaminants

NSF/ANSI 55 - 2017:

Ultraviolet Microbiological Water Treatment Systems

Reason:
202 – There currently are no definitions for a water treatment device, nor for point-of-use or point-of-entry treatment devices. These are generally accepted definitions.

611.0 – Changing the heading of the section to be consistent with what is used and installed in the industry today.

611.1 – These standards do not deal with design of the products, but rather the safety, structural integrity, and performance requirements. Updated language to describe the current standards for all POE and POU treatment devices. ASSE 1087 is a new standard developed to specifically address commercial water treatment equipment.

611.2 - Drain discharge applies to all treatment devices, not just reverse osmosis systems. Further, the type of backflow prevention device may be varied in order to ensure protection of the potable water supply, even though the most common ones used are air gaps and air gap devices. Finally, it is critical that the drain system be able to accept the volume of discharge from the device.

611.3 – The title "Connections" is more appropriate as there are connections both to and from a device as well as within the device. Described the appropriate standards for each of these use cases. When the connections are within a device covered by a standard, the connections need to meet the requirements of that device's standard. Also, as an example, the low pH or minimal total dissolved solids from the product water of a reverse osmosis system will cause pitting and corrosion of downstream copper tubing. Some consideration needs to be made for this when a system is designed and installed.

611.4 & 611.5 – This language is missing from section 611 as questions arise frequently in the field as to how to size a system when water conditioning and treatment units are involved. Documentation on losses is not always available which may lead to over- or under-sized systems. This is a more accurate representation of how to properly size any water distribution system, and is consistent with the existing language in Appendix E.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

These changes clarify how water conditioning and treatment products are used. The additional sections codifies information that should be given to the designer and installer anyway for proper sizing.

Analysis: A review of the standard proposed for inclusion in the code, ASSE 1087—2018, NSF 401-2017, NSF 55-2017 and IAPMO PS 65-2002 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 1728

P103-18 Part I

IPC: TABLE 702.3, Chapter 15

Proponent: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Revise as follows:

TABLE 702.3
BUILDING SEWER PIPE

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters, including Schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with a solid, cellular core or composite wall	ASTM D2661; ASTM D2680; ASTM F628; ASTM F1488; CSA B181.1
Acrylonitrile butadiene styrene (ABS) plastic pipe in sewer and drain diameters, including SDR 42 (PS 20), PS 35, SDR 35 (PS 45), PS 50, PS 100, PS 140, SDR 23.5 (PS 150) andPS 200; with a solid, cellularcore or composite wall	ASTM F1488; ASTM D2751
Cast-iron pipe	ASTM A74; ASTM A888; CISPI 301
Concrete pipe	ASTM C14; ASTM C76; CSA A257.1M; CSA A257.2M
Copper or copper-alloy tubing (Type K or L)	ASTM B75; ASTM B88; ASTM B251
Polyethylene (PE) plastic pipe (SDR-PR)	ASTM F714
Polypropylene (PP) plastic pipe	ASTM F2736; ASTM F2764; CSA B182.13
Polyvinyl chloride (PVC) plastic pipe in IPS diameters, including Schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with a solid, cellular core or composite wall	ASTM D2665; ASTM F891; ASTM F1488
Polyvinyl chloride (PVC) plastic pipe in sewer and drain diameters, including PS 25, SDR 41 (PS 28), PS 35, SDR 35 (PS	ASTM F891; ASTM F1488; ASTM D3034; CSA B182.2; CSA B182.4

46), PS 50, PS 100, SDR 26 (PS 115), PS 140 and PS 200; with a solid, cellular core or composite wall	
Polyvinyl chloride (PVC) plastic pipe with a 3.25-inch O.D. and a solid, cellular core or composite wall	ASTM D2949, ASTM F1488
Polyvinylidene fluoride (PVDF) plastic pipe	ASTM F1673; CSA B181.3
Stainless steel drainage systems, Types 304 and 316L	ASME A112.3.1
Vitrified clay pipe	ASTM C4; ASTM C700

For SI: 1 inch = 25.4 mm.

Add new standard(s) follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

D2680 - 01(2014):

Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly(Vinyl Chloride) (PVC) Composite Sewer Piping

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Analysis: A review of the standard proposed for inclusion in the code, ASTM D2680 - 01(2014), with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 521

P103-18 Part II

IRC: TABLE P3002.2, Chapter 44

Proponent: Pennie Feehan, representing Plumbing, Mechanical, and Fuel Gas Code Action Committee (PMGCAC@iccsafe.org)

2018 International Residential Code

Revise as follows:

TABLE P3002.2
BUILDING SEWER PIPE

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters,including schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with asolid, cellular core or composite wall	ASTM D2661; ASTM D2680; ASTM F628; ASTM F1488
Acrylonitrile butadiene styrene (ABS) plastic pipe in sewer and draindiameters, including SDR 42 (PS 20), PS35, SDR 35 (PS 45), PS50,PS100, PS140, SDR 23.5 (PS 150) and PS200; with asolid, cellular core or composite wall	ASTM D2751; ASTM F1488
Polyvinyl chloride (PVC) plastic pipe in sewer and drain diameters,including PS 25, SDR 41 (PS 28), PS 35, SDR 35 (PS 46), PS 50,PS 100, SDR 26 (PS 115), PS140 and PS 200; with a solid, cellularcore or composite wall	ASTM D3034; ASTM F891; ASTM F1488; CSA B182.2; CSA B182.4
Cast-iron pipe	ASTM A74; ASTM A888; CISPI 301
Concrete pipe	ASTM C14; ASTM C76; CSA A257.1; CSA A257.2
Copper or copper-alloy tubing (Type K or L)	ASTM B75/B75M; ASTM B88; ASTM B251
Polyethylene (PE) plastic pipe (SDR-PR)	ASTM F714
Polyolefin pipe	ASTM F1412; CSA B181.3
Polyvinyl chloride (PVC) plastic pipe in IPS diameters, includingschedule 40, DR 22 (PS 200) and DR 24 (PS 140); with solid,cellular core or composite wall	ASTM D2665; ASTM D2949; ASTM D3034;ASTM F1412; CSA B182.2; CSA B182.4
Polyvinyl chloride (PVC) plastic pipe with a 3.25 inch O.D. and asolid, cellular core or composite wall	ASTM D2949, ASTM F1488
Stainless steel drainage systems, Types 304 and 316L	ASME A112.3.1
Vitrified clay pipe	ASTM C425; ASTM C700

For SI: 1 inch = 25.4 mm.

Add new standard(s) follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428
US

D2680 - 01(2014):

Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly(Vinyl Chloride) (PVC) Composite Sewer Piping

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Reason:
A new standard for ABS piping is being added to increase flexibility in piping choices for building sewers.

This proposal is submitted by the ICC Plumbing/Mechanical/Gas Code Action Committee (PMG CAC). The PMG CAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance the International Codes or portions thereof that were under the purview of the PMG CAC. In 2017 the PMG CAC held one face-to-face meeting and 11 conference call meetings. Numerous interested parties attended the committee meetings and offered their input.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

ABS piping is not required to be used-it is a designer or installer decision. No new materials or labor are required by this proposal thus, there is not a cost increase.

Internal ID: 3472

P104-18

IPC: 702.6, TABLE 702.6 (New), 901.3, 902.1.1 (New), Chapter 15

Proponent: Brian Helms, Charlotte Pipe and Foundry, Plastics Division, representing Charlotte Pipe and Foundry (brian.helms@charlottepipe.com)

2018 International Plumbing Code

Revise as follows:

702.6 Chemical waste drainage system. A chemical waste drainage system, including its vent system, shall be completely ~~separated~~ independent from ~~the~~ any sanitary drainage system. The pipes and fittings of a chemical waste drainage system shall conform to any of the applicable standards indicated in Table 702.6. The pipe and fitting material shall be recommended by the manufacturers of the pipe and fittings for the temperatures, types and concentrations of chemicals that the system is designed for. The drainage in a chemical waste drainage system shall be treated in accordance with Section 803.2 before discharging to ~~the~~ a sanitary drainage system. ~~Separate drainage systems for chemical wastes and vent pipes shall be of an *approved* material that is resistant to corrosion and degradation for the concentrations of chemicals involved.~~

Add new text as follows:

TABLE 702.6
CHEMICAL DRAINAGE SYSTEM PIPE AND FITTINGS

MATERIAL	STANDARD
Chlorinated polyvinyl chloride (CPVC)	ASTM F2618
High silicon iron	ASTM A518/A518M
Polypropylene (PP)	ASTM F1412
Polyvinylidene flouride (PVDF)	ASTM F1673
Chemical-resistance glass	ASTM C1053
Stainless steel drainage systems	ASME A112.3.1

Revise as follows:

901.3 Chemical waste ~~vent systems.~~drainage system venting.. The vent system for a chemical waste drainage system shall be independent of ~~the sanitary vent system and shall terminate separately~~ any vent system for a sanitary drainage system. The termination of a vent system for a chemical waste drainage system shall be through the roof to the outdoors or to an air admittance valve that complies with ASSE 1049. Air admittance valves for chemical waste drainage systems shall be constructed of materials ~~*approved*~~ in accordance with Section 702.6 and shall be tested for chemical resistance in accordance with ASTM F1412.

Add new text as follows:

902.1.1 Chemical waste drainage system vents. The pipe and fitting materials for the vent system of a chemical waste drainage system shall be in accordance with Section 702.6. The methods utilized for construction and installation of such venting system shall be in accordance with the pipe and fitting manufacturers' instructions.

Add new standard(s) follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

F2618-15:

Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Fittings for Chemical Waste Drainage Systems

C1053-00 (2015):

Standard Specification for Borosilicate Glass Pipe and Fittings for Drain, Waste, and Vent (DWV) Applications

A518/A518M -99 (2012):

Standard Specification for Corrosion-Resistant High-Silicon Iron Castings

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Reason:

Chemical waste drainage is very different from sanitary drainage applications included in Chapter 7. Chemical waste applications require pipe and fitting systems that are specifically designed to convey waste that may be harmful to other piping materials as well as the health and safety of the public. The code currently provides direction on allowable materials for sanitary drainage systems in tables 702.1, 702.2, 702.3 and 702.4 but is not as specific regarding chemical waste in 702.6.

Since the code requires chemical waste systems to be completely separated from the sanitary system in section 702.6 and provides direction on system design in section 803.2, it should also include a table to provide direction on allowable materials for these applications. Currently, section 702.6 requires an “approved” material, which by definition in Chapter 2, means that the material should be “acceptable to the code official.” The removal of this statement and the addition of the proposed table will eliminate any confusion regarding appropriate materials for chemical waste drainage applications. Since there is no single piping system available that is impervious to every chemical, manufacturers recommendations regarding suitability for temperature and chemical resistance should be referenced when choosing a material for a specific application.

Materials used for vents in these systems should exhibit the same physical characteristics regarding temperature and chemical resistance and therefore should be held to the same requirements.

This code change proposal includes all materials either currently manufactured or available in the market that are manufactured to standards specifically for corrosive or laboratory waste drainage applications.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This code change proposal will not increase or decrease the cost of construction because it is intended to clarify allowable third party certified products appropriate for chemical waste drainage applications.

Analysis: A review of the standard proposed for inclusion in the code, ASTM F2618-15, ASTM C1053-00 (2015), and ASTM A518/A518M -99 (2012) with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 1831

P105-18

IPC: Table 702.4, 705.2.4 (New), Chapter 15

Proponent: Brian Conner, Charlotte Pipe and Foundry, representing Charlotte Pipe and Foundry (bconner@charlottepipe.com)

2018 International Plumbing Code

Add new text as follows:

705.2.4 Push-fit joints. Push-fit joints shall conform to ASME A112.4.4 and shall be installed in accordance with the manufacturer's instructions.

Revise as follows:

TABLE 702.4
PIPE FITTINGS

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters	ASTM D2661; ASTM F628; CSA B181.1; ASME A112.4.4
Acrylonotrile butadiene styrene (ABS) plastic pipe in sewer and drain diameters	ASTM D2751
Cast iron	ASME B16.4; ASME B16.12; ASTM A74; ASTM A888; CISPI 301
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME B16.26; ASME B16.29
Glass	ASTM C1053
Gray iron and ductile iron	AWWA C110/A21.10
Polyethylene	ASTM D2683
Polyolefin	ASTM F1412; CSA B181.3
Polyvinyl chloride (PVC) plastic in IPS diameters	ASTM D2665; ASTM F1866
Polyvinyl chloride (PVC) plastic pipe in sewer and drain diameters	ASTM D3034
Polyvinyl chloride (PVC) plastic pipe with a 3.25-inch O.D.	ASTM D2949
Polyvinylidene fluoride (PVDF) plastic pipe	ASTM F1673; CSA B181.3
Stainless steel drainage systems, Types 304 and 316L	ASME A112.3.1
Steel	ASME B16.9; ASME B16.11; ASME B16.28
Vitrified clay	ASTM C700

For SI: 1 inch = 25.4 mm.

Add new standard(s) follows:

ASME

American Society of Mechanical Engineers
Two Park Avenue
New York NY 10016-5990

A112.4.4-2017:

Plastic Push Fit Drain, Waste, and Vent (DWV) Fittings

Reason:
Adding this section along with the consensus standard for Push-fit DWV fittings will give code officials direction on inspecting push-fit fitting installations and installers direction on installing push-fit fittings.

Adding this section is consistent with 'push-fit joints" sections in chapter 6.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

Use of push-fit DWV fittings is an option. More options in the code usually result in an overall lowering of costs of construction because of increased flexibility for adapting to varying project situations.

Analysis: A review of the standard proposed for inclusion in the code, ASME A112.4.4-2017, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 2214

P106-18 Part I

IPC: 705.2.4 (New), TABLE 702.4, Chapter 15

Proponent: Angel Guzman Rodriguez, ASME, representing The American Society of Mechanical Engineers (ASME)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Add new text as follows:

705.2.4 Push-fit joints. Push-fit joints shall conform to ASME A112.4.4 and shall be installed in accordance with the manufacturer's instructions.

Revise as follows:

TABLE 702.4
PIPE FITTINGS

	MATERIAL	STANDARD
	Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters	ASTM D2661; ASTM F628; CSA B181.1; ASME A112.4.4
	Acrylonotrile butadiene styrene (ABS) plastic pipe in sewer and drain diameters	ASTM D2751
	Cast iron	ASME B16.4; ASME B16.12; ASTM A74; ASTM A888; CISPI 301
	Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME B16.26; ASME B16.29
	Glass	ASTM C1053
	Gray iron and ductile iron	AWWA C110/A21.10
	Polyethylene	ASTM D2683
	Polyolefin	ASTM F1412; CSA B181.3
	Polyvinyl chloride (PVC) plastic in IPS diameters	ASTM D2665; ASTM F1866
	Polyvinyl chloride (PVC) plastic pipe in sewer and drain diameters	ASTM D3034
	Polyvinyl chloride (PVC) plastic pipe with a 3.25-inch O.D.	ASTM D2949
	Polyvinylidene fluoride (PVDF) plastic pipe	ASTM F1673; CSA B181.3
	Stainless steel drainage systems, Types 304 and 316L	ASME A112.3.1
	Steel	ASME B16.9; ASME B16.11; ASME B16.28
	Vitrified clay	ASTM C700

For SI: 1 inch = 25.4 mm.

Add new standard(s) follows:

ASME

American Society of Mechanical Engineers
Two Park Avenue
New York NY 10016-5990

A112.4.4-2017:

Plastic Push Fit Drain, Waste, and Vent (DWV) Fittings

Analysis: A review of the standard proposed for inclusion in the code, ASME A112.4.4-2017 , with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 1418

P106-18 Part II

IRC: P3003.3.4 (New), TABLE P3002.3, Chapter 44

Proponent: Angel Guzman Rodriguez, ASME, representing The American Society of Mechanical Engineers (ASME)

2018 International Residential Code

Add new text as follows:

P3003.3.4 **Push-fit joints.** Push-fit joints shall conform to ASME A112.4.4 and shall be installed in accordance with the manufacturer's instructions.

Revise as follows:

TABLE P3002.3
PIPE FITTINGS

PIPE MATERIAL	FITTING STANDARD
Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters	ASTM D2661; ASTM D3311; ASTM F628; CSA B181.1; ASME A112.4.4
Acrylonotrile butadiene styrene (ABS) plastic pipe in sewer and drain diameters	ASTM D2751
Cast-iron	ASME B16.4; ASME B16.12; ASTM A74; ASTM A888; CISPI 301
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME B16.26; ASME B16.29
Gray iron and ductile iron	AWWA C110/A21.10
Polyethylene	ASTM D2683
Polyolefin	ASTM F1412; CSA B181.3
Polyvinyl chloride (PVC) plastic in IPS diameters	ASTM D2665; ASTM D3311; ASTM F1866
Polyvinyl chloride (PVC) plastic pipe in sewer and drain diameters	ASTM D3034
Polyvinyl chloride (PVC) plastic pipe with a 3.25 inch O.D.	ASTM D2949
PVC fabricated fittings	ASTM F1866
Stainless steel drainage systems, Types 304 and 316L	ASME A112.3.1
Vitrified clay	ASTM C700

For SI: 1 inch = 25.4 mm.

Add new standard(s) follows:

ASME

American Society of Mechanical Engineers
Two Park Avenue
New York NY 10016-5990

A112.4.4-2017:

Plastic Push Fit Drain, Waste, and Vent (DWV) Fittings

Reason:
A new standard has been published for push fit fittings to be used in DWV applications. Fittings are to be used with ABS or PVC pipe only in non-pressure applications.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

This proposal is only adding an optional type fitting that can be used for joining ABS pipe.

A review of the standard proposed for inclusion in the code, ASME A112.4.4-2017, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 1458

P107-18

IPC: 705.3.3.1 (New)

Proponent: Richard Houle, Reliance Worldwide Corporation, representing Reliance Worldwide Corporation (rich.houle@rwc.com)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Add new text as follows:

705.3.3.1 Restraint of hubless joints. Hubless joints shall be restrained to withstand a thrust force associated with 40 feet of water head pressure (17.3 psi) (119.6 kPa) in accordance with CISPI 301 or CISPI 310. Restraint systems shall be third party certified to this requirement. Such restraints shall be installed in accordance with manufacturer's instructions.

Reason:

This proposal brings forward the language currently included in Chapter 3 with the addition of a prescriptive requirement that is not currently included in the CISPI 301 and 310 standards, The Thrust Force Tables are included but no specific requirements for the restraint systems to meet. This proposal also includes the third party certification requirement for restraint systems. Manufactures of the hubless system currently support the installation of these systems to be in accordance with CISPI 301 and CISPI 310. This proposal would ensure that all systems would be installed uniformly throughout the US.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal is clarifying the code language already included in the code. It brings language forward from Section 303.5.

Internal ID: 1509

P108-18

IPC: Table 702.4, 705.10.4 (New), Chapter 15

Proponent: Brian Conner, representing Charlotte Pipe and Foundry (bconner@charlottepipe.com)

2018 International Plumbing Code

Add new text as follows:

705.10.4 Push-fit joints. Push-fit joints shall conform to ASME A112.4.4 and shall be installed in accordance with the manufacturer's instructions.

Revise as follows:

TABLE 702.4
PIPE FITTINGS

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters	ASTM D2661; ASTM F628; CSA B181.1
Acrylonotrile butadiene styrene (ABS) plastic pipe in sewer and drain diameters	ASTM D2751
Cast iron	ASME B16.4; ASME B16.12; ASTM A74; ASTM A888; CISPI 301
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME B16.26; ASME B16.29
Glass	ASTM C1053
Gray iron and ductile iron	AWWA C110/A21.10
Polyethylene	ASTM D2683
Polyolefin	ASTM F1412; CSA B181.3
Polyvinyl chloride (PVC) plastic in IPS diameters	ASTM D2665; ASTM F1866; ASME A112.4.4
Polyvinyl chloride (PVC) plastic pipe in sewer and drain diameters	ASTM D3034
Polyvinyl chloride (PVC) plastic pipe with a 3.25-inch O.D.	ASTM D2949
Polyvinylidene fluoride (PVDF) plastic pipe	ASTM F1673; CSA B181.3
Stainless steel drainage systems, Types 304 and 316L	ASME A112.3.1
Steel	ASME B16.9; ASME B16.11; ASME B16.28
Vitrified clay	ASTM C700

For SI: 1 inch = 25.4 mm.

Add new standard(s) follows:

ASME

American Society of Mechanical Engineers
Two Park Avenue
New York NY 10016-5990

A112.4.4-2017:

Plastic Push Fit Drain, Waste, and Vent (DWV) Fittings

Reason:
Use of push-fit DWV fittings is an option. More options in the code usually result in an overall lowering of costs of construction because of increased flexibility for adapting to varying project situations.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

Use of push-fit DWV fittings is an option. More options in the code usually result in an overall lowering of costs of construction because of increased flexibility for adapting to varying project situations.

Analysis: A review of the standard proposed for inclusion in the code, ASME A112.4.4-2017, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 2223

P109-18 Part I

IPC: TABLE 702.4, 705.10.4 (New), Chapter 15

Proponent: Angel Guzman Rodriguez, ASME, representing The American Society of Mechanical Engineers (ASME)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Add new text as follows:

705.10.4 Push-fit joints. Push-fit joints shall conform to ASME A112.4.4 and shall be installed in accordance with the manufacturer's instructions.

Revise as follows:

TABLE 702.4
PIPE FITTINGS

	MATERIAL	STANDARD
	Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters	ASTM D2661; ASTM F628; CSA B181.1
	Acrylonotrile butadiene styrene (ABS) plastic pipe in sewer and drain diameters	ASTM D2751
	Cast iron	ASME B16.4; ASME B16.12; ASTM A74; ASTM A888; CISPI 301
	Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME B16.26; ASME B16.29
	Glass	ASTM C1053
	Gray iron and ductile iron	AWWA C110/A21.10
	Polyethylene	ASTM D2683
	Polyolefin	ASTM F1412; CSA B181.3
	Polyvinyl chloride (PVC) plastic in IPS diameters	ASTM D2665; ASTM F1866; ASME A112.4.4
	Polyvinyl chloride (PVC) plastic pipe in sewer and drain diameters	ASTM D3034
	Polyvinyl chloride (PVC) plastic pipe with a 3.25-inch O.D.	ASTM D2949
	Polyvinylidene fluoride (PVDF) plastic pipe	ASTM F1673; CSA B181.3
	Stainless steel drainage systems, Types 304 and 316L	ASME A112.3.1
	Steel	ASME B16.9; ASME B16.11; ASME B16.28
	Vitrified clay	ASTM C700

For SI: 1 inch = 25.4 mm.

Add new standard(s) follows:

ASME

American Society of Mechanical Engineers
Two Park Avenue
New York NY 10016-5990

A112.4.4-2017:

Plastic Push Fit Drain, Waste, and Vent (DWV) Fittings

Analysis: A review of the standard proposed for inclusion in the code, ASME A112.4.4-2017, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 1423

P109-18 Part II

IRC: P3003.9.4 (New), TABLE P3002.3, Chapter 44

Proponent: Angel Guzman Rodriguez, ASME, representing The American Society of Mechanical Engineers (ASME)

2018 International Residential Code

Add new text as follows:

P3003.9.4 **Push-fit joints.** Push-fit joints shall conform to ASME A112.4.4 and shall be installed in accordance with the manufacturer's instructions.

Revise as follows:

TABLE P3002.3
PIPE FITTINGS

PIPE MATERIAL	FITTING STANDARD
Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters	ASTM D2661; ASTM D3311; ASTM F628; CSA B181.1
Acrylonotrile butadiene styrene (ABS) plastic pipe in sewer and drain diameters	ASTM D2751
Cast-iron	ASME B16.4; ASME B16.12; ASTM A74; ASTM A888; CISPI 301
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME B16.26; ASME B16.29
Gray iron and ductile iron	AWWA C110/A21.10
Polyethylene	ASTM D2683
Polyolefin	ASTM F1412; CSA B181.3
Polyvinyl chloride (PVC) plastic in IPS diameters	ASTM D2665; ASTM D3311; ASTM F1866; ASME A112.4.4
Polyvinyl chloride (PVC) plastic pipe in sewer and drain diameters	ASTM D3034
Polyvinyl chloride (PVC) plastic pipe with a 3.25 inch O.D.	ASTM D2949
PVC fabricated fittings	ASTM F1866
Stainless steel drainage systems, Types 304 and 316L	ASME A112.3.1
Vitrified clay	ASTM C700

For SI: 1 inch = 25.4 mm.

Add new standard(s) follows:

ASME

American Society of Mechanical Engineers
Two Park Avenue
New York NY 10016-5990

A112.4.4-2017:

Plastic Push Fit Drain, Waste, and Vent (DWV) Fittings

Reason:
A new standard has been published for push fit fittings to be used in DWV applications. Fittings are to be used with ABS or PVC pipe only in non-pressure applications.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

This proposal is only adding an optional type fitting that can be used for joining PVC pipe.

A review of the standard proposed for inclusion in the code, ASME A112.4.4-2017, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 1459

P110-18

IPC: 706.3, TABLE 706.3

Proponent: Ronald George, Plumb-Tech Design & Consulting Services LLC, representing Self (Ron@Plumb-TechLLC.com)

2018 International Plumbing Code

Revise as follows:

706.3 Installation of fittings. Fittings shall be installed to guide sewage and waste in the direction of flow. Change in direction shall be made by fittings installed in accordance with Table 706.3. Change in direction by combination fittings, side inlets or increasers shall be installed in accordance with Table 706.3 based on the pattern of flow created by the fitting. <u>Horizontal building drains shall have all branch connections rolled up as close to the building drain connection as possible so that the invert elevation of the branch connection is at least as high as the centerline of the building drain at the point of connection.</u> Double sanitary tee patterns shall not receive the discharge of back-to-back water closets and fixtures or appliances with pumping action discharge.

> **Exception:** Back-to-back water closet connections to double sanitary tees shall be permitted where the horizontal *developed length* between the outlet of the water closet and the connection to the double sanitary tee pattern is 18 inches (457 mm) or greater.

TABLE 706.3
FITTINGS FOR CHANGE IN DIRECTION

TYPE OF FITTING PATTERN	CHANGE IN DIRECTION		
	Horizontal to vertical	**Vertical to horizontal**	**Horizontal to horizontal**
Sixteenth bend	X	X	X
Eighth bend	X	X	X
Sixth bend	X	X	X
Quarter bend	X	X[a]	X[a]
Short sweep	X	X[a,b]	X[a]
Long sweep	X	X	X
Sanitary tee	X[c]	—	—
Wye	X	X	X[d]
Combination wye and eighth bend	X	X	X[d]

For SI: 1 inch = 25.4 mm.

a. The fittings shall only be permitted for a 2-inch or smaller fixture drain.

b. Three inches or larger.

c. For a limitation on double sanitary tees, see Section ~~706.3.~~706.3

d. Rolled up to above the centerline of the downstream horizontal drain where connected to the horizontal building drain.

Reason:

This code change is necessary in order to maintain the hydraulic depth of flow in the main building drain and to prohibit waste from flowing back into building drain branches from the main building drain flow which causes a loss in the hydraulic depth of flow in the main building drain each time a water line flows past a branch drain and some of the mainline waste flows into to horizontal branches.

Excerpt fro an Article in Plumbing Engineer Magazine:

Energy and Water Savings Mandates are Contributing "Dry-Drains"

In 1992, the federal Energy Policy Act, was passed, and has since undergone various amendments. The broad focus of this law is to increase clean energy use and improve overall energy efficiency in the United States. Mandates for the reduction of water usage by residential and commercial users were included in this law based upon the understanding that the production and distribution of water requires energy. The law sets minimum efficiency standards for flow rates for water closets, urinals, faucets and showerheads, (except emergency fixture showerheads) that are distributed in commerce for personal use or commercial use or consumption.

The minimum efficiency standards for water closets, urinals faucets and showerheads set forth in the 1992 Energy Policy Act, section 123, are covered in in Title 42 USC section 6295(j) and , 6295 (k).

42 USC section 6295(k)(1)(A) Except as provided in subparagraph (B), the maximum water use allowed in gallons per flush for any of the following water closets manufactured after January 1, 1994, is the following:

Gravity tank-type toilets	1.6 gpf.
Flushometer tank toilets	1.6 gpf.
Electromechanical hydraulic toilets	1.6 gpf.
Blowout toilets	3.5 gpf.

42 USC section 6295(k)(1)(B)

The maximum water use allowed for any gravity tank-type white 2-piece toilet which bears an adhesive label conspicuous upon installation consisting of the words “Commercial Use Only” manufactured after January 1, 1994, and before January 1, 1997, is 3.5 gallons per flush.

42 USC section 6295(k)(1)(C)

The maximum water use allowed for flushometer valve toilets, other than blowout toilets, manufactured after January 1, 1997, is 1.6 gallons per flush.

42 USC section 6295(k)(2)

The maximum water use allowed for any urinal manufactured after January 1, 1994, is 1.0 gallon per flush.

There are similar maximum flow requirements for faucets and showers in section (j). These flow rate reductions have led to an increased the number of drainline transport problems for older plumbing systems when they were combined with poorly designed and poorly performing plumbing fixtures at the time. Manufacturers had to spend great sums of money to redesign water closets to flush with better performance. We are approaching the point where manufacturers cannot make many more improvements to plumbing fixture performance at these very low flow rates. There is a minimum amount of water required to maintain a hydraulic depth of flow in a drain and for drains to flow and perform properly. When low-flow plumbing fixtures are installed on older plumbing systems that have existing larger drains installed at the minimum slope, the lower flows create a lower hydraulic depth of flow in the drain and solids will do not transport down the drain as well. They tend to pile up and form a dam over time. The dam creates a pond in from of the dam where flow velocities are interrupted allowning solids to settle out in the pond that is formed in the drain pipe. Over a period of time, the solids plug up the existing oversized drain lines. This necessitates a call for a drain cleaning service technician.

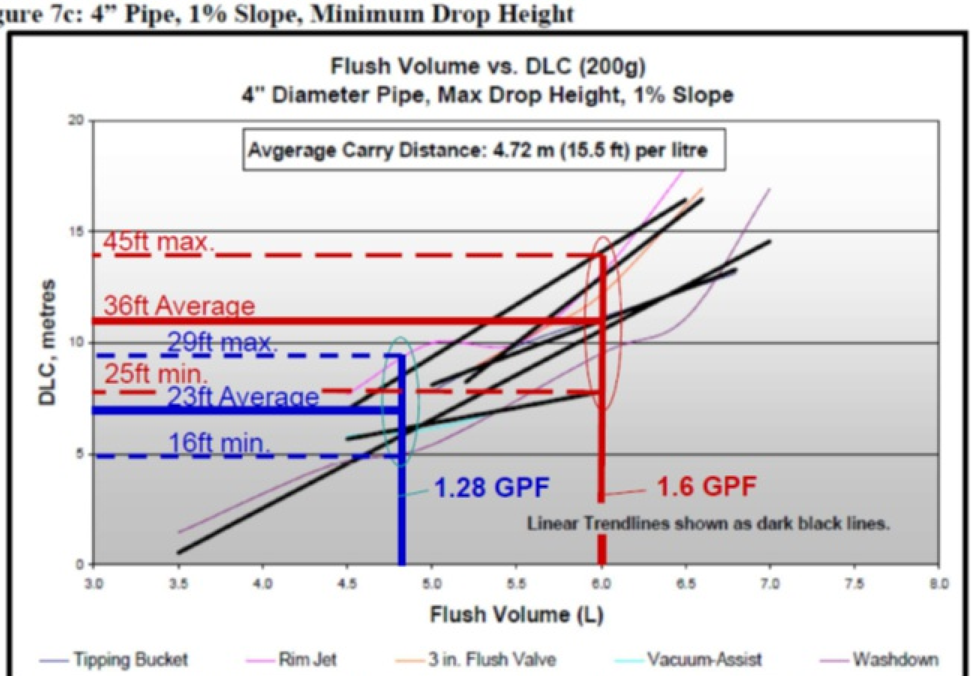
Many of us may have heard about problems in drains and sewers following the advent of the 1992 Energy Policy Act and the mandated water flow reductions. Since then, the plumbing product manufacturers have invested a lot of money redesigning their fixtures to perform better at lower flows, however there is a limit to the possible improvements with respect to performance. The Plumbing Industry Research Coalition (PERC) was formed and has been doing research to learn more about the drainline transport issues using low-flow fixtures. Their funding has been limited, and more research is needed, to address issues with flushable wipes, flushable toilet seat covers, and feminine products in the drain line. The research they have provided so far has been valuable with respect to understanding the limitations of plumbing fixtures and drain line transport at lower flow rates. For information on the PERC research see the following website: http://www.plumbingefficiencyresearchcoalition.org/ (Phase 1, Phase 2 and Phase 2.1).

Studies by two engineers, Bill Gauley and John Koeller, show when various models of 1.6 and 1.28 Gallon per flush GPF water closet's were tested, tests showed drainline transport of solids is generally less in 1.28 GPF water closets when compared to 1.6 GPF water closets. The was a reduction in the drainline transport of about at 37 percent when reducing flows from 1.6 to 1.28 GPF. The transport distance was reduced from 36 feet on average to about 23 feet on average. (See Figure 4). With even lower flows being proposed, it will be difficult if not impossible for larger horizontal drainage systems to transport solids. Drain blockages will become more common at lower flow rates. In high-rise vertical buildings, it should be relatively easy to transport the waste a short distance to a vertical stack if the stack is within about 15 feet of the fixtures. There should be enough additional uses of water in the stack in a high-rise building to provide sufficient drainline transport at the lowest level in the horizontal building drain.

In a remote restroom in a large horizontal building, with no other branches providing drainage flow, there will be drainline transport problems and an increase in drainline blockages. The energy expended after cleaning up after a sewage back-ups could easily exceed the cost associated with having an adequate drain flow in the original system design. When you consider the enery and expenses associated with:

Cleaning the drain lines,
Removing moldy drywall and finishes
Repairing damage to the building
Healthcare costs associated with the spread of disease, bacteria and mold
The small amount of energy and water that may be saved will be offset by far with remediation costs. Another consideration that I have experienced is, when people realize the drains block-up on a regular basis because of inadequate flow, people will be trained to flush twice or three times to ensure the waste goes down the drain. I have seen signs in many restrooms asking users to flush multiple times if there are solids in the bowl. There is a minimum sustainable drainline flow rate and more research is needed to understand these limitations before we arbitrarily pick lower flow rates in order to gain points for an energy and environmental, water conservation program.

Figure 7c: 4" Pipe, 1% Slope, Minimum Drop Height



Source: Evaluation of Low Flush Volume Toilet Technologies to Carry Waste in Drainlines 2005. (with Ron George edits in color)

Figure 4 – Illustration Showing Drainline Transport Distance at various flow rates

Source: Evaluation of Low-Flush-Volume Toilet Technologies to Carry Waste in Drainlines, February 2005, by: Bill Gauley, P.Eng., and John Koeller, P.E.

The 'Dry Drains' Phenomenon

Dry drains is a phenomenon being brought about because of aggressive energy and water conservation efforts. Energy and water conservation code changes continue to be proposed for further reductions of water consumption for plumbing fixtures beyond the requirements in the Energy Policy Act of 1992. These water flow reduction proposals are what I have referred to in the past as the "water conservation limbo. How low can we go?" Using the Manning Formula, and from various drainage research that is available, we have a basic understanding of the minimum flow required for each pipe size and pipe slope for various drain loadings. Despite this available knowledge, people still propose code change submittals based on simple math of water savings based on a lower flow over a fixture use period. There is no consideration of the impact on other parts of the plumbing system. Many code change proposals don't consider the laws of physics. Many code changes seem to be on the edge of violating or maybe violate the laws of physics. However, plumbing systems should perform properly with health and safety being more important than energy and water conservation. The International code change process has a button to click that asks if the proposed code change will add cost to building construction. I would like to see a button that asks: Will this code change potentially cause a decrease in system performance? I would also like to see a button for: Will this code change cause a health and Safety Issue? Code changes should be provided with technical support and research that shows no adverse effect on system performance, and the health and safety issues. The problem is complex and a simple request to save water comes with many other performance and health & safety ramifications that are not always contemplated by code change proponents with the good intentions of saving water.

Drain flows are getting to the point where the flows are insufficient to transport solids down the drain. If drain flows are reduced, and the drain pipes are the same size, then the hydraulic depth of flow will be less. In older buildings, there will likely be more problems than in newer buildings that can be designed with smaller drains with more slope.

To compound the issue, when a greywater reuse system collects discharged water from fixtures for reuse to flush water closets or for sub-surface irrigation purposes, it is taking water away from the sanitary drainage system. (See Figure 4). The wastewater flow needs to be maintained at a level to keep the hydraulic depth of flow sufficient for proper water velocities and drain line transport.

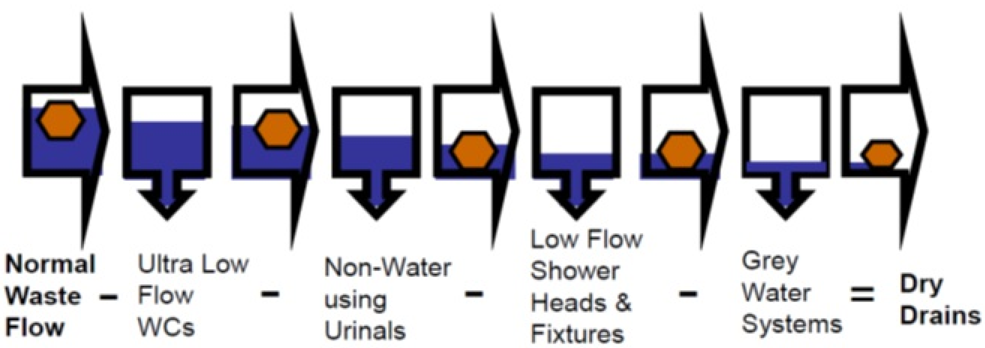


Figure 5 – Illustration showing Less Water in Drains Due to Water Conservation

Loss of Hydraulic Depth in Building Drains from Flow into Horizontal Branch Drains

There has been research done in Australia that was reported on at the Dry Drains conference that addressed flows in horizontal building drains with horizontal branch connections. The study showed when building drain branches are connected horizontally to the building drain, they allow waste to divert or back-up into each branch as the waste flows by each branch. This lowers the hydraulic depth of flow in the main. (See Figure's 5, 6 & 7) This illustrates the need to consider code requirements to roll up branches up on a 45-degree angle to prevent the waste from entering the branches (and further reducing the drainline transport capacity for drains that are already at or near minimum flow rates for proper drainline transport for ultra-low flow fixtures).

The research also confirmed a drain should not drop from directly overhead into a horizontal drain. Waste usually would be directed upstream from a vertical stack dropping into a horizontal drain. This allowed solids to settle in the horizontal pipe upstream of the connection

and reduced the hydraulic depth of flow because of the diversion of waste. The stack should use a 45 and a Y fitting rolled to allow a rolled up 45-degree entry into the horizontal drain.

Some of these are already required in our codes. We should also be more aware of using directional drainage pattern fittings as water closet flow rates are further reduced. An interesting thing of note is the fact that the minimum slope in Australia is 1.67 percent and in the U.S., the minimum slope is 1.0104 percent (1/8 inch per foot) because they generally use smaller drain pipes.

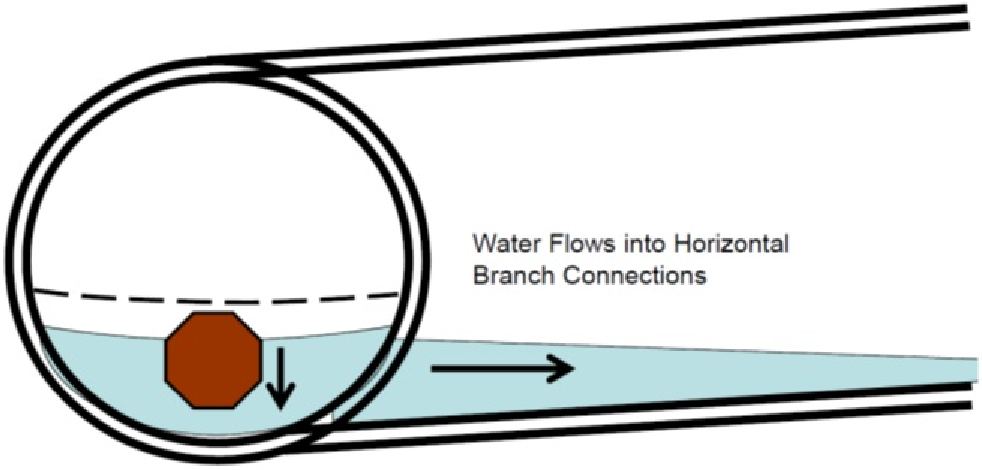


Figure 6 – Less Water in Drains Due to flow into Horizontal Branch Connections

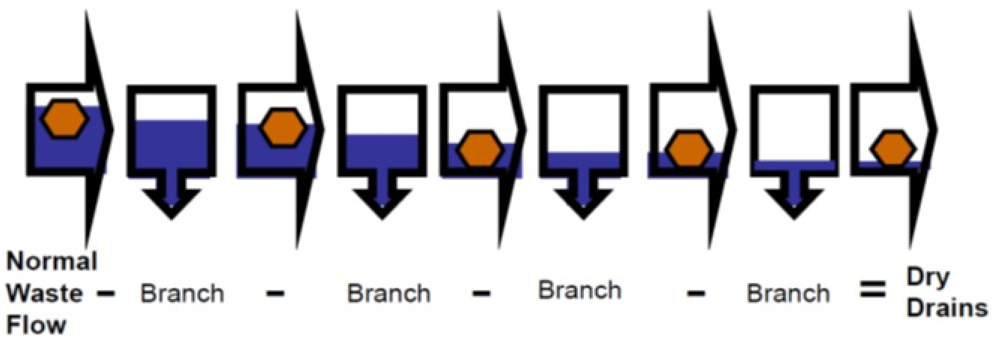


Figure 7 – Less Water in Drains Due to flow into Multiple Horizontal Branch Connections

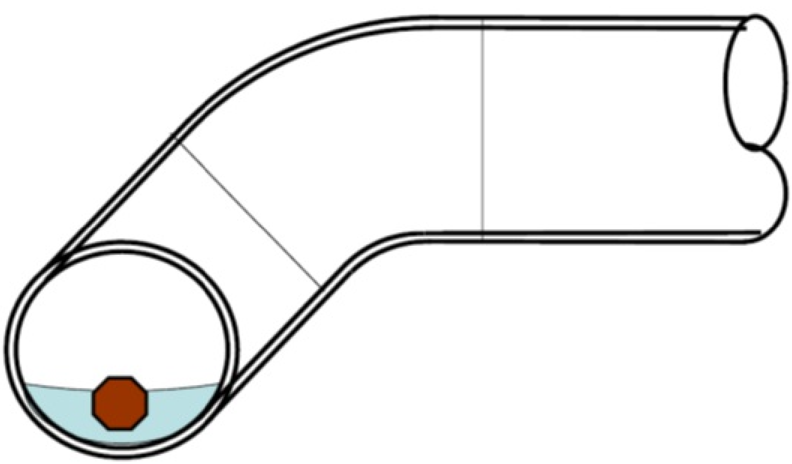


Figure 8 –Rolled Up Branch Drain to Assist with Transport of Solids.

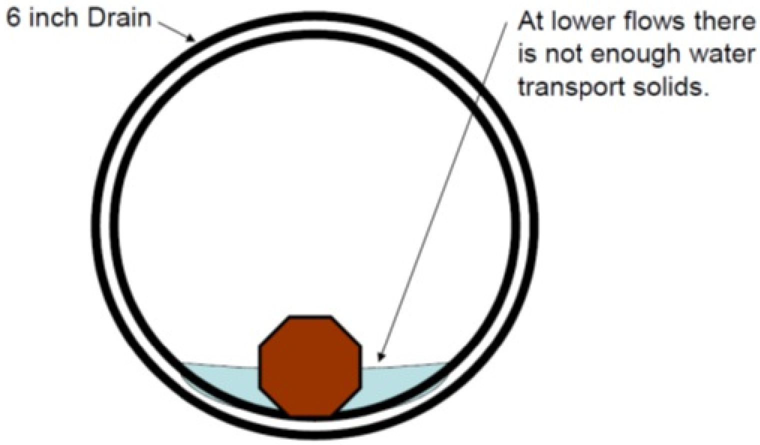


Figure 9 – Large Pipe with Low Flow Fixtures = Low hydraulic depth and Drainline Transport Problems

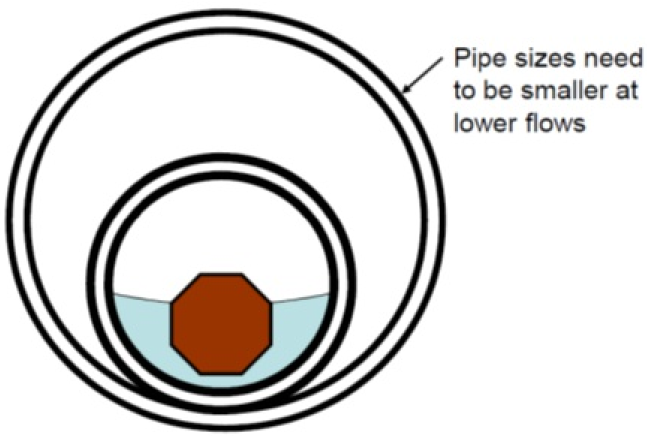


Figure 10 – Small Pipe with Low Flow Fixtures = Good Hydraulic Depth and Drainline Transport (Smaller pipes may require increased slope)

As a member of a water utility, we were experiencing water quality problems at the ends of the water distribution network because of aging water. We were also dealing with blockages in the sewer mains because there was not enough flow in the sewers. We ended up flushing fire hydrants every couple of weeks and directing the flow into sewer manholes to address the water quality and simultaneously flushing the sewers. How is this accounted for in the energy and water conservation calculations? Sadly it is not. We need to determine what the minimum flows are in order to maintain safe and properly performing plumbing systems.

I am hoping the water quality studies associated with water conservation programs at Drexel University and Purdue University look at these issues. Dumping water to keep water treatment chemical residuals up and low flow fixtures contributing to drain line transport issues seems counter-productive if we continue to make cuts in water use without knowing what are the minimum sustainable flows for each pipe size.

Ron George, CPD is president of Plumb-Tech Design & Consulting Services he has over 40 years' experience designing plumbing systems.

Cost Impact

The code change proposal will increase the cost of construction .

This code change will only address branch connections to the building drain. It is needed for health and safety.

Internal ID: 2181

P111-18

IPC: 706, 706.3 (New), 706.3, Table 706.3, 706.3.2 (New), 706.3.3 (New), 706.34 (New)

Proponent: James Richardson Jr, representing City of Columbus Ohio (jarichardson@columbus.gov); Robert Schutz, representing City of Columbus, OH (RJSchutz@columbus.gov)

2018 International Plumbing Code

Revise as follows:

SECTION 706 ~~CONNECTIONS BETWEEN~~ DRAINAGE ~~PIPING AND FITTINGS~~SYSTEMS

Add new text as follows:

706.3 Installation. Drainage systems shall be installed in accordance with 706.3.1 thru 706.3.4.

Revise as follows:

~~706.3~~706.3.1 ~~Installation of fittings.~~Fittings. Fittings shall be installed to guide sewage and waste in the direction of flow. Change in direction shall be made by fittings installed in accordance with Table 706.3. Change in direction by combination fittings, side inlets or increasers shall be installed in accordance with Table ~~706.3~~ 706.3.1 based on the pattern of flow created by the fitting. ~~Double sanitary tee patterns shall not receive the discharge of back-to-back water closets and fixtures or appliances with pumping action discharge.~~

~~**Exception:** Back-to-back water closet connections to double sanitary tees shall be permitted where the horizontal *developed length* between the outlet of the water closet and the connection to the double sanitary tee pattern is 18 inches (457 mm) or greater.~~

TABLE ~~706.3~~ 706.3.1
FITTINGS FOR CHANGE IN DIRECTION

TYPE OF FITTING PATTERN	CHANGE IN DIRECTION		
	Horizontal to vertical	Vertical to horizontal	Horizontal to horizontal
Sixteenth bend	X	X	X
Eighth bend	X	X	X
Sixth bend	X	X	X
Quarter bend	X	X[a]	X[a]
Short sweep	X	X[a,b]	X[a]
Long sweep	X	X	X
Sanitary tee	X[c]	—	—
Wye	X	X	X
Combination wye and eighth bend	X	X	X

For SI: 1 inch = 25.4 mm.

a. The fittings shall only be permitted for a 2-inch or smaller fixture drain.

b. Three inches ~~or~~ larger.

~~c. For a limitation on double sanitary tees, see Section 706.3.~~

Add new text as follows:

<u>**706.3.2** **Fixture drains.** Fixture drains shall discharge to a horizontal branch drain, stack or building drain.</u>

<u>**706.3.3** **Branch drains.** Branch drains, horizontal or vertical, shall discharge to a stack or a building drain.</u>

<u>**706.3.4** **Building drain.** Building drains shall discharge to a building sewer.</u>

Reason:
We have been witnessing a decline in the understanding of good plumbing practices. Unfortunately, many do not seem to understand that the base knowledge for the code is derived from the definitions. The definitions in the codes are the most important item in the code to understand, for without a clear understanding of the definitions you could not reasonably understand the intent of the code sections. This is the reason when a word included in the definitions is used in the code text, it is <u>**italicized**</u>. This provides a clear road sign back so people will refer back to the definition when developing their interpretation of the code.

Unfortunately this doesn't seem to be happening like it should. From my experience many jurisdictions will adopt some form of the ICC Building Codes, though many will also amend the code based on local submissions or adopted legislation (including my own). For my State, this has resulted in the "road signs" disappearing because someone felt it was better to italicize our changes. The end result as I have stated is many now do not apply the definitions when developing designs. This is a problem that is not centralized to design professionals in my jurisdiction, we have seen it from design professionals all across the United States.

Horizontal branch drains are intended to serve as a collector for fixture discharge and convey the discharge to a stack or the building drain. The horizontal branch drain is intended to receive waste from the same floor level that requires little time to settle in a non-turbulant horizontal flow The discharge of a stack into a horizontal branch drain results in the discharge affecting fixtures attached to the horizontal branch drain. The waste from a stack reaches terminal velocity resulting in "hydraulic jump" when the waste reached the base of the stack and transitions to a horizontal flow pattern.

In simple terms, if we look at different plumbing items as though they were part of the transportation infrastructure, we could identify **fixture drains** as neighborhood streets, **horizontal branch drains** as North/South, East /West connector streets (Main St., High St.), **stacks** and **building drains** as State Routes, and the **building sewers** and **public sewers** as the InterState Highways. Applying that logic, we can see we don't typically have the higher traffic roads discharging through the smaller roads. The plumbing code was designed the same way if people would apply the definitions.

Clearly this was something that was initially in people's minds when the code was developed and revised over the years as there are multiple instances where code language was written in such a way to prevent a stack from discharging to; a wet vent, a circuit vented horizontal branch drain, a combination waste and vent system. That language really just tiptoes around the issue though and has lead to a very blurred line.

Since as stated before, design professionals often are not applying the definitions, the same holds true for many plans examiners, inspectors and contractors. The intent of this proposal is to clearly define how the waste should be collected in each point of the process as it makes its way to the end point of disposal.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

This change is a simple clarification as to how a drainage system is built. This doesn't result in any change in code requirements and thus no impact to the costs of construction.

Internal ID: 2050

P112-18

IPC: 707.1

Proponent: James Richardson Jr, representing City of Columbus Ohio (jarichardson@columbus.gov); Robert Schutz, representing City of Columbus, OH (RJSchutz@columbus.gov)

2018 International Plumbing Code

Revise as follows:

707.1 Prohibited joints. The following types of joints and connections shall be prohibited:

1. Cement or concrete joints.
2. Mastic or hot-pour bituminous joints.
3. Joints made with fittings not *approved* for the specific installation.
4. Joints between different diameter pipes made with elastomeric rolling O-rings.
5. Solvent-cement joints between different types of plastic pipe except where provided for in Section 705.16.4.
6. Saddle-type fittings.
7. <u>Double pattern fittings shall not be used in sanitary drains.</u>

Reason:
We receive constant complaints about double pattern fittings from the service industry. Everyone who has ever ran a snake for any amount of time can attest to the issue with a double cross. We have all heard stories where a technician has pulled back a shower curtain from an adjacent restroom, even from an adjacent apartment. The service contractors are reporting issues where double pattern combination Wye & 1/8th bend and double pattern Wye's have been used in a horizontal configuration on a building drain. Videos have shown that waste is flowing straight across and blocking one of the branches causing backups to occur. Additionally, when they run snakes through the branches, as it reaches the double pattern fitting, often times the snake will go through to the other branch instead of turning in the intended direction of flow. This is a needless nuisance for a building owner and the occupants. These connections can be made simply by using a wye then upstream of the wye, a combination wye & 1/8th bend or just using another wye. The issue for the owners/occupants goes away and should result in a savings in maintenance costs for the owner.

Cost Impact
The code change proposal will increase the cost of construction .

There will be a small cost impact associated with this proposal as it will require an additional fitting and slightly more labor. These costs will be offset by the savings in maintenance costs.

Internal ID: 2019

P113-18 Part I

IPC: 708.1, 708.1.6 (New)

Proponent: Janine Snyder, City of Thornton, representing Colorado Association of Plumbing & Mechanical Officials (CAPMO) (Janine.Snyder@cityofthornton.net); Guy Tomberlin, Fairfax County, VA, representing Fairfax County Building Division (guy.tomberlin@fairfaxcounty.gov)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Add new text as follows:

708.1.6 Cleanout equivalent. A fixture trap or a fixture with integral trap, removable without altering concealed piping, shall be acceptable as a cleanout equivalent.

Revise as follows:

708.1 Cleanouts required. Cleanouts shall be provided for drainage piping in accordance with Sections 708.1.1 through ~~708.1.11~~708.1.12.

Analysis: The change in the section number in 708.1 is the result of adding new Section 708.1.6 which renumbers subsequent sections.

Internal ID: 2070

P113-18 Part II

IRC: P3005.2 P3005.2.10.1 (New)

Proponent: Janine Snyder, City of Thornton, representing Colorado Association of Plumbing & Mechanical Officials (CAPMO) (Janine.Snyder@cityofthornton.net); Guy Tomberlin, Fairfax County, VA, representing Fairfax County Building Division (guy.tomberlin@fairfaxcounty.gov)

2018 International Residential Code

Add new text as follows:

P3005.2.10.1 Cleanout Equivalent. A fixture trap or a fixture with integral trap, removable without altering the concealed piping shall be acceptable as a cleanout equivalent.

Revise as follows:

P3005.2 Cleanouts required. Cleanouts shall be provided for drainage piping in accordance with Sections P3005.2.1 through ~~P3005.2.11~~P3005.2.12.

Reason:

This is a companion change to the 2018 IRC subsection reintroduction of cleanout equivalents that was mistakenly left out during the reorganization of the cleanout section in the 2015 IRC. This is a viable option for cleanout equivalents in the IPC as well which is why the addition of the language is being proposed to match the IRC language.

Cost Impact

The code change proposal will decrease the cost of construction .

This will reduce the cost of construction by allowing fixtures such as water closets to be utilized as cleanouts, as have been allowed in the past.

Internal ID: 1362

P114-18

IPC: 708.1.8, Chapter 15

Proponent: Sidney Cavanaugh, representing LMK Technologies (sidneycavanaugh@yahoo.com)

2018 International Plumbing Code

Revise as follows:

708.1.8 Installation arrangement. The installation arrangement of a cleanout shall enable cleaning of drainage piping only in the direction of drainage flow.

Exceptions:

1. Test tees serving as cleanouts.
2. A two-way cleanout installation that is *approved* for meeting the requirements of Section 708.1.3.
3. A small bore vacuum excavation saddle installed in accordance with ASTM F3097.

Add new standard(s) follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959
US

F3097-17:

Standard Practice for Installation of an Outside Sewer Service Cleanout through a Minimally Invasive Small Bore Vacuum Excavation

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Reason:
This change is needed to recognize a less costly and invasive means of installing a clean out which may be used for maintenance and rehabilitation of building sewer and sewer service lateral.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

This type of cleanout is not required and therefore doesn't result in an increase in the cost of construction. Use of this type of cleanout could actually decrease the cost as the building sewer line does not have to be excavated to install a cleanout (tee).

Analysis: A review of the standard proposed for inclusion in the code, ASTM F3097-17, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 925

P115-18 Part I

IPC: 717 (New), Chapter 15

Proponent: Guy Tomberlin, Fairfax County, VA, representing The Virginia Plumbing and Mechanical Inspectors Assco. and the Virginia Building and Code Officials Assco Code Committee (guy.tomberlin@fairfaxcounty.gov); Janine Snyder, representing Colorado Association of Plumbing & Mechanical Officials (CAPMO) (Janine.Snyder@cityofthornton.net)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Add new text as follows:

717 RELINING BUILDING SEWERS AND BUILDING DRAINS

717.1 General. This section shall govern the relining of existing *building sewers and building drainage piping*.

717.2 Applicability. The relining of existing *building sewer* and building drainage piping shall be limited to gravity drainage piping,4 inches (102 mm) in diameter and larger. The relined piping shall be of the same nominal size as the existing piping.

717.3 Pre-installation requirements. Prior to commencement of the relining installation, the existing piping sections to be relined shall be descaled and cleaned. After the cleaning process has occurred and water has been flushed through the system, the piping shall be inspected internally by a recorded video camera survey.

717.3.1 Pre-installation recorded video camera survey. The video survey shall include verification of the project address location. The video shall include notations of the cleanout and fitting locations, and the approximate depth of the existing piping. The video shall also include notations of the length of piping at intervals no greater than 25 feet.

717.4 Permitting. Prior to permit issuance, the code official shall review and evaluate the pre-installation recorded video camera survey to determine if the piping system is capable to be relined in accordance with the proposed lining system manufacturer's installation requirements and applicable referenced standards.

717.5 Prohibited applications.
Where review of the pre-installation recorded video camera survey reveals that piping systems are not installed correctly or defects exist, relining shall not be permitted. The defective portions of piping shall be exposed and repaired with pipe and fittings in accordance with this code. Defects shall include, but are not limited to, backgrade or insufficient slope, complete pipe wall deterioration or complete separations such as from tree root invasion or improper support.

717.6 Relining materials. The relining materials shall be manufactured in compliance with applicable standards and certified as required in Section 303. Fold -and-form pipe reline materials shall be manufactured in compliance with ASTM F1504 or ASTMF1871.

717.7 Installation. The installation of relining materials shall be performed in accordance with the manufacturer's installation instructions, applicable referenced standards and this code.

717.7.1 Material data report. The installer shall record the data as required by the relining material manufacture and applicable standards. The recorded data shall include but is not limited to the location of the project, relining material type, amount of product installed and conditions of the installation. A copy of the data report shall be provided to the code official prior to final approval.

717.8 Post-installation recorded video camera survey. The completed relined piping system shall be inspected internally by a recorded video camera survey after the system has been flushed and flow tested with water. The video survey shall be submitted to the the *code official* prior to finalization of the permit. The video survey shall be reviewed and evaluated to provide verification that no defects exist. Any defects identified shall be repaired and replaced in accordance with this code.

717.9 Certification. A certification shall be provided in writing to the code official, from the permit holder, that the relining materials have been installed in accordance with the manufacturer's installation instructions, the applicable standards and this code.

717.10 Approval. Upon verification of compliance with the requirements of Sections 717.1 through 717.9, the code official shall approve the installation.

Add new standard(s) follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959
US

F1504—2014:

Standard Specification for Folded Poly (Vinyl Chloride) (PVC) for Existing Sewer and Conduit Rehabilitation

F1871—2011:

Standard Specification for Folded/Formed Poly (Vinyl Chloride) Pipe Type A for Existing Sewer and Conduit Rehabilitation

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Analysis: The referenced standards, ASTM F1504-2014 and F1871-2011, are currently referenced in the 2018 IRC.

Internal ID: 1881

P115-18 Part II

IRC: P3011, P3011.1, P3011.2, P3011.3, P3011.4, P3011.5, P3011.6, P3011.7, P3011.7.1 (New), P3011.7.2 (New), P3011.8 (New), P3011.9 (New), P3011.10 (New)

Proponent: Guy Tomberlin, Fairfax County, VA, representing The Virginia Plumbing and Mechanical Inspectors Assco. and the Virginia Building and Code Officials Assco Code Committee (guy.tomberlin@fairfaxcounty.gov); (janine.snyder@cityofthorton.net)

2018 International Residential Code

Revise as follows:

SECTION P3011 ~~REPLACEMENT~~ RELINING OF ~~UNDERGROUND~~ BUILDING SEWERS ~~BYPVC FOLD~~ AND ~~FORM METHODS~~BUILDING DRAINS

P3011.1 General. This section shall govern the ~~replacement~~ relining of existing *building sewer* ~~piping by PVC Fold and Form methods.~~ and building drainage piping.

P3011.2 Applicability. The ~~replacement~~ relining of existing *building sewer* ~~piping by PVC fold and form methods~~ and building drainage piping shall be limited to gravity drainage piping 4 inches (102 mm) ~~to 18 inches (457 mm). The replacement~~ in diameter and larger. The relined piping shall be of the same nominal size as the existing piping.

P3011.3 ~~Preinstallation inspection~~ Pre-installation Requirements. ~~The~~ Prior to commencement of the relining installation, the existing piping sections to be ~~replaced~~ relined shall be descaled and cleaned. After the cleaning process has occurred and water has been flushed through the system, the piping shall be inspected internally by a recorded video camera survey. ~~The survey shall include notations of the position of cleanouts and the depth of connections to the existing piping.~~

Add new text as follows:

P3011.3.1 Pre-installation recorded video camera survey. The video survey shall include verification of the project address location. The video shall include notations of the cleanout and fitting locations, and the approximate depth of the existing piping. The video shall also include notations of the length of piping at intervals no greater than 25 feet.

P3011.4 Permitting. Prior to issuing a permit for relining, the building official shall review and evaluate the pre-installation recorded video camera survey to determine whether the piping system is capable to be relined in accordance with the proposed lining system manufacturer's installation requirements and applicable referenced standards.

Delete and substitute as follows:

~~**3011.4 Pipe.** The replacement piping shall be manufactured in compliance with ASTM F1504 or ASTM F1871.~~

P3011.5 Prohibited applications. Where review of the pre-installation recorded video camera survey reveals that piping systems are not installed correctly, or defects exist, relining shall not be permitted. The defective portions of piping shall be exposed and repaired with pipe and fittings in accordance with this code. Defects shall include, but are not limited to, backslope or insufficient slope, complete pipe wall deterioration or complete separations such as from tree root invasion or improper support.

~~**3011.5 Installation.** The piping sections to be replaced shall be cleaned and flushed. Remediation shall be performed where there is groundwater infiltration, roots, collapsed pipe, dropped joints, offsets more than 12 percent of the inside pipe diameter or other obstructions.~~

P3011.6 Relining materials. The relining materials shall be manufactured in compliance with applicable standards and certified as required in Section P2609. Fold-and-form pipe reline materials shall be manufactured in compliance with ASTM F1504 or ASTM F1871.

Add new text as follows:

P3011.7.1 Material data report. The installer shall record the data as required by the relining material manufacture and applicable standards. The recorded data shall include but is not limited to the location of the project, relining material type, amount of product installed and conditions of the installation. A copy of the data report shall be provided to the building official prior to final approval.

Delete and substitute as follows:

~~**3011.6 Cleanouts.** Where the existing *building sewer* did not have cleanouts meeting the requirements of this code, cleanout fittings shall be installed as required by this code.~~
P3011.7 Installation. The installation of relining materials shall be performed in accordance with the manufacturer's installation instructions, applicable referenced standards and this code.

~~**3011.7 Post-installation inspection.** The completed replacement piping shall be inspected internally by a recorded video camera survey. The video survey shall be reviewed and *approved* by the *building official* prior to pressure testing of the replacement piping system.~~
P3011.8 Post-installation recorded video camera survey. The completed relined piping system shall be inspected internally by a recorded video camera survey after the system has been flushed and flow tested with water. The video survey shall be submitted to the the *code official* prior to finalization of the permit. The video survey shall be reviewed and evaluated to provide verification that no defects exist. Any defects identified shall be repaired and replaced in accordance with this code.

Delete without substitution:

~~**P3011.8 Pressure testing..** The replacement piping system as well as the connections to the replacement piping shall be tested in accordance with Section P2503.4.~~

Add new text as follows:

P3011.9 Certification. A certification shall be provided in writing to the building official, from the permit holder, that the relining materials have been installed in accordance with the manufacturer's installation instructions, the applicable standards and this code.

P3011.10 Approval. Upon verification of compliance with the requirements of Sections P3011.1 through P3011.9, the building official shall approve the installation.

Reason:
To date there has been limited to no code reference for all the technologies currently available to the reline piping systems. Many localities across the country are accepting it as an alternate material and method with no code guidance. This proposal is not an endorsement of any particular method or process. It does not promote or require relining. It simply provides installation and acceptance criteria when the application is encountered. This language will provide consistent application for all materials and technologies for the industry, including the code official and installers alike. Pipe relining technology has been successfully used for many years. It began with larger utility piping systems and has progressed into smaller piping systems that are privately owned and fall within the purview of the plumbing code. The process reduces the impact of open trench excavation's and thereby reduces repair cost according to industry data.

Cost Impact
The code change proposal will decrease the cost of construction .

Reducing open trench excavation, assisting with preservation of the natural environment and limiting destruction of private property will reduce the cost of plumbing repairs.

Internal ID: 1867

P116-18

IPC: 717 (New), 717.1 (New), Chapter 15

Proponent: Sidney Cavanaugh, representing LMK Technologies (sidneycavanaugh@yahoo.com)

2018 International Plumbing Code

Add new text as follows:

717 BUILDING SEWER AND SEWER SERVICE LATERAL REHABILITATION

717.1 Building sewer and sewer service lateral rehabilitation. Any rehabilitation of building sewer piping and sewer service lateral piping shall be in accordance with ASTM F2599. Any rehabilitation of building sewer and sewer service lateral pipe and its connection to the main sewer pipe shall be in accordance with F2561. All rehabilitation of building sewer piping and sewer service laterals shall include the use of hydrophilic rings or gaskets meeting ASTM F3240 to assure water tightness and elimination of ground water penetration.

Add new standard(s) follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

F2599-16:

Standard Practice for The Sectional Repair of Damaged Pipe By Means of An Inverted Cured-In-Place Liner

F2561-17:

Standard Practice for Rehabilitation of a Sewer Service Lateral and Its Connection to the Main Using a One Piece Main and Lateral Cured-in-Place Liner

F3240-17:

Standard Practice for Installation of Seamless Molded Hydrophilic Gaskets (SMHG) for Long-Term Watertightness of Cured-in-Place Rehabilitation of Main and Lateral Pipelines

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Reason:
To add necessary requirements for rehabilitation of building sewers and sewer service laterals that are currently missing from IPC.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

In most cases this method would decrease cost of repair of existing piping because there would be no need to dig up and replacing existing piping.

Analysis: A review of the standard proposed for inclusion in the code, ASTM F2599-16, ASTM F2561-17,ASTM F3240- 17, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 507

P117-18

IPC: 903.1, 903.1.1 (New), 903.1.2 (New), 903.1.3 (New), 903.1.4 (New), 903.6

Proponent: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing Tesla (JBEngineer@aol.com)

2018 International Plumbing Code

Revise as follows:

903.1 ~~Roof extension.~~Vent terminal required. ~~Open vent pipes that extend through a roof shall be terminated not less than [NUMBER] inches (mm) above the roof. Where a roof is to be used for assembly or as a promenade, observation deck, sunbathing deck or similar purposes, open vent pipes shall terminate not less than 7 feet (2134 mm) above the roof.~~The vent pipe shall terminate by extending to the outdoors through the roof or the side wall in accordance with one of the methods identified in Section 903.1.1 through 903.1.4.

Add new text as follows:

903.1.1 Roof extension unprotected. Open vent pipes that extend through a roof shall be terminated not less than [NUMBER] inches (mm) above the roof.

903.1.2 Roof used for recreational or assembly purposes. Where a roof is to be used as a promenade, restaurant, bar, observation deck, sunbathing deck, or similar purposes, open vent pipes shall terminate not less than 7 feet (2134 mm) above the roof.

903.1.3 Protected vent terminal. Where an open vent pipe terminates above a sloped roof and is covered by either a roof-mounted panel (such as a solar collector or photovoltaic panel mounted over the vent opening) or a roof element (such as an architectural feature or a decorative shroud), the vent pipe shall terminate not less than 2 inches (51 mm) above the roof surface. Such roof elements shall be designed to prevent the adverse effects of snow accumulation and wind on the function of the vent. The placement of a panel over a vent pipe and the design of a roof element covering the vent pipe shall provide for an open area for the vent pipe to the outdoors that is not less than the area of the pipe, as calculated from the inside diameter of the pipe. Such vent terminals shall be protected by a method that prevents birds and rodents from entering or blocking the vent pipe opening.

903.1.4 Sidewall vent terminal. Vent terminals extending through the wall shall terminate not less than 10 feet (3048 mm) from the lot line and 10 feet (3048 mm) above the highest adjacent grade within 10 feet (3048 mm) horizontally of the vent terminal. Vent terminals shall not terminate under the overhang of a structure with soffit vents. Side wall vent terminals shall be protected to prevent birds or rodents from entering or blocking the vent opening.

Delete without substitution:

~~**903.6 Extension through the wall.** Vent terminals extending through the wall shall terminate at a point not less than 10 feet (3048 mm) from a lot line and not less than 10 feet (3048 mm) above average ground level. Vent terminals shall not terminate under the overhang of a structure with soffit vents. Side wall vent terminals shall be protected to prevent birds or rodents from entering or blocking the vent opening.~~

Reason:

A similar change was proposed during the last cycle. There was concern regarding the wording used in the proposed code text. Those issues have been addressed with revised wording. A similar change was approved for inclusion in the International Residential Code-Plumbing Section.

The proposed change reorganizes vent terminal requirements. There are currently three options for a vent terminal, extending the vent (number) inches or more above the roof, extending the vent more than 7 feet above the roof when the roof is used for entertainment, or extending the vent through the side wall. However, the three requirements are separated between multiple sections. This makes the requirement readily identifiable in a section that presents all the options in one main section.

A fourth option for terminating the vent has been included. The fourth option would allow the vent to terminate 2 inches above a sloped roof when protected by a covering. This would allow photovoltaic solar collectors to be installed over vent terminals. It would also allow other protected vent terminals, such as architectural features that hide the vent for aesthetic purposes.

The size, length, and location of vent terminals has been a subject matter that has been greatly discussed over the last century. There are many myths, innuendoes, theories, and hypothesis regarding vent terminals. One of the most complete papers on vent terminals was published by the National Bureau of Standards (NBS) in 1954, entitled, "Frost Closure of Roof Vents in Plumbing Systems," authored by Nerbert Eaton and Robert Wyly. Most of the current code requirements originate from the recommendations of this paper.

The NBS paper investigated plumbing roof vents and their termination throughout North America. Identified as a major concern is the frost closure of the vent terminal. Other concerns included snow blockage, shearing off of the vent terminal, and rainwater entrance.

Prior to this paper, it was largely alluded that the reason for a minimum size of 1-1/4 inch and a termination above the roof surface was to prevent a bird from building a nest and laying an egg to block off the vent. To this day, birds building nests in vents is a concern. However, that concern is more related to side wall venting that provides an easy opening for a bird to build a nest.

When a vent terminates lower to the roof, measures must be taken to prevent a bird from building a nest around the vent pipe and blocking it off. Increasing the size of the vent is one means used to avoid a bird's nest. Screening and vent covers also are used to prevent birds from building a nest.

The more pressing issue is how far above the roof a vent should terminate. Two issues of importance are water tightness of the flashing and preventing rainwater entrance into the plumbing vent. Modern day flashings can make the roof penetration water tight at much lower heights, including a termination 2 inches above the roof.

The NBS report suggested a minimum of 2 inch penetration above the roof to prevent rainwater from entering the plumbing vent. It is recognized that a flat roof can have a greater accumulation of water hence the need for the vent to be at a higher elevation. Typically secondary roof drains are located between 2 and 4 inches above the roof. Thus, the vent terminal would have to be located at a higher height which is the reason for maintaining a minimum of inserting the appropriate number of inches above the roof for a flat roof.

The NBS report identified a vent terminal used in Saskatoon, Canada that terminates at the sloped roof. There was no extension above the roof. This was found to be extremely effective in preventing frost closure. As the NBS report states, the closer the vent terminates to the roof, the lower the possibility of frost closure. The report also found that by making the vent a minimum of 3 inch in diameter, frost closure that impacts the performance of the venting system was avoided.

Snow accumulation has been a subject of more recent discussions regarding vent terminals. However, snow accumulation was addressed in the NBS report. The NBS report found that while snow may completely cover the vent terminal, the snow eventually melts from the heated vapors emanating out of the vent. Prior to the snow melting, the NBS report found that the snow cover did not impact the performance of the vent. This makes sense since the purpose of the vent is to balance the pressure in the drainage system with atmospheric pressure. The snow cover is not dense enough to prevent the balancing of pressure in the piping system.

The current code requires the vent to terminate at a height specified by the jurisdiction. The Residential Code requires the termination to be 6 inches above the anticipated snow cover. The requirement add the local value remains intact. However, when the vent is covered, such as by a solar panel or architectural feature, it cannot be covered by snow such that the vent doesn't perform properly. Thus, the vent could terminate at a 2 inch height above a sloped roof.

In the mountain west, shearing of the roof vent is a problem when the snow and ice melt and slide off of sloped roofs. By extending the vent higher through the roof, there is a greater force applied on the vent that can result in the pipe being sheared off. If the vent is lowered, the force on the vent during snow and ice slides is also lowered. This may reduce the shearing incidents of vent pipes. However, that is not part of the reason for lowering the vent terminal height. The vent would be protected if installed at a lower height. Hence, the snow and ice slides would have little to no impact on the vent since it is covered.

Plumbing contractors in the mountain west with heavy snow and ice accumulations have found that the more practical solution is to extend the vent through the roof closer to the peak of the roof. Thus, the force from sliding snow and ice is lowered. This has not been addressed in this code change and is more of a regional issue addressed by knowledgeable local contractors.

The remaining issue that is not often addressed for vent terminals is the impact of wind. During windy conditions, the vent terminal can create a reduced pressure zone that siphons the trap seal. This is often called a Venturi effect. The other concern is downdrafts that can increase the pressure in the drainage system. However, downdrafts have not had a major impact on the drainage system based on the termination height above the roof. While the possibility exists that a lower vent termination height could result in higher wind downdrafts, this has not proven to be the case. However, the code requirement addresses downdrafts by requiring the covering to prevent any adverse impact from wind.

What the plumbing profession must acknowledge is that solar is a viable source of energy for a building. As such, accommodations must be made to allow for the maximum area of roof coverage with solar panels. This may require the adjustment in the height of the vent terminal.

While accommodations must be made, there cannot be a sacrifice of public health. The lowering of the vent terminal to 2 inches on a sloped roof will not impact public health. This was proven by the NBS study published in 1954. Furthermore, modern building practices will result in a water tight vent terminal that will perform as intended.

Bibliography:

"Frost Closure of roof Vents in Plumbing Systems," Herbert N. Eaton and Robert S. Wyly, BMS Report 142, published 1954, United States Department of Commerce, National Bureau of Standards.

National Plumbing Code Handbook, Standards and Design Information, Vincent T. Manas, P.E., copyright 1957, McGraw-Hill Book Company

Cost Impact

The code change proposal will decrease the cost of construction .

Options for vent termination will be provided. This will lower the cost of construction.

Internal ID: 1311

P118-18

IPC: 915.1

Proponent: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing InSinkErator (JBENGINEER@aol.com)

2018 International Plumbing Code

Revise as follows:

915.1 Type of fixtures. A *combination waste and vent system* shall not serve fixtures other than floor drains, sinks, lavatories and drinking fountains. *Combination waste and vent systems* shall not receive the discharge from a ~~food waste disposer or~~ clinical sink.

Reason:
The ASPE Research Foundation did a study on food waste disposers discharging through a combination waste and vent system. There was no problem found with the installation of a combination waste and vent system connecting a food waste disposer. Testing was performed with both residential and commercial food waste disposers. A copy of the ASPE Research Foundation report is included with this submittal. This paper documents why this current code restriction is unnecessary.

A series of videos taken during the research project can be viewed at: https://aspe.org/FoodDisposerTestVideos.

A similar restriction in the Residential Code Plumbing Section was removed during the last code change cycle. This IPC should be consistent with the IRC plumbing requirements.

Cost Impact
The code change proposal will decrease the cost of construction .

This will allow a lower cost venting system where a food waste disposer is installed.

Internal ID: 884

P119-18

IPC: 202, 919 (New), 919.1 (New), 919.2 (New), Chapter 15

Proponent: Ronald George, representing IPS corporation (Ron@Plumb-TechLLC.com)

2018 International Plumbing Code

Add new definition as follows:

POSTIVE PRESSURE REDUCTION DEVICE A device that is connected to a drainage or vent stack to attenuate pressure waves and reduce pressure fluctuations in the sanitary waste & vent system to within acceptable levels.

Add new text as follows:

919 POSITIVE PRESSURE REDUCTION DEVICES

919.1 General. Positive pressure reduction devices used in vent systems shall comply with ASSE 1030.

919.2 Installation. The installation of positive pressure reduction devices in sanitary drainage and vent systems shall be in accordance with the device manufacturer's instructions.

Add new standard(s) follows:

ASSE

ASSE International
18927 Hickory Creek Drive, Suite 220
Mokena IL 60448

1030-2016:

Performance Requirements for Positive Pressure Reduction Devices for Sanitary Drainage Systems

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Reason:
This proposal adds a definition for positive pressure reduction devices and a standard for such devices. Positive pressure reduction devices (hereafter referred to as “device”) are to be used in building drainage waste and vent (DWV) systems. They are intended to reduce the impact of short duration air pressure transients that arise in DWV stacks through use. The device consists of a variable volume reservoir contained within a ventilated rigid outer casing with an inlet connection by which the reservoir inflates when subjected to positive pressure. In its inactive state, the flexible reservoir is deflated. Expansion only occurs in response to an increase in line pressure at the entrance to the device. This expansion provides a variable volume reservoir for air. The device connects to the drainage network via an airtight seal to prevent the diversion of airflow from entering the reservoir. As a result, the reservoir becomes an integral part of the drainage network.

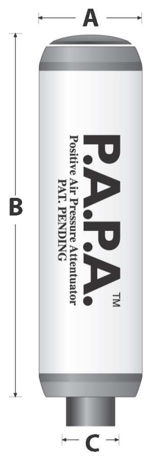
P.A.P.A.™ - Positive Air Pressure Attenuator

The P.A.P.A. device is the perfect complement to STUDOR Air Admittance Valves. Together they form an Engineered System known as "Studor Single Pipe System (SSPS)", a total solution to building venting requirements. The Studor AAVs deal with negative pressure in the system while the P.A.P.A. effectively deals with the positive pressure transients. The combination of the two maintains the perfect system balance quickly and efficiently throughout the system preventing siphonage and blowing of traps.

- For Commercial use
- The P.A.P.A. can be used in conjunction with a conventional DWV system
- ASSE 1030 - Positive Pressure Reduction Devices for Sanitary Drainage Systems

DIMENSIONS

A	B	Nominal Pipe Size C
7-7/8"	29-1/2"	3" Spigot



CAPACITY

Series Assembly	
Maximum Number of Units: 4	
Air Capacity	**US Gallons**
1 Unit	1
2 Units	2
3 Units	3
4 Units	4

The P.A.P.A. is rated for 5 PSI

Weight: 5 pounds

Bibliography:

Pages 29 through 44 &49 of Studor Technical Manual, 9th Edition

Web Link: http://ipscorp.com/pdf/studor/Studor_Technical_Manual.pdf

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This is only an option that is not required to be used. When used in single stack drainage systems, it can decrease the cost of construction, however these devices can be used in any sanitary waste and vent system that is experiencing pressure fluctuations and it will attenuate pressure waves.

Analysis: A review of the standard proposed for inclusion in the code, ASSE 1030-2016, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 1126

P120-18

IPC: 1002.1

Proponent: James Richardson Jr, representing City of Columbus Ohio (jarichardson@columbus.gov); Robert Schutz, representing City of Columbus, OH (RJSchutz@columbus.gov)

2018 International Plumbing Code

Revise as follows:

1002.1 Fixture traps. Each plumbing fixture shall be separately trapped by a liquid-seal trap, except as otherwise permitted by this code. The vertical distance from the fixture outlet to the trap weir shall not exceed 24 inches (610 mm), and the horizontal distance shall not exceed 30 inches (610 mm) measured from the centerline of the fixture outlet to the centerline of the inlet of the trap. The height of a clothes washer standpipe above a trap shall conform to Section 802.3.3. A fixture shall not be double trapped.

Exceptions:

1. This section shall not apply to fixtures with integral traps.
2. A combination plumbing fixture is permitted to be installed on one trap, provided that one compartment is not more than 6 inches (152 mm) deeper than the other compartment and the waste outlets are not more than 30 inches (762 mm) apart.
3. ~~A grease interceptor intended to serve as a fixture trap in accordance with the manufacturer's installation instructions shall be permitted to serve as the trap for a single fixture or a combination sink of not more than three compartments where the vertical distance from the fixture outlet to the inlet of the interceptor does not exceed 30 inches (762 mm) and the *developed length* of the waste pipe from the most upstream fixture outlet to the inlet of the interceptor does not exceed 60 inches (1524 mm).~~

~~4.~~<u>3.</u> Floor drains in multilevel parking structures that discharge to a building storm *sewer* shall not be required to be individually trapped. Where floor drains in multilevel parking structures are required to discharge to a combined *building sewer* system, the floor drains shall not be required to be individually trapped provided that they are connected to a main trap in accordance with Section 1103.1.

Reason:
This is an error in the code that has been present since the change was made to section 802.1.7 requiring that utensil/pot/pan sinks to be indirectly connected. Previously a direct connection was also permissible, which promulgated exception # 3. Since a direct connection is no longer permissible for these type of sinks, exception # 3 would be in direct violation of 802.1.7

Bibliography:

2018 International Plumbing Code

PUB. - 08/31/2017

802.1.7 Food utensils, dishes, pots and pans sinks.

Sinks, in other than dwelling units, used for the washing, rinsing or sanitizing of utensils, dishes, pots, pans or service ware used in the preparation, serving or eating of food **shall discharge indirectly through an air gap or an air break to the drainage system.**

1002.1 Fixture traps.

Each plumbing fixture shall be separately trapped by a liquid-seal trap, except as otherwise permitted by this code. The vertical distance from the fixture outlet to the trap weir shall not exceed 24 inches (610 mm), and the horizontal distance shall not exceed 30 inches (610 mm) measured from the centerline of the fixture outlet to the centerline of the inlet of the trap. The height of a clothes washer standpipe above a trap shall conform to Section 802.3.3. A fixture shall not be double trapped.

Exceptions:

1. This section shall not apply to fixtures with integral traps.

2. A combination plumbing fixture is permitted to be installed on one trap, provided that one compartment is not more than 6 inches (152 mm) deeper than the other compartment and the waste outlets are not more than 30 inches (762 mm) apart.

3. A grease interceptor intended to serve as a fixture trap in accordance with the manufacturer’s installation instructions shall be permitted to serve as the trap for a single fixture or a combination sink of not more than three compartments where the vertical distance from the fixture outlet to the inlet of the interceptor does not exceed 30 inches (762 mm) and the developed length of the waste pipe from the most upstream fixture outlet to the inlet of the interceptor does not exceed 60 inches (1524 mm).

4. Floor drains in multilevel parking structures that discharge to a building storm sewer shall not be required to be individually trapped. Where floor drains in multilevel parking structures are required to discharge to a combined building sewer system, the floor drains shall not be required to be individually trapped provided that they are connected to a main trap in accordance with Section 1103.1.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

There will be no cost impact due to the fact that the requirement is already in chapter 8 for an indirect connection.

Internal ID: 1533

P121-18

IPC: 1002.4.1.1

Proponent: Ed Osann, representing Natural Resources Defense Council (eosann@nrdc.org)

2018 International Plumbing Code

Revise as follows:

1002.4.1.1 Potable water-supplied trap seal primer valve. A potable water-supplied trap seal primer valve shall supply water to the trap. Water-supplied trap seal primer valves shall conform to ASSE 1018~~.~~, and shall be of the type that uses not more than 30 gallons per year per trap. The discharge pipe from the trap seal primer valve shall connect to the trap above the trap seal on the inlet side of the trap.

Reason:
A water-supplied trap seal primer that is unrestricted can discharge 300 to 500 gallons a year to a trap. By comparison, a 2-inch trap, for example, actually requires les than 1/2 gallon per year to maintain the trap seal. Trap seal primer valves that limit the amount of water discharged to 8 gallons per year have been on the market for several years.

The maximum of 30 gallons of discharge per year in this proposal is contained in both the 2015 International Green Construction Code (IgCC) and the 2015 IAPMO Green Plumbing and Mechanical Code Supplement. It is time to bring this common-sense requirement into the IPC to prevent an unnecessary waste of drinking water.

Bibliography:
2015 International Green Construction Code, International Code Council, 2015, sec. 702.8.2.

2015 Green Plumbing and Mechanical Code Supplement, International Association of Plumbing and Mechanical Officials, 2015, sec. 415.1.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

This code change proposal applies to only one of four available compliance paths where trap seal protection is required, and thus will not increase the cost of construction.

Internal ID: 1621

P122-18

IPC: 1002.4.1.5 (New), 1002.4.1

Proponent: James Richardson Jr, representing City of Columbus Ohio (jarichardson@columbus.gov); Robert Schutz, representing City of Columbus, OH (RJSchutz@columbus.gov)

2018 International Plumbing Code

Add new text as follows:

1002.4.1.5 Fixture drain connection for trap priming. A fixture drain from a lavatory or hand sink shall serve as a method of providing trap seal protection for an emergency floor drain, a trench drain, or a floor sink where such fixtures are located in the same room. A fixture drain from a drinking fountain shall serve as a method of providing trap seal protection for an emergency floor drain, a trench drain, or a floor sink where such fixtures are in the same room or in a room adjacent to the room having the drinking fountain. The fixture drain shall not be routed on or above the surface of the floor and shall connect to the floor drain, trench drain, or floor sink at a point that is below the flood level rim and above the inlet to the trap of the receiving fixture.

Revise as follows:

1002.4.1 Trap seal protection. Trap seals of *emergency floor drain* traps and trap seals subject to evaporation shall be protected by one of the methods in Sections 1002.4.1.1 through ~~1002.4.1.4~~1002.4.1.5.

Reason:
This is a method of providing trap seal protection that can lower the owner's overall cost of maintenance and requires no special or certified product to do so.

Currently the 2018 International Plumbing Code allows for reclaimed or gray water supplied trap primer devices that comply with ASSE 1018, as well as a waste water supplied device that complies with ASSE 1044. The proposed method simply removes the need for any "certified" product. Experience has proven that the ASSE 1018 devices don't typically have a record of providing long service, maintenance issues have also been reported with the 1044 devices. When owners decide to go back to using gel type soaps even though the manufacture specifically states the need for foaming soap, the 1044 device have a tendency to plug up with the gel soaps over time which requires maintenance intervention. The maintenance for the 1018 device is even more problematic, often we would be replacing these devices within 6-12 months of installation. This proposed method is essentially already something that is allowed by the code. We have used this method since before I entered into the plumbing trade and have never had a complaint about it failing or creating an unsafe/serious condition for an occupancy.

2018 International Plumbing Code

PUB. - 08/31/2018

1002.4.1.2 Reclaimed or gray water-supplied trap seal primer valve.

A reclaimed or gray water-supplied trap seal primer valve shall supply water to the trap. Water-supplied trap seal primer valves shall conform to ASSE 1018. The quality of reclaimed or gray water supplied to trap seal primer valves shall be in accordance with the requirements of the manufacturer of the trap seal primer valve. The discharge pipe from the trap seal primer valve shall connect to the trap above the trap seal, on the inlet side of the trap.

1002.4.1.3 Waste water-supplied trap primer device.

A waste water-supplied trap primer device shall supply water to the trap. Waste water-supplied trap primer devices shall conform to ASSE 1044. The discharge pipe from the trap seal primer device shall connect to the trap above the trap seal on the inlet side of the trap

Cost Impact
The code change proposal will decrease the cost of construction .

This method should actually result in a decrease cost of construction because no special trap priming devices are required. The fixture drain already has to be piped, it is just piped to the fixture needing trap priming. This will also save maintenance costs because trap priming devices will not need repaired/replaced.

Internal ID: 1534

P123-18

IPC: 1003.3.2

Proponent: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing InSinkErator (JBENGINEER@aol.com)

2018 International Plumbing Code

Revise as follows:

1003.3.2 Food waste disposers restriction. A food waste disposer shall not discharge to a grease interceptor.

Exception: A two or three compartment sink that is required to discharge to a grease interceptor shall be permitted to have a food waste disposer provided that the disposer rating is not greater than 1.0 horsepower.

Reason:
The commercial food handling industry has requested that small food waste disposers be permitted on two or three compartment sinks to handle the incidental food waste that accumulates in the wash sink after cleaning. The food waste disposer would not be the typical commercial food waste disposer unit handling all of the food waste from the establishment. It would only account for a small portion of food waste remaining during the washing operation.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

The allowance for having a small disposer discharging to a grease interceptor could save the cost of materials and labor of needing a separate sink just for a small disposer and the need for separate drainage piping to connect that sink downstream of the interceptor.

Internal ID: 1882

P124-18

IPC: 1003.3.2.1 (New)

Proponent: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing InSinkErator (JBENGINEER@aol.com)

2018 International Plumbing Code

Add new text as follows:

1003.3.2.1 Existing installations. For existing installations where the food waste disposer discharges through the grease interceptor, the grease interceptor shall be properly sized to include the discharge from the food waste disposer. The sizing of the grease interceptor shall be based on the continuous flow from the food waste disposer.

Reason:
The code was revised to add the prohibition for the discharge of food waste disposers through grease interceptors. However, there are many existing installations where the food waste disposer discharges through the grease interceptor. When the grease interceptor is replaced, the sizing must include the increase load from the food waste disposer.

It is common practice to have the food waste disposer operating in a food handling establishment. When connected to a grease interceptor, this can add a greater load than normal dishwashing sinks. This additional load must be considered when sizing the replacement grease interceptor. The time interval between cleaning of the grease interceptor must also be considered.

In a recently published paper, “A critical review of fat, oil, and grease (FOG) in sewer collection systems: Challenges and control,” the importance of properly sizing and maintaining a grease interceptor was identified as a means of reducing the problems of FOG build up in public sewer systems. This proposed change will provide guidance in the proper sizing when an existing system has a food waste disposer discharging to a grease interceptor. This will reduce the contributions of FOG to the public sewer system.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

This addresses existing installations and has no impact on the cost.

Internal ID: 885

P125-18

IPC: 1106.2, 1106.2.1 (New), TABLE 1106.2.1 (New), 1106.2.1.1 (New), 1106.2.1.2 (New), 1106.2.2 (New), 1106.2.2.1 (New)

Proponent: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing Self (JBEngineer@aol.com)

2018 International Plumbing Code

Revise as follows:

1106.2 **~~Size of storm drain piping.~~Storm drain pipe sizing.** ~~Vertical and horizontal~~ The storm ~~drain~~ drainage piping shall be sized ~~based on the flow rate through the roof drain. The flow rate in storm drain piping shall not exceed that specified in Table 1106.2.~~in accordance with Section 1106.2.1 or Section 1106.2.2.

Add new text as follows:

1106.2.1 **Roof drainage.** The rainwater drainage flow rate from the roof surface shall be determined based on the rainfall rate of a 60 minute storm with a 100 year return period and the area of the roof being drained in accordance with Table 1106.2.1.

TABLE 1106.2.1
ROOF AREA DRAINAGE FLOW RATE

Roof Drainage Area (sq. ft.)	Drainage Flow Rate (gpm)					
	Based on Rainfall Rates (in/hr)					
	1	2	3	4	5	6
500	5	10	16	21	26	31
1000	10	21	31	42	52	62
1500	16	31	47	62	78	94
2000	21	42	62	83	104	125
2500	26	52	78	104	130	156
3000	31	62	94	125	156	187
3500	36	73	109	145	182	218
4000	42	83	125	166	208	249
4500	47	94	140	187	234	281
5000	52	104	156	208	260	312
5500	57	114	171	229	286	343
6000	62	125	187	249	312	374
6500	68	135	203	270	338	405
7000	73	145	218	291	364	436
7500	78	156	234	312	390	468
8000	83	166	249	332	416	499
9000	94	187	281	374	468	561
10000	104	208	312	416	519	623
11000	114	229	343	457	571	686
12000	125	249	374	499	623	748

1106.2.1.1 Roof drain. The flow rate used for sizing the roof drainage system shall be not less than the roof drain manufacturer's published flow rate based on a head height of 4 inches (102 mm) of water ponding. Storm drainage piping shall be sized in accordance with Table 1106.2.

1106.2.1.2 Secondary roof drainage. The opening for the secondary roof drainage shall be not less than 2 inches (51 mm) and not more than 5 inches (76 mm) above the bottom opening of the primary roof drain.

1106.2.2 Engineered Roof Drain Flow Rate. Vertical and horizontal storm drain piping shall be sized based on the flow rate through the roof drain. The flow rate used for sizing the storm drainage piping shall be based on the maximum anticipated ponding at the roof drain based on a rainfall rate of a 60 minute storm with a 100 year return period and a 5 minute storm with a 10 year return period. The flow rate used for sizing the storm drainage piping system shall be the manufacturer's published flow rate for the roof drain based on the established maximum anticipated water ponding height. The storm drainage piping shall be sized in accordance with Table 1106.2.

1106.2.2.1 Secondary roof drainage. The discharge through the secondary roof drain shall not be considered when establishing the maximum height of ponding at the primary roof drain. The opening for the secondary roof drainage shall be not less than 2 inches (51 mm) above the bottom opening of the primary roof drain.

Reason:
The code was revised a few cycles ago to reflect the research published by the ASPE Research Foundation. ASPE RF and IAPMO cosponsored research on the performance of roof drains in storm drainage systems. There has been a number of requests for a fast sizing method that does not require engineering calculations. The change adds such a fast, cook-book method of sizing the storm drainage piping system.

The ASPE RF research report states the problem associated with a storm drainage system is the improper sizing of the storm drainage pipe. The old sizing method did not account for the high quality of the roof drain. The research report is included with the submittal and can be downloaded at no cost at www.aspe.org.

The code change identifies two methods for sizing the storm drainage system. The first sizing method listed in Section 1106.2.1 Roof Drainage, is the quick sizing method. When using this method, the storm drain pipe may be sized large than the engineered sizing method. The quick method will not result in smaller diameter pipe for the storm drainage system.

These requirements respond to the request by inspectors, contractors, and engineers. They first sizing method identified was developed to provide a cookbook method of sizing rather than conducting a full engineering design analysis. The sizing of the storm drainage system still relies on the values published by the roof drain manufacturers. This data identifies the flow rate based on head height through the roof drain.

Because the method takes a cookbook approach, the secondary roof drainage must be considered. For that reason, secondary roof drainage is required to be between 2 inch and 5 inches above the primary roof drainage. This is calculated into the flow rate sizing values in Table 1106.2.1. It will assure that the system will not exceed the ponding height determined in flow calculations.

The second method, identified as Section 1106.2.2 Engineered Roof Drain Flow Rate, is the current sizing method required by the code. One change has been added to the engineered sizing method. The engineered sizing will require the evaluation of the roof drainage system for a microburst, which is a 5-minute storm with a 10-year return period. While a 100-year storm may appear to be the most drastic storm for sizing a system, a microburst can overpower the storm drainage piping resulting in failure of the piping system. The microburst will typically not have a significant impact on the roof loading compared to a 100-year storm of 60-minute duration. The ASPE RF research report recommends the evaluation of both a 100-year storm of 60 minutes duration and a 10-year storm of 5-minute duration.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This provides an option for sizing the storm drainage system and options usually lower the cost of construction.

Internal ID: 1313

P126-18

IPC: 1102.6, Chapter 15

Proponent: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing Froet Industries (JBEngineer@aol.com)

2018 International Plumbing Code

Revise as follows:

1102.6 Roof Drains. Roof drains shall conform to ASME A112.6.4 or ASME A112.3.1. <u>Roof drains, other than siphonic roof drains, shall be tested and rated in accordance with ASME A112.6.4 or ASPE/IAPMO Z1034.</u>

Add new standard(s) follows:

ASPE

American Society of Plumbing Engineers
6400 Shafer Ct., Suite 350
Rosemont IL 60018-4914

<u>ASME/IAPMO 21034-2015</u>:

<u>Test Method for Evaluating Roof Drain Performance</u>

Reason:
ASPE/IAPMO Z1034 is the consensus standard for testing and rating roof drains for their flow rate at different ponding heights. The current code requires the manufacturer to publish their flow rates. The flow rates are determined by testing to either of the two standards referenced.

Siphonic roof drains are rated differential with the system designed in accordance with ASPE 45 and the roof drain tested in accordance with ASME A112.6.9.

The testing requirements in the standard are consistent with the results published in the ASPE Research Foundation Roof Drainage Research Report. There are third party laboratories currently testing and certifying roof drains to the ASPE/IAPMO Z1034 standard.

Cost Impact
The code change proposal will increase the cost of construction .

There is a cost associated with the testing of roof drains.

Analysis: A review of the standard proposed for inclusion in the code, ASPE/IAPMO 21034-2015, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 1173

P127-18

IPC: 1105.1

Proponent: Mark Jelinske, representing Self (mjelinske@rmhgroup.com)

2018 International Plumbing Code

Delete without substitution:

~~**1105.2 Roof drain flow rate.** The published roof drain flow rate, based on the head of water above the roof drain, shall be used to size the storm drainage system in accordance with Section 1106. The flow rate used for sizing the storm drainage piping shall be based on the maximum anticipated ponding at the roof drain.~~

Reason:

Recent (Dec 2017) conversations and correspondence with major roof drain manufacturers have indicated that there is no published flow data for roof drains, no recognized standards for testing the flow rate of roof drains, and no industry initiative to develop such testing programs.

While a good idea, this provision is premature until there are recognized standards developed, and until the manufacturers have developed the performance data from these standards.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This has no cost impact since there is no practical method to comply with the provisions of this section anyway. If anything, this proposal will reduce cost for the unlucky project forced to comply, since at present, a construction project would have to fund the development of a testing standard, fund a laboratory to perform such testing, and fund the publication of the data.

Internal ID: 1143

P128-18

IPC: 1105.2

Proponent: James Richardson Jr, representing City of Columbus Ohio (jarichardson@columbus.gov); Robert Schutz, representing City of Columbus, OH (RJSchutz@columbus.gov)

2018 International Plumbing Code

Revise as follows:

1105.2 Roof drain flow rate. The published roof drain flow rate, based on the head of water above the roof drain, shall be used to size the storm drainage system in accordance with Section 1106. The flow rate used for sizing the storm drainage piping shall be based on the ~~maximum anticipated ponding~~ <u>height water</u> at the roof drain <u>should not exceed with regard to the weight of ponding water equal to the acceptable threshold established by the structural engineer.</u>

Reason:
The previous revision to this code section left no real direction or parameters for design professionals. This proposal is simply suggesting at the minimum height of water that should be used when calculating the flow rate through the roof drain should be equal to the height ponding water would reach yet stay below the maximum weight threshold as established by the structural engineer.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

This is only providing providing direction for minimum safety.

Internal ID: 2358

P129-18

IPC: 1106.2, 1106.2.1 (New)

Proponent: Ronald George, Plumb-Tech Design & Consulting Services LLC, representing Self (Ron@Plumb-TechLLC.com)

2018 International Plumbing Code

Revise as follows:

1106.2 Size of storm drain piping. Vertical and horizontal storm drain piping shall be sized based on the flow rate through the roof drain. The flow rate<u>, as calculated in accordance with Section 1106.2.1, shall be checked against the roof drain manufacturer's published flow rate for the specific roof drain model and size to verify that the selected roof drain will handle the anticipated flow. The flow rate </u>in storm drain piping shall not exceed that specified in Table 1106.2.

Add new text as follows:

<u>**1106.2.1** **Rainfall rate conversion method.** The rainfall rate falling on a roof surface shall be converted to a gallons per minute flow rate in accordance with Equation 11-1.</u>

<u>GPM = R • A • 0.0104 **(Equation 11-1)**</u>

<u>where,</u>

<u>R = Rainfall intensity in inches per hour</u>

<u>A = Roof area in square feet</u>

Reason:
The flow rates for varios pipe sizes in the roof drain sizing table were changed from square feet (SF) to gallons per minute (GPM). This code change simply adds a calculation from SF to GPM.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

This code change only adds a calculation method and a caution about selecting an appropriate roof drain model.

Internal ID: 2246

P130-18

IPC: TABLE 1106.2

Proponent: Mark Jelinske, representing Self (mjelinske@rmhgroup.com)

2018 International Plumbing Code

Revise as follows:

TABLE 1106.2
STORM DRAIN PIPE SIZING

PIPE SIZE (inches)	CAPACITY[a] (gpm)				
	VERTICAL DRAIN	SLOPE OF HORIZONTAL DRAIN			
		$^1/_{16}$ inch per foot	$^1/_8$ inch per foot	$^1/_4$ inch per foot	$^1/_2$ inch per foot
2	34	15	22	31	44
3	87	39	55	79	111
4	180	81	115	163	231
5	311	117	165	234	331
6	538	243	344	487	689
8	1,117	505	714	1,010	1,429
10	2,050	927	1,311	1,855	2,623
12	3,272	1,480	2,093	2,960	4,187
15	5,543	2,508	3,546	5,016	7,093

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 gallon per minute = 3.785 L/m.

a. Values based on PVC piping. For cast iron pipe other than 5 inches, multiply the indicated capacity by 0.75.

Reason:

When this table was added to the 2015 IPC, it was based on PVC pipe, except for 5" which was based on cast iron. See the ICC 2012/2013 Code Development Cycle Group A Proposal P219-12. This is the smoothest pipe allowed by the IPC. Cast Iron is still a commonly used material, but is a rougher pipe, and therefore has a different flow capacity.

Gravity flow through a pipe is governed by the Gauckler–Manning formula. A roughness coefficient is used to account for the different roughness of materials. Flow is directly proportional to this roughness factor.

The roughness factor is generally given as 0.009 for PVC , and as 0.012 for cast iron. Since flow is directly proportional to roughness for the same diameter and slope, cast iron pipe is 0.009/0.012 = 0.75 the capacity of PVC.

Using the smoothest possible pipe as the basis of the code will result in undersized pipe if not corrected for rougher pipe.

Since codes usually assume a worst case in establishing minimum requirements, an alternate method would be to modify the table with cast iron as the basis and allowing a 0.012/0.009 = 1.33 credit if PVC is used.

It is recognized that there are other materials allowed, but PVC and cast iron are overwhelmingly dominant. Cast iron is the roughest, and PVC is the smoothest. In the interest of keeping this table simple, this proposal is just establishing the range of options, a designer can document alternate factors for other materials if desired.

Bibliography:

INTERNATIONAL CODE COUNCIL2012/2013 CODE DEVELOPMENT CYCLE Group A (2012) PROPOSED CHANGES TO THE2012 EDITIONS OF THE INTERNATIONAL PLUMBING CODE

P219 – 12

Pages 283-285

https://cdn-web.iccsafe.org/wp-content/uploads/05_IPC1.pdf

Cost Impact

The code change proposal will increase the cost of construction .

This proposal will not increase the cost of correctly sized cast iron storm drainage systems. This will avoid the potential costs involved with an undersized cast iron system if a designer does is not aware of the limitations of the table. The above statement is based on the assumption that many designers are not aware that the table will undersize a cast iron system.

Internal ID: 1978

P131-18 Part I

IPC: 1301.1.1 (New), Chapter 15

Proponent: Dave Cantrell, representing The Joint CSA/ICC Rainwater System Design and Installation Consensus Committee (dave.cantrell.codes@gmail.com)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Add new text as follows:

<u>**1301.1.1 Alternate compliance path.** Systems for nonpotable uses that comply with CSA B805/ICC 805 are deemed to comply with this chapter.</u>

Add new standard(s) follows:

CSA

CSA Group
8501 East Pleasant Valley Road
Cleveland OH 44131-5516

<u>**CSA B805-18/ICC 805-2018**</u>**:**

<u>**Rainwater Harvesting Systems**</u>

Analysis: A review of the standard proposed for inclusion in the code, CSA 805-17/ICC 805-2017, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 1971

P131-18 Part II

IRC: P2912.1.1 (New), Chapter 44

Proponent: Dave Cantrell, representing The Joint CSA/ICC Rainwater System Design and Installation Consensus Committee (dave.cantrell.codes@gmail.com)

2018 International Residential Code

Add new text as follows:

P2912.1.1 Alternate compliance path. Systems for nonpotable uses that comply with CSA B805/ICC 805 are deemed to comply with Section P2912.

Add new standard(s) follows:

CSA

CSA Group
8501 East Pleasant Valley Road
Cleveland OH 44131-5516

CSA B805-18/ICC 805-2018:

Rainwater Harvesting Systems

Reason:
This proposal adds the CSA B805/ICC 805 Standard as an alternate compliance path for rainwater to be used in nonpotable applications. The Canadian Standards Association and the International Code Council jointly formed the Rainwater System Design and Installation Consensus Committee (IS-RCSDI) in order to create a Rainwater Harvesting Standard for use in North America. Nonpotable rainwater harvesting systems that conform to this Standard will comply with Chapter 13 (IRC Section P2912), thus providing a far more comprehensive guidance document as an alternate compliance path.

While this new Standard addresses rainwater for potable use and stormwater for nonpotable use, neither of which are addressed in Chapter 13 (IRC P2912), including this Standard in Chapter 14 (IRC Chapter 44) would not mandate such uses. However, it will provide code officials with the guidance needed for reviewing and inspecting these types of water reuse systems that are becoming more common with ever-increasing water conservation measures.

Here are some necessary provisions that the committee felt obligated to include in this Standard:

1. This Standard addresses roof surface rainwater and stormwater being used as source water. It addresses rainwater intended for use in nonpotable applications as well as potable applications.

2. Recognizing that the risk to public health increases with the number of persons using a rainwater harvesting system, this Standard provides different methods for protecting water based on the influent water quality, the system, and the application. Stormwater runoff is expected to have a higher likelihood of contamination as a result of its flowing overland. Therefore, this Standard specifies additional treatment process requirements for stormwater runoff and does not cover its use for potable water applications.

3. In order to ensure the consideration of the wide range of variables associated with each site, location, design, and application, this Standard requires that a water safety plan be developed for all rainwater harvesting systems. The water safety plan considers the specific challenges and risks presented by the site and associated impact on source water quality, operation of system components, and the risk associated with the end use.

4. Applications for harvested rainwater are separated into four end use tiers that consider the exposure potential through ingestion, inhalation, and skin contact. It further separates these tiers into two groups, one for single-family residential and one for multifamily, commercial and public facilities.

5. This Standard specifies minimum performance criteria for each end use tier in consideration of the health risk and identifies possible treatment process options to meet the specified performance criteria.

6. Based on the expected source water quality, this Standard establishes suitable water quality parameters that are used to substantiate that the treatment process is operating as intended to produce safe water for the specified end use.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

The proposed alternate compliance path is an option provided to the user, not a requirement. Therefore, no added cost is mandated to the user of the code.

Analysis: A review of the standard proposed for inclusion in the code, CSA B805-18/ICC 805-2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 1986

P132-18 Part I

IPC: 1301.1.1 (New), Chapter 15

Proponent: Dave Cantrell, representing The Joint CSA/ICC Rainwater System Design and Installation Consensus Committee (dave.cantrell.codes@gmail.com)

2018 International Plumbing Code

Add new text as follows:

1301.1.1 Alternate compliance path. Systems designed for potable uses shall comply with CSA B805/ICC 805.

Add new standard(s) follows:

CSA

CSA Group
8501 East Pleasant Valley Road
Cleveland OH 44131-5516

CSA B805-18/ICC 805-2018:

Rainwater Harvesting Systems

Analysis: A review of the standard proposed for inclusion in the code, CSA 805-18/ICC 805-2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 1981

P132-18 Part II

IRC: P2912.1.1 (New), Chapter 44

Proponent: Dave Cantrell, representing The Joint CSA/ICC Rainwater System Design and Installation Consensus Committee (dave.cantrell.codes@gmail.com)

2018 International Residential Code

Add new text as follows:

P2912.1.1 Alternate compliance path. Systems designed for potable uses shall comply with CSA B805/ICC 805.

Add new standard(s) follows:

CSA

CSA Group
8501 East Pleasant Valley Road
Cleveland OH 44131-5516

CSA B805-18/ICC 805-18:

Rainwater Harvesting Systems

Reason:
This proposal adds the CSA B805/ICC 805 Standard as an alternate compliance path for rainwater to be used in both potable and nonpotable applications. The Canadian Standards Association and the International Code Council jointly formed the Rainwater System Design and Installation Consensus Committee (IS-RCSDI) in order to create a Rainwater Harvesting Standard for use in North America, one that will provide further guidance for rainwater to serve both potable and nonpotable uses.

Chapter 13 (IRC Section P2912) does not address rainwater for potable use, nor does it contain provisions for the use of stormwater for nonpotable use. This Standard provides code officials the guidance needed for reviewing and inspecting these types of water reuse systems that are becoming more common with ever-increasing water conservation measures. For this reason this Standard should be referenced in Chapter 14 (IRC Chapter 44) . It should further be noted that nonpotable rainwater harvesting systems that conform to this Standard will comply with Chapter 13 (Section P2912), thus providing a far more comprehensive guidance document as an alternate compliance path.

Here are some necessary provisions that the committee felt obligated to include in this Standard:

1. This Standard addresses roof surface rainwater and stormwater being used as source water. It addresses rainwater intended for use in nonpotable applications as well as potable applications.

2. Recognizing that the risk to public health increases with the number of persons using a rainwater harvesting system, this Standard provides different methods for protecting water based on the influent water quality, the system, and the application. Stormwater runoff is expected to have a higher likelihood of contamination as a result of its flowing overland. Therefore, this Standard specifies additional treatment process requirements for stormwater runoff and does not cover its use for potable water applications.

3. In order to ensure the consideration of the wide range of variables associated with each site, location, design, and application, this Standard requires that a water safety plan be developed for all rainwater harvesting systems. The water safety plan considers the specific challenges and risks presented by the site and associated impact on source water quality, operation of system components, and the risk associated with the end use.

4. Applications for harvested rainwater are separated into four end use tiers that consider the exposure potential through ingestion, inhalation, and skin contact. It further separates these tiers into two groups, one for single-family residential and one for multifamily, commercial and public facilities.

5. This Standard specifies minimum performance criteria for each end use tier in consideration of the health risk and identifies possible treatment process options to meet the specified performance criteria.

6. Based on the expected source water quality, this Standard establishes suitable water quality parameters that are used to substantiate that the treatment process is operating as intended to produce safe water for the specified end use.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

The proposed alternate compliance path is an option provided to the user, not a requirement. Therefore, not added cost is mandated to the user of the code.

Analysis: A review of the standard proposed for inclusion in the code, CSA B805-18/ICC 805-2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Internal ID: 1988

P133-18 Part I

IPC: Chapter 14, 1401.1, 1401.2, 1401.3, 1401.4, 1401.5, 1401.6, 1402.1, 1402.3, TABLE 1402.3, 1403.1

Proponent: Brent Mecham, Irrigation Association, representing Irrigation Association (brentmecham@irrigation.org)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC-PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2018 International Plumbing Code

Revise as follows:

CHAPTER 14 SUBSURFACE ~~LANDSCAPE IRRIGATION~~ GRAY WATER SOIL ABSORPTION SYSTEMS

1401.1 Scope. The provisions of this chapter shall govern the materials, design, construction and installation of subsurface ~~landscape irrigation~~ graywater soil absorption systems connected to nonpotable water from on-site water reuse systems.

1401.2 Materials. Above-ground drain, waste and vent piping for subsurface ~~landscape irrigation~~ graywater soil absorption systems shall conform to one of the standards listed in Table 702.1. Subsurface ~~landscape irrigation~~graywater soil absorption systems, underground building drainage and vent pipe shall conform to one of the standards listed in Table 702.2.

1401.3 Tests. Drain, waste and vent piping for subsurface ~~landscape irrigation~~ graywater soil absorption systems shall be tested in accordance with Section 312.

1401.4 Inspections. Subsurface ~~landscape irrigation~~ graywater soil absorption systems shall be inspected in accordance with Section 107.

1401.5 Disinfection. Disinfection shall not be required for on-site nonpotable water reuse for subsurface ~~landscape irrigation~~ graywater soil absorption systems.

1401.6 Coloring. On-site nonpotable water reuse for subsurface ~~landscape irrigation~~ graywater soil absorption systems shall not be required to be dyed.

1402.1 Sizing. The system shall be sized in accordance with the sum of the output of all water sources connected to the subsurface ~~irrigation~~ gray water soil absorption system. Where gray water collection piping is connected to subsurface landscape irrigation systems, gray water output shall be calculated according to the gallons-per-day-per-occupant number based on the type of fixtures connected. The gray water discharge shall be calculated by the following equation:

$C = A \times B$ (Equation 14-1)

where:

A = Number of occupants:

Residential-Number of occupants shall be determined by the actual number of occupants, but not less than two occupants for one bedroom and one occupant for each additional bedroom.

Commercial-Number of occupants shall be determined by the International Building Code.

B = Estimated flow demands for each occupant:

Residential-25 gallons per day (94.6 lpd) per occupant for showers, bathtubs and lavatories and 15 gallons per day (56.7 lpd) per occupant for clothes washers or laundry trays.

Commercial-Based on type of fixture or water use records minus the discharge of fixtures other than those discharging gray water.

C = Estimated gray water discharge based on the total number of occupants.

1402.3 Subsurface ~~landscape irrigation~~ graywater soil absorption site location. The surface grade of all soil absorption systems shall be located at a point lower than the surface grade of any water well or reservoir on the same or adjoining lot. Where this is not possible, the site shall be located so surface water drainage from the site is not directed toward a well or reservoir. The soil absorption system shall be located with a minimum horizontal distance between various elements as indicated in Table 1402.3. Private sewage disposal systems in compacted areas, such as parking lots and driveways, are prohibited. Surface water shall be diverted away from any soil absorption site on the same or neighboring lots.

TABLE 1402.3
LOCATION OF SUBSURFACE ~~IRRIGATION~~ GRAYWATER SOIL ABSORPTION SYSTEM

ELEMENT	**MINIMUM HORIZONTAL DISTANCE**	
	Storage tank (feet)	Absorption field (feet)
Buildings	5	2
Lot line adjoining private property	5	5
Water wells	50	100
Streams and lakes	50	50
Seepage pits	5	5
Septic tanks	0	5
Water service	5	5
Public water main	10	10

For SI: 1 foot = 304.8 mm.

1403.1 Installation. Absorption systems shall be installed in accordance with Sections 1403.1.1 through 1403.1.5 ~~to provide landscape irrigation without surfacing of water.~~.

Internal ID: 1251

P133-18 Part II

IRC: P3009, P3009.1, P3009.2, P3009.3, P3009.4, P3009.5, P3009.6, P3009.7, P3009.9, TABLE P3009.9, P3009.10

Proponent: Brent Mecham, Irrigation Association, representing Irrigation Association (brentmecham@irrigation.org)

2018 International Residential Code

Revise as follows:

SECTION P3009 SUBSURFACE ~~LANDSCAPE IRRIGATION~~ GRAY WATER SOIL ABSORPTION SYSTEMS

P3009.1 Scope. The provisions of this section shall govern the materials, design, construction and installation of subsurface ~~landscape irrigation~~ gray water soil absorption systems connected to nonpotable water from on-site water reuse systems.

P3009.2 Materials. Above-ground drain, waste and vent piping for subsurface ~~landscape irrigation~~ gray water soil absorption systems shall conform to one of the standards indicated in Table P3002.1(1). Subsurface ~~landscape irrigation~~gray water soil absorption, underground building drainage and vent pipe shall conform to one of the standards indicated in Table P3002.1(2).

P3009.3 Tests. Drain, waste and vent piping for subsurface ~~landscape irrigation~~ gray water soil absorption systems shall be tested in accordance with Section P2503.

P3009.4 Inspections. Subsurface ~~landscape irrigation~~ gray water soil absorption systems shall be inspected in accordance with Section R109.

P3009.5 Disinfection. Disinfection shall not be required for on-site nonpotable reuse water for subsurface ~~landscape irrigation~~ gray water soil absorption systems.

P3009.6 Coloring. On-site nonpotable reuse water used for subsurface ~~landscape irrigation~~ gray water soil absorption systems shall not be required to be dyed.

P3009.7 Sizing. The system shall be sized in accordance with the sum of the output of all water sources connected to the subsurface ~~irrigation system.~~ gray water soil absorptionsystem. Where gray-water collection piping is connected to subsurface ~~landscape~~ gray water soil absorption irrigation systems, gray-water output shall be calculated according to the gallons-per-day-per-occupant (liters per day per occupant) number based on the type of fixtures connected. The gray- water discharge shall be calculated by the following equa-tion:

$$C = A \times B \qquad \textbf{(Equation 30-1)}$$

where:

A = Number of occupants:

Number of occupants shall be determined by the actual number of occupants, but not less than two occupants for one bedroom and one occupant for each additional bedroom.

B = Estimated flow demands for each occupant:

25 gallons (94.6 L) per day per occupant for showers, bathtubs and lavatories and 15 gallons (56.7 L) per day per occupant for clothes washers or laundry trays.

C = Estimated gray-water discharge based on the total number of occupants.

P3009.9 Subsurface ~~landscape irrigation~~ gray water soil absorption system site location. The surface grade of soil absorption systems shall be located at a point lower than the surface grade of any water well or reservoir on the same or adjoining lot. Where this is not possible, the site shall be located so surface water drainage from the site is not directed toward a well or reservoir. The soil absorption system shall be located with a minimum horizontal distance between various elements as indicated in Table P3009.9. Private sewage disposal systems in compacted areas, such as parking lots and driveways, are prohibited. Surface water shall be diverted away from any soil absorption site on the same or neighboring lots.

TABLE P3009.9
LOCATION OF SUBSURFACE ~~IRRIGATION~~ GRAY WATER SOIL ABSORPTION SYSTEM

ELEMENT	MINIMUM HORIZONTAL DISTANCE	
	STORAGE TANK(feet)	~~IRRIGATION~~ ~~DISPOSAL~~ ABSORPTION FIELD(feet)
Buildings	5	2
Lot line adjoining private property	5	5
Water wells	50	100
Streams and lakes	50	50
Seepage pits	5	5
Septic tanks	0	5
Water service	5	5
Public water main	10	10

For SI: 1 foot = 304.8 mm.

P3009.10 Installation. Absorption systems shall be installed in accordance with Sections P3009.10.1 through P3009.11 ~~to provide landscape irrigation without surfacing of water.~~.

Reason:
The proposed changes better identifies the content of the chapter from irrigation systems to soil absorption systems. The technical requirements can remain as written.

While gray water is a good source of water for maintaining plants, the provisions in this section do not adequately describe the technical aspects for use in an irrigation system. The technical requirements are addressing the soil's ability to absorb water and percolate into the soil. There are no requirements mentioned about considering the needs of plants which is an essential part of an irrigation system.

When gray water is to be used for irrigation, then chapters that are in the International Green Construction Code include better technical requirements for irrigation systems and those should be followed.

Cost Impact
The code change proposal will not increase or decrease the cost of construction .

The proposed changes only better identify the name of the chapter and do not include any technical changes that would affect construction costs

Internal ID: 3503

PSD1-18

IPSDC: 101.2, 101.3, 107.2, 107.2.1, 107.2.2, 1 (New), 304, 304.1, 304.1.1, 304.2, 304.3, 304.4, 304.5, 304.6, 504.5, 802.1, 802.4, 802.5, 802.10, 805.3, 805.6, Chapter 11, 1101.1, 1101.2, 1202.4, Chapter 14

Proponent: Dennis Hallahan, Infiltrator Water Technologies, representing National Onsite Wastewater Recycling Association (dhallahan@infiltratorwater.com)

2018 International Private Sewage Disposal Code

Revise as follows:

[A] 101.2 Scope. Septic tank and effluent absorption systems or other treatment tank and effluent disposal systems shall be permitted where a public sewer is not available to the property served. ~~Unless specifically approved, the *private sewage disposal system* of each building shall be entirely separate from and independent of any other building.~~ The use of a common system or a system on a parcel other than the parcel where the structure is located shall be subject to the full requirements of this code as for systems serving public buildings.

[A] 101.3 Public sewer connection. Where public sewers become available to the premises served, the use of the *private sewage disposal system* shall be discontinued within that period of time required by law, but such period shall not exceed one year. The building sewer shall be disconnected from the *private sewage disposal system* and connected to the public sewer.

> <u>**Exception:** Where approved by the code official for such reasons as excessive cost or project difficulty, or where the existing system does not pose a health threat or is code compliant, then connection to the public sewer shall not be required.</u>

[A] 107.2 Special inspections. Special inspections of alternative ~~engineered~~ design *private sewage disposal system*s shall be conducted in accordance with Sections 107.2.1 and 107.2.2.

[A] 107.2.1 Periodic inspection. The registered design professional or designated inspector shall periodically inspect and observe the alternative ~~engineered~~ design to determine that the installation is in accordance with the approved plans. Discrepancies shall be brought to the immediate attention of the *private sewage disposal system* contractor for correction. Records shall be kept of all inspections.

[A] 107.2.2 Written report. The registered design professional shall submit a final report in writing to the code official upon completion of the installation, certifying that the alternative ~~engineered~~ design conforms to the approved construction documents. A notice of approval for the *private sewage disposal system* shall not be issued until a written certification has been submitted.

SECTION 304 ALTERNATIVE ~~ENGINEERED~~ DESIGN

304.1 Alternative engineered design. The design, documentation, inspection, testing and approval of an alternative ~~engineered~~ design *private sewage disposal system* shall comply with Sections 304.1.1 through 304.6.

304.1.1 Design criteria. An alternative ~~engineered~~ design shall conform to the intent of the provisions of this code and shall provide an equivalent level of quality, strength, effectiveness, fire resistance, durability and safety. Material, equipment or components shall be designed and installed in accordance with the manufacturer's instructions.

304.2 Submittal. The registered design professional shall indicate on the permit application that the *private sewage disposal system* is an alternative ~~engineered~~ design. The permit and permanent permit records shall indicate that an alternative ~~engineered~~ design was part of the approved installation.

304.3 Technical data. The registered design professional shall submit sufficient technical data to substantiate the proposed alternative ~~engineered~~ design and to prove that the performance meets the intent of this code.

304.4 Construction documents. The registered design professional shall submit to the code official two complete sets of signed and sealed construction documents for the alternative ~~engineered~~ design.

304.5 Design approval. Where the code official determines that the alternative ~~engineered~~ design conforms to the intent of this code, the *private sewage disposal system* shall be approved. If the alternative ~~engineered~~ design is not approved, the code official shall notify the registered design professional in writing, stating the reasons therefor.

304.6 Inspection and test. The alternative ~~engineered~~ design shall be inspected in accordance with the requirements of Section 107.

Add new text as follows:

504.5 Thermoplastic Tanks. Thermoplastic tanks shall conform to IAPMO Z1000, IAPMO IGC 262-2013 or CSA B66-16.

Revise as follows:

504.~~5~~ 6 Manholes. Manhole ~~collars and extensions shall be of the same material as the tank. Manhole~~ covers shall be of concrete, steel, cast iron, thermoplastic or other approved material.

802.1 General. Septic tanks shall be fabricated or constructed of welded steel, monolithic concrete, fiberglass, thermoplastic or an approved material. Tanks shall be water tight and fabricated to constitute an individual structure, and shall be designed and constructed to withstand anticipated loads. The design of prefabricated septic tanks shall be approved. Plans for site-constructed concrete tanks shall be approved prior to construction.

805.3 Construction. Holding tanks shall be constructed of welded steel, monolithic concrete, glass-fiber-reinforced polyester, thermoplastic or other approved materials.

802.4 Manholes. Each compartment of a tank shall be provided with not fewer than one manhole opening located over the inlet or outlet opening, and such opening shall be not less than 24 inches (610 mm) square or 24 inches (610 mm) in diameter. Where the inlet compartment of a septic tank exceeds 12 feet (3658 mm) in length, an additional manhole shall be provided over the baffle wall. Manholes shall terminate not greater than 6 inches (152 mm) below the ground surface. ~~Manholes shall be of the same material as the tank.~~ Steel tanks shall have not less than a 2-inch (51 mm) collar for the manhole extensions permanently welded to the tank. ~~The manhole extension on fiberglass tanks shall be of the same material as the tank and an integral part of the tank. The collar shall be not less than 2 inches (51 mm) high.~~

802.5 Manhole covers. Manhole risers shall be provided with a fitted, water-tight cover of concrete, steel, cast iron, thermoplastic or other approved material capable of withstanding all anticipated loads. Manhole covers terminating above grade shall have an approved locking device.

805.6 Manholes. Each tank shall be provided with either a manhole not less than 24 inches (610 mm) square or with a manhole having a 24-inch (610 mm) inside diameter extending not less than 4 inches (102 mm) above ground. Finished grade shall be sloped away from the manhole to divert surface water from the manhole. Each manhole cover shall have an effective locking device or tamper resistant screw fastener. Service ports in manhole covers shall be not less than 8 inches (203 mm) in diameter and shall be 4 inches (102 mm) above finished grade level. The service port shall have an effective locking cover or a brass cleanout plug.

802.10 Manhole riser joints. Joints on concrete risers and manhole covers shall be tongue-and-groove or shiplap type and sealed water tight using neat cement, mortar or bituminous compound. Joints on steel risers shall be welded or flanged and bolted and water tight. Steel manhole extensions shall be bituminous coated both inside and outside. Methods of attaching fiberglass and thermoplastic risers shall be water tight and approved.

CHAPTER 11 ~~RESIDENTIAL~~ ADVANCED WASTE-WATER TREATMENT SYSTEMS

1101.1 Scope. The provisions of this chapter shall govern ~~residential~~ advanced wastewater treatment systems.

1101.2 ~~Residential~~ Advanced waste-water treatment systems. The regulations for materials, design, construction and performance shall comply with NSF 40, NSF 245 or NSF 350, as applicable.

1202.4 Other inspections. In addition to the required inspection prior to backfilling, the code official shall conduct any other inspections deemed necessary to determine compliance with this code. Including inspections to verify adequate ongoing performance of the system as required.

Add new standard(s) follows:

NSF/ANSI 245 - 2013:

Wastewater Treatment Systems - Nitrogen Reduction

NSF/ANSI 350-2014:

Onsite Residential and Commercial Water-Reuse Treatment Systems

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CSA

CSA Group
8501 East Pleasant Valley Road
Cleveland OH 44131-5516

B602—15:

Mechanical Couplings for Drain, Waste, and Vent Pipe and Sewer Pipe

B66-16:

Design, material, and manufacturing requirements for prefabricated septic tanks and sewage holding tanks

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IAPMO IAPMO/ANSI Z1000-2013 Prefabricated Septic Tanks

IAPMO IAPMO IGC 262-2013 Corrugated Thermoplastic Tanks

Reason:

101.1 Cluster system designs are very common, can serve more than one building, and allow additional solutions to protect public health.

101.3 A private sewage treatment system can provide wastewater treatment similar to a public sewer.

107.2, 107.2.1, 304, 304.1, 304.1.1, 304.2, 304.3, 304.4, 304.5, 304.6:

In the 2015 International Private Sewage Disposal Code, the phrase Alternative Engineered Design is stated 16 times, including the table of contents and the index, therefore there are additional locations to remove this term. The Code does not define an "Alternative Engineered Design", nor does it provide guidance as to what constitutes an Alternative Engineered Design. Many states, provinces, and international programs allow registered sanitarians or environmental specialists to design sewage treatment systems, hence NOWRA requests that the term "engineered" be removed from this section and others.

New Section 504.5 Thermoplastic tanks are approved by all 50 states and provinces and are common internationally.

504.5 (this section number should be moved up to 504.6) Thermoplastic collars and extensions are approved by all 50 states. It is common practice to have materials differing than the tank. For example, thermoplastic extensions are cast into concrete tanks.

802.1 Thermoplastic tanks are approved by all 50 states and provinces and are common internationally.

802.4 Thermoplastic collars and manhole extensions are approved by all 50 states and provinces. It is common practice to have materials differing than the tank.

802.5, 802.10, & 805.3 Thermoplastic materials have been in use for many years and are approved in all states and provinces.

805.6 Tamper resistant screws are standard practice are approved in many state and provincial codes.

11 The title is proposed to change to Advanced Waste-Water Treatment Systems because this is the most common industry term. The term "Residential" is removed because the facilities served can be residential or commercial.

1101.1 Change consistent with Section 11 above.

1101.2 The term Residential is removed to be consistent with Section 11 above. Available new standards are NSF 245 and NSF 350 to address nutrient removal and reuse.

1202.4 As the decentralized wastewater industry progresses, many states, provinces, and counties require operational permits for private sewage treatment systems, both conventional and/or advanced waste-water treatment systems.

Cost Impact

The code change proposal will decrease the cost of construction .

101.1 By allowing other solutions to be considered the cost may be lowered.

101.3 The private sewage treatment system option may have a lower cost.

107.2, 107.2.1, 304, 304.1, 304.1.1, 304.2, 304.3, 304.4, 304.5, & 304.6:

Allowing other certified professionals to design systems will increase choices and may lower costs.

New Section 504.5 The inclusion of Thermoplastic tanks will increase choices and may offer cost savings in materials and labor.

504.5 The inclusion of thermoplastic collars and extensions will increase choices and may offer cost savings.

802.1 The inclusion of thermoplastic materials will increase choices and may offer cost savings.

802.4 The inclusion of thermoplastic materials will increase choices and may offer cost savings.

802.5 The inclusion of thermoplastic materials will increase choices and may offer cost savings.

802.10 The inclusion of thermoplastic materials will increase choices and may offer cost savings.

805.3 The inclusion of thermoplastic materials will increase choices and may offer cost savings.

805.6 The inclusion of tamper resistant screws will increase choices and may offer cost savings.

11 The code change proposal will have no impact on the cost of construction.

1101.1 The code change proposal will have no impact on the cost of construction.

1101.2 For the jurisdictions that require treatment in accordance with these standards, the code change proposal will have no impact on the cost of construction.

1202.4 For the jurisdictions that require operational permits, the code change proposal will have no impact on the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, NSF 245-2013, IAPMO Z1000-2013, IAPMO IGC 262-2013 and CSA B66-16 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018. The referenced standard, NSF 350-2014, is currently referenced in other 2018 I-codes.

Internal ID: 1277

PSD2-18

IPSDC: 504.2.1, 504.2.2 (New), 504.2.3 (New), 504.5, 504.2.1 (New), Chapter 14

Proponent: William Hall, Portland Cement Association, representing Alliance For Concrete Codes and Standards (jhall@cement.org); Eric Carleton, representing National Precast Concrete Association (ecarleton@precast.org)

2018 International Private Sewage Disposal Code

Revise as follows:

~~504.2~~504.2.1 **Precast concrete and site-constructed tanks.** Precast concrete septic tanks and square or rectangular holding tanks shall conform to ASTM ~~C913~~C1227. The floor and sidewalls of a site-constructed concrete tank shall be monolithic, except a construction joint is permitted in the lower 12 inches (305 mm) of the sidewalls of the tank. The construction joint shall have a keyway in the lower section of the joint. The width of the keyway shall be approximately 30 percent of the thickness of the sidewall with a depth equal to the width. A continuous water stop or baffle not less than 56 inches (1422 mm) wide shall be set vertically in the joint, embedded one-half its width in the concrete below the joint with the remaining width in the concrete above the joint. The water stop or baffle shall be copper, neoprene, rubber or polyvinyl chloride designed for this specific purpose. Joints between the concrete septic tank and the tank cover and between the septic tank cover and manhole riser shall be tongue and groove or shiplap-type and sealed water tight using cement, mortar or bituminous compound. Connections between concrete septic tanks and holding tanks shall conform to ASTM C1644

Add new text as follows:

504.2.2 Precast Circular Concrete. Pre-cast circular concrete;manhole riser sections, collars circular dosing or pump chambers, and holding tanks shall conform to ASTM C478

504.2.3 Pre-cast square or rectangular concrete. Precast square or rectangular concrete; riser sections, collars, dosing or pump chambers shall conform to ASTM C913

Revise as follows:

504.5 Manholes. Manhole collars and extensions shall be of ~~the same material as the tank. Manhole covers shall be of concrete, steel, cast iron or other approved material.~~an approved material that maintains a watertight seal.

Add new text as follows:

504.2.1 Manhole Covers. Manhole covers shall be of an approved material that maintains a watertight seal. When required by the jurisdiction having authority each manhole cover shall have an effective locking device.

Add new standard(s) follows:

CHAPTER 14 REFERENCED STANDARDS

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

C478-15a:

Specification for Circular Precast Reinforced Concrete Manhole Sections

C1644-06:

Specification for Resilient Connectors Between Reinforced Concrete On-Site Wastewater Tanks and Pipes

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Reason:

Section 504.2 Precast concrete and site-constructed tanks - because it is suggested to reference the specific components based on their shape, function and individual ASTM reference, it was felt that separate sections for each precast concrete shape helped clarify the code references and applications.

Section 504.2.1. The current edition specifies the ASTM C913 Specification for Precast Concrete Water and Wastewater Structures standard, which may be appropriate for many precast structures utilized for water and wastewater applications including other precast items within this code. However, the suggested ASTM C1227 Specification for Precast Concrete Septic Tanks provides the specific requirements for septic tank materials, fabrication and quality testing. Additionally, the provisions within C1227 are appropriate for the sewage holding tank applications described within Section 805. To provide best uniform assurance of water tightness a resilient connector between tank and pipe is required. The standard for this product is ASTM C1644 Specification for Resilient Connectors Between Reinforced Concrete On-Site Wastewater Tanks and Pipes.

Section 504.2.2 Included within this code are precast concrete components that are circular shaped. Those components are referenced as risers for tanks or holding structures. Consequently, the appropriate ASTM standard for describing these components are best defined and included within ASTM C478 Specification for Circular Precast Reinforced Concrete Manhole Sections.

Section 504.2.3 Additionally, there are available precast risers, collars, dosing or pump chambers which are not circular nor a septic tank. These components are best described and fall under the umbrella of ASTM c913 Specification for Precast Concrete Water and Wastewater Structures.

Section 504.5 Manholes - The existing language requires the use of the same materials for the extension sections (collars, risers, etc.) upon the flattop lid. Current septic tank fabrication methods have successfully fabricated hybrid systems which utilize precast concrete for the tank chamber for the attributes it possesses and other materials which are directly cast into the flattop lid as the riser section. Such materials could be cast-iron frames, or virgin resin pvc components.

Section 504.5.1. This new provision clarifies the cover is also to be watertight like the balance of the system and not the weak link. Additional language is added as a response to an identified safety issue regarding unauthorized access to septic systems, primarily by children, leading to dangerous or life-threatening situations. The proposed language as similarly described within section 805.6, provides guidance and authority for local agencies to require locking apparatus on septic tank access covers if deemed appropriate for their jurisdiction.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal only clarifies the code by referring to the correct reference standard and separates circular from square or rectangular pre-cast components.

Analysis: A review of the standard proposed for inclusion in the code, ASTM C478a-15a and ASTM ASTM C1644-06, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018. The standard ASTM C1227-13 is already in the current edition of the code.

Internal ID: 663

PSD3-18

IPSDC: 802.1

Proponent: William Hall, Portland Cement Association, representing Alliance For Concrete Codes and Standards (jhall@cement.org); Eric Carleton, National Precast Concrete Association, representing National Precast Concrete Association (ecarleton@precast.org); Stephen Szoke, representing American Concrete Institute (steve.szoke@concrete.org)

2018 International Private Sewage Disposal Code

Revise as follows:

802.1 General. Septic tanks shall be fabricated or constructed of welded steel, monolithic concrete, fiberglass or an approved material. Tanks shall be water tight and fabricated to constitute an individual structure, and shall be designed and constructed to withstand anticipated ~~loads.~~ <u>hydraulic and structural loads including soil, hydrostatic, flotation and traffic when conditions exist. When required by the code official, the design of septic tanks shall be by a registered professional engineer within the state or province of the septic tank installation.</u> The design of prefabricated septic tanks shall be approved. Plans for site-constructed concrete tanks shall be approved prior to construction.

Reason:

Section 802.1 General. The current language ignores clarifying that the critical components of septic tank design is both hydraulic for correct sizing <u>and</u> structural for continued function of the tank without failure. The listing of specific loads is for the benefit of the reviewer to be aware that each site is unique and requires the designer to be aware and acknowledge those variable conditions have been analyzed.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The proposed language is only a clarification of the code requirements and therefore, does not impact the cost of construction.

Internal ID: 669

PSD4-18

IPSDC: 802.4

Proponent: William Hall, Portland Cement Association, representing Alliance For Concrete Codes and Standards (jhall@cement.org); Stephen Szoke, representing American Concrete Institute (steve.szoke@concrete.org); Eric Carleton, National Precast Concrete Association, representing National Precast Concrete Association (ecarleton@precast.org)

2018 International Private Sewage Disposal Code

Revise as follows:

802.4 Manholes. Each compartment of a tank shall be provided with not fewer than one manhole opening located over the inlet or outlet opening, and such opening shall be not less than 24 inches (610 mm) square or 24 inches (610 mm) in diameter. Where the inlet compartment of a septic tank exceeds 12 feet (3658 mm) in length, an additional manhole shall be provided over the baffle wall. Manholes shall terminate not greater than 6 inches (152 mm) below the ground surface. ~~Manholes shall be of the same material as the tank.~~ Steel tanks shall have not less than a 2-inch (51 mm) collar for the manhole extensions permanently welded to the tank. The manhole extension on fiberglass tanks shall be of the same material as the tank and an integral part of the tank. The collar shall be not less than 2 inches (51 mm) high.

Reason:

Same as section 504.5, the existing language requires the use of same materials for the extension sections upon the flattop lid. Current septic tank fabrication methods have successfully fabricated hybrid systems which utilize precast concrete for the tank chamber for the attributes it possesses and other materials which are directly cast into the flat top lid for the riser section such as cast-iron frames and covers.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The proposed language is only a clarification of the code requirements and therefore, does not impact the cost of construction.

Internal ID: 675

PSD5-18

IPSDC: Chapter 11, SECTION 1101, 1101.1, 1101.2, 1101.3 (New), 1101.4 (New), 1101.5 (New), 1101.5.1 (New), 1101.5.2 (New), 1101.5.3 (New), 1101.5.4 (New), 1101.6 (New), 1101.7 (New), 1101.7.1 (New), 1101.7.2 (New), SECTION 1102 (New), 1102.1 (New), 1102.2 (New), 1102.2.1 (New), 1102.2.2 (New), 1102.2.3 (New), 1102.2.4 (New), 1102.2.5 (New), SECTION 1103 (New), 1103.1 (New), 1103.2 (New), 1103.2.1 (New), 1103.2.2 (New), 1103.2.3 (New), 1103.2.4 (New), 1103.2.5 (New), 1103.3 (New), 1103.4 (New), Chapter 14

Proponent: Scott Hetrick, representing Norweco, Inc. (shetrick@norweco.com)

2018 International Private Sewage Disposal Code

Revise as follows:

CHAPTER 11 ADVANCED RESIDENTIAL ~~WASTE-WATER~~ WASTEWATER TREATMENT SYSTEMS

SECTION 1101 GENERAL

1101.1 Scope. The provisions of this chapter shall govern advanced residential ~~waste-water~~ wastewater treatment systems.

1101.2 ~~Residential waste-water treatment systems.~~Advanced residential wastewater treatment systems (ATUs). The regulations for materials, design, construction and performance of advanced residential wastewater treatment systems shall comply with NSF 40, 46, 245 or 350 as applicable. Products certified to these standards shall be considered for use where residential building lots have size or soil limitations that prevent the use of septic tanks, the existing onsite system has failed and is causing a public health nuisance, or the building owner wants improved wastewater treatment.
Advanced residential wastewater treatment systems or any other product that displays and promotes the NSF Mark shall be subject to required service obligations under the provisions of the NSF listing, regardless of the treatment technology.

Add new text as follows:

1101.3 Treatment tank construction. Advanced treatment system tankage for residential use shall be manufactured from precast concrete, plastic or fiberglass.

1101.4 Description. Where soils are not ideal for leaching such as soils having high perched water tables or limiting layers both of which negatively affect the transport of treated effluent into the ground, advanced residential wastewater treatment (ATU) systems shall be considered for overcoming soil limitations or inadequate lot size. Advanced residential wastewater treatment systems shall include pretreatment followed by secondary treatment. Tertiary treatment and disinfection shall be required where soil limitations necessitate a greater level of treatment.

1101.5 Daily design flow. The owner or owner's agent shall provide information to the Board of Health or system designer about the source of sewage from the dwelling or structures to be served by an advanced residential wastewater treatment system so as to document system design flow and waste strength . Where required by the Board of Health, building and plumbing plans including plumbing fixture details and other information shall be submitted. The daily design flow estimate for an advanced wastewater treatment system shall comply with Sections 1101.5.1 through 1101.5.4, as applicable.

1101.5.1 Flow per bedroom. The daily design flow for an advanced residential wastewater treatment system shall be 150 gallons per bedroom per day and not less than a total of 300 gallons per day except where conditions described in Sections 1101.5.2 or 1101.5.3 require greater or lesser flow, respectively.

1101.5.2 Non-residential use systems. For an advanced wastewater treatment system for non-residential use, daily design flow shall be determined in accordance with Table 802.7.2 of this code or an alternative daily design flow established by the Board of Health. Where required by the Board of Health, flow monitoring data in addition to or in place of the minimum daily design flow requirements in Table 802.7.2 shall be provided. Where flow monitoring is used as the method of determining daily design flows, the daily design flow shall be not less than 1.5 times the measured average daily flows.

For non-residential use systems, effluent storage shall be permitted to avoid exceeding 1,500 gallons per day daily design loading provided that the peak design flow does not exceed 6,000 gallons per day. Where effluent is stored to avoid exceeding the 1,500 gallons per day daily design flow limit, the design shall use timed dosing and the appropriate tank capacity to store effluent during peak flows.

1101.5.3 Anticipated increased flows. An increase in the daily design flow for an advanced wastewater treatment system shall be required by the Board of Health where there is an indication that the flows established in accordance with Sections 1101.5.1 or 1101.5.2 of the code will be exceeded. Any required increase in daily flow shall be documented on the installation permit and operation permit.

1101.5.4 Anticipated decreased flows. A reduction in the daily design flow for an advanced wastewater treatment system shall be permitted to be approved by the Board of Health provided that information is submitted indicating conditions that justify reduced flows such as low flow fixtures, alternative toilets or other circumstances that support a reduction in daily design flow. Justification for a proposed reduction in daily design flow shall be included in the site review application and, if approved, shall be documented on the installation permit and operation permit. Where actions are taken to reduce the flows to an advanced wastewater treatment system, the design shall address increased waste strength caused by the reduced flows.

1101.6 Influent wastewater strength. The influent wastewater strength for an advanced residential wastewater treatment system shall be determined for design purposes. Wastewater shall be considered typical residential strength where the 30 day averages have all of the following parameters:

1. BOD_5 not exceeding 300 mg/l.
2. TSS not exceeding 350 mg/l.
3. Fats, oils and grease (FOG) not exceeding 25 mg/l.

Wastewater strength estimates for non-residential use treatment systems shall be determined by the Board of Health or system designer using information provided by the owner or the owner's agent.

1101.7 System design. Designers and designs of sewage treatment system (STS) shall be in accordance with Sections 1101.7.1 and 1101.7.2.

1101.7.1 Preparation and submittal. STS designs shall be prepared and submitted by persons capable of reviewing the soil evaluation, site conditions, information provided by the building owner. Such designs shall be in accordance with this code and shall facilitate the choice of an appropriate, site specific STS and complete the STS design in compliance with Section 1101.7.2. Designers shall be knowledgeable of the requirements of this section and obtain education as necessary or required by manufacturer for all STS technologies they are responsible for designing. Designers shall complete the STS design either while acting as an agent of a Board of Health, or acting as an independent agent of the building owner. A Board of Health employing staff qualified to prepare STS designs shall be permitted to charge a fee for the preparation of the design including associated costs before or after the design is created.

1101.7.2 Required tasks. For the purposes of this section, STS designers shall demonstrate the ability to perform the following tasks required for STS designs through the submission of complete and accurate designs to the Board of Health by performing all of the following, where necessary:

1. Estimate STS flows including daily design flows and any expected variations, and estimate pollutant concentrations and mass loads exceeding typical residential sewage strength.
2. Interpret and evaluate all site-specific information including the soil evaluation, site conditions, site prohibitions and information provided by the owner to determine feasible STS options that will meet the requirements of this section.
3. Evaluate site hydraulics and understand how the proposed STS integrates with the site topography and grade to site the STS.
4. Select devices and components capable of meeting performance requirements based on knowledge of these rules and STS technologies approved by the director of health.
5. Provide approximate installation and operation costs of feasible STS options to assist the owner in selection of the STS to design.
6. Prepare a detailed design which fully complies with this section.
7. Delineate by staking or flagging the proposed soil absorption areas on the site as they relate to topography and contour.
8. Be available to clarify any questions with and make adjustments to the system design, layout or operational concerns. Be available to meet with the owner, soil scientist, installer, service provider

or local health department during, prior and after the installation.

9. Either perform a site visit or have his designee perform a site visit where the STS is to be located during the design process.

SECTION 1102 EFFLUENT QUALITY FOR SOIL-BASED DISCHARGE

1102.1 General. Advanced residential wastewater treatment systems shall be permitted for use in conjunction with any soil based disposal method including gravity pipe and stone, chambers, sand mounds, pressurized mounds, at grade mounds, drip irrigation, spray irrigation, constructed wetlands and any other soil based dispersal system that has been reviewed and approved by the Board of Health.

1102.2 Effluent quality standards. Advanced residential wastewater treatment systems shall comply with the performance based effluent quality standards in Sections 1102.2.1 through 1102.2.5, as applicable, before the system can be considered for approval by the director or Board of Health for reductions in soil absorption area sizing, soil depth credits, nutrient reduction or reduction of high strength waste before distribution to a soil absorption component. A soil absorption component meeting the requirements of this code shall be installed after the advanced residential wastewater treatment system.

1102.2.1 $CBOD_5$ and TSS.
Treatment system effluent quality shall comply the following requirements for carbonaceous 5-day biochemical oxygen demand ($CBOD_5$) and total suspended solids (TSS) as demonstrated by 30 day averages in an NSF 40 certification report:

1. $CBOD_5$ not exceeding 25 mg/l.
2. TSS not exceeding 30 mg/L.

1102.2.2 Fecal coliform and E. coli. Soil depth credits for the disposal system shall be granted based on the following 30 day geometric mean effluent requirements:

1. Fecal coliform not exceeding 10,000 CFU/100ml, or E. coli not exceeding 5,150 CFU/100ml for a 12 inch soil depth credit.
2. Fecal coliform not exceeding 1,000 CFU/100ml, or E. coli not exceeding 515 CFU/100ml for a 24 inch soil depth credit.
3. Fecal coliform not exceeding 200 CFU/100ml, or E. coli not exceeding 103 CFU/100ml for surface application.

1102.2.3 Nutrient reduction. The director or Board of Health shall establish nutrient reduction standards for pretreatment components where there is a significant risk of nutrient contamination to surface or ground water because of risk factors identified in the site review or other types of water quality assessments, or because of risks involved with the proximity to local, state, or federally recognized nutrient sensitive environments.

1102.2.3.1 Total nitrogen reduction. Where total nitrogen reduction is required, pretreatment components shall be capable of not less than a fifty percent reduction in the total nitrogen concentration based on average influent and effluent total nitrogen concentrations as demonstrated by NSF 245 or CAN/BNQ 3680-600. The actual reduction percentage for the pretreatment component shall be indicated.

1102.3.2.2 Other nutrients. The director or Board of Health shall develop standards for areas requiring greater reductions of other nutrients such as nitrogen or phosphorus.

1102.2.4 High strength waste. he director or Board of Health shall establish standards for the reduction of high strength waste or systems receiving sewage from sources producing or expected to produce sewage of a higher strength than typical residential sewage.

1102.2.5 Deemed to comply. The system shall be deemed to comply with the effluent quality standards provided that the system is operated and maintained in accordance with the permit approval documents. The system shall include one or more advanced treatment components for the removal of $CBOD_5$ and TSS before the wastewater is discharged to the receiving waters, common collector or ground or surface. A treatment component classified as "deemed to comply" shall be assumed to comply with the adopted standard without requiring effluent sampling during system operation.

SECTION 1103 EFFLUENT QUALITY FOR OFF-LOT DISCHARGE

1103.1 General. Advanced residential wastewater treatment systems shall be permitted to be used for off-lot discharges provided that circumstances do not allow for discharge of effluent to a soil based disposal field,

1103.2 Effluent quality standards. Advanced residential wastewater treatment systems shall comply with the performance based effluent quality standards in Sections 1103.2.1 through 1103.2.5,as applicable, in order to be considered for approval by the director for off-lot discharge.

1103.2.1 $CBOD_5$ and TSS. Treatment system effluent quality shall comply with both of the following 30 day average requirements for carbonaceous 5-day biochemical oxygen demand ($CBOD_5$) and total suspended solids (TSS).

1. $CBOD_5$ not exceeding 15 mg/l.
2. TSS not exceeding 18 mg/l.

1103.2.2 NH_3 ammonia. Treatment system effluent quality shall comply with both of the following 30 day average requirements for NH_3 ammonia.

1. NH_3 ammonia not exceeding 2 mg/l (summer).
2. NH_3 ammonia not exceeding 4 mg/l (winter).

1103.2.3 Dissolved oxygen. Treatment system effluent dissolved oxygen shall be not less than 6 mg/l.

1103.2.4 Fecal coliform and E. coli. Treatment system effluent fecal coliform shall not exceed 200 CFU/100ml.

1103.4 Effluent sample collection.
This section shall apply where periodic effluent sampling is required to determine whether an advanced residential wastewater treatment system is working properly, Collection of effluent shall be performed by a qualified service provider who is trained on the treatment technology. Samples shall be collected from the location and sample port approved by the system manufacturer. Effluent sample collection shall address all of the following guidelines:

1. Effluent shall not contain settleable solids above prescribed standards.
2. Color and odor shall be reduced to below discernable levels.
3. Effluent shall not contain floating debris, visible oil, grease, scum or sludge solids.
4. Fecal coliform bacteria concentration shall not exceed 200 CFU/100ml.
5. Any surface discharging system installed, repaired, renovated or replaced shall have a sample port downstream of and within a reasonable distance of the treatment tankage prior to discharge off-lot. For systems that are repaired or replaced and are connected to an existing effluent discharge line, one acceptable sampling port design shall be an inline cross fitting 4 inches (102 mm) in diameter with one branch extending deep enough to accept a sample bottle. For new construction, the sampling port design shall allow for collection of a free falling sample without the sample being tainted by existing flow in the port's sump.
6. A surface discharging system shall discharge to a roadside ditch, stream, pond, lake or other body of water with some method of disinfection.
7. Where samples are collected, they shall be analyzed in accordance with approved methods.

1103.2.5 Deemed to comply. The system shall be deemed to comply with the effluent quality standards provided that the system is operated and maintained in accordance with the permit approval documents. The system shall include one or more advanced treatment components for the removal of $CBOD_5$ and TSS before the wastewater is discharged to the receiving waters, common collector or ground surface. A treatment component shall be classified as deemed to comply because it complies with the adopted standard without requiring effluent sampling during system operation.

1103.3 Effluent discharges. Systems complying with NSF 245, Class R or C per NSF 350, Class I per NSF 40, or any department approved or accepted system shall discharge to any one of the following:

1. A receiving stream, river, lake or pond that provides greater than a 5:1 dilution of the effluent, based on the 7-day, 10-year low flow rate. A discharge within 10 feet of one of these receiving bodies of water shall be considered to be a discharge to the receiving body of water. Discharges to a lake or pond shall be limited to 2 discharges per surface acre of water. Where more than 2

discharges occur per individual surface acre of water, the total number of discharges to total surface acres of water shall not exceed a ratio of 2:1. Where discharges are not equally distributed around a lake or pond, the department or local authority shall be consulted to assure that nuisance conditions are not created.

2. A common collector, provided that the collector does not discharge within one mile upstream from a public water supply intake, public bathing beach, or to any public use area such as any area frequently used by the public.

3. The ground surface, where the discharge points of private sewage disposal systems with surface discharges do not exceed an average of one per acre and the effluent does not pond or create a nuisance condition.

Add new standard(s) follows:

NSF

NSF International
789 N. Dixboro Road
Ann Arbor MI 48105

NSF/ANSI 46 - 2016:

Evaluation of Components and Devices Used in Wastewater Treatment Systems

NSF/ANSI 245 - 2013:

Wastewater Treatment Systems - Nitrogen Reduction

CAN/BNQ Bureau De Normalisation Du Quebec CAN/BNQ 3680-600/2009 Onsite Residential Wastewater Treatment Technologies including Modification 1 dated March 16, 2017

Reason:
Currently, Chapter 11 only contains two very brief sections to cover a very complex topic. As currently written, no real guidance regarding Advanced Residential Treatment Systems is provided in Chapter 11. The language that I have proposed includes the details necessary to properly specify a treatment system for a residential application. The majority of the information included in this draft has been modeled after existing state codes that are currently being used. By adding additional details, this code will be valuable to regulators and will be more likely to be adopted.

Cost Impact
The code change proposal will increase the cost of construction .

As compared to the current version of the International Private Sewage Disposal Code, the proposed changes may result in increased costs, but the anticipated increased cost of advanced treatment technology may be offset by a reduction in the cost of the soil based disposal footprint for that particular technology. The current version of the code is limited and does not provide adequate guidance regarding the installation, maintenance and inspection of Advanced Residential Wastewater Treatment systems. In reality, most regulatory agencies responsible for onsite system installations have implemented their own sewage disposal codes, but these codes vary widely from state to state. There is significant value in publishing an International Private Sewage Disposal Code with detailed guidelines that could be adopted by these regulatory agencies in lieu of their existing codes. Harmonization of codes between regulatory agencies would allow manufacturers to focus their design efforts and not be restricted by provincial attitudes and practices. If a regulatory agency decides to adopt the International Private Sewage Disposal Code in place of their existing code, the actual cost impact would depend on the code being replaced. In its present form, the International Private Sewage Disposal Code only recognizes 19th and 20th Century onsite technology, and does not properly address the challenges of 21st Century site development.

The proposed changes will provide usable guidelines that regulatory agencies can use to assure that Advanced Residential Wastewater Treatment systems are installed, maintained and inspected in a manner that protects the public. The proposed changes are not intended to specify a particular treatment technology. There are many treatment technologies commercially available that meet the proposed guidelines, and these technologies vary in price depending on their complexity. Some simpler technologies may be available at pricing that is comparable to a conventional septic tank, while other more complex technologies could result in an additional $5,000 to $20,000. The more complex technologies are typically used in applications with very stringent effluent and/or monitoring requirements.

Analysis: A review of the standard proposed for inclusion in the code, CAN/BNQ 3680-600/2009 including Mod1 March 16, 2017, NSF 46-2016 and NSF 245-13, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

The referenced standard, NSF 350-2014, is currently referenced in other 2018 I-codes.

Internal ID: 384

PSD6-18

IPSDC: SECTION 1203 (New), 1203.1 (New), 1203.2 (New), 1203.3 (New), 1203.3.1 (New), 1203.3.2 (New), 1203.4 (New), 1203.5 (New), 1203.5.1 (New), 1203.5.2 (New), 1203.5.3 (New), 1203.6 (New), 1203.7 (New), 1203.8 (New), 1203.9 (New), 1203.10 (New), 1203.11 (New), 1203.12 (New), 1203.13 (New), 1203.14 (New), 1203.15 (New)

Proponent: Scott Hetrick, Norweco, Inc., representing Norweco, Inc. (shetrick@norweco.com)

2018 International Private Sewage Disposal Code

Add new text as follows:

SECTION 1203 SYSTEM MAINTENANCE

1203.1 General. An ongoing maintenance program shall be required for advanced residential wastewater treatment systems or any onsite system installation with a mechanical component. Periodic maintenance must be provided to the treatment system on an annual basis in the form of a renewable maintenance contract. The yearly maintenance visits shall be conducted by a service provider that has been trained by the system manufacturer or distributor.

1203.2 Installation. All components of advanced residential wastewater treatment systems shall be installed at the time of the original installation. If this is not possible, a solid end cap shall be securely placed over the end of the discharge line until the system can be completed to prevent the discharge of raw sewage to the ground surface.

1203.3 Accessibility for inspection and maintenance. Advanced residential wastewater treatment systems shall be equipped with ground-level access ports that are sized and located to facilitate the installation, removal, sampling, examination, maintenance, and servicing of components and compartments that require routine maintenance and inspection.

1203.3.1 Access port size and location. Ground-level access ports shall be of sufficient size and located so as to allow for the following:

1. Visual inspection and removal of all mechanical or electrical components.
2. Periodic cleaning or replacement of components and removal of residuals.
3. Visual inspection and sampling, including a means for collecting a representative effluent sample and determining the need for residuals removal.
4. Removal of collected residuals as required by the manufacturer in the operations and maintenance manual. If the operations and maintenance manual describes a means to determine the need to remove residuals from a chamber without ground-level access, then only the ability to install ground-level access shall be required. Systems without ground-level access to a chamber shall be equipped with a means to locate the opening to the chambers. This information shall be provided on or in a ground-level access opening.

1203.3.2 Access port protection. Access ports larger than 6 inches (152 mm) in diameter shall be protected against unauthorized intrusions. Acceptable protective measures include, but are not limited to:

1. A padlock.
2. A cover that can be removed only with specialized tools. Cover fasteners shall have tamper-resistant heads. Hex head, flat groove or Phillips head fasteners shall be prohibited.
3. A cover having a minimum net weight of 65 lb. (29.5 kg).

1203.4 Service. Advanced residential wastewater treatment systems shall require periodic maintenance to achieve performance consistent with demonstrated capabilities. Assured professional service is imperative to ensure system performance. A two-year initial service policy shall be furnished to the owner by the manufacturer or the authorized representative. The cost of the initial service policy shall be included in the original purchase price.

1203.5 Initial service policy. The private sewage disposal installation contractor, through the manufacturer or the distributor of the advanced residential wastewater treatment system, shall furnish a two-year initial service policy to the purchaser. This policy shall cover the requirements in Sections 1203.5.1 though 1203.5.3.

1203.5.1 Service calls. The policy shall include four inspection and service calls, not less than one every six months.

The call shall include inspection, adjustment and servicing of the mechanical and the applicable component parts to ensure proper function.

1203.5.2 Effluent quality inspection. The policy shall include an effluent quality inspection consisting of a visual check for color, turbidity, scum overflow, and an examination for odors.

1203.5.3 Homeowner reporting. The policy shall include immediate reporting to the owner about any improper operation that cannot be corrected at the time of the inspection or service call.

1203.6 Continuing service policy. Each manufacturer of a system shall make available for purchase by the owner , a continuing service policy with terms equal to the initial service policy.

1203.7 Standby parts. The local distributor shall stock standby mechanical and electrical component parts for use where the plant's mechanical or electrical components are required to be removed from the site for repairs.

1203.8 Component parts. The mechanical and electrical component parts shall be guaranteed against any defects in materials and workmanship as warranted.

1203.9 Service. Service shall be available within two working days following a request.

1203.10 Owner's manual. The manufacturer shall provide an owner's manual with each unit. The manual shall include the following information:

1. Model numbers
2. Functional description of unit, including a statement of minimum performance requirements as established by test
3. Design and flow diagrams
4. Warranty
5. Replacement policy and service policy
6. Installation instructions
7. Detailed operation and maintenance requirements including user responsibility, parts and service
8. Rated service flow in GPM (gallons per minute) or GPD (gallons per day)
9. Energy source and energy required for proper operation of the plant
10. Specification of models tested in accordance with NSF 40.

1203.11 Service label. A clearly visible, permanently attached label or plate giving instructions for obtaining service shall be placed at the audible and visual alarm.

1203.12 Responsibility of property owner. The property owner shall be responsible for maintaining and operating the system in accordance with this code and the manufacturer's specifications.

1203.13 Maintenance. If a routine service call indicates an electrical, mechanical or performance failure or malfunction or if routine laboratory test results indicate improper treatment, the property owner shall immediately take action to bring the advanced residential wastewater treatment system into compliance with this section.

1203.14 Non-residential use. Advanced residential wastewater treatment systems certified to comply with Class I requirements of NSF 40 by an ANSI accredited third-party certification agency shall be considered for use to serve a non-residential property, provided that all of the following are met:

1. Total daily flows from the wastewater source into the plant are at least 75% of the rated hydraulic capacity and do not exceed the rated hydraulic capacity of the plant.
2. Wastewater influent does not exceed the manufacturer's design specifications for BOD5 loading as established by the ANSI accredited third-party certification agency to determine compliance with NSF 40 during testing of the system.

1203.15 Certification compliance. Private sewage disposal installation contractors or building owners who maintain or service wastewater treatment systems that have been certified to the NSF standards shall be required to maintain the integrity of the seal of the ANSI accredited third-party certification agency that has certified the compliance with the appropriate standard. Only component parts approved by the manufacturer for use in an individual system shall be used. No design changes or component part changes shall be made that will void compliance with the appropriate standard. Any person who voids the compliance with the appropriate standard shall be responsible for repairing the system so it can bear the seal of the ANSI accredited third-party certification agency that has certified compliance or the person shall replace the plant with an approved residential wastewater treatment system.

Reason:
Currently, Chapter 12 does not provide much detail regarding the actual inspection of a private sewage disposal system. In addition, maintenance and service is typically performed in conjunction with routine service inspections. It makes sense to include language in this chapter that provides some direction for the maintenance and service of private sewage treatment systems. The majority of the information included in this draft has been modeled after existing state codes that are currently being used. By adding additional details, this code will be valuable to regulators and will be more likely to be adopted.

Cost Impact
The code change proposal will increase the cost of construction .

As compared to the current version of the International Private Sewage Disposal Code, the proposed changes may result in increased costs, but the anticipated increased cost of advanced treatment technology may be offset by a reduction in the cost of the soil based disposal footprint for that particular technology. The current version of the code is limited and does not provide adequate guidance regarding the installation, maintenance and inspection of Advanced Residential Wastewater Treatment systems. In reality, most regulatory agencies responsible for onsite system installations have implemented their own sewage disposal codes, but these codes vary widely from state to state. There is significant value in publishing an International Private Sewage Disposal Code with detailed guidelines that could be adopted by these regulatory agencies in lieu of their existing codes. Harmonization of codes between regulatory agencies would allow manufacturers to focus their design efforts and not be restricted by provincial attitudes and practices. If a regulatory agency decides to adopt the International Private Sewage Disposal Code in place of their existing code, the actual cost impact would depend on the code being replaced. In its present form, the International Private Sewage Disposal Code only recognizes 19th and 20th Century onsite technology, and does not properly address the challenges of 21st Century site development.

The proposed changes will provide usable guidelines that regulatory agencies can use to assure that Advanced Residential Wastewater Treatment systems are installed, maintained and inspected in a manner that protects the public. The proposed changes are not intended to specify a particular treatment technology. There are many treatment technologies commercially available that meet the proposed guidelines, and these technologies vary in price depending on their complexity. Some simpler technologies may be available at pricing that is comparable to a conventional septic tank, while other more complex technologies could result in an additional $5,000 to $20,000. The more complex technologies are typically used in applications with very stringent effluent and/or monitoring requirements.

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