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IRC — Plumbing

2015 GROUP A PROPOSED CHANGES TO THE I-CODES MEMPHIS COMMITTEE ACTION HEARINGS

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2015 GROUP A – PROPOSED CHANGES TO THE INTERNATIONAL RESIDENTIAL CODE – PLUMBING/MECHANICAL

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Central Regional Office
Country Club Hills, IL

TENTATIVE ORDER OF DISCUSSION
2015 PROPOSED CHANGES TO THE
INTERNATIONAL RESIDENTIAL CODE
(PLUMBING)

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 RP code change proposals may not be included on this list, as they are being heard by another committee.

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RP19-15

RP 1-15

P2503.4

Proponent: Gary Kozan, CPD, representing Florida Association of Plumbing Heating Cooling Contractors (garyk@ridgewayplumbing.com)

2015 International Residential Code

Revise as follows:

P2503.4 Building sewer testing. The *building sewer* shall be tested by insertion of a test plug at the point of connection with the public sewer~~,~~ and completely filling the *building sewer* with water ~~and pressurizing~~from the lowest to the ~~sewer to not less than 10-foot (3048 mm) head of water~~highest point thereof. The test pressure shall not decrease during a period of not less than 15 minutes. The *building sewer* shall be watertight at all points.

A forced sewer test shall consist of pressurizing the piping to a pressure of not less than 5 psi (34.5 kPa) greater than the pump rating and maintaining such pressure for not less than 15 minutes. The forced sewer shall be water tight at all points.

Reason: Subjecting a gravity house sewer to a 10-foot head test is outdated and impractical. By the time the building sewer is connected, fixtures have usually been installed, so both ends have to be plugged off before testing in order to protect the building from flooding. Leaks on gravity house sewers are rare, considering that most today are constructed with plastic pipe and contain few fittings and joints. Simply filling the sewer with water is sufficient to identify any leaks. It should be noted that public sewer mains and branch laterals downstream of the building sewer are not water tested at all.
This testing method is identical to that found in the other model plumbing code (UPC), used in many states. Florida adopted similar testing requirements in 2000. It is time that the IPC recognizes this proven practice and bring the codes closer together.

Bibliography:
2012 Uniform Plumbing Code:

723.0 Building Sewer Test

723.1 General. Building sewers shall be tested by plugging the end of the building sewer at its points of connection with the public sewer or private sewage disposal system and ***completely filling the building sewer with water from the lowest to the highest point thereof***(emphasis added), or approved equivalent low-pressure air test. Plastic DWV piping systems shall not be tested by the air test method. The building sewer shall be watertight.

2010 Florida Building Code - Plumbing

312.6 Gravity sewer test. Gravity sewer tests shall consist of plugging the end of the building sewer with water at the point of connection with the public sewer, ***completely filling the building sewer with water from the lowest to the highest point thereof***(emphasis added), and maintaining such pressure for 15 minutes. The building sewer shall be watertight at all points.

2010 Florida Building Code - Residential:

2503.4 Gravity sewer test. Gravity sewer tests shall consist of plugging the end of the building sewer with water at the point of connection with the public sewer, ***completely filling the building sewer with water from the lowest to the highest point thereof***(emphasis added), and maintaining such pressure for 15 minutes. The building sewer shall be watertight at all points.

Cost Impact: Will not increase the cost of construction
Reducing the head test for gravity sewers will shorten the length of the fill stack, and eliminate the need for additional test fittings, test balls, and labor to plug off the upper end of the sewer. This should translate to a modest reduction in cost of approx. $20 - $40 per sewer test.

RP 1-15 : P2503.4-KOZAN3454

RP 2-15

P2503.5.1

Proponent: Janine Snyder, City of Thornton, Colorado, representing Colorado Association of Plumbing & Mechanical Officials (CAPMO) (Janine.Snyder@cityofthornton.net)

2015 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, for piping systems other than plastic, by air, without evidence of leakage. Either 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~~ 10 feet (~~1524~~3048 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.

Reason: Historically the codes required a 10 foot head on DWV systems. With the change in the 2015 to only 5 feet head the DWV system can have leaks that are undetectable therefore placing the property owner at risk for damage over the life of the structure. The 10 foot head not only elliminates that risk it ensures that the system is in fact water tight which is the purpose of the test in the first place.

Cost Impact: Will increase the cost of construction
The 10 foot head requirement has been in place and is the standard for testing. The cost of replacing or repairing portions of the DWV system that have leaks that have gone undetected due to the relaxed testing pressures overrules the cost of the additional 5 foot head of water.

RP 2-15 : P2503.5.1-SNYDER4419

RP 3-15

P2603.2.1

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

2015 International Residential Code

Revise as follows:

P2603.2.1 Protection against physical damage. In concealed locations, where piping, other than cast-iron or galvanized steel, is installed through holes or notches in studs, joists, rafters or similar members less than ~~1 1/4~~ 1 ½ inches (~~31.8~~38.1 mm) from the nearest edge of the member, the pipe shall be protected by steel shield plates. Such shield plates shall have a thickness of not less than 0.0575 inch (1.463 mm) (No. 16 Gage). Such plates shall cover the area of the pipe where the member is notched or bored, and shall extend not less than 2 inches (51 mm) above sole plates and below top plates.

Reason: For the 2015 IRC, a proposal was approved that reduced the dimension to 1 ¼ inches to match what the National Electrical Code has for wiring protection. Such a reason has no technical basis as wiring is not piping. Drywall nails or screws penetrating wires could cause a short such that a circuit breaker would trip and the circuit becomes dead. Yes, finding such an electrical fault is sometimes difficult but it does not lead to structure damage. A screw or nail penetration of a pipe leads to water damage of a structure. Sometimes the water damage does not immediately occur or the leak is so small that it takes months or even years for the leak to be discovered. Water, or worse, sewage leaks over a long period of time cause mold damage in walls and ceilings and bacteria contamination of living spaces.
The plumbing codes have maintained this 1 ½ inch dimension for many decades with great success in limiting widespread issues with pipe penetrations. Consider that a 2 inch long drywall screw attaching ½ inch gypsum board to framing will penetrate the framing member 1 ½ inches.

This should have not been allowed to change in the IRC in the 2015 edition. This proposal is needed for consistency between the IRC and the IPC.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes or portions thereof. This includes both the technical aspects of the codes and the code content in terms of scope and application of referenced standards. The PMGCAC has held one open meeting and multiple conference calls which included members of the PMGCAC. Interested parties also participated in all conference calls to discuss and debate the proposed changes. This is PMGCAC Item 143.

Cost Impact: Will not increase 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.

RP 3-15 : P2603.2.1-SNYDER4137

RP 4-15

P2708.4

Proponent: Ed Osann, representing Natural Resources Defense Council (eosann@nrdc.org)

2015 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 provide thermal shock protection for the rated 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: Installation of a shower valve meeting the referenced ASSE/ASME/CSA standard is not sufficient to ensure shower safety. 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 referenced standard for shower valves allows for acceptance at a rated flow of up to 2.5 gpm. However, 2.5 gpm at 80 psi is the current federal *maximum* flowrate for showerheads, and showerheads with maximum flow rates well below 2.5 gpm are widely available. The current EPA *WaterSense* specification for showerheads has a maximum flow rate of 2.0 gpm, and over 3,000 qualifying models are on the market today. Many showerheads are available with flow rates between 2.0 and 1.5 gpm. As manufacturers continue to innovate with more water- and energy-efficient showerheads, the code change proposed here is needed to ensure that new buildings built to this 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 shower valve provide the thermal protection called for under the recognized standard when tested at a flow rate that matches the flow rate of the showerhead.

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

Additional Technical Background

As noted above, 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. As noted by Martin and Johnson (2008) (as cited in Codes and Standards Enhancement Initiative (CASE), "Multi-Head Showers and Lower-Flow Shower Heads," 2013 California Building Energy Efficiency Standards, California Utilities Statewide Codes and Standards Team, September 2011), combinations of valves and shower heads were tested to determine whether pressure-compensating valves and thermostatic valves with rated flows of 2.5 gpm would perform adequately at lower flow rates. The tests included 22 shower valves from six manufacturers, and the valves were assessed on their ability to maintain water temperature within certain bounds for a given time after a change in pressure event, as described by the ASSE 1016-2005 standard for shower valves. The results indicated that a significant share of shower valves rated for 2.5 gpm failed to provide the thermal protection specified by ASSE 1016 when tested at lower flow rates. As summarized in the CASE report (p. 15): "These results indicate that shower valve temperature maintenance is strongly affected by flow rate, and that new showers with lower-flow shower heads would have to be installed with valves that are designed for 2.0 and lower flow rates."

Cost Impact: Will not increase the cost of construction
Adoption of this proposal will have no effect on the cost of construction, since 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 mixing 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 valves available at moderate price points that can accomodate the builder's deision. For example, in January 2015, Moen was offering numerous models of showerhead, valve, and trim featuring a pressure-balance type valve retail priced at $102.90 that is fully compatible with showerheads rated at 1.75 gpm maximum or higher. Valves of the temperature-balancing type are more expensive, but are not required by this proposal.

RP 4-15 : P2708.4-OSANN5184

RP 5-15

P2801.6

Proponent: Kari Hebrank, Wilson & Associates, representing VizCO-US (khebrank@wilsonmgmt.com); Howard Guard (howard@vizco.com)

2015 International Residential Code

Revise as follows:

P2801.6 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 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 shall be constructed of material having a flame spread index of 25 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723.

Reason: The reason for this code proposal is that there should not be a restriction against the installation of all plastic pans beneath gas-fired hot water heaters and storage tanks as there are some plastic pans that have been developed and successfully tested against tough industry standards and ratings for flammability and smoke, specifically ASTM E84 Class A standards, thus making these type of pans perfectly suitable for water leakage protection for gas-fired hot water heaters.
One such product is manufactured by VizCO-US, Inc., and their proprietary SECUREFLX material, which was tested and met both UL94 V2 flammability rating and ASTM E84 Class A standards for flame spread and smoke development, has been used and approved in furnace drain pans for years. The heat and distortion thresholds of this material and the accompanying proven test and rating standards make VizCO-US pans an extremely safe product for use with either gas or electric water heaters. The VizCO-US product test reports are included in an attachment to this code proposal {510} {509} and it is important to note that the UL94 flammability rating for plastic materials --to which the VizCO-US plastic pan adheres--states that specimens may not burn with flaming combustion for more than 30 seconds after either application of the test flame.

Another reason for this code change is that without it, there would be a restriction of trade for manufacturers who produce plastic drip pans that meet the mandated UL and ASTM standards for flammability and smoke. Furthermore, the building code is intended to accommodate new products and new technology as innovative ideas and products emerge, rather than discriminate against products that meet current industry building standards. Without this code change, there will be discrimination against one segment of the building product manufacturing industry.

Moreover, with ZERO CLEARANCE gas water heater models, the manufacturers have approved a zero clearance between the bottom of the tank and any flammable surface, so a plastic pan that meets flammability ratings should be allowed upon the manufacturers approval.

Without this code change, only metal pans would be allowed to be installed beneath a gas-fired water heater, thus limiting choice for both the contractor and the consumer, and ultimately increasing costs. VizCO-US plastic pans meet or exceed ASTM E-84 and UL 94 testing and performance standards and contain the following characteristics: self-extinguishing, low smoke, flexible, extreme strength, affordability and perform without failure at a higher temperature range than any other non-metallic solution. (See sales sheet attachment for product characteristics.) {511} {512}

The standards UL 723 and ASTM 84 are standards that characterize the relative rate at which flame will spread as the subject material burns. Testing reports for the VizCO-US plastic pans are attached to this code proposal.

VizCO US
THE VIZIONARY COMPANY

INSPECTOR PREFERRED

SECUREFLX material

VizCO Corporate office in Bradenton, Florida.

Extrusion line at the Monticello, Florida factory.

SecureFLX is designed to be safer and physically outperform every other drain pan at a superior price point.

Our goal is to provide a product with the following characteristics: self extinguishing, low smoke, flexibility, extreme strength and to perform without failure at a higher temperature range than any other non-metallic solution.

The result is a cost effective material unlike anything on the market.

Independent laboratories have tested and rated our material to meet or exceed ASTM E-84 class A and UL-94 testing and performance standards.

INDEPENDENT LABORATORIES Testing and Performance Ratings

CLASS A SMOKE/FIRE RATED Meets ASTM E84 class A rating

Meets or Exceeds UL94 v2 Standards

ASTM E 84 - CLASS A RATING:

	Flame Spread Index	Smoke Developed Index
Class A	0-25	0-450

Material Properties

PROPERTIES	ASTM METHOD	VALUE
Izod Impact	D-256	12.0 ft-lbs/in
Tensile Strength	D-638	8,900 psi
Flexural Strength	D-790	13,500 psi
Flexural Modulus	D-790	345,000 psi
Rockwell Hardness	D-785	112 R
HDTUL Unannealed (264 psi)	D-648	270°F

USED BY CODE OFFICIALS AND REGULATORY AGENCIES IN THE ACCEPTANCE OF INTERIOR FINISH MATERIALS FOR VARIOUS APPLICATIONS.

THE MOST WIDELY ACCEPTED CLASSIFICATION SYSTEM DESCRIBED IN THE NATIONAL FIRE PROTECTION ASSOCIATION PUBLICATION NFPA 101 LIFE SAFETY CODE.

CHARACTERIZES THE RELATIVE RATE AT WHICH FLAME WILL SPREAD AS THE SUBJECT MATERIAL BURNS.

Mechanical Properties

TEMPERATURE RANGE: -20°F TO 260°F
DISTORTION TEMPERATURE: 310°F
LOAD SUPPORT (LBS): 1000+
FLAME RETARDANT
SELF-EXTINGUISHING
LOW SMOKE

MADE WITH PRIDE IN THE U.S.A

UL94 FLAMMABILITY RATING:

SPECIMENS MAY NOT BURN WITH FLAMING COMBUSTION FOR MORE THAN 30 SECONDS AFTER EITHER APPLICATION OF THE TEST FLAME.

THE STANDARD FOR SAFETY OF FLAMMABILITY OF PLASTIC MATERIALS

SECUREFLX

www.VizCo.com • (941) 753-3333
3500 9th Street West • Bradenton, FL 34205

Bibliography: The referenced testing standards and ratings are included in the attachments. {509} {510}

Cost Impact: Will not increase the cost of construction
This code proposal has cost-savings implications to the construction industry and consumers. VizCO-US plastic pans will save distributors, contractors and homeowners anywhere from 10%-30% when installed beneath gas-fired water heaters, rather than installation of the higher-priced metal pans. Additionally, oftentimes there are replacement costs with the metal pans, especially the flimsier aluminum pans, that are easily dented and crushed during transportation from the manufacturer to the distributor, from the distributor to the contractor and from the contractor to the jobsite.
Unlike metal pans which are dented and crushed during installation of the water tanks that roll over the sides of the pan, VizCO-US plastic pans are designed not to break, crack, split or crush. You can actually roll a tank over the side of a VizCO-US pan which is designed to aide in the installation process and keep the contractor from having to lift a tank up and over a sidewall of the pan. (See sales sheet attachment for

product description.) {511} {512}

VizCO-US pans offer cost-savings to everyone in the supply chain from the time it is released from the manufacturing plant unitl the time the tank is set in place. Due to the extreme strength of the product, there are cost-savings in shipping/delivery costs and financial cost-savings by not having to worry about replacement costs, or credits and returns for damaged products like there are with metal pans.

RP 5-15 : P2801.6-HEBRANK5541

RP 6-15

P2802 (New), P2802.1 (New), P2802.2 (New), Table P2802.2 (New), P2802.3 (New)

Proponent: Ed Osann, representing Natural Resources Defense Council (eosann@nrdc.org)

2015 International Residential Code

Add new text as follows:

SECTION P2802
RADIAL DISTANCE TO CERTAIN PLUMBING FIXTURES

P2802.1 Scope. The distance limitation in Section P2802.2 shall apply to the following plumbing fixtures:

1. lavatories.
2. kitchen sinks.
3. showers.
4. tub-shower combinations.

Exception: Plumbing fixtures connected to a hot water recirculation system.

P2802.2 Maximum distance to certain plumbing fixtures For hot water distribution systems serving individual dwelling units, the maximum radial distance in plan view between the location of a water heater and a plumbing fixture receiving hot water from it shall be no more than the length shown in Table P2802.2. For purposes of this determination, the location of a water heater shall be translated vertically to each floor on which a fixture served by such water heater is located.

TABLE P2802.2
MAXIMUM RADIAL DISTANCE BETWEEN A WATER HEATER AND CERTAIN PLUMBING FIXTURES

Dwelling Unit Floor Area (ft^2)	Maximum Plan View distance (ft)	
	Two or More Story Structures	One-Story Structures
≤1000	20 ft.	30 ft.
>1000 to ≤1600	30 ft.	40 ft.
>1600 to ≤2200	40 ft.	50 ft.
>2200 to ≤2800	45 ft.	55.ft.
>2800	50 ft.	65 ft.

P2802.3 Points of Measurement Radial distance shall be measured in plan view betwee the center point of the water heater and the hot water outlet serving a plumbing fixture indicated in Section P2802.1.

Reason: Cold or tepid water in the initial draw from a hot water outlet is often unusable for its intended purpose and is frequently purged, resulting in a waste of water, energy, and time for residents. Pipe insulation significantly reduces heat loss and helps to ensure that hot water gets to users sooner. However, a complementary strategy is to reduce the volume of water contained in the hot water distribution system subject to cool-down. This proposal seeks to reduce entrained hot water volume by setting generous but clear limits on the distance between a hot water heater and the furthest bathroom or kitchen fixture it serves.

Providing greater proximity between the hot water source and the fixtures using hot water will reduce the need for purging. This proposal is similar in intent and effect to Section 607.2 of the International Plumbing Code, which sets a maximum developed length of 50 feet for hot water supply piping between a heat source and any hot water fixture. While not a limitation on pipe length or internal volume *per se*, this proposal will have similar results and has the avantage of requiring no special drawings nor any measurements or calculations at the job site. Rather, its simple provisions can be easily applied during project design and confirmed at plan check, and its graduated distance limits meet the need for a flexible approach that respects the diversity of types and sizes of single-family homes covered by the IRC.

Plans for most two-story production homes should comply with this provision with little or no adjustment. Most home designs where the principal length-to-width ratio of the building footprint is 2 to 1 or less should face few compliance isues. The concept may be more challenging for single-story homes, and for that reason an additinal distance allowance is provided for single-story buildings. Plans for homes with long and narrow configuration may require adjustment, largely to avoid positioning the hot water heater and its furthest fixture outlet at diagonally opposite corners of the building. Avoiding such inherently inefficient designs is the primary intent of this proposal.

The specific limitations in this proposal have their origin in a review of data collected from a diverse group of 55 single-family homes under construction in California in 2010-11. A plot of house floor area and maximum length of pipe between the hot water heater and the furthest hot water fixture was developed. Based upon these plotted data, in 2011 the California Utilities Statewide Codes and Standards team devloped a draft proposal setting a grauated limit on the maximum length of hot water pipe between a water heater and the furthest fixture. The proposal was estimated to save over 2500 gallons of water and over 24 therms of natural gas annually when applied to prototype homes. However, these initial pipe length criteria would have been met by just 10 out of the 55 homes surveyed. Subsequent workshops raised concerns about the challenges of field verification of pipe length subject to the limit. As a result, the concept was modified to measure radial distance in plan view, in lieu of field verification of pipe length. In its second iteration, limits were expressed as radial distances instead of pipe length, but the proposal was intended to be equally stringent. In this proposal for the IRC 2018 model code, these stringent distant limits have been increased by 50%; we estimate that over 75% of the surveyed homes in the 2010-11 data set would meet these proposed limits.

Plans not meeting the radial length limitation can come into compliance using several strategies, including fixture repositioning or hot water repositioning. The latter can often be accomplished by repositioning the proposed water heater location from an exterior garage wall to an interior garage wall; moving a basement water heater from a corner toward a more central location; or rearranging fixture locations in a bathroom to move hot water outlets closer to the water heater. Installation of a second water heater is also an option, as is a recirculation loop. Design flexibility is maintained, and architects and builders can easily identify any compliance issues at an early stage.

The IRC, as a minimum code, has a crucial role to play in curbing excessive waste of water and energy in future years by means of improved design and construction of new homes. An inefficient hot water distribution system is likely to remain in place for the life of the building, leaving owners without access to options that would have only been practical at the time of construction.

Reducing the waste of energy and water is an integral part of the stated purpose of the IRC:

> R101.3 Intent.
>
> The purpose of this code is to establish minimum requirements to safeguard the public safety, health and general welfare through affodability, structural strength, means of egress facilities, stability, sanitation, light and ventilation, energy conservation and safety to life and property from fire and other hazards attributed to the built environment and to provide safety to fire fighters and emergency responders during emergency operations.

This proposal, by reducing demands on energy and water systems in new homes, clarly advances the "public safety, health and general welfare" through cost-effective designs and energy conservation. Water-saving building designs reduce unnecessary water use, helping to ensure that water supplies are maintained at safe and reliable levels, protecting human health and firefighting capability as well as environmental resources. Energy- and water-saving designs, such as those meeting the criteria of this proposal, also enhance housing affordability and general welfare through reduced energy, water and sewer bills of building owners and occupants.

Additional Technical Background

A 2009 paper by Robert Hendron of the National Renewable Energy Laboratory and others quantified the waste of hot water in initial draws waiting for water to reach 105ºF. Modeling the plumbing typical of a 3-bedroom, 2-bath, single-story home with a hot water distrubutiuon simulation tool found that an estimated 12% of all hot water used on an annual basis is wasted. When viewed by fixture, the results are as follows:

- Showers -- over 10% wastage.
- Kitchen sinks -- 18% wastage.
- Lavatories -- over 30% wastage.

Purging at these fixtures is responsible for 95% of the estimated total of nearly 3,000 gallons of hot water wastage annually. Of course, many new homes are built with more hot water outlets than this model's base case and with hot water distribution systems that are far less efficient. Nevertheless, this proposal will direct the attention of designers and code officials to the proximity between water heaters and those fixtures that are responsible for the great majority of hot water waste.

Bibliography: Hendron, Robert, et al, "Potential for Energy Savings through Residential Hot Water Distribution System Improvements", Proceedings of the 3rd International Conference on Energy Sustainability, San Francisco, CA July 2009.
Single Family Water Heating Distribution System Improvements, Codes and Standards Enhancement Initiative (CASE), California Utilities Statewide Codes and Standards Team, draft May 2011.

Single Family Water Heating Distribution System Improvements, Codes and Standards Enhancement Initiative (CASE), California Utilities Statewide Codes and Standards Team, final September 2011.

Cost Impact: Will not increase the cost of construction
This proposal is a design requirement that can be met without increasing the cost of construction. Plans that may be initially out of conformance can most commonly be adjusted with strategies that need not carry a cost penalty, such as repositioning the proposed hot water heater location from an exterior garage wall to an interior garage wall, or by rearranging fixture locations in a bathroom to move hot water outlets closer to the water heater. Such changes typically result in shorter lengths of both cold and hot water piping, thereby reducing costs. The CASE report referenced in the bibliography evaluated the cost-effectiveness of radial distance limits that were significantly more stringent than proposed here, and found them to be cost-effective in all cases. (See final report, pp. 20-21.) The report's estimate even assumed an initial cost of $390 for additional lengths of natural gas piping and water heater vent piping, even though repositioning a water heater from an outer garage wall to an inner garage wall need not increase gas service line length. Cost savings averageing $73 from reduced length of PEX hot water piping were estimated. Natural gas savings of 24 therms per year more than ofset these costs on a life-cycle basis. What's more, no savings were calculated or credited for reduced water and sewer charges over the life of the building, which would further improve the cost-effctiveness of this measure.

RP 6-15 : P2802 (New)-OSANN5261

RP 7-15

P2804.6.1

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

2015 International Residential Code

Revise as follows:

P2804.6.1 Requirements for discharge pipe. The discharge piping serving a pressure-relief valve, temperature-relief valve or combination valve shall:

1. Not be directly connected to the drainage system.
2. Discharge through an air gap located in the same room as the water heater.
3. Not be smaller than the diameter of the outlet of the valve served and shall discharge full size to the air gap.
4. Serve a single relief device and shall not connect to piping serving any other relief device or equipment.
5. Discharge to the floor, ~~to the pan serving the water heater or~~ storage tank, to a waste receptor or to the outdoors.
6. Discharge in a manner that does not cause personal injury or structural damage.
7. Discharge to a termination point that is readily observable by the building occupants.
8. Not be trapped.
9. Be installed to flow by gravity.
10. Terminate not more than 6 inches (152 mm) and not less than two times the discharge pipe diameter above the floor or waste receptor flood level rim.
11. Not have a threaded connection at the end of the piping.
12. Not have valves or tee fittings.
13. Be constructed of those materials indicated in Section P2906.5 or materials tested, rated and *approved* for such use in accordance with ASME A112.4.1.
14. Be one nominal size larger than the size of the relief-valve outlet, where the relief-valve discharge piping is constructed of PEX or PE-RT tubing. The outlet end of such tubing shall be fastened in place.

Reason: A water heater pan does not have sufficient volume or drain size to adequately drain the volume of water that is delivered when the relief valve opens due to an over temperature event.

Cost Impact: Will not increase the cost of construction
This will not increase the cost of construction as there is already a drain in place if there is a water heater pan.

RP 7-15 : P2804.6.1-CHAPIN5710

RP 8-15

P2902.5.4, P2904.1

Proponent: Jeffrey Shapiro, representing International Residential Code Fire Sprinkler Coalition (jshapiro@ircfiresprinkler.org)

2015 International Residential Code

Revise as follows:

P2902.5.4 Connections to automatic fire sprinkler systems. The potable water supply to automatic fire sprinkler systems shall be protected against backflow by a double check backflow prevention assembly, a double check fire protection backflow prevention assembly, a reduced pressure principle backflow prevention assembly or a reduced pressure principle fire protection backflow prevention assembly.

> **Exception:**~~Where~~ Where sprinkler systems are installed ~~as a portion of the water distribution system~~ in accordance with ~~the requirements of this code and are not provided with a fire department connection~~Section P2904.1, backflow protection for the water supply system shall not be required.

P2904.1 General. The design and installation of residential fire sprinkler systems shall be in accordance with NFPA 13D or Section P2904, which shall be considered equivalent to NFPA 13D. Partial residential sprinkler systems shall be permitted to be installed only in buildings not required to be equipped with a residential sprinkler system. Section P2904 shall apply to stand-alone and multipurpose wet-pipe sprinkler systems that do not include the use of antifreeze. A multipurpose fire sprinkler system shall provide domestic water to both fire sprinklers and plumbing fixtures. A stand-alone sprinkler system shall be separate and independent from the water distribution system.

A backflow preventer shall not be required to separate a ~~stand-alone~~ sprinkler system from the water distribution system, provided that the sprinkler system complies with all of the following:

1. The system complies with NFPA 13D or Section P2904.
2. The piping material complies with Section P2905.
3. The system does not contain antifreeze.
4. The system does not have a fire department connection.

Reason: The proposed revision clarifies the code by coordinating the requirements in Sections P2902.5.4 with P2904.1. The allowance to omit backflow protection for certain stand-alone systems currently permitted by Section P2904.1 was not previously correlated with Section P2902.5.4, which has caused confusion in applying the code. The proposed text further improves usability of the code by placing a complete backflow preventer exception in Section P2904.1 rather than the current approach, which covers multipurpose systems in Section P2902.5.4 and standalone systems in Section P2904.1.

The proposed revision also makes it clear that the permissible exception to backflow protection applies to systems installed to either Section P2904 or NFPA 13D, and it corrects an oversight in the current code text related to fire department connections, making it clear that backflow protection may not be omitted on any system, stand-alone or multipurpose, that is provided with a fire department connection. Although fire department connections aren't required by Section P2904 and aren't ordinarily installed on home fire sprinkler systems, the possibility that such a connection might be voluntarily provided must be addressed.

Cost Impact: Will not increase the cost of construction

The proposal will reduce the cost of construction in cases where a backflow preventer would otherwise have been provided because of a misunderstanding of the current code provisions.

RP 8-15 : P2902.5.4-SHAPIRO4703

RP 9-15

P2903.4, P2903.4.1, P2903.4.2

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

2015 International Residential Code

Revise as follows:

P2903.4 Thermal expansion control. ~~A means for controlling increased~~
Where a storage water heater is supplied with cold water that passes through a check valve, pressure ~~caused by~~reducing valve or backflow preventer, a thermal expansion tank shall be ~~installed where required~~connected to the water heater cold water supply pipe at a point that is downstream of all check valves, pressure reducing valves and backflow preventers. Thermal expansion tanks shall be sized in accordance with ~~Sections P2903.4.1~~the tank manufacturer's instructions and ~~P2903.4.2~~shall be sized such that the pressure in the water distribution system shall not exceed that required by Section P2903.3.1.

Delete without substitution:

~~**P2903.4.1 Pressure-reducing valve.** For water service system sizes up to and including 2 inches (51 mm), a device for controlling pressure shall be installed where, because of thermal expansion, the pressure on the downstream side of a pressure-reducing valve exceeds the pressure-reducing valve setting.~~

~~**P2903.4.2 Backflow prevention device or check valve.** Where a backflow prevention device, check valve or other device is installed on a water supply system using storage water heating equipment such that thermal expansion causes an increase in pressure, a device for controlling pressure shall be installed.~~

Reason: Any location there is a pressure reducing device, a check valve or a backflow preventer in the cold water piping to a storage-type water heater, a means to compensate for thermal expansion must be installed. This is typically accomplished with an expansion tank. Other methods for relieving thermal expansion pressure, such additional relief valves, waste water for the life of the system. Thermal expansion tanks are required by most storage water heater manufacturers to protect the water heater. Expansion tank manufacturers typically size their tanks so that the water distribution system pressure will remain just shy of the pressure required to open a 150 psi water heater relief valve. This will allow the system pressure to exceed the maximum pressure intended by Section P2903.3.1, which is unacceptable. A similar proposal for the 2015 IPC was Approved as Submitted.
This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes or portions thereof. This includes both the technical aspects of the codes and the code content in terms of scope and application of referenced standards. The PMGCAC has held one open meeting and multiple conference calls which included members of the PMGCAC. Interested parties also participated in all conference calls to discuss and debate the proposed changes. This is PMGCAC Item 149.

Cost Impact: Will increase the cost of construction
This proposal will increase the cost of construction because additional labor, materials, equipment, appliances or devices are mandated beyond what is currently required by the code. Specifically, there will be the added cost for a thermal expansion tank and the labor to connect it to the piping versus the cost and labor to install a relief valve that discharges a small amount of water to relieve thermal expansion caused pressure. Where specialized water closet tank fill valves were used for the relief, the change might result in no cost impact at all. Where use of a relief valve (before) required a drain to be installed for capturing the discharge, installing a thermal expansion tank might cost less than the drain installation.

RP 9-15 : P2903.4-SNYDER4139

RP 10-15

P2903.5

Proponent: Michael Meagher, representing Sioux Chief Mfg (michael.meagher@siouxchief.com)

2015 International Residential Code

Revise as follows:

P2903.5 Water hammer. The flow velocity of the water distribution system shall be controlled to reduce the possibility of water hammer. A water hammer arrestor shall be installed where quick-closing valves are utilized. Water-hammer arrestors shall be installed in accordance with the manufacturer's instructions. Water-hammer arrestors shall conform to ASSE 1010.

Reason: This proposal re-aligns both the IRC P2903.5 with the IPC 604.9 Water Hammer paragraphs as they were when they were first created, eliminating confusion and clearly spelling out the necessary requirement for water hammer control on all plumbing systems. Originally, these two code paragraphs on water hammer control were identical. Then, the 2009 IRC P2903.5 was edited, striking a single sentence that contained the mandatory language. This same edit proposal did not make it through to the 2009 IPC 604.9. It was voted down, keeping the mandatory language as is. Confusion amongst code officials throughout the country has ensued over this discrepency in the two codes ever since.
Water hammer control has been a part of our plumbing codes and practices ever since plain air chambers were introduced over a hundred years ago. Today, modern plumbing systems require water hammer control even more so than in the past. In regards to the science of water hammer, the laws of physics do not change when comparing the pressure surge in a 1-or-2 family dwelling to the surge in a multi-family system. They are the same. In addition, the advent of plastic piping systems, with various designs of metal and hard-plastic mechanical fitting systems, do not eliminate this need for water hammer control, as some may have assumed. Rather, the need to protect these systems from damaging pressure surges is even greater due to their lower pressure ratings compared to traditional metal piping systems.

Over the years, the plumbing industry has developed a wide variety of ASSE 1010 certified AA size arresters, even laundry boxes with certified integral arresters, which have become very popular throughout the country, making water hammer control very easy and affordable. Other model codes requiring arresters have been successfully welcomed and easily enforced throughout much of the United States, Canada, and in many parts of the world, for many years now. The installation of AA arresters is now common practice for well over half the residential construction in North America, in both single-family and multi-family.

Bibliography: [Link to website for additional information] This link to the ASSE website verifies the many arrester manufacturers and the wide variety of ASSE certified AA arrester options available in the plumbing industry.
http://www.asse-plumbing.org/prodlist_new.asp

Cost Impact: Will increase the cost of construction
For fhe tens of thousands of new homes that are already being installed with AA arresters, there is NO cost impact.
For the tens of thousands of new homes that are still being installed with old-fashioned plain air chambers, there is NO cost impact, and more likely a cost savings, due to the elimination of the cost of labor and material of installing 12-16 air chambers versus the cost of 3 to 5 AA arresters per home.

Where the current IRC is being used and interpreted as requiring NO water hammer control, the initial installation cost impact of this code change will be roughly $18 to $30 per home, depending on local interpretation of required quick-closing valves. This cost impact is calculated using the most common practice of arrester installation, which is installing outlet boxes (such as laundry boxes) with integral arresters. Since the arresters are already factory-installed, the cost impact is simply the cost difference in boxes with and without arresters, roughly $6 per single valve/arrester box ($12 per laundry box since it includes two arresters per box). The second most popular AA arrester installaion is the swivel compression tee arrester which easily and quickly hooks up to the compression supply stop that serves the quick-closing valve. The cost impact of this is roughly $8. Depending on local enforcement, the total cost impact per home could be $18-$30, or an average of about $24 per home.

The LONG TERM cost impact of water hammer control, however, is immeasurable. yet very obvious. Just like many other required devices in a plumbing system, such as pressure reducing valves limiting static pressures to 80 psi, water hammer arresters will help protect the entire plumbing system and all of its necessary appurtenances and appliances from premature failure, saving the homeowner thousands of dollars in repairs and damage over the life of the home.

RP 10-15 : P2903.5-MEAGHER5179

RP 11-15

P2902.5.4, P2904.1, 2904.1.1 (New)

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

2015 International Residential Code

Revise as follows:

P2902.5.4 Connections to automatic fire sprinkler systems. The potable water supply to automatic fire sprinkler systems shall be protected against backflow by a double check backflow prevention assembly, a double check fire protection backflow prevention assembly, a reduced pressure principle backflow prevention assembly or a reduced pressure principle fire protection backflow prevention assembly.

> **Exception:** Where <u>sprinkler</u> systems are installed~~ as a portion of the water distribution system~~ in accordance with ~~the requirements of this code and are not provided with a fire department connection~~<u>Section P2904.1.1</u>, backflow protection for the water supply system shall not be required.

P2904.1 General. The design and installation of residential fire sprinkler systems shall be in accordance with NFPA 13D or Section P2904, which shall be considered equivalent to NFPA 13D. Partial residential sprinkler systems shall be permitted to be installed only in buildings not required to be equipped with a residential sprinkler system. Section P2904 shall apply to stand-alone and multipurpose wet-pipe sprinkler systems that do not include the use of antifreeze. A multipurpose fire sprinkler system shall provide domestic water to both fire sprinklers and plumbing fixtures. A stand-alone sprinkler system shall be separate and independent from the water distribution system.~~ A backflow preventer shall not be required to separate a stand-alone sprinkler system from the water distribution system.~~

Add new text as follows:

<u>2904.1.1</u> <u>Backflow protection.</u>
<u>A backflow preventer shall not be required to separate a stand-alone sprinkler system from the water distribution system, provided that the sprinkler system complies with all of the following:</u>

1. <u>The system complies with NFPA 13D or Section P2904.</u>
2. <u>The piping material complies with Section P2905.</u>
3. <u>The system does not contain antifreeze.</u>
4. <u>The system does not have a fire department connection.</u>

Reason: The proposed revision clarifies the code by coordinating the requirements in Sections P2902.5.4 with P2904.1. The allowance to omit backflow protection for certain stand-alone systems currently permitted by Section P2904.1 was not previously correlated with Section P2902.5.4, which has caused confusion in applying the code. The proposed text further improves usability of the code by placing a complete backflow preventer exception in the proposed Section P2904.1.1 rather than the current approach, which covers multipurpose systems in Section P2902.5.4 and standalone systems in Section P2904.1.
The proposed revision also makes it clear that the permissible exception to backflow protection applies to systems installed to either Section P2904 or NFPA 13D, and it corrects an oversight in the current code text related to fire department connections, making it clear that backflow protection may not be omitted on any system, stand-alone or multipurpose, that is provided with a fire department connection. Although fire department connections aren't required by Section P2904 and aren't ordinarily installed on home fire sprinkler systems, the possibility that such a connection might be voluntarily provided must be addressed.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes or portions thereof. This includes both the technical aspects of the codes and the code content in terms of scope and application of referenced standards. The PMGCAC has held one open meeting and multiple conference calls which included members of the PMGCAC. Interested parties also participated in all conference calls to discuss and debate the proposed changes. This is PMGCAC Item 145.

Cost Impact: Will not increase 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.

RP 11-15 : P2904.1-SNYDER4138

RP 12-15

Table P2906.6, Chapter 44

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

2015 International Residential Code

Revise as follows:

TABLE P2906.6
PIPE FITTINGS

MATERIAL	STANDARD
Fittings for polyethylene of raised temperature (PE-RT) plastic tubing	ASSE 1061; ASTM F 1807; ASTM F2098; ASTM F 2159; ASTM F 2735; ASTM F 2769

(Portions of table not shown remain unchanged)

Add new standard(s) as follows:
ASSE 1061-2011 Peformance Requirements for Push-Fit Fittings (UPDATE of edition year).

Reason: ASSE 1061-2011 added PE-RT to the list of tubing that can be used with the fittings.

Cost Impact: Will not increase the cost of construction
This will not increase the cost of construction as it only adds another option for the installer.

Analysis: Successful action on this proposal will result in the update of Reference Standard ASSE 1061 to the 2011 edition level for only the change indicated in the table. A coordinating proposal for updating the standard for the entire code will be submitted to Group B for inclusion in the Reference Standards administrative update proposal.

RP 12-15 : Table P2906.6-CHAPIN5711

RP 13-15

P2906.6.1 (New)

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

2015 International Residential Code

Add new text as follows:

P2906.6.1 Saddle tap fittings. The use of saddle tap fittings and combination saddle tap and valve fittings shall be prohibited.

Reason: As PEX, PE-RT and CPVC tubings are becoming even more popular than ever for water distribution systems in residential buildings, there are more reports of saddle tap fittings being installed on these types of tubing. This just doesn't work out very well. The IRC does not require that refrigerator ice maker water supply connection boxes be installed at rough-in. And the installation of reverse osmosis drinking water systems is becoming quite popular. Where can someone tap into the water distribution system for the supply of water? A saddle tap is quick and easy but is subject to being bumped and twisted. Where the tap is a combination tap and valve, operation of the valve makes the potential for leakage problems greater.
This connection method should be prohibited just like it has been prohibited in the IPC for some time.

This proposal is submitted by the ICC Plumbing, Mechanical and Fuel Gas Code Action Committee (PMGCAC) The PMGCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes or portions thereof. This includes both the technical aspects of the codes and the code content in terms of scope and application of referenced standards. The PMGCAC has held one open meeting and multiple conference calls which included members of the PMGCAC. Interested parties also participated in all conference calls to discuss and debate the proposed changes. This is PMGCAC Item 130.

Cost Impact: Will increase the cost of construction
This proposal will increase the cost of construction because additional labor, materials, equipment, appliances or devices are mandated beyond what is currently required by the code. For those plumbing contractors that were trying to legally cut corners in every way possible, there will be the minor added cost for a tee installation. Can they convince the builder or developer that they should be paid more for their work because of this change? It would be very, very doubtful that the builder or developer will be impacted with this minor cost addition.

RP 13-15 : P2906.6.1 (New)-SNYDER4140

RP 14-15

P2906.9.1.5, P2906.9.1.5.1, P2906.9.1.5.2

Proponent: Gary Morgan, Viega.LLC, representing Viega LLC (gary.morgan@viega.us)

2015 International Residential Code

Revise as follows:

~~P2906.9.1.5~~P2906.10 Cross-linked polyethylene plastic (PEX). Joints between cross-linked polyethylene plastic tubing or fittings shall comply with Section ~~P2906.9.1.5.1~~P2906.10.1 or Section ~~P2906.9.1.5.2~~P2906.10.2.

~~P2906.9.1.5.1~~P2906.10.1 Flared joints. *No change to text.*

~~P2906.9.1.5.2~~P2906.10.2 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions. Fittings for cross-linked polyethylene (PEX) plastic tubing shall comply with the applicable standards indicated in Table P2906.6 and shall be installed in accordance with the manufacturer's instructions. PEX tubing shall be factory marked with the applicable standards for the fittings that the PEX manufacturer specifies for use with the tubing.

Reason: This proposal fixes an oversight that has existed for several years in this code in that the Section for "PEX Plastic" (P2906.9.1.5) should never have been subcategorized under "Solvent cementing" Section P2906.9.1. Like other specific piping material types, "PEX plastic" should have had it's own section like that of Polypropylene (PP), PEX/AL/PEX, Stainless Steel, Press-connect,and PE-RT to name a few.
This proposal also brings the IRC in consistant alignment with how the IPC is now organized by renumbering the sections for PEX.

Cost Impact: Will not increase the cost of construction
This proposal will have no effect on the cost of construction and only seeks to correct an oversight of organizational numbering.

RP 14-15 : P2906.9.1-MORGAN5492

RP 15-15

P2906.9.1.4

Proponent: Tim Earl, GBH International, representing The Oatey Company, representing The Oatey Company (tearl@gbhinternational.com)

2015 International Residential Code

Revise as follows:

P2906.9.1.4 PVC plastic pipe. A purple primer , or other *approved* primer, that conforms to ASTM F 656 shall be applied to PVC solvent-cemented joints. Solvent cement for PVC plastic pipe conforming to ASTM D 2564 shall be applied to all joint surfaces.

Reason: The market place has already begun using clear as well as UV-light visible primers where local inspectors allow. Many users prefer this as spilled purple primers can permanently stain surfaces and cause added expenses in repair/replacement of stained items. This simply meets a market condition and gives broader authority for these applications to occur. This would also be consistent with language in the IPC and other proposals in the IRC.

Cost Impact: Will not increase the cost of construction
This proposal will not impact cost as it simply adds another primer option.

RP 15-15 : P2906.9.1.4-EARL4723

RP 16-15

Table P2906.4, Table P2906.5, Table P2906.6, P2906.19, P2906.19.2 (New), P2906.19.3 (New)

Proponent: Larry Gill, representing IPEX USA LLC (larry.gill@ipexna.com)

2015 International Residential Code

Revise as follows:

TABLE P2906.4
WATER SERVICE PIPE

MATERIAL	STANDARD
Polyethylene of raised temperature (PE-RT) plastic tubing	ASTM F 2769; <u>CSA B137.18</u>

(Portions of table not shown remain unchanged)

TABLE P2906.5
WATER DISTRIBUTION PIPE

MATERIAL	STANDARD
Polyethylene of raised temperature (PE-RT) plastic tubing	ASTM F 2769; <u>CSA B137.18</u>

(Portions of table not shown remain unchanged)

TABLE P2906.6
PIPE FITTINGS

MATERIAL	STANDARD
Fittings for polyethylene of raised temperature (PE-RT) plastic tubing	ASTM F 1807; ASTM F2098; ASTM F 2159; ASTM F 2735; ASTM F 2769; <u>ASTM F1055; ASTM D2683; ASTM D3261; CSA B137.18</u>

(Portions of table not shown remain unchanged)

P2906.19 Polyethylene of raised temperature plastic. Joints between polyethylene of raised temperature plastic tubing and fittings shall be in accordance with ~~Section~~<u>Sections</u> P2906.19.1<u>, P2906.19.2 and P2906.19.3</u>.

Add new text as follows:

<u>**P2906.19.2 Heat fusion Joints** Joints shall be of the socket-fusion, saddle-fusion, or butt-fusion type, and shall be joined in accordance with ASTM D2657. Joint surfaces shall be clean and free of moisture. Joint surfaces shall be heated to melt temperatures and joined. The joint shall remain undisturbed until cool. Fittings shall be manufactured in accordance with ASTM D2683 or ASTM D3261.</u>

<u>**P2906.19.3 Electrofusion Joints** Joints shall be of the electrofusion type. Joint surfaces shall be clean and free of moisture and scoured to expose virgin resin. Joint surfaces shall be heated to melt temperatures for a period of time specified my the manufacturer and joined. The joint shall remain undisturbed until cool. Fittings shall be manufactured in accordance with ASTM F1055.</u>

Add new standard(s) as follows:
<u>CSA B137.18 - 2013 - Polyethylene of raised temperature resistance (PE-RT) tubing systems for pressure applications.</u>

Reason: Add new CSA B137.18 Polyethylene of raised temperature resistance (PE-RT) tubing systems for pressure applications to tables

P2906.4, P2906.5 and P2906.6. This standard includes both pipe and fittings for water service and water distribution. This change will permit pipe and fittings meeting CSA B137.18 to be used in accordance with the Code.
Add new sections P2906.19.2 and P2906.19.3 for PE-RT fusion joints. Also add corresponding reference standards for PE-RT fusion - ASTM F1055, ASTM D2683 and ASTM D3261. This change will permit PE-RT pipe to be joined by fusing methods.

Cost Impact: Will not increase the cost of construction
This proposal adds additional standards for use with PERT pipe and fittings. These new standards are similar to existing referenced standards and product are similar so there is no increase in the cost of the PERT system by referenciing these standards and adding standards to permit fusion of PERT.

Analysis: A review of the standard proposed for inclusion in the code, CSA B137.18 - 2013, 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, 2015.

RP 16-15 : P2906.19-GILL4509

RP 17-15

P3003.9.2

Proponent: Tim Earl, GBH International, representing The Oatey Company (tearl@gbhinternational.com)

2015 International Residential Code

Revise as follows:

P3003.9.2 Solvent cementing. Joint surfaces shall be clean and free from moisture. A purple primer, or other *approved* primer, that conforms to ASTM F 656 shall be applied. Solvent cement not purple in color and conforming to ASTM D 2564, CSA B137.3 or CSA B181.2 shall be applied to all joint surfaces. The joint shall be made while the cement is wet, and shall be in accordance with ASTM D 2855. Solvent-cement joints shall be installed above or below ground.

Exception: A primer shall not be required where all of the following conditions apply:

1. The solvent cement used is third-party certified as conforming to ASTM D 2564.
2. The solvent cement is used only for joining PVC drain, waste and vent pipe and fittings in non-pressure applications in sizes up to and including 4 inches (102 mm) in diameter

Reason: The market place has already begun using clear as well as UV-light visible primers where local inspectors allow. Many users prefer this as spilled purple primers can permanently stain surfaces and cause added expenses in repair/replacement of stained items. Also, there are some installations (under sinks, basements) where the PVC will be exposed and the primer visible after installation. This simply meets a market condition and gives broader authority for these applications to occur. This would also be consistent with language in the IPC and other proposals in the IRC.
Visible primer stains on pipe installation:

Typical installation with visible primer

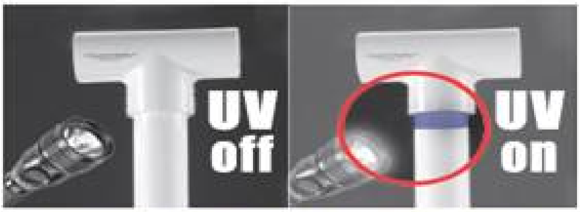
UV-visible primer:

UV visible primer

Staining to floor from purple primer (after being wiped off, with less than one minute of exposure):

Stained floor

Stained tile



Inspector can verify the use of Primer with a UV flashlight.

Cost Impact: Will not increase the cost of construction
This proposal will not impact cost as it simply allows another primer option.

RP 17-15 : P3003.9.2-EARL4721

RP 18-15

P3010.4, P3010.5

Proponent: Larry Gill, representing IPEX USA LLC (larry.gill@ipexna.com)

2015 International Residential Code

Revise as follows:

P3010.4 Pipe. The replacement pipe shall be made of a high-density polyethylene (HDPE) that conforms to ~~cell classification number~~ material designation code PE3608, PE4608 or PE4710 as indicated in ASTM F 714. The pipe fittings shall be manufactured with an SDR of 17 and in compliance with ASTM F 714.

P3010.5 Pipe fittings. Pipe fittings to be connected to the replacement piping shall be made of high-density polyethylene (HDPE) that conforms to ~~cell classification number~~ material designation code PE3608, PE4608 or PE4710 as indicated in ASTM F 714. The pipe fittings shall be manufactured with an SDR of 17 and in compliance with ASTM D 2683.

Reason: The listed designations PE 3608, 4608 and 4710 are not cell classiciations per the referecned standard ASTM F714. They are material designation codes. Minor correction to terminology.

Cost Impact: Will not increase the cost of construction
Change to correct terminology with no impact on cost. The proposal does not change the cost of the product it only corrects how the product is referenced.

RP 18-15 : P3010.4-GILL4929

RP 19-15

P3201.1, P3201.2, P3201.2.1.1, P3201.2.1.2, P3201.2.1.3, P3201.2.1.4, P3201.3, P3201.5, P3201.6, Chapter 44

Proponent: Ronald George, Plumb-Tech Design & Consulting LLC on belhalf of Hepworth Bldg Prods (A Trading Div. of Wavin UK Holdings) Ltd., representing Hepworth Building Products (A trading Division of Wavin UK Holdings) Ltd./HepVO

2015 International Residential Code

Revise as follows:

P3201.1 Design of traps. Traps shall be of standard design, shall have smooth uniform internal waterways, shall be self-cleaning and shall not have interior partitions except where integral with the fixture. Traps shall be constructed of lead, cast iron, copper or copper alloy or *approved* plastic. Copper or copper alloy traps shall be not less than No. 20 gage (0.8 mm) thickness. Solid connections, slip joints and couplings shall be permitted to be used on the trap inlet, trap outlet, or within the trap seal. Slip joints shall be accessible.

Exception: Sanitary waste valve devices complying with ASME A112.18.8 shall be an alternative to the traps required by this section where such devices are installed in accordance with the manufacturer's instructions.

P3201.2 Trap seals. Each fixture trap shall have a liquid seal of not less than 2 inches (51 mm) and not more than 4 inches (102 mm).

Exception: Sanitary waste valve devices complying with ASME A112.18.8 shall not be required to have a liquid seal.

P3201.2.1.1 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. The devices shall be installed in accordance with the manufacturer's instructions. 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.

P3201.2.1.2 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 devices shall be installed in accordance with the manufacturer's instructions. 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.

P3201.2.1.3 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 devices shall be installed in accordance with the manufacturer's instructions. 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.

P3201.2.1.4 Barrier-type trap seal protection device. A barrier-type trap seal protection device ~~shall protect the floor drain trap seal from evaporation. Barrier-type floor drain trap seal protection devices~~ shall conform to ASSE 1072. The devices shall be installed in accordance with the manufacturer's instructions.

P3201.3 Trap setting and protection. Traps shall be set level with respect to their water seals and shall be protected from freezing. Trap seals shall be protected from siphonage, aspiration or back pressure by an *approved* system of venting (see Section P3101). The devices shall be installed in accordance with the manufacturer's instructions.

P3201.5 Prohibited trap designs. The following types of traps are prohibited:

1. Bell traps.
2. Separate fixture traps with interior partitions, except those lavatory traps made of plastic, stainless steel or other corrosion-resistant material.
3. "S" traps.
4. Drum traps.
5. Trap designs with moving parts.

Exception: Sanitary waste valve devices complying with ASME A112.18.8 shall be permitted provided that the devices are installed in accordance with the manufacturer's instructions.

P3201.6 Number of fixtures per trap. Each plumbing fixture shall be separately trapped by a water seal trap. 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 (762 mm) measured from the center line 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 P2706.1.2. Fixtures shall not be double trapped.

Exceptions:

1. Fixtures that have integral traps.
2. A single trap shall be permitted to serve two or three like fixtures limited to kitchen sinks, laundry tubs and lavatories. Such fixtures shall be adjacent to each other and located in the same room with a continuous waste arrangement. The trap shall be installed at the center fixture where three fixtures are installed. Common trapped fixture outlets shall be not more than 30 inches (762 mm) apart.
3. Connection of a laundry tray waste line into a standpipe for the automatic clothes-washer drain shall be permitted in accordance with Section P2706.1.2.1.
4. <u>A water seal trap shall not be required where a sanitary waste valve device complying with ASME A112.18.8 is installed in accordance with the manufacturer's instructions.</u>

Add new standard(s) as follows:

<u>ASME A112.18.8 -2009 (Reaffirmed 2014) In-Line Sanitary Waste Valves for Plumbing Drainage Systems</u>

Reason: This code change proposal is for a new plumbing product that outperforms a p-trap, but it is not a p-trap. A p-trap is based on trapping water in the drain to provide a seal between the interior of a building and the sewer gasses and odors in the public sewer. This product is called an In-Line Sanitary Waste valve. It is designed to prevent sewer odors from the building drain and public sewers from entering the building but it does not "Trap water" it uses a flexible membrane and therefore it needs to be identified separately with an exception. In-line sanitary waste valves perform better than a P-trap. P-traps will often plug when solids are put into the drain, where in-line waste valve easily pass solids. P-traps often crack and leak when exposed to freezing temperatures and P-traps will dry up an allow sewer odors to escape into the building when the fixture has not been used for a period of time. (A couple of weeks) In-line sanitary waste valves perform very well in freezing conditions and they still prevent sewer gasses from entering a building when the fixture has not been used for an extended period. Long periods of non-use is common for many seasonal type hotel, school and state park types of buildings. Sanitary waste valves have been used extensively in many other parts of the world very successfully. (Europe, South Africa, and Asia) (See attached testimonial letters)

This proposal is seeking to allow the use of in-line sanitary waste valves that conform to the requirements of the attached standard to be used in lieu of p-traps, but not replace p-traps. These devices cost more than a p-trap, so they will not take over the market. They are intended to only be used on sinks, lavatories, and bathtubs where freezing conditions may exist (in overhangs) or in seasonal buildings like cabins, vacation homes or large hotels where some wings or building may not be used for long periods, They may also be used in State Park facilities, National Park Facilities, seasonal resorts, schools, and stadiums during off-seasons or in buildings where traps can freeze or dry up. This option is currently not available and this code change is intended to give consumers a choice for a better product if they choose to purchase it.

The manufacturer went to the American Society of Mechanical Engineers to develop a Standard for this product. The standard is ASME A112.18.8, the standard was titled: "In-Line Sanitary Waste Valves for Plumbing Drainage Systems". This standard includes a "Scope" that states these devices are intended "for use as an alternate to tubular p-traps" (1-1/4 inch and 1-1/2 inch at sinks, lavatories and bathtubs only) The standard also covers the material and performance requirements for the product. It also states that these devices are not intended for use with water closets and urinals.

The Standard includes Material Requirements for the device to comply with the Seal material requirements in ASTM F409 Standard Specification for Thermoplastic Accessible and Replaceable Plastic Tube and Tubular Fittings. It also addresses the Seal material to comply with or exceed the following material requirements from ASTM D2000: M3BA507, A14, B13, C12 and F17 or M2BG714, B14, EO14, and EO34. The ASTM D2000 standard is an industry standard for rubber and polymer products. The material requirements have been confirmed with a 3rd party laboratory test report. (Attached)

The Standard also has material requirements for the bladder/checking member material to comply with or exceed the following material requirements from ASTM D2000: M3FC607, EA14, EO16 and G11. The bladder/checking member material requirements have been confirmed with a 3rd party laboratory test report. (Attached)

Other material requirements address valve inlet dimensions, valve outlet dimensions and threaded connections.

The Standard includes performance testing requirements which includes the following tests: 1. Waterway Flow test; 2. One-Way Sealing Performance Test; 3. Airway Flow Rate; 4. Recovery from an Excess Back Pressure Test; 5. Leak Tightness Test; 6. Thermal Cycling; 7. Resistance to Household Substances: rice, diced vegetables, resistance to cleaning product, soaps, solids, kiln dried sand, and the lard test from the grease interceptor and trap seal protection device standards; 9. Resistance to Chemicals and Solvents; 10. Drop Test; and 11. Life Cycle Operation Test.

The Standard also has requirements for marking, Identification and installation Instructions.

In-Line sanitary waste valves are an innovative, hygienic, Self Sealing, Waste Valve.

In-Line sanitary waste valves can be installed vertically or horizontally (with an adaptor) and are available in 1-1/4 inch (32mm) and 1-1/2 inch (40mm) sizes.

The Recreational Vehicle industry in North America has embraced this technology because it out performs P-traps in freezing conditions and when there are periods of non-use. Another advantagee over p-traps is it prevents sewage from backing up into bathtubs when there is movement and it could help prevent backflow of sewage.

Bibliography: Link to website for additional information: http://overseas.wavin.com/overseas/HepVo_waste_valve.html

Cost Impact: Will not increase the cost of construction
There will be no addditional cost associated with this code change, because it is not mandating the use of products meeting this Standard, it is simply listing it as an alternate to a p-trap as an alternate method for a better performing installation. It is not a mandatory code change, If someone chooses to install an in-line Sanitary Waste Valve, Then it must conform to the industry Standard.

Analysis: A review of the standard proposed for inclusion in the code, ASME A112.18.8 -2009 (Reaffirmed 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, 2015.

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