P11 – 12
202, 301.3, Chapter 13, Chapter 13 (New), Chapter 14 (New)

Proposed Change as Submitted

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Add new definitions as follows:

STORAGE TANK. A fixed container for holding water at atmospheric pressure for subsequent reuse as part of a plumbing or irrigation system.

RECLAIMED WATER. *Non-potable water* that has been derived from the treatment of wastewater by a facility or system licensed or permitted to produce water meeting the jurisdiction's water requirements for its intended uses. Also known as "Recycled Water."

ONSITE NON-POTABLE WATER REUSE SYSTEMS. Water systems for the collection, treatment, storage, distribution, and reuse of non-potable water generated onsite, including but not limited to graywater systems. This definition does not include rainwater harvesting systems.

DISTRIBUTION PIPE. Pressurized or non-pressure piping used within the plumbing system of a building to deliver rainwater or graywater from the *storage tank* or pump to the point of use.

COLLECTION PIPE. Unpressurized pipe used within the collection system that drains onsite non-potable water or rainwater to a storage tank by gravity.

ALTERNATE ON–SITE NON-POTABLE WATER. Non-potable water from other than public utilities, onsite surface sources and subsurface natural freshwater sources. Examples of such water are graywater, on-site reclaimed water, collected rainwater, captured condensate, and rejected water from reverse osmosis systems.

METER. A measuring device used to collect data and indicate water usage.

RAINWATER. Water from natural precipitation.

Revise as follows:

301.3 Connections to drainage system. Plumbing fixtures, drains, appurtenances and appliances used to receive or discharge liquid wastes or sewage shall be directly connected to the sanitary drainage system of the building or premises, in accordance with the requirements of this code. This section shall not be construed to prevent indirect waste systems required by Chapter 8.

> **Exception:** Bathtubs, showers, lavatories, clothes washers and laundry trays shall not be required to discharge to the sanitary drainage system where such fixtures discharge to an approved ~~gray water~~ system in accordance with Chapter 13 and 14 ~~for flushing of water closets and urinals or for subsurface landscape irrigation~~.

Delete existing Chapter 13 and substitute as follows:

~~CHAPTER 13~~
~~GRAY WATER RECYCLING SYSTEMS~~

CHAPTER 13
NON-POTABLE WATER SYSTEMS

SECTION 1301
GENERAL

1301.1 Scope. The provisions of Chapter 13 shall govern the materials, design, construction and installation of systems for the collection, storage, treatment, and distribution of non-potable water. The use and application of non-potable water shall comply with laws, rules and ordinances applicable in the jurisdiction.

1301.2 Water quality. Non-potable water for each end use application shall meet the minimum water quality requirements as established for the intended application by the laws, rules and ordinances applicable in the jurisdiction. Where *non-potable* water from different sources is combined in a system, the system shall comply with the most stringent of the requirements of this code that are applicable to such sources.

1301.2.1 Residual disinfectants. Where chlorine is used for disinfection, the *non-potable* water shall contain not more than 4 mg/L of chloramines or free chlorine when tested in accordance with ASTM D1253. Where ozone is used for disinfection, the *non-potable* water shall not contain gas bubbles having elevated levels of ozone at the point of use.

1301.2.2 Filtration required. *Non-potable* water utilized for water closet and urinal flushing applications shall be filtered by a 100 micron or finer filter.

> **Exception:** Reclaimed water sources shall not be required to comply with the requirements of 1301.2.1 and 1301.2.2.

1301.3 Signage required. All non-potable water outlets such as hose connections, open ended pipes, and faucets shall be identified at the point of use for each outlet with signage that reads as follows: "Non-potable water is utilized for [application name]. Caution: non-potable water. DO NOT DRINK." The words shall be legibly and indelibly printed on a tag or sign constructed of corrosion-resistant waterproof material or shall be indelibly printed on the fixture. The letters of the words shall be not less than 0.5 inches in height and in colors in contrast to the background on which they are applied. In addition to the required wordage, the pictograph shown in Figure 1301.3 shall appear on the signage required by this section.

Figure 1301.3 – Pictograph DO NOT DRINK

1301.4 Permits. *Permits* shall be required for the construction, installation, *alteration*, and *repair* of non-potable water systems. *Construction documents*, engineering calculations, diagrams, and other such data pertaining to the non-potable water system shall be submitted with each application for *permit*.

1301.5 Potable water connections. Where a *potable* system is connected to a non-potable water system, the *potable* water supply shall be protected against backflow in accordance with Section 608.

1301.6 Approved components and materials. Piping, plumbing components, and materials used in the collection and conveyance systems shall be manufactured of material *approved* for the intended application and compatible with any disinfection and treatment systems used.

1301.7 Insect and vermin control. The system shall be protected to prevent the entrance of insects and vermin into *storage tanks* and piping systems. Any screen materials shall be compatible with contacting system components and shall not accelerate corrosion of system components.

1301.8 Freeze protection. Where sustained freezing temperatures occur, provisions shall be made to keep *storage tanks* and the related piping from freezing.

1301.9 Non-potable water storage tanks. Where used, non-potable water *storage tanks* shall comply with Sections 1301.9.1 through 1301.9.11.

1301.9.1 Sizing. The holding capacity of the *storage tank* shall be sized in accordance with the anticipated demand.

1301.9.2 Location. *Storage tanks* shall be installed above or below grade. Above grade *storage tanks* shall be protected from direct sunlight and shall be constructed using opaque, UV resistant, materials such as, but not limited to, heavily tinted plastic, fiberglass, lined metal, concrete, wood, or painted to prevent algae growth, or shall have specially constructed sun barriers including but not limited to installation in garages, crawlspaces, or sheds. *Storage tanks* and their manholes shall not be located directly under any soil or waste piping or any source of contamination.

1301.9.3 Materials. Where collected onsite, water shall be collected in an *approved* tank constructed of durable, nonabsorbent and corrosion-resistant materials. The *storage tank* shall be constructed of materials compatible with any disinfection systems used to treat water upstream of the tank and with any systems used to maintain water quality within the tank. Wooden *storage tanks* that are not equipped with a makeup water source shall be provided with a flexible liner.

1301.9.4 Foundation and supports. *Storage tanks* shall be supported on a firm base capable of withstanding the *storage tank's* weight when filled to capacity. *Storage tanks* shall be supported in accordance with the *International Building Code*.

1301.9.4.1 Ballast. Where the soil can become saturated, an underground *storage tank* shall be ballasted, or otherwise secured, to prevent the tank from floating out of the ground when empty. The combined weight of the tank and hold down ballast shall meet or exceed the buoyancy force of the tank. Where the installation requires a foundation, the foundation shall be flat and shall be designed to support the *storage tank* weight when full, consistent with the bearing capability of adjacent soil.

1301.9.4.2 Structural support. Where installed below grade, *storage tank* installations shall be designed to withstand earth and surface structural loads without damage and with minimal deformation when filled with water or empty.

1301.9.5 Makeup water. Where an uninterrupted supply is required for the intended application, *potable* or reclaimed water shall be provided as a source of makeup water for the *storage tank*. The makeup water supply shall be protected against backflow in accordance with Section 608. A full-open valve located on the makeup water supply line to the *storage tank* shall be provided. Inlets to *storage tank* shall be controlled by fill valves or other automatic supply valves installed so as to prevent the tank from overflowing and to prevent the water level from dropping below a predetermined point. Where makeup water is provided, the water level shall not be permitted to drop below the source water inlet or the intake of any attached pump.

1301.9.6 Overflow. The *storage tank* shall be equipped with an overflow pipe having a diameter not less than that shown in Table 606.5.4 The overflow pipe shall be protected from insects or vermin and shall be discharged in a manner consistent with storm water runoff requirements of the jurisdiction. The overlow piope shall discharge at a sufficient distance from the tank to avoid damaging the tank foundation or the adjacent property. Drainage from overflow pipes shall be directed so as not to freeze on roof walks. The overflow drain shall not be equipped with a shutoff valve. A cleanout shall be provided on each overflow pipe in accordance with Section 708.

1301.9.7 Access. A minimum of one access opening shall be provided to allow inspection and cleaning of the tank interior. Access openings shall have an *approved* locking device or other *approved* method of securing access. Below grade *storage tanks*, located outside of the *building*, shall be provided with either a manhole not less than 24 inches (610 mm) square or a manhole with an inside diameter not less than 24 inches (610 mm) . Manholes shall extend not less than 4 inches above ground or shall be designed to as to prevent water infiltration. Finished grade shall be sloped away from the manhole to divert surface water from the manhole. Each manhole cover shall be secured to prevent unauthorized access. Service ports in manhole covers shall be not less than 8 inches (203 mm) in diameter and shall be a minimum of 4 inches (102 mm) above the finished grade level. The service port be secured to prevent unauthorized access.

> **Exception:** *Storage tanks* under 800 gallons in volume installed below grade shall not be required to be equipped with a manhole, but shall have a service port not less than 8 inches (203 mm) in diameter.

1301.9.8 Venting. *Storage tanks* shall be provided with a vent sized in accordance with Chapter 9 and based on the aggregate diameter of all tank influent pipes. The reservoir vent shall not be connected to sanitary drainage system vents. Vents shall be protected from contamination by means of a U-bend installed with the opening directed downward or an *approved* cap. Vent outlets shall extend a minimum of 4” above grade, or as necessary to prevent surface water from entering the *storage tank*. Vent openings shall be protected against the entrance of vermin and insects in accordance with the requirements of Section 1307.1.

1301.9.9 Draining of tanks. Where tanks require draining for service or cleaning, tanks shall be drained by using a pump or by a drain located at the lowest point in the tank The tank drain pipe shall discharge as required for overflow pipes and shall not be smaller in size than specified in Table 606.5.7. A minimum of one cleanout shall be provided on each drain pipe in accordance with Section 708.

1301.9.10 Marking and signage. Each non-potable water *storage tank* shall be *labeled* with its rated capacity. The contents of *storage tanks* shall be identified with the words “CAUTION: NON-POTABLE WATER – DO NOT DRINK.” Where an opening is provided that could allow the entry of personnel, the opening shall be marked with the words, “DANGER – CONFINED SPACE.” Markings shall be indelibly printed on a tag or sign constructed of corrosion-resistant waterproof material mounted on the tank or shall be indelibly printed on the tank. The letters of the words shall be not less than 0.5 inches in height and shall be of a color in contrast with the background on which they are applied.

1301.9.11 Storage tank tests. *Storage tanks* shall be tested in accordance with the following:

Storage tanks shall be filled with water to the overflow line prior to and during inspection. All seams and joints shall be left exposed and the tank shall remain water tight without leakage for a period of 24 hours.

1. After 24 hours, supplemental water shall be introduced for a period of 15 minutes to verify proper drainage of the overflow system and verify that there are no leaks.

2. The tank drain shall be observed for proper operation.
3. The makeup water system shall be observed for proper operation and successful automatic shutoff of the system at the refill threshold shall be verified.

1301.10 System abandonment. If the owner of an onsite non-potable water reuse system or *rainwater collection and conveyance system* elects to cease use of, or fails to properly maintain such system, the system shall be abandoned and shall comply with the following:

1. All system piping connecting to a utility-provided water system shall be removed or disabled.
2. The *distribution piping* system shall be replaced with an *approved potable* water supply piping system. Where an existing *potable* pipe system is already in place, the fixtures shall be connected to the existing system.
3. The storage tank shall be secured from accidental access by sealing or locking tank inlets and access points, or filling with sand or equivalent.

1301.11 Trenching requirements for non-potable water piping. Non-potable water collection and distribution piping and reclaimed water piping shall be separated from the *building* sewer and *potable* water piping underground by 5 feet (1524 m) of undisturbed or compacted earth. Non-potable water collection and distribution piping shall not be located in, under or above cesspools, septic tanks, septic tank drainage fields or seepage pits. Buried non-potable water piping shall comply with the requirements of Section 306.

Exceptions:

1. The required separation distance shall not apply where the bottom of the non-potable water pipe within 5 feet (1524 mm) of the sewer is not less than 12 inches (305 mm) above the top of the highest point of the sewer and the pipe materials conforms to Table 702.3.
2. The required separation distance shall not apply where the bottom of the *potable* water service pipe within 5 feet (1524 mm) of the non-potable water pipe is a minimum of 12 inches (305 mm) above the top of the highest point of the non-potable water pipe and the pipe materials comply with the requirements of Table 605.4
3. Non-potable water pipe is permitted to be located in the same trench with a building sewer, provided that such sewer is constructed of materials that comply with the requirements of Table 702.2.
4. The required separation distance shall not apply where a non-potable water pipe crosses a sewer pipe provided that the pipe is sleeved to at least 5 feet (1524 mm) horizontally from the sewer pipe centerline on both sides of such crossing with pipe materials that comply with Table 702.2.
5. The required separation distance shall not apply where a *potable* water service pipe crosses a non-potable water pipe provided that the *potable* water service pipe is sleeved for a distance of at least 5 feet (1524 mm) horizontally from the centerline of the non-potable pipe on both sides of such crossing with pipe materials that comply with Table 702.2.
6. Irrigation piping located outside of a *building* and downstream of the backflow preventer is not required to meet the trenching requirements where non-potable water is used for outdoor applications.

1301.12 Outdoor outlet access. Sillcocks, hose bibs, wall hydrants, yard hydrants, and other outdoor outlets supplied by *non-potable* water shall be located in a locked vault or shall be operable only by means of a removable key.

SECTION 1302
ONSITE NON-POTABLE WATER REUSE SYSTEMS

1302.1 General. The provisions of Section 1302 shall govern the construction, installation, *alteration,* and *repair* of *onsite non-potable water reuse systems* for the collection, storage, treatment and distribution of on-site sources of non-potable water as permitted by the jurisdiction.

1302.2 Sources. Onsite non-potable water reuse systems shall collect waste discharge from only the following sources: bathtubs, showers, lavatories, clothes washers, and laundry trays. Water from other approved non-potable sources including swimming pool backwash operations, air conditioner condensate, rainwater, cooling tower blow-down water, foundation drain water, steam system condensate, fluid cooler discharge water, food steamer discharge water, combination oven discharge water, industrial process water, and fire pump test water shall also be permitted to be collected for reuse by onsite non-potable water reuse systems, as approved by the code official and as appropriate for the intended application.

1302.2.1 Prohibited sources. Wastewater containing urine or fecal matter shall not be diverted to onsite non-potable water reuse systems and shall discharge to the sanitary drainage system of the building or premises in accordance with Chapter 7. Water from reverse osmosis system reject water, water softener discharge water, kitchen sink wastewater, dishwasher wastewater, and wastewater discharged from wet-hood scrubbers shall not be collected for reuse within a to onsite non-potable water reuse systems.

1302.3 Traps. Traps serving fixtures and devices discharging wastewater to to onsite non-potable water reuse systems shall comply with the Section 1002.4.

1302.4 Collection pipe. Onsite non-potable water reuse systems shall utilize drainage piping *approved* for use within plumbing drainage systems to collect and convey untreated water for reuse. Vent piping *approved* for use within plumbing venting systems shall be utilized for vents within the graywater system. Collection and vent piping materials shall comply with Section 702.

1302.3.1 Installation. Collection piping conveying untreated water for reuse shall be installed in accordance with Section 704.

1302.3.2 Joints. Collection piping conveying untreated water for reuse shall utilize joints *approved* for use with the *distribution piping* and appropriate for the intended applications as specified in Section 705.

1302.3.3 Size. Collection piping conveying untreated water for reuse shall be sized in accordance with drainage sizing requirements specified in Section 710.

1302.3.4 Labeling and marking. Additional marking of collection piping conveying untreated water for reuse shall not be required beyond that required for sanitary drainage, waste, and vent piping by the Chapter 7.

1302.5 Filtration. Untreated water collected for reuse shall be filtered as required for the intended end use. Filters shall be accessible for inspection and maintenance. Filters shall utilize a pressure gage or other *approved* method to provide indication when a filter requires servicing or replacement. Filters shall be installed with shutoff valves installed immediately upstream and downstream to allow for isolation during maintenance.

1302.6 Disinfection. Where the intended application for non-potable water collected onsite for reuse requires disinfection or other treatment or both, it shall be disinfected as needed to ensure that the required water quality is delivered at the point of use. Non-potable water collected onsite containing untreated *graywater* shall be retained in collection reservoirs for a maximum of 24 hours.

1302.7 Storage tanks. *Storage tanks* utilized in onsite non-potable water reuse systems shall comply with Section 1301.9.

1302.7.1 Location. *Storage tanks* shall be located with a minimum horizontal distance between various elements as indicated in Table 1302.7.1.

TABLE 1302.7.1
LOCATION OF NON-POTABLE WATER REUSE STORAGE TANKS

ELEMENT	MINIMUM HORIZONTAL DISTANCE FROM STORAGE TANK (FEET)
Critical root zone (CRZ) of protected trees	2
Lot line adjoining private lots	5
Seepage pits	5
Septic tanks	5
Water wells	50
Streams and lakes	50
Water service	5
Public water main	10

1302.7.3 Outlets. Outlets shall be located at least 4 inches (102 mm) above the bottom of the *storage tank*, and shall not skim water from the surface.

1302.8 Valves. Valves shall be supplied on onsite non-potable water reuse systems in accordance with Sections 1302.8.1 and 1302.8.2.

1302.8.1 Bypass valve. One three-way diverter valve listed and labeled to NSF 50 or other *approved* device shall be installed on collection piping upstream of each *storage tank*, or drainfield, as applicable, to divert untreated onsite reuse sources to the sanitary sewer to allow servicing and inspection of the system. Bypass valves shall be installed downstream of fixture traps and vent connections Bypass valves shall be *marked* to indicate the direction of flow, connection and *storage tank* or drainfield connection. Bypass valves shall be installed in accessible locations. Two shutoff valves shall not be installed to serve as a bypass valve.

1302.8.2 Backwater valve. One or more *backwater valves* shall be installed on each overflow and tank drain pipe. *Backwater valves* shall be in accordance with Section 715.

1302.9 Pumping and control system. Mechanical equipment including pumps, valves and filters shall be easily accessible and removable in order to perform *repair*, maintenance and cleaning. The minimum flow rate and flow pressure delivered by the pumping system shall appropriate for the application and in accordance with Section 604.

1302.10 Water-pressure reducing valve or regulator. Where the water pressure supplied by the pumping system exceeds 80 psi (552 kPa) static, a pressure-reducing valve shall be installed to reduce the pressure in the nonnpotable water distribution system piping to 80 psi (552 kPa) static or less. Pressure-reducing valves shall be specified and installed in accordance with Section 604.8.

1302.11 Distribution pipe. *Distribution piping* utilized in onsite non-potable water reuse systems shall comply with Sections 1302.11.1 through 1302.11.4.

Exception: Irrigation piping located outside of the *building* and downstream of a backflow preventer.

1302.11.1 Materials, joints and connections. *Distribution piping* shall conform to the standards and requirements specified in Section 605.

1302.11.2 Design. Onsite non-potable water reuse distribution piping systems shall be designed and sized in accordance with Section 604 for the intended application.

1302.11.3 Marking. Onsite non-potable water distribution piping labeling and marking shall comply with Section 608.8.

1302.12 Tests and inspections. Tests and inspections shall be performed in accordance with Sections 1302.12.1 through 1302.12.6.

1302.12.1 Collection pipe and vent test. Drain, waste and vent piping used for onsite water reuse systems shall be tested in accordance with Section 312.

1302.12.2 Storage tank test. *Storage tanks* shall be tested in accordance with the Section 1301.9.11.

1302.12.3 Water supply system test. The testing of makeup water supply piping and *distribution piping* shall be conducted in accordance with Section 312.5.

1302.12.4 Inspection and testing of backflow prevention assemblies. The testing of backflow preventers and *backwater valves* shall be conducted in accordance with Section 312.10.

1302.12.5 Inspection vermin and insect protection. Inlets and vents to the system shall be inspected to verify that each is protected to prevent the entrance of insects and vermin into the *storage tank* and piping systems in accordance with Section 1301.7.

1302.12.6 Water quality test. The quality of the water for the intended application shall be verified at the point of use in accordance with the requirements of the *jurisdiction*.

1302.13 Operation and maintenance manuals. Operations and maintenance materials shall be supplied with non-potable onsite water reuse systems in accordance with Sections 1302.13.1 through 1302.13.4.

1302.13.1 Manual. A detailed operations and maintenance manual shall be supplied in hardcopy form with all systems.

1302.13.2 Schematics. The manual shall include a detailed system schematic, locations of all system components, and a list of all system components including manufacturer and model number.

1302.13.3 Maintenance procedures. The manual shall provide a maintenance schedule and procedures for all system components requiring periodic maintenance. Consumable parts including filters shall be noted along with part numbers.

1302.13.4 Operations procedures. The manual shall include system startup and shutdown procedures. The manual shall include detailed operating procedures for the system.

SECTION 1303
NON-POTABLE RAINWATER COLLECTION AND DISTRIBUTION SYSTEMS

1303.1 General. The provisions of Section 1303 shall govern the construction, installation, *alteration,* and *repair* of *rainwater collection and conveyance systems* for the collection, storage, treatment and distribution of rainwater for non-potable applications, as permitted by the jurisdiction.

1303.2 Collection surface. *Rainwater* shall be collected only from above-ground impervious roofing surfaces constructed from *approved* materials. Collection of water from vehicular parking or pedestrian surfaces shall be prohibited except where the water is used exclusively for landscape irrigation. Overflow and bleed-off pipes from roof-mounted appliances including but not limited to evaporative coolers, water heaters, and solar water heaters shall not discharge onto *rainwater* collection surfaces.

1303.3 Debris excluders. Downspouts and leaders shall be connected to a *roof washer* and shall be equipped with a debris excluder or equivalent device to prevent the contamination of collected *rainwater* with leaves, sticks, pine needles and similar material. Debris excluders and equivalent devices shall be self-cleaning.

1303.4 Roof washer. A sufficient amount of *rainwater* shall be diverted at the beginning of each rain event, and not allowed to enter the *storage tank*, to wash accumulated debris from the collection surface. The amount of rainfall to be diverted shall be field adjustable as necessary to minimize *storage tank* water contamination. The *roof washer* shall not rely on *manually* operated valves or devices, and shall operate automatically. Diverted *rainwater* shall not be drained to the roof surface, and shall be discharged in a manner consistent with the storm water runoff requirements of the *jurisdiction*. *Roof washers* shall be accessible for maintenance and service.

1303.5 Roof gutters and downspouts. Gutters and downspouts shall be constructed of materials that are compatible with the collection surface and the *rainwater* quality for the desired end use. Joints shall be made water-tight.

1303.5.1 Slope. Roof gutters, leaders, and *rainwater* collection piping shall slope continuously toward collection inlets. Gutters and downspouts shall have a slope of not less than 1/8 inch per foot along their entire length, and shall not permit the collection or pooling of water at any point.

> **Exception:** Siphonic drainage systems installed in accordance with the manufacturer's installation instructions shall not be required to have slope.

1303.5.2 Size. Gutters and downspouts shall be installed and sized in accordance with Section 1106.6 and local rainfall rates.

1303.5.3 Cleanouts. Cleanouts shall be provided in the water conveyance system so as to allow access to all filters, flushes, pipes and downspouts.

1303.6 Drainage. Water drained from the *roof washer* or debris excluder shall not be drained to the sanitary sewer. Such water shall be diverted from the *storage tank* and discharge in a location that will not cause erosion or damage to property in accordance with the *International Building Code*. *Roof washers* and debris excluders shall be provided with an automatic means of self draining between rain events, and shall not drain onto roof surfaces.

1303.7 Collection pipe. Rainwater collection and conveyance systems shall utilize drainage piping *approved* for use within plumbing drainage systems to collect and convey captured rainwater. Vent piping *approved* for use within plumbing venting systems shall be utilized for vents within the rainwater system. Collection and vent piping materials shall comply with Section 702.

1303.7.1 Installation. Collection piping conveying captured rainwater shall be installed in accordance with Section 704.

1303.7.2 Joints. Collection piping conveying captured rainwater shall utilize joints *approved* for use with the *distribution piping* and appropriate for the intended applications as specified in Section 705.

1303.7.3 Size. Collection piping conveying captured rainwater shall be sized in accordance with drainage sizing requirements specified in Section 710.

1303.7.4 Labeling and marking. Additional marking of collection piping conveying captured rainwater for reuse shall not be required beyond that required for sanitary drainage, waste, and vent piping by the Chapter 7.

1303.8 Filtration. Collected rainwater shall be filtered as required for the intended end use. Filters shall be accessible for inspection and maintenance. Filters shall utilize a pressure gage or other *approved* method to provide indication when a filter requires servicing or replacement. Filters shall be installed with shutoff valves installed immediately upstream and downstream to allow for isolation during maintenance.

1303.9 Disinfection. Where the intended application for rainwater requires disinfection or other treatment or both, it shall be disinfected as needed to ensure that the required water quality is delivered at the point of use. Where chlorine is used for disinfection or treatment, water shall be tested for residual chlorine in accordance with ASTM D1253. The levels of residual chlorine shall not exceed the levels allowed for the intended use in accordance with the requirements of the *jurisdiction*.

1303.10 Storage tanks. *Storage tanks* utilized in non-potable rainwater collection and conveyance systems shall comply with Section 1301.9 and 1303.10.1 through 1303.10.3.

1303.10.1 Location. *Storage tanks* shall be located with a minimum horizontal distance between various elements as indicated in Table 1303.10.1.

TABLE 1303.10.1
LOCATION OF RAINWATER STORAGE TANKS

ELEMENT	MINIMUM HORIZONTAL DISTANCE FROM STORAGE TANK (FEET)
Critical root zone (CRZ) of protected trees	2
Lot line adjoining private lots	5
Seepage pits	5
Septic tanks	5

1303.10.2 Inlets. *Storage tank* inlets shall be designed to introduce collected rainwater into the tank with minimum turbulence, and shall be located and designed to avoid agitating the contents of the *storage tank*.

1303.10.3 Outlets. Outlets shall be located at least 4 inches (102 mm) above the bottom of the *storage tank*, and shall not skim water from the surface.

1303.11 Valves. Valves shall be supplied on rainwater collection and conveyance systems in accordance with Sections 1303.11.1 and 1303.11.2.

1303.10.2 Backwater valve. *Backwater valves* shall be installed on each overflow and tank drain pipe. *Backwater valves* shall be in accordance with Section 715.

1303.12 Pumping and control system. Mechanical equipment including pumps, valves and filters shall be easily accessible and removable in order to perform *repair*, maintenance and cleaning. The minimum flow rate and flow pressure delivered by the pumping system shall appropriate for the application and in accordance with Section 604.

1303.13 Water-pressure reducing valve or regulator. Where the water pressure supplied by the pumping system exceeds 80 psi (552 kPa) static, a pressure-reducing valve shall be installed to reduce the pressure in the rainwater distribution system piping to 80 psi (552 kPa) static or less. Pressure-reducing valves shall be specified and installed in accordance with Section 604.8.

1303.14 Distribution pipe. *Distribution piping* utilized in rainwater collection and conveyance systems shall comply with Sections 1303.14.1 through 1303.14.3.

Exception: Irrigation piping located outside of the *building* and downstream of a backflow preventer.

1303.14.1 Materials, joints and connections. *Distribution piping* shall conform to the standards and requirements specified in Section 605 for non-potable water.

1303.14.2 Design. Distribution piping systems shall be designed and sized in accordance with the Section 604 for the intended application.

1303.14.3 Marking. Non-potable rainwater distribution piping labeling and marking shall comply with Section 608.8.

1303.15 Tests and inspections. Tests and inspections shall be performed in accordance with Sections 1303.15.1 through 1303.15.8.

1303.15.1 Roof gutter inspection and test. Roof gutters shall be inspected to verify that the installation and slope is in accordance with Section 1303.5.1. Gutters shall be tested by pouring a minimum of one gallon of water into the end of the gutter opposite the collection point. The gutter being tested shall not leak and shall not retain standing water.

1303.15.2 Roofwasher test. Roofwashers shall be tested by introducing water into the gutters. Proper diversion of the first quantity of water in accordance with the requirements of Section 1303.4 shall be verified.

1303.15.3 Collection pipe and vent test. Drain, waste and vent piping used for rainwater collection and conveyance systems shall be tested in accordance with Section 312.

1303.15.4 Storage tank test. *Storage tanks* shall be tested in accordance with the Section 1301.9.11.

1303.15.5 Water supply system test. The testing of makeup water supply piping and *distribution piping* shall be conducted in accordance with Section 312.5.

1303.15.6 Inspection and testing of backflow prevention assemblies. The testing of backflow preventers and *backwater valves* shall be conducted in accordance with Section 312.10.

1303.15.7 Inspection vermin and insect protection. Inlets and vents to the system shall be inspected to verify that each is protected to prevent the entrance of insects and vermin into the *storage tank* and piping systems in accordance with Section 1301.7.

1303.15.8 Water quality test. The quality of the water for the intended application shall be verified at the point of use in accordance with the requirements of the *jurisdiction*. Except where site conditions as specified in ASTM E2727 affect the rainwater, collected rainwater shall be considered to have the parameters indicated in Table 1303.15.8.

TABLE 1303.15.8
RAINWATER QUALITY

PARAMETER	**VALUE**
pH	6.0-7.0
BOD	Not greater than 10 mg/L
NTU	Not greater than 2
Fecal Coliform	No detectable fecal coli in 100 mL
Sodium	No detectable sodium in 100 mL
Chlorine	No detectable chlorine in 100 mL
Enteroviruses	No detectable enteroviruses in 100 mL

1303.16 Operation and maintenance manuals. Operations and maintenance materials shall be supplied with rainwater collection and conveyance systems in accordance with Sections 1303.16.1 through 1303.16.4.

1303.16.1 Manual. A detailed operations and maintenance manual shall be supplied in hardcopy form with all systems.

1303.16.2 Schematics. The manual shall include a detailed system schematic, locations of all system components, and a list of all system components including manufacturer and model number.

1303.16.3 Maintenance procedures. The manual shall provide a maintenance schedule and procedures for all system components requiring periodic maintenance. Consumable parts including filters shall be noted along with part numbers.

1303.16.4 Operations procedures. The manual shall include system startup and shutdown procedures. The manual shall include detailed operating procedures for the system.

SECTION 1304
RECLAIMED WATER SYSTEMS

1304.1 General. The provisions of this section shall govern the construction, installation, *alteration*, and *repair* of systems supplying *non-potable reclaimed water*.

1304.2 Water-pressure reducing valve or regulator. Where the *reclaimed water* pressure supplied to the *building* exceeds 80 psi (552 kPa) static, a pressure-reducing valve shall be installed to reduce the pressure in the *reclaimed water* distribution system piping to 80 psi (552 kPa) static or less. Pressure-reducing valves shall be specified and installed in accordance with Section 604.8 of the *International Plumbing Code*.

1304.3 Reclaimed water systems. The design of the *reclaimed water* systems shall conform to ASTM E 2635 and *accepted engineering practice.*

1304.3.1 Distribution pipe. *Distribution piping* shall comply with Sections 1304.3.1.1 through 1304.3.1.3.

> **Exception:** Irrigation piping located outside of the *building* and downstream of a backflow preventer.

1304.3.1.1 Materials, joints and connections. *Distribution piping* conveying reclaimed water shall conform to standards and requirements specified in Section 605 for non-potable water.

1304.3.1.2 Design. Distribution piping systems shall be designed and sized in accordance with the Section 604 for the intended application.

1304.3.1.3 Labeling and marking. Non-potable rainwater distribution piping labeling and marking shall comply with Section 608.8.

1304.4 Tests and inspections. Tests and inspections shall be performed in accordance with Sections 1304.4.1 and 1304.4.2.

1304.4.1 Water supply system test. The testing of makeup water supply piping and *reclaimed water distribution piping* shall be conducted in accordance with Section 312.5.

1304.4.2 Inspection and testing of backflow prevention assemblies. The testing of backflow preventers shall be conducted in accordance with Section 312.10.

Add new Chapter and next text as follows:

CHAPTER 14
SUBSURFACE LANDSCAPE IRRIGATION SYSTEMS

SECTION 1401
GENERAL

1401.1 Scope. The provisions of Chapter 14 shall govern the materials, design, construction and installation of subsurface landscape irrigation systems connected to non-potable water from onsite water reuse systems.

1401.2 Materials. Above-ground drain, waste and vent piping for subsurface landscape irrigation systems shall conform to one of the standards listed in Table 702.1. Subsurface landscape irrigation 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 systems shall be tested in accordance with Section 312.

1401.4 Inspections. Subsurface landscape irrigation systems shall be inspected in accordance with Section 107.

1401.5 Disinfection. Disinfection shall not be required for onsite non-potable reuse water used for subsurface landscape irrigation systems.

1401.6 Coloring. Onsite non-potable reuse water used for subsurface landscape irrigation systems shall not be required to be dyed.

SECTION 1402
SYSTEM DESIGN AND SIZING

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 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 x 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.

1402.2 Percolation tests. The permeability of the soil in the proposed absorption system shall be determined by percolation tests or permeability evaluation.

1402.2.1 Percolation tests and procedures. At least three percolation tests in each system area shall be conducted. The holes shall be spaced uniformly in relation to the bottom depth of the proposed absorption system. More percolation tests shall be made where necessary, depending on system design.

1402.2.1.1 Percolation test hole. The test hole shall be dug or bored. The test hole shall have vertical sides and a horizontal dimension of 4 inches to 8 inches (102 mm to 203 mm). The bottom and sides of the hole shall be scratched with a sharp-pointed instrument to expose the natural soil. All loose material shall be removed from the hole and the bottom shall be covered with 2 inches (51 mm) of gravel or coarse sand.

1402.2.1.2 Test procedure, sandy soils. The hole shall be filled with clear water to a minimum of 12 inches (305 mm) above the bottom of the hole for tests in sandy soils. The time for this amount of water to seep away shall be determined, and this procedure shall be repeated if the water from the second filling of the hole seeps away in 10 minutes or less. The test shall proceed as follows: Water shall be added to a point not more than 6 inches (152 mm) above the gravel or coarse sand. Thereupon, from a fixed reference point, water levels shall be measured at 10-minute intervals for a period of 1 hour. Where 6 inches (152 mm) of water seeps away in less than 10 minutes, a shorter interval between measurements shall be used, but in no case shall the water depth exceed 6 inches (152 mm). Where 6 inches (152 mm) of water seeps away in less than 2 minutes, the test shall be stopped and a rate of less than 3 minutes per inch (7.2 s/mm) shall be reported. The final water level drop shall be used to calculate the percolation rate. Soils not meeting the above requirements shall be tested in accordance with Section 1303.7.1.3.

1402.2.1.3 Test procedure, other soils. The hole shall be filled with clear water, and a minimum water depth of 12 inches (305 mm) shall be maintained above the bottom of the hole for a 4-hour period by refilling whenever necessary or by use of an automatic siphon. Water remaining in the hole after 4 hours shall not be removed. Thereafter, the soil shall be allowed to swell not less than 16 hours or more than 30 hours. Immediately after the soil swelling period, the measurements for determining the percolation rate shall be made as follows: any soil sloughed into the hole shall be removed and the water level shall be adjusted to 6 inches (152 mm) above the gravel or coarse sand. Thereupon, from a fixed reference point, the water level shall be measured at 30-minute intervals for a period of 4 hours, unless two successive water level drops do not vary by more than 1/16 inch (1.59 mm). At least three water level drops shall be observed and recorded. The hole shall be filled with clear water to a point not more than 6 inches (152 mm) above the gravel or coarse sand whenever it becomes nearly empty. Adjustments of the water level shall not be made during the three measurement periods except to the limits of the last measured water level drop. When the first 6 inches (152 mm) of water seeps away in less than 30 minutes, the time interval between measurements shall be 10 minutes and the test run for 1 hour. The water depth shall not exceed 5 inches (127 mm) at any time during the measurement period. The drop that occurs during the final measurement period shall be used in calculating the percolation rate.

1402.2.1.4 Mechanical test equipment. Mechanical percolation test equipment shall be of an approved type.

1402.2.2 Permeability evaluation. Soil shall be evaluated for estimated percolation based on structure and texture in accordance with accepted soil evaluation practices. Borings shall be made in accordance with Section 1402.2.1.1 for evaluating the soil.

1402.3 Subsurface landscape irrigation 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 SYSTEM

ELEMENT	MINIMUM HORIZONTAL DISTANCE	
	STORAGE TANK (feet)	IRRIGATION DISPOSAL 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.

SECTION 1403
INSTALLATION

1403.1 Installation. Absorption systems shall be installed in accordance with Sections 1403.1.1 through 1403.2.1 to provide landscape irrigation without surfacing of water.

1403.1.1 Absorption area. The total absorption area required shall be computed from the estimated daily gray water discharge and the design-loading rate based on the percolation rate for the site. The required absorption area equals the estimated gray water discharge divided by the design-loading rate from Table 1403.1.1.

TABLE 1403.1.1
DESIGN LOADING RATE

PERCOLATION RATE (minutes per inch)	DESIGN LOADING FACTOR (gallons per square foot per day)
0 to less than 10	1.2
10 to less than 30	0.8
30 to less than 45	0.72
45 to 60	0.4

For SI: 1 minute per inch = min/25.4 mm,
1 gallon per square foot = 40.7 L/m2.

1403.1.2 Seepage trench excavations. Seepage trench excavations shall be not less than 1 foot (304 mm) in width and not greater than 5 feet (1524 mm) in width. Trench excavations shall be spaced not less than 2 feet (610 mm) apart. The soil absorption area of a seepage trench shall be computed by using the bottom of the trench area (width) multiplied by the length of pipe. Individual seepage trenches shall be not greater than100 feet (30 480 mm) in developed length.

1403.1.3 Seepage bed excavations. Seepage bed excavations shall be not less than 5 feet (1524 mm) in width and have more than one distribution pipe. The absorption area of a seepage bed shall be computed by using the bottom of the trench area. Distribution piping in a seepage bed shall be uniformly spaced not greater than 5 feet (1524 mm) and not less than 3 feet (914 mm) apart, and greater than 3 feet (914 mm) and not less than 1 foot (305 mm) from the sidewall or headwall.

1403.1.4 Excavation and construction. The bottom of a trench or bed excavation shall be level. Seepage trenches or beds shall not be excavated where the soil is so wet that such material rolled between the hands forms a soil wire. All smeared or compacted soil surfaces in the sidewalls or bottom of seepage trench or bed excavations shall be scarified to the depth of smearing or compaction and the loose material removed. Where rain falls on an open excavation, the soil shall be left until sufficiently dry so a soil wire will not form when soil from the excavation bottom is rolled between the hands. The bottom area shall then be scarified and loose material removed.

1403.1.5 Aggregate and backfill. Not less than 6 inches in depth of aggregate ranging in size from 1/2 to 21/2 inches (12.7 mm to 64 mm) shall be laid into the trench below the distribution piping elevation. The aggregate shall be evenly distributed not less than 2 inches (51 mm) in depth over the top of the distribution pipe. The aggregate shall be covered with approved synthetic materials or 9 inches (229 mm) of uncompacted marsh hay or straw. Building paper shall not be used to cover the aggregate. Not less than 9 inches (229 mm) of soil backfill shall be provided above the covering.

1403.2 Distribution piping. Distribution piping shall be not less than 3 inches (76 mm) in diameter. Materials shall comply with Table 1303.10. The top of the distribution pipe shall be not less than 8 inches (203 mm) below the original surface. The slope of the distribution pipes shall be not less than 2 inches (51 mm) and not greater than 4 inches (102 mm) per 100 feet (30 480 mm).

TABLE 1403.2
DISTRIBUTION PIPE

MATERIAL	STANDARD
Polyethylene (PE) plastic pipe	ASTM F 405
Polyvinyl chloride (PVC) plastic pipe	ASTM D 2729
Polyvinyl chloride (PVC) plastic pipe with a 3.5 inch O.D. and solid cellular core or composite wall.	ASTM F 1488

1403.2.1 Joints. Joints in distribution pipe shall be made in accordance with Section 705 of this code.

Reason: The sections shown to be added to the code are from the IgCC. These sections really need to be in the IPC as these subjects are more applicable to the IPC scope. Currently, the IPC does not address different types of nonpotable water (other than gray water) and therefore provides no guidance as to how nonpotable waters are to be collected, stored and distributed. The current Chapter 13 only deals with the use/reuse of gray water for the flushing of water closets and urinals and subsurface irrigation. It is clarified that gray water and rain water recycling systems must be separate systems and may not be interconnected.
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 an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This language is already in the IgCC and doesn't need to be repeated in the IPC. Because testimony indicated that" although this language might need more work, it should still be put in the code" is a concern. The language needs further work for example; The language mandates a roof washer for rainwater collection – there are other ways to accomplish the same function without the expense involved with a pressurized roof washer system. Also, Table 1303.15.8 gives a pH range outside the normal range of reuse water and requires control of enteroviruses which would require adding considerable cost to a rainwater system. This proposal is a lot of language that seems to need more work before it can be added to the code.

Assembly Action: **Approved as Submitted**

Individual Consideration Agenda

This code change proposal is on the agenda for individual consideration because the proposal received a successful assembly action of Approved as Submitted and public comments were submitted.

Public Comment 1:

Shawn Strausbaugh, Arlington County, VA, International Code Council Plumbing, Mechanical, and Fuel Gas Code Action Committee (ICC PMG CAC), requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

~~**STORAGE TANK.** A fixed container for holding water at atmospheric pressure for subsequent reuse as part of a plumbing or irrigation system.~~

~~**DISTRIBUTION PIPE.** Pressurized or non-pressure piping used within the plumbing system of a building to deliver rainwater or graywater from the *storage tank* or pump to the point of use.~~

Remainder of proposal is unchanged

Commenter's Reason: The proposal was approved as submitted by the assembly action. The one point raised in regard to the roof washer was rebutted under testimony and made clear to the committee member that "pressurized" roof washer system was not the only means of satisfying this requirement. The deletion of the above two definitions are due to a conflict with other terms contained within the plumbing code as these definitions would be added to chapter 2 not just chapter 13 and 14 which is the specific chapters where these definitions where intended to be used.

Public Comment 2:

Bob Eugene, representing Underwriters Laboratories, LLC, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

STORAGE TANK. A fixed container for holding water ~~at atmospheric pressure~~ for subsequent reuse as part of a plumbing or irrigation system.

Remainder of proposal is unchanged

Commenter's Reason: A storage tank may be either pressurized or non-pressurized, and are used in several different applications. For example, a storage tank water heater is operated under pressure. IPC section 501.7 specifically covers pressurized storage tanks.

Public Comment 3:

Guy Tomberlin, Fairfax County, Virginia, representing Fairfax County VA, VA Plumbing and Mechanical Inspectors Association, VA Building and Code Officials, ICC Region IIV and Colorado Association of Plumbing and Mechanical Officials requests Approved as Submitted.

Commenter's Reason: The drought conditions of this summer are a painful reminder that, for many jurisdictions, there is not adequate raw water sources (reservoirs, aquifers) and adequate public infrastructures (water treatment plant capacity) to keep up with the demand for potable water. The demand for potable water needs to be reduced so that potable water is available for those uses where potable water must be used (drinking, bathing, food preparation). Even though the codes have reduced allowable flow rates for plumbing fixtures and required other methods to limit potable water waste, the biggest impact to be made towards reducing the demand for potable water is to stop using potable water for end uses that do not require potable water. In other words, need to be able to use nonpotable water in ways that do not impact the health and safety of humans and the environment.

Where do we get nonpotable water to use for applications that don't require potable water? Some jurisdictions have public water utilities that provide "reclaimed water" through a water supply distribution system that parallels the potable water supply distribution system. However, most jurisdictions do not have municipal reclaimed water distribution systems. It then falls upon the building designer to develop onsite treatment systems for raw nonpotable water that can be collected onsite. A building generates many sources of raw nonpotable water (other than sewage) such as graywater, condensate and cooling tower blow down. Rainwater that falls on building roofs is also a source.

The IPC currently has very limited provisions on how to process and use graywater for water closet flushing, urinal flushing and subsurface irrigation. (Note that the IPC does not mandate the use of graywater for those purposes-it only tells you how to use graywater if you should decide to use it). It does not currently address rainwater or reclaimed water. Many code officials are already being pressed to approve graywater reuse, rainwater reuse and reclaimed water systems. Some jurisdictions require use rainwater reuse systems as part of the federally-mandated management of storm water. Unfortunately, the current IPC does not provide adequate support to the code official to make approvals for rainwater reuse systems or reclaimed water systems.

We cannot wait another code change cycle to get the IPC up to speed with what is already happening in the plumbing industry. As stated during testimony by Julius Ballanco, "This new Chapter 13 is ten times better than the current Chapter 13." This proposal is a significant improvement to the code that is sorely needed. No proposed code language is ever "perfect" as evidenced by the dozens of "tweaks" to almost every code section of the many I-codes over many code change cycles. Please keep in mind that most of this proposal's language is directly from the IgCC which was developed through two draft public versions plus a full code change cycle of public hearing and final action hearing. This language isn't just being seen for the first time – it has been vetted better than most new code text that is proposed (and accepted) to the codes. The PMG Code Action Committee worked hard in order to submit this proposal. The Committee vote on this proposal was very close, 6 in favor to 7 against. There was a successful Floor Action for As Submitted. We need this language in the IPC to begin using it so we can fully understand how to improve on anything that it might currently lack.

Responses to Testifier and Committee comments made during the public hearing:

1. Why does this language have to be in the IPC? It's already in the IgCC.

   Reply: The main purpose of the IgCC is to allow jurisdictions to require buildings to exceed the requirements of the other I-codes to promote more sustainable construction. With respect to water use, the IgCC allows jurisdictions to require reduced use of potable water through reductions in flow rates, reductions in potable water waste and the use of nonpotable water instead of potable water. Those requirements are necessarily tied to "how to execute" requirements. The "how to execute" requirements could not be put in the 2012 IPC because the code change cycle for the IPC had already started long before the IgCC requirements were in final form. The intent was always to move the "how to execute" requirements over to the plumbing code as the work described in the requirements is plumbing work. If this proposal is successful, then a proposal will be made to the IgCC (in 2014) to remove the "how to execute" requirements from the IgCC so that the IPC will control the "how to execute" requirements and the IgCC will control the "when to execute" requirements. Note that this proposal's language does not require or mandate the use of nonpotable water for any application. The language only has requirements on "how to execute" should a decision be made to use nonpotable water.

2. The rainwater section requires a roof washer. I understand a roofwasher to be a pressurized water spray system to clean the roof of debris before rainfall is collected. This would be very expensive to execute and might make a rainwater reuse system cost prohibitive.

Reply: The proposed language does not require a pressurized roof washer system. A roof washer could simply be a device that diverts the initial rainfall flow (which washes the roof) from the storage tank. It is up to the designer on how "roof washing" is accomplished.

3. Section 1303.15.8 seems to require that rainwater have the parameter values indicated in Table 1303.15.8. Making rainwater comply with those parameter values could be very costly and might make a rainwater reuse system cost prohibitive.

   Reply: Section 1303.15.8 does not require collected rainwater to have the parameter values shown in Table 1303.8. The parameter values in Table 1303.8 are the values that the rainwater is considered to possess unless affected by site conditions specified by ASTM E2727. The information is provided for use by the designer of the rainwater reuse system. The quality of the rainwater required for the end use is up to the requirements of the jurisdiction.

4. The proposed language adds a definition for the term "meter" which is different than the definition for the same term in the IgCC. Won't this be confusing?

   Reply: No. The term "meter" as used in the IPC is only related to water measuring, not measurement of electrical use. Different codes can use the same term but their definitions can be different.

Public Comment 4:

Craig Conner, Building Quality, representing self, requests Disapproval.

Commenter's Reason: P11 intends to add parts of the IGCC into the IPC. Unfortunately P11 creates inconsistences between the existing IGCC and the proposed IPC, as well as other problems.

Examples of P11 problems:

- The proposed "*meter*" definition applies only to water, whereas the existing IECC and IGCC also use the word "*meter*" for energy. The proposed IPC "*meter*" definition is different from the existing IGCC definition of "*meter*".
- The proposed IPC "*distribution pipe*" definition applies only to rainwater and gray water. However the main IPC use of the term "*distribution pipe*" is for potable water; for example, in the existing IPC Section 605.4.
- Useful parts of the IPC are deleted without replacement. For example, the existing figures showing common parts of a gray water system for landscape irrigation (existing IPC 1301.1(1)), and common parts of a gray water system for water closets and urinals (existing IPC 1301.1(2)) are deleted by P11.
- Some optional items in the existing IGCC are made mandatory in the proposed IPC change. For example, installing locks on the outdoor access for non-potable water is optional in the existing IGCC (IGCC A107.3), but is made a new requirement in the proposed IPC (IPC 1301.12).
- Names for the different categories of water are used inconsistently. For example, P11 would effectively change the existing IPC's "gray water recycling system" (IPC 1301.7) to "onsite non-potable water reuse systems" (proposed IPC 1302.2.1) even though the existing IGCC calls them "gray water systems" (IGCC 708.12.1.1).

These examples include less than half the inconsistencies introduced by P11. The best option is to disapprove P11.

P11-12

Final Action:	AS	AM	AMPC____	D

P12-12
301.4

Proposed Change as Submitted

Proponent: Shawn Strausbaugh, Arlington County VA representing the Virginia Plumbing and Mechanical Inspectors Association and The Virginia Building Code Officials Association and ICC Region 7 (Sstrausbaugh@arlingtonva.us)

Revise as follows:

301.4 Connections to water supply. ~~Every~~ Plumbing fixture<u>s</u>, device<u>s</u> or appliance<u>s</u> requiring or using water ~~for its proper operation~~ shall be directly or indirectly connected to the water supply system in accordance with the provisions of this code. <u>Faucets provided with a connection for cold water shall be connected to the cold water distribution system.</u>

Reason: The current code does not require a fixture to be supplied with cold water even if the handles or trim plate indicate cold water will be supplied when it is turned to the "on" position.. If a faucet has the "indication" that cold water can be obtained (e.g. single handle cold water position or a two handle faucet), the code should require that cold water actually be connected and provided to the faucet.

Cost Impact: none

301.4-P-STRAUSBAUGH

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal is a common sense issue that doesn't need to be in the code. There is no safety issue being addressed. The proposal would force designers to not use 2 handle faucets where tempered water must be supplied at the faucet.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Shawn Strausbaugh, Arlington County, VA, representing the VA Plumbing and Mechanical Inspectors Assoc. (VPMIA), VA Building Code Officials Association (VBCOA), and ICC Region VII, requests Approval as Submitted.

Commenter's Reason: Contrary to the committee's reason statement this change would not disallow the use of two handle faucets and would only require cold water to be supplied to the applicably marked cold side and the required hot water or tempered water for public hand washing facilities, as mentioned by the committee, would be on the applicably marked left hand side of the fixture fitting.

P12-12
Final Action: AS AM AMPC____ D

P14-12
303.3, 611.3

Proposed Change as Submitted

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

Delete without substitution:

~~**303.3 Plastic pipe, fittings and components.** All plastic pipe, fittings and components shall be third-party certified as conforming to NSF 14.~~

Revise as follows:

611.3 Connection tubing. The tubing 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.

Reason: With the addition of Section 303.4 to the 2012 edition, there is no need to have a separate reference to NSF 14. All plumbing material must be listed by a third party certifier.

NSF 14 was originally inserted into the code as a quality control standard. In the latest edition of NSF 14, material requirements were added. It is completely inappropriate for a quality control standard to have material requirements. The material requirements belong in the material standards that are listed in the code (and referenced in NSF 14), not a quality control standard. With the change to NSF 14, it is no longer a viable quality control standard. It has crossed over to being a quazi-material standard. All material standards should be complete material standards regulating the full requirements of the material. NSF 14 does not do this.

For these reasons, NSF 14 should no longer be referenced in the International Plumbing Code.

Cost Impact: This may reduce the cost of certain plumbing products.

303.3-P-BALLANCO

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee heard a significant amount of testimony against approval of this proposal and made a remark that they were confused by some of the testimony.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing self, requests Approval as Modified by this Public Comment.

Replace the proposal as follows:

303.3 Plastic pipe, fittings and components. All plastic pipe, fittings and components shall be third-party certified as conforming to <u>the health effects requirements of</u> NSF 14.

Commenter's Reason: I would encourage the membership to vote against the motion to deny and vote to approve this change, with modifications. The proposed text is similar to the requirement that appears in the ASTM standards regulating plastic pipe. The key requirements to NSF 14 is the health effects requirements for listing.

The reason this is important is because of the recent changes to NSF 14, adding testing requirements for dezincification. This is a major error made by the NSF 14 Committee, adding a dezincification test requirement to the standard. I have petitioned the NSF 14 Committee to remove this test from the standard. There is more technical support for the removal of this test requirement than there is to support such a test.

When the dezincification test was first proposed to NSF 14, the claim was that there needs to be some test since there are all these lawsuits regarding the matter. A lawsuit is not technical justification for adding a test requirement. Most claims made by the plaintiffs' attorney are wrong. We should not be adding requirement to the Plumbing Code to keep attorneys at bay.

NSF 14 should never have material requirements for copper alloys in the standard. The standard is a plastic standard. Yes, there are copper alloy components to plastic piping systems. However, the material requirements for copper alloys should be left to the committees responsible for that particular material. For many of the plastic products, that would be the ASTM standards. This is where a test requirement for copper alloy belongs, not NSF 14.

When dealing with metal components, it is a recognized fact that all metals in plumbing systems corrode. To think otherwise is foolishness. Copper alloys corrode, so does copper tube, so does galvanized steel, so does cast iron. In other words, corrosion is a part of life in the plumbing industry. What we attempt to do is reduce the rate of corrosion to extend the life of a product.

With metallic components, there are many ways to extend the life of the material. It often involves more than simply changing the formulation of the material. Heat treatment and cooling play an important role in developing a material that reduces the rate of corrosion. We have been using copper alloys, also known as yellow brasses, for more than 80 years in the plumbing industry. I might add - with much success. So, the question you needs to ask is,"Why do we, all of the sudden, need a test on dezincification?"

ISO 6509 was developed after testing was conducted in Göteborg, Sweden. Water was circulated for 3-1/2 years at a temperature of 140 degrees F. The water used in the testing was Göteborg water. After the conclusion of this test, the researchers attempted to duplicate the same impact on brass in a 24 hour time period. In doing so, they did not develop any end point criteria. The researchers, however, suggested an end point criteria that, in their opinion, equated to 60 years of life. It should also be noted that the fittings being tested were already in service for a period of 4 years.

There are many problems with this research. There is no water in the United States or Canada that is of the same poor quality as that of Göteborg, Sweden in the 1970's when the research was conducted. Even today, Göteborg, Sweden has a poorer quality water than the water in the United States. So why should we use a test based on water that is not used in the United States?

The other problem with the requirement is the end point criteria. The engineering community in the United States has always used a time period of 30 years for longevity testing of construction products. Europe has used values of 50 years, 60 years, and 70 years. There is no engineering accuracy to these values. To choose a length of time of 60 years using Swedish water running continuously at 140 degrees F is ridiculous. Again, there is no technical basis for such a test requirement.

The researchers also assume a straight line rate of corrosion over the years. Research done by metallurgists over the last three years has proven this to be inaccurate. The rate of corrosion begins at one rate, than reduces. The corrosion rate occurs in a curve, not a straight line. Hence, the assumptions are again wrong by these researchers. Using their analysis, you would have a life of probably 250 years. That proves even more how ridiculous the end point criteria is that was chosen by the NSF 14 Committee.

ISO 6509 is only good for verifying that yellow brass corrodes by dezincification, which is technically de-alloying. That is somewhat of a "duh" statement. We already know the corrosion process. We don't have to prove it by a useless test.

Unfortunately, no one can equate ISO 6509 to performance in a plumbing system installed in the United States or Canada. That is because this has not been studied. All that has been done is analysis of what one "thinks" it equates to. That is not good enough to change a standard so significantly.

Another way to view this test requirement is to consider an equivalent test for galvanized steel products. Galvanized steel has a corrosion rate higher than copper alloy. If we had a galvanized steel equivalent corrosion test, there would be no galvanized steel permitted to be installed in plumbing systems. That does not make any sense. Similarly, the dezincification test does not make any sense.

Substantiation supporting the inclusion of a dezincification test should never be based on, "I think it is a good idea," or "The attorneys think we should add this." There should be proper technical justification. There is none for the inclusion of ISO 6509 to NSF 14. If you review the ASME and ASTM standards on copper alloy, you will not find any requirement for a dezincification test using ISO 6509.

It was apparent that no testing was done on manufacturers' products prior to the inclusion of the dezincification test. Some recent tests proved how ineffective ISO 6509 is. To date, six manufacturers' PEX fittings were put through the ISO 6509 test for longer than 24 hours (the time required on the test). The dezincification ranged from 50 percent to 100 percent in the fittings. Yet the fittings passed the ASTM F877 test requirements. When brought to failure, the PEX tube failed, not the fittings.

Interestingly, NSF 14 assumes these fittings are not acceptable since they could not pass the dezincification test. How can we exclude perfectly acceptable fittings because of some made up testing of a certain grade of brass? This establishes a very poor precedence.

Before adding this test requirement to NSF 14, the Committee did not do any failure analysis of copper alloy in the United States and Canada. This is dangerous and often results in invalid tests being added to standards. There are billions of yellow brass fittings, faucets, valves, fixture fittings, and backflow preventers installed throughout the country. If yellow brass was such a problem, we would see millions of failures, not a handful, by comparison.

Unfortunately, the Plumbing Code Committee and the ICC membership has not been able to evaluate the alleged dezincification failures. I have for many projects. The vast majority of the failures were related to improper installation. This cannot be corrected by adding a dezincification test to the standard. It would appear that the NSF 14 Committee was completely unaware of this.

One manufacturer of yellow brass components for a particular adapter fitting could not pass the dezincification test. They conducted a survey of failures of that fitting. I should mention that they have manufactured thousands of those fittings over the last 35 years. They could not find one failure. Not one fitting was returned, not one fitting was identified as failing in the field. How can we make a perfectly good fitting unacceptable? What changed to make this fitting no longer permissible to install?

If there really was a problem, perhaps adding a test would be acceptable. But, again, that test should be to the ASTM standards, not NSF 14. The dezincification test was added because of assumed problems with PEX fittings. However, it applies to any plastic piping component. The failure rate of PEX fittings manufactured by US manufacturers is insignificant. The failure rate of non-PEX products is nonexistent.

P14-12
Final Action: AS AM AMPC____ D

P15-12
305.1

Proposed Change as Submitted

Proponent: Shawn Strausbaugh, Arlington County VA representing the Virginia Plumbing and Mechanical Inspectors Association and The Virginia Building Code Officials Association and ICC Region 7 (Sstrausbaugh@arlingtonva.us)

Delete and substitute as follows:

~~**305.1 Corrosion.** Pipes passing through concrete or cinder walls and floors or other corrosive material shall be protected against external corrosion by a protective sheathing or wrapping or other means that will withstand any reaction from the lime and acid of concrete, cinder or other corrosive material. Sheathing or wrapping shall allow for movement including expansion and contraction of piping. The wall thickness of the material shall be not less than 0.025 inch (0.64 mm).~~

<u>**305.1 Corrosion.** Metallic piping shall not be installed in direct contact with concrete, masonry or corrosive soil. Where plastic sheathing is used to prevent direct contact, the wall thickness of the sheathing shall be not less than 0.006 inches (6 mil) (0.152 mm) thick .</u>

Reason: The intent of the code is to protect piping from direct contact with concrete, masonry and corrosive soils, this proposal is a cleanup action to clarify that intent. The commonly used plastic sheathing for pipe protection has a wall thickness of only 0.004 inches or 0.006 inches thick. The 0.025 inch thick material is really unnecessary and beyond the minimum standard practice used to protect the piping system. The thinner material has been used for years with satisfactory results.

Cost Impact: none

305.1-P-STRAUSBAUGH

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: There was a concern that if the thickness of the sleeving material is reduced, there might not be enough clearance left to accommodate piping movement caused by expansion and contraction. The current text allows other means to protect piping against the lime and acid in concrete; the new text doesn't mention anything about protection against corrosion of piping caused by concrete.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment 1:

Shawn Strausbaugh, Arlington County, VA , VA Plumbing and Mechanical Inspectors Assoc. (VPMIA), VA Building Code Officials Association (VBCOA), and ICC Region VII requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

305.1 Corrosion. Metallic piping, <u>other than cast iron and ductile iron,</u> shall not be installed in direct contact with concrete~~,~~ <u>or</u> masonry ~~or corrosive soil~~. <u>Metallic piping shall not be installed in direct contact with corrosive soil.</u> Where plastic sheathing is used to prevent direct contact, the wall thickness of the sheathing shall be not less than 0.006 inches (6 mil) (0.152 mm) thick.

Commenter's Reason: The modified language as shown above was submitted as a floor modification to the committee. The committee approved the modified language but the modified proposal failed to be approved by the committee. This public comment reintroduces the same language that was presented in the floor modification. This new language is clear and answers the committee's reason for rejection. The committee reason stating the reduction in the thickness of the plastic sheathing material might not allow for expansion and contraction of piping has no merit. The thickness of plastic sheathing has nothing to do with piping movement. Besides, existing code sections 305.2 and 305.3 already require that piping movements be accounted for. The proposed language allows other means of protection and only states that where plastic sheathing is used to prevent direct contact, the thickness of that material must be not less than 0.006 inches. The new language still recognizes that concrete will affect metallic piping, other than cast iron and ductile iron, and further limits the contact of metallic piping from corrosive soils.

Public Comment 2:

Michael Cudahy, representing Plastic Pipe and Fittings Association (PPFA), requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

305.1 Corrosion. Sheathing or other means shall be used to prevent the direct contact of metallic piping ~~shall not be installed in direct contact~~ with concrete, masonry, cinder, corrosive material or corrosive soil. Where plastic sheathing is used to prevent direct contact, the wall thickness of the sheathing shall be not less than ~~0.006 inches (6 mil) (0.152 mm) thick .~~ 0.025 inch (0.64 mm). Sheathing shall allow for movement including expansion and contraction of piping.

Commenter's Reason: The current code text for the corrosion section does not indicate "metallic", but rather, implies that all piping requires corrosion protection. Obviously, not all piping materials are subject to corrosion. This modification restores the language the committee felt should have remained, "other means" and expansion and contraction language back to the section. It also retains the original thickness of sheathing required.

P15-12

Final Action: AS AM AMPC____ D

P16-12

305.6, 305.6.1 (New), 305.6.2 (New)

Proposed Change as Submitted

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

305.6 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 1-1/2 inches (38 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 and to each side of a stud, joist, rafter or similar member.

305.6.1 Formed steel framing members. *Piping*, other than cast-iron or galvanized steel, shall not be installed within the channel of a formed steel framing member except where the piping is not less than 1-1/2 inches from the backside of any fastening face of the member.

305.6.2 Piping installed parallel to framing members. In concealed locations where *piping*, other than cast-iron or galvanized steel, is installed parallel to studs, joists, rafters or similar members less than 1-1/2 inches (38 mm) from the nearest edge of the member, such pipe shall be protected along its length by steel shield plates that comply with the requirements of Section 305.6.

Reason: Like the IPC, Section 404.7 does not address pipe or tubing run down the side of a stud or inside of a “C” channel metal stud or rafter. Such installations are subject to penetrations but the code addresses only holes and notches for pipe and tubing that runs perpendicular to the framing member. The NEC treats wiring that runs parallel to framing members the same as wiring that runs perpendicular. The IMC, IFGC and IPC need to catch up. If the sheeting material fasteners miss a framing member, they can easily penetrate piping which is why the code requires the protection shield to extend 2 inches above and below wall plates. Placing piping parallel to a member, either on the side or within a channel, exposes the piping to penetration, yet current code addresses only perpendicular penetrations.Given the speed at which drywall installers put up and fasten drywall to studs and rafters, there is a great potential for drywall screws or nails to miss the intended stud and hit a pipe or tube. The code already requires that shield plates on sole plates and top plates extend 2 inches above and below the edges of those framing members. Why should not piping to the sides of framing members be protected to the same degree?

Section 305.6.1 is being added to prohibit piping from being installed within 1-1/2 inches of the backside of the fastening flange of a formed steel member. Piping located in this area is likely to be penetrated by drywall fasteners. An all too common practice is to install piping ”inside” of formed steel members such that the piping is within 1-1/2” of the fastening face of the member. It is unrealistic to protect the piping with steel shield plates as installing the shield plates requires the installation fasteners. Piping just should not be placed in this location.

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 an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

305.6-P-STRAUSBAUGH.PMGCAC

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal limits the size of piping that can be used in the walls of standard construction and this would be a major hindrance to the building industry. The committee would like the proponent to come back with a public comment that would address the specific means for protecting the pipe from the front of the studs.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Shawn Strausbaugh, Arlington County, VA, representing International Code Council Plumbing, Mechanical, and Fuel Gas Code Action Committee (ICC PMG CAC), requests Approval as Modified by this Public Comment.

Replace proposal as follows:

305.6 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 1-1/2 inches (38 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.~~ Where piping will be concealed within light-frame construction assemblies, the piping shall be protected against penetration by fasteners in accordance with Sections 305.6.1 through 305.6.3.

Exception: Cast iron piping and galvanized steel piping shall not be required to be protected.

305.6.1 Piping through bored holes or notches. Where *piping* is installed through holes or notches in framing members and the piping is located less than 1 ½ inches (38 mm) from the framing member face to which wall, ceiling or floor membranes will be attached, the pipe shall be protected by shield plates that cover the width of the pipe and the framing member and that extend 2 inches (51 mm) to each side of the framing member. Where the framing member that the piping passes through is a bottom plate, bottom track, top plate or top track, the shield plates shall cover the framing member and extend 2 inches (51 mm) above the bottom framing member and 2 inches (51 mm) below the top framing member.

305.6.2 Piping in other locations. Where the piping is located within a framing member and is less than 1 ½ inches (38 mm) from the framing member face to which wall, ceiling or floor membranes will be attached, the piping shall be protected by shield plates that cover the width and length of the piping. Where the piping is located outside of a framing member and is located less than 1 ½ inches (38 mm) from the nearest edge of the face of the framing member to which the membrane will be attached, the piping shall be protected by shield plates that cover the width and length of the piping.

305.6.3 Shield plates. Shield plates shall be of steel material having a thickness of not less than 0.0575 inch (1.463 mm) (No. 16 gage).

Commenter's Reason: The committee thought that the originally proposed Section 305.6.1 was too restrictive because it prohibited piping from being located within the channel of a light frame, cold formed steel framing member unless the pipe was at least 1 ½ inches from the face of the member. The committee wanted a public comment that addressed protection of piping (within the channel of the member) that was closer than 1 ½ inches to the face of the member so that any size of pipe could be located in that area.

This public comment completely replaces the original proposal in order to provide clear requirements of where shield plates are needed. Section 305.6 uses the term "light frame construction assemblies" to describe wall, floor and roof assembles that can be made up from either wood members or light frame, cold formed steel members.

Section 305.6.1 covers applications where piping runs perpendicular to a framing member and passes through a bored hole or notch in the framing member. If the piping is within 1 ½ inches of the face of the member where wall ceiling or floor membranes will be attached, then the piping is required to be protected by a shield pate that covers the width of the piping by the width of the framing member plus 2 inches on either side of the framing member. Protection of the piping on either side of the framing member is needed because it is too easy for a membrane/fastener installer to miss the framing member's fastening face or penetrate the member at an angle and hit the piping that is just outside of the framing member. Section 305.6.1 also covers the application where piping runs perpendicular to and penetrates top and bottom plates, or top and bottom tracks. Protection of the piping above the bottom framing member (or below the top framing member) is needed because it is too easy for a membrane/fastener installer to miss the framing member's fastening face or penetrate the member at an angle and hit the piping just outside of the framing member.

Section 305.6.2 covers applications where the piping runs alongside of a framing member or in the case of a light frame, cold formed steel framing member, piping that runs parallel to the length of and within the framing member (in other words, within the channel section). If the piping is within 1 ½ inches of the face of the member where wall, ceiling or floor membranes will be attached, then the piping is required to be protected by a shield pate that covers the width of the piping by the length of piping that is within the 1 ½ inch proximity of the framing member's fastening face. Piping that is located behind the fastening face of the member and within 1 ½ inches of the fastening face of the member obviously needs protection from fastener penetration. Piping that is located adjacent to and within 1 ½ inches of the fastening face of the member needs protection because it is too easy for a membrane/fastener installer to miss the framing member's fastening face or penetrate the member at an angle and hit the piping that is just outside of the framing member.

P16-12

Final Action: AS AM AMPC____ D

P18 – 12
308.5

Proposed Change as Submitted

Proponent: James Paschal, Paschal Engineering representing himself (Jim@PaschalEngineering.com)

Revise as follows:

308.5 Interval of support. Pipe shall be supported in accordance with Table 308.5.

> **Exception:** The interval of support for piping systems designed to provide for expansion/contraction shall conform to the engineered design in accordance with Section 316.1. <u>The interval of support for fiberglass or metal reinforced plastic piping shall be in accordance with the manufacturer's specifications and shall conform to the engineered design in accordance with Section 316.1.</u>

Reason: There are a variety of plastic piping systems available which utilize metal or fiberglass reinforcement to add rigidity and strength to the piping, and as a result, may require different support spacing than the traditional materials shown in Table 308.5. In addition to the existing requirement that the spacing be per the engineered design and approved by the code official, the proposed wording here also requires that the spacing be per the manufacturer's specifications. This will ensure that the spacing is consistent between the design professional, code official, and manufacturer.

Cost Impact: None

308.5-P-PASCHAL

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The proposal adds guidance for supporting these new pipe materials that are being used.

Assembly Action: **Disapproved**

Individual Consideration Agenda

This code change proposal is on the agenda for individual consideration because the proposal received a successful assembly action of Disapproved.

P18-12
Final Action: AS AM AMPC____ D

P21-12
311.1

Proposed Change as Submitted

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

311.1 General. Toilet facilities shall be provided for construction workers and such facilities shall be maintained in a sanitary condition. Construction worker toilet facilities of the nonsewer type shall conform to ANSI Z4.3. <u>Not less than one portable toilet facility for every 50 workers or fraction thereof shall be provided.</u>

Reason: The code currently provides no guidance as to how many portable toilet facilities are needed for construction sites. To save money, a contractor could provide just one toilet facility for hundreds of workers. The ratio of 1 per fifty workers is reasonable.

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 an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

311.1-P-STRAUSBAUGH.PMGCAC

Public Hearing Results

Committee Action: Disapproved

Committee Reason: Portable toilets are not connected to the plumbing system and really should not be part of a plumbing code. The proposed language would be very hard to enforce and may be in conflict with OSHA regulations, state laws and union requirements.

Assembly Action: None

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Shawn Strausbaugh, Arlington County, VA, representing International Code Council Plumbing, Mechanical, and Fuel Gas Code Action Committee (ICC PMG CAC), requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

311.1 General. Toilet facilities shall be provided for construction workers and such facilities shall be maintained in a sanitary condition. Construction worker toilet facilities of the nonsewer type <u>shall be provided in the quantity specified in</u> ~~shall conform to~~ ANSI Z4.3 <u>and shall conform the requirements of such standard</u>. ~~Not less than one portable toilet facility for every 50 workers or fraction thereof shall be provided.~~

Commenter's Reason: The committee's argument for disapproving this code change was that portable toilets were not connected to the plumbing system and therefore should not be part of the code. The requirement for portable toilet facilities for construction workers are already in the IPC and have been since the first edition in 1995. Because the current code language provides no guidance as to how many portable toilet facilities are needed for construction sites, the intent of the proposed code change was to provide that guidance. The original proposed code change was to require 1 portable toilet for every 50 workers or fraction thereof. Due to the concern expressed by the committee that the 1:50 ratio could be in conflict with OSHA requirements for toilets for workers, additional research was done which concluded that the ANSI Z4.3 standard contains two elements, the construction of the nonsewer type toilet facility and the minimum number required for construction workers. This leaves one to wonder, has the code referenced only part of a standard? This change will clarify that the standard addresses not only the construction of, but also the minimum number of portable toilet facilities required for construction workers.

P21-12

Final Action: AS AM AMPC____ D

P26-12
403.1 (IBC [P] 2902.1)

Proposed Change as Submitted

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

Revise as follows:

403.1 (IBC [P] 2902.1) Minimum number of fixtures. Plumbing fixtures shall be provided ~~for the type of occupancy and~~ in the minimum number as shown in Table 403.1 based upon the actual use of the building or space. ~~Types of occupancies~~ Uses not shown in Table 403.1 shall be considered individually by the code official. The number of occupants shall be determined by the International Building Code. ~~Occupancy classification shall be determined in accordance with the International Building Code.~~

Reason: The purpose of the table is to provide fixtures based on the use of the building space, not based on the use group classification. By referencing the use group in accordance with the Building Code, an incorrect number of fixtures may be established for a building. A typical example is a mixed use building. Each use must be considered separately as to the fixture demands. Another example would be a high school that has a cafeteria, an auditorium for productions, and a stadium for sporting events. Each space would have different requirements. The listing of the use group in the table was done merely for convenience. The fixture demands have always been based on the use of the space.

Cost Impact: There is no impact to the cost of a building.

403.1-P-BALLANCO

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The proposal recognizes that a building can have different actual uses with respect to plumbing fixture needs than what the occupancy classification is for the building.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Roger Harper, Jr, Louisa County, VA, representing Virginia Plumbing & Mechanical Inspectors Association (VPMIA) & Virginia Building Code Officials Association (VBCOA) requests Disapproval.

Commenter's Reason: IPC Table 403.1 is correct and the current language in 403.1 is very clear showing the occupant loads and plumbing fixture requirements. When a mixed use building is reviewed EACH USE is reviewed separately and fixtures are required per each use. Calculating such fixtures is outlined in 403.1.1. The proponent's example of a high school is a somewhat inaccurate as the 2012 IBC section 303.1.3 clearly tells one that a school is reviewed in its entirety as Group E.

P26-12
Final Action: AS AM AMPC____ D

P28-12

Table 403.1 (IBC Table [P]2902.1)

Proposed Change as Submitted

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

TABLE 403.1
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a]
(See Sections 403.2 and 403.3)

NO.	CLASSIFICATION	OCCUPANCY	DESCRIPTION	WATER CLOSETS (URINALS SEE SECTION 419.2) MALE	WATER CLOSETS (URINALS SEE SECTION 419.2) FEMALE	LAVATORIES MALE	LAVATORIES FEMALE	BATHTUBS/ SHOWERS	DRINKING FOUNTAIN[e, f] (SEE SECTION 410.1)	OTHER
2	Business	B	Buildings for the transaction of business, professional services, other services involving merchandise, office buildings, banks, light industrial and similar uses.[j]	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[g]

j. <u>Exam and procedure rooms in doctor, dentist and veterinarian offices shall be provided with a hand washing sink.</u>

(Portions of table and footnotes not shown remain unchanged)

Reason: The code is silent about requiring hand washing sinks in doctor, dentist and veterinarian exam and procedures rooms. Sanitation is vitally important to prevent the spread of disease causing organisms. Hand washing is critical in preventing this spreading. The code needs to require hand washing sinks in these areas to allow for proper sanitation.

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 an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

T403.1-P-STRAUSBAUGH.PMGCAC

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This is an issue that needs to be controlled by the health services industry, not the plumbing code.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Shawn Strausbaugh, Arlington County, VA, representing International Code Council Plumbing, Mechanical, and Fuel Gas Code Action Committee (ICC PMG CAC), requests Approval as Submitted.

Commenter's Reason: Of those who spoke in opposition to this proposed change at the Dallas hearings, it was suggested that the use of a hand sanitizer would address the concern about the spread of disease. Aside from being an enforcement nightmare to allow the use of hand sanitizers, hand sanitizers do not kill all germs. They strip away the outer lay of oil on the skin, which usually prevents bacteria which are present in the body from coming to the surface. However, the bacteria normally present in the human body are different than those that will make us sick. Using soap and water is the most effective method of handwashing. A hand sanitizer should not take the place of proper cleansing using soap and water.

Another issue by those speaking in opposition was that the code is a minimum standard. Handwashing is the single most important and easiest way of preventing the spread of disease according to the Center for Disease Control. Changing the IPC to require a handwashing sink in areas prone in the spread of disease can only benefit everyone. Another opposing issue was that veterinarian offices were too specific. There are diseases that are easily transferred from animals to humans, called zoonotic diseases. The American Veterinary Medical Association recognizes that the number one preventer in spreading these diseases is through handwashing.

P28-12

Final Action: AS AM AMPC____ D

P29-12
202 (IBC 202), Table 403.1 (IBC Table [P]2902.1)

Proposed Change as Submitted

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Add new definitions as follows:
(Definitions to also be added to the IBC)

GRANDSTAND. Tiered seating that is supported on a dedicated structural system, that is two or more rows high and that is not a *building element*. See "Bleachers".

BLEACHERS. Tiered seating that is supported on a dedicated structural system, that is two or more rows high and that is not a *building element*. See "Grandstand".

BUILDING ELEMENT. A functional component of building construction that is listed in Table 601 of the IBC. Such components are constructed of materials consistent with the construction type of the building and can be fire-resistance-rated.

Revise table as follows:

TABLE 403.1 (IBC Table [P]2902.1)
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a]
(See Sections 403.2 and 403.3)

NO.	CLASSIFICATION	OCCUPANCY	DESCRIPTION	WATER CLOSETS (URINALS SEE SECTION 419.2)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAIN[e, f] (SEE SECTION 410.1)	OTHER
				MALE	FEMALE	MALE	FEMALE			
1	Assembly	A-5	Stadiums, amusement parks, bleachers and grandstands for outdoor sporting events and activities[h]	1 per 75 for the first 1,500 and 1 per 120 for the remainder exceeding 1,500	1 per 40 for the first 1,520and 1 per 60 for the remainder exceeding 1,520	1 per 200	1 per 150	—	1 per 1,000[i]	1 service sink[i]

(Portions of table and footnotes not shown are unchanged)

h. Where the total *bleacher* or *grandstand* seating capacity is less than 150 persons and permanent toilet facilities are not provided, portable toilets facilities that conform to ANSI 4.3 shall be provided.

i. Where the total *bleacher* or *grandstand* seating capacity is less than 150 persons, drinking fountains and service sinks shall not be required.

Reason: Consider a small city park with a ball field having a several bleacher units. The code currently requires that any venue with bleachers and grandstands have permanent toilet facilities and a drinking fountain and a service sink. This seems to be an unreasonable requirement where the ball field is used only seasonally, the anticipated attendance is very low and the provision of utilities (water, sewer) might be difficult. However, it is recognized that the presence of even a small number of people at an event does create the need for basic toilet facilities. Therefore, if permanent toilet facilities are not required, then portable toilet facilities need to be required.

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 an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

T403.1 #2-P-STRAUSBAUGH.PMGCAC

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This is an issue that is best left up to the discretion of the local code official.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Shawn Strausbaugh, Arlington County, VA, representing International Code Council Plumbing, Mechanical, and Fuel Gas Code Action Committee (ICC PMG CAC), requests Approval as Submitted.

Commenter's Reason: The committee's argument for disapproving this code change was that determining plumbing fixtures for a small city park having a ball field with bleachers should be left up to the discretion of the code official. The reason the PMG CAC developed the proposed language was that it felt that the current language in the IPC was not providing the code official direction on how to handle this type of setting and the change would then be providing the code official with some discretion. The current code language could result in one of two things - either being overly restrictive by applying provisions for a large stadium to a small ball field OR not being clearly defined as the occupant load at a small city park ball field would not warrant the number of fixtures as a professional ball park. The proposed code change would eliminate confusion as to when to apply the footnotes to allow for portable toilet facilities in lieu of permanent fixtures for small neighborhood park ball fields.

Because these facilities may not be used all year round, the anticipated attendance is very low. Due to the location of the park, utilities may also be difficult to obtain. This code change recognizes that even a small number of people warrant the need of basic toilet facilities. At the very least portable toilets should be required for those smaller crowds associated with neighborhood park ball fields.

P29-12
Final Action: AS AM AMPC____ D

P35-12
403.3 (IBC [P] 2902.3)

Proposed Change as Submitted

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing Little Caesar Enterprises (JBEngineer@aol.com)

Revise as follows:

403.3 (IBC [P] 2902.3) Required public toilet facilities. Customers, patrons and visitors shall be provided with *public* toilet facilities in structures and tenant spaces intended for public utilization. The number of plumbing fixtures located within the required toilet facilities shall be provided in accordance with Section 403 for all users. Employees shall be provided with toilet facilities in all *occupancies*. Employee toilet facilities shall be either separate or combined employee and *public* toilet facilities.

Exceptions: Public toilet facilities shall not be required in:

1. Open or enclosed parking garages~~. Toilet facilities shall not be required in parking garages~~ where there are no parking attendants.
2. Structures and tenant spaces intended for quick transactions, including take out, pick up and drop off, having a public access area less than or equal to 300 square feet.

Reason: Tenant spaces that are only intended for quick transactions do not need to provide public facilities for customers, patrons, and visitors. The public does not rely on such spaces to provide public toilet rooms. Patrons spend a short period of time completing a transaction, then they depart.

Examples of these types of spaces include: take out food locations, such as Chinese food take outs; pizza take outs; and carry out ribs. Similar quick transaction facilities include: dry cleaners, atm facilities, florists, shoe repair shops, and newspaper stands.

It is recognized that the text of the second exception could be shortened to read: Structures and tenant spaces having a public access area less than or equal to 300 square feet. The added text is provided for clarity.

The purpose of this section has always been to provide comfort facilities for anyone spending a period of time in the public space. Quick transaction spaces are unique, in that people are not in the space for any length of time. Furthermore, the space open to the public is limited to 300 square feet.

It would be a safety and/or health hazard to have the public travel to the working areas of the tenant space to use toilet facilities. Hence, if a public toilet room is added, the space for the toilet room would have to be located in the front space where the small public area is located. This creates a security concern where the public toilet room would block openings in the front tenant space.

The 300 square foot dimension is based on the standard large spaces used by these types of facilities. Most tenant spaces of this type have an area less than 300 square feet for the public.

Cost Impact: This change does not increase the cost of construction.

403.3-P-BALLANCO

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Small spaces intended for momentary occupancy by the public do not require toilet facilities.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Roger Harper, Jr, Louisa County, VA, representing Virginia Plumbing & Mechanical Inspectors Association (VPMIA) & Virginia Building Code Officials Association (VBCOA) requests Disapproval.

Commenter's Reason: What is a "stand alone" carry out facility? The proponent's examples are all establishments that will occupy a space within a new or existing building, usually with several spaces for rent. During the new structure plan review process designers are informed that restrooms and other required fixtures are required to be accessible to the public. During the plan review stage, tenants are generally not known so the fixture count is based on the proposed potential uses and square footage for each space. The building owner may define portions of the building with 2 hour rated walls to allow for a restaurant or two. Tenants come and go however a new structure already has the fixtures in place thus creating no hard ship in the event of a tenant change.

In existing facilities if one of these carry outs are proposed, the space still will generally be required to be brought up to the standards of IBC Chapter 34 or The International Existing Building Codes and this minor proposed change will prolong the intent of the IEBC which is to get structures to a level of accessibility over time.

P35-12

Final Action: AS AM AMPC____ D

P36-12
403.3.1 (IBC [P] 2902.3.1)

<u>Proposed Change as Submitted</u>

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee, the Virginia Plumbing and Mechanical Inspectors Association (VPMIA), the Virginia Building Code Officials Association (VBCOA) and ICC Region 7.

Revise as follows:

403.3.1 (IBC [P] 2902.3.1) **<u>Location and</u> access.** <u>The required public toilet facilities shall be located in the same building or in an adjacent building that is under the same tenant control.</u> Access to the required facilities shall be from within the building or from the exterior of the building<u>.</u> ~~All~~ <u>Access</u> routes shall comply with the accessibility requirements of the *International Building Code*. The <u>access</u> route to ~~the~~ *public* toilet facilities ~~required by Section 403.3~~ shall not pass through kitchens, storage rooms or closets. The public shall have access to the required toilet facilities at all times that the building is occupied.

Reason: Access to toilet facilities can be from the exterior of a building and facilities for one building can be located in another building given that the required travel distance is met and it's an accessible route. This proposal ensures that the tenant that is required to provide facilities is actually authorized to use toilets in another area during all times that such tenant space is occupied. The current problem is that some creative designs have attempted to utilize facilities where the tenant has absolutely no control over the location of the non-local facilities. Concerning the second line: If access to toilet facilities can be from the exterior of a building, could toilet facilities for one building be located in another building given that the required travel distance is met?

Examples: Could amusement park buildings have central toilet facilities in one building to serve the requirements of those buildings? Could a business office building with an adjacent working warehouse building have the toilet facilities for the warehouse in the office building?

For example, a strip center type mall setting may have an adjacent retail building. The tenants in the mall might expect their customers to use the facilities in the adjacent building, so long as they are not more than 500 feet away and on an accessible route. This proposal prevents that from occurring if the adjacent retail building is not under the same "tenant control." This example creates two serious problems. The first is the retail building owner may not be aware that he is the facility provider for spaces in the strip mall. In addition there is no way to regulate or mandate the hours of operation for the adjacent building to coincide with those of the strip mall. The second is what if the adjacent building operation goes out of business? There are many examples of campus type properties and outlet mall complexes where the required toilet facilities are in another building and this should be allowed if access to such buildings is controlled such that the facilities will always be available when needed.

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 an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

403.3.1-P-STRAUSBAUGH.PMGCAC

<u>Public Hearing Results</u>

Committee Action: **Disapproved**

Committee Reason: Although the intent of this proposal is good, future contractual disputes between tenants and owners could create a problem for which the code would have no control over resulting in occupants of a building no longer having access to the required number of plumbing fixtures.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Shawn Strausbaugh, Arlington County, VA, representing International Code Council Plumbing, Mechanical, and Fuel Gas Code Action Committee (ICC PMG CAC); requests Approval as Submitted.

Commenter's Reason: The committee disapproved this proposal stating that although the intent of this proposal is good, future contractual disputes between tenants and owners could create a problem for which the code would have no control over resulting in occupants of a building no longer having access to the required number of plumbing fixtures
The revised language that was proposed for the location of required public facilities did not intend to include specifically owners as the committee stated only adjacent buildings under the same tenant control. However, there could be some commercial businesses that have a sole owner such as a warehouse or trucking company whereby the restroom facilities are in a totally separate building outside of the main business office. The proposed language was intended to provide useful guidance for the required access when access is allowed from the exterior of the building.

Public Comment 2:

Shawn Strausbaugh, VA Plumbing and Mechanical Inspectors Assoc. (VPMIA), VA Building Code Officials Association (VBCOA), and ICC Region VII, requests Approval as Submitted.

Commenter's Reason: The committee's reason given is exactly the reason why the proposed language is needed. As such if a "contractual " issue arises the code official will have a code section clearly requiring the required toilet facilities must be under the same tenant control and another entity cannot control the use of the required public toilet facilities.

Public Comment 3:

Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing self, requests Approval as Submitted.

Commenter's Reason: This change is how many public plumbing facilities are provided. The Committee should not be expressing a concern with future contract disputes. In most installations, the buildings are interconnected. A good example is an outlet mall. Many of these facilities are separate buildings, with a centrally located building housing the plumbing fixtures. There is no need to have public facilities in each building when the centrally located facilities are within the specified distance. Another example is open schools that do not have facilities in each building. This proposal meets the intent of the code for providing access to public facilities. I encourage the membership to overturn the Committee vote and vote to approve this change as submitted.

P36-12
Final Action: AS AM AMPC____ D

P42-12
404.2 (New), 404.3 (New), Chapter 14

Proposed Change as Submitted

Proponent: Julius Ballanco, P.E./JB Engineering and Code Consulting, P.C. representing McGuire Manufacturing (JBEngineer@aol.com)

Add new text as follows:

404.2 Accessible fixture requirements. Accessible plumbing fixtures shall be installed with the clearance, height, spacing, and arrangement 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.

Add new standards to Chapter 14 as follows:

ASME
A112.18.9-2011 Protectors/Insulators for Exposed Waste and Supplies on Accessible Fixtures

ICC
A117.1-2009 Accessible and Usable Buildings and Facilities

Reason: Reference should be made to ICC A117.1 in the plumbing code. While this standard is referenced in the Building Code, it should also be referenced in the Plumbing Code since the standard contains requirements for plumbing fixture installations.

One of the common concerns is who inspects accessible plumbing fixtures for compliance with ICC A117.1? Plumbing fixtures are inspected by the plumbing official. Therefore, appropriate reference to the spacing, sizing, and configuration requirements needs to be placed in the plumbing code.

ASME A112.18.9 Protectors/Insulators for Exposed Waste and Supplies on Accessible Fixtures is the national consensus standard regulating protective covers for water and drain pipes. This Standard is intended to regulate products that must meet the requirements of ICC A117.1. The standard has performance requirements for protectors/insulators for exposed waste and supplies, so a physically challenged person will be protected when using a sink or lavatory in a public/commercial or private/residential facility.

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

Analysis: A review of the standard proposed for inclusion in the code, ASME A112.18.9-2011 and ICC A117.1-2009, 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, 2012.

404.2-P-BALLANCO

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The proposal accurately clarifies the requirement for protecting piping under accessible plumbing fixtures. Similar proposals in past code cycles received good support but the standard for the covers was not finished. Now that the standard is complete, this language is acceptable for addition to the code.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Roger Harper, Jr, Louisa County, VA, representing Virginia Plumbing & Mechanical Inspectors Association (VPMIA), Virginia Building Code Officials Association (VBCOA), requests Disapproval.

Commenter's Reason: The IPC does not need to start mandating the accessibilities requirements which are very clear in Chapter 11 of the IBC as well as ICC ANSI A117.1-09 (in this case section 606.6). Most jurisdictions use the I-Codes, however some use the IBC but not the IPC which is one reason why this should not be added to the IPC. There is no confusion among the code enforcement community as to who inspects what. Some localities have plumbing inspectors and they should inspect from the plumbing code. The commercial building inspector would catch the supplies and trap protection on his final inspection. Furthermore, adding new standards is moot. If ASME A112.18.9-2011 has anything to do with flame spread/smoke then what's next: Trash bags to comply with this standard? Toilet tissue dispensers? Soap bottles mounted in countertops?

P42-12
Final Action: AS AM AMPC____ D

P45 – 12
405.3.2

Proposed Change as Submitted

Proponent: Shawn Strausbaugh, Arlington County VA Representing, the Virginia Plumbing and Mechanical Inspectors Association and The Virginia Building Code Officials Association and ICC Region 7 (Sstrausbaugh@arlingtonva.us)

Revise as follows:

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

> **Exception:** In educational use occupancies, the required lavatory shall be permitted to be located adjacent to the room or space containing the water closet provided that not more than one operational door is between the water closet and the lavatory.

Reason: This has been a long standing practice in school construction. It is geared towards helping educate children on the importance of personal hygiene. This arrangement also allows for group wash fixtures to be located adjacent to core toilet rooms. This allows the instructors to wait outside and assure the children wash their hands upon exit of the toilet room. More commonly, it permits the installation of the lavatory to be located within the classroom when water closets are installed in the classroom itself. So when a child uses the facilities they walk through a single door (no different in concept to exiting a typical toilet stall) into the classroom where the instructor can assure hands are washed.

Cost Impact: None

405.3.2-P-STRAUSBAUGH

Public Hearing Results

Committee Action: **Approved as Modified**

Modify the proposal as follows:

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

> **Exception:** In educational use occupancies~~, the required~~ lavator~~y~~ies shall be permitted to be located adjacent to the room or space containing the water closet provided that not more than one operational door is between the water closet and the lavatory.

Committee Reason: The modification was made because if the word "the" in front of "required" in the exception is left in, it refers back to 'the required lavatory' in the main sentence. By making the change, the exception refers to the lavatory that is in the room with the bathroom.

The committee agreed with the proponent's written reason statement.

Assembly Action: **Disapproved**

Individual Consideration Agenda

This code change proposal is on the agenda for individual consideration because the proposal received a successful assembly action of Disapproved and a public comment was submitted.

Public Comment:

Shawn Strausbaugh, Arlington County, VA, representing VA Plumbing and Mechanical Inspectors Assoc. (VPMIA), VA Building Code Officials Association (VBCOA), and ICC Region VII, requests Approval as Submitted.

Commenter's Reason: The original proposed code change language is clear and concise and use the same terminology found in the existing code language. Based upon the assembly action to disapprove the modification the was approved by the committee it is apparent that the assembly thought the proposed language was clear and concise and did not require changing.

P45-12
Final Action: AS AM AMPC____ D

P53-12
202, 410.1, 410.3, 410.4, Chapter 14

Proposed Change as Submitted

Proponent: John Watson, Manager-Compliance and Sustainability, Elkay Manufacturing, representing Elkay Manufacturing (john.watson@elkay.com)

Add new definitions as follows:

BOTTLE FILLING STATION. A plumbing fixture that is connected to the potable water distribution and building drainage system and is designed and intended for filling personal use drinking water bottles not less than 10 inches (250 mm) in height. Such fixtures can be separate from or integral to a *drinking fountain*.

DRINKING FOUNTAIN. A plumbing fixture connected to the potable water distribution system that provides drinking water in a flowing stream so that the user can consume water directly from the fixture without the use of any accessories. Drinking fountains can incorporate a *bottle filling station*. Wasted water from the flowing stream and from the *bottle filling station* is captured and directed into the building's drainage system. These fixtures have a permanent connection to a building's potable cold water supply and to the building's drainage system through a trap and can incorporate a water filter and a cooling system for chilling the drinking water.

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. Drinking fountains and *bottle filling stations* with a self contained cooling system for chilling the drinking water ~~and water coolers~~ shall conform to ~~ARI 1010~~ ASHRAE Standard 18. Drinking fountains and ~~water coolers~~ bottle filling stations shall conform to NSF 61, Section 9.

410.3 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, *bottle filling stations* ~~water coolers or bottled water dispensers~~ shall be permitted to be substituted for not more than 50 percent of the required number of drinking fountains. Bottled water dispensers shall not be substituted for required drinking fountains.

410.4 Prohibited location. Drinking fountains and *bottle filling stations*~~, water coolers and bottle water dispensers~~ shall not be installed in public ~~restrooms~~ toilet facilities.

Add new standard to Chapter 14 as follows:

American Society of Heating, Refrigeration and Air-Conditioning Engineers, Inc.
1791 Tullie Circle, NE
Atlanta, GA 30329

ASHRAE

Standard 18-2008	Methods of Testing for Rating Drinking-Water Coolers with Self-Contained Mechanical Refrigeration

Reason: Drinking fountain manufacturers use the term "water cooler" to indicate a drinking fountain that supplies chilled drinking water. However, some people think of water coolers as the bottled water dispensers. My proposal eliminates the term "water cooler" to prevent future misunderstanding of what is allowed and what is not.

Using bottled water dispensers to substitute for a *required* number of permanently installed drinking fountains is just a cheap way for the designer to get around the full intent of the code. Providing permanent fixtures for obtaining drinking water is the intent of the code. Bottled water dispensers frequently run dry, cups for their use are sometimes not to be available and it's too easy for a bottled water service to be discontinued. Bottled water dispensers are temporary and should not be allowed to be a substitute for permanent fixtures.

We need to recognize that the use of personal drinking water bottles or containers has increased dramatically in recent years. Use of such a personal device eliminates having to obtain drinking water from a drinking fountain that might not have been cleaned for some time. Some people just don't like the idea of putting their mouth so close to an area where others have previously done so; and getting water from a lavatory in order to fill a water bottle is no better. So why not realize the trend towards personal water bottle use and have the code allow a bottle filling station substitution for drinking fountains? It is a permanent fixture, it provides access to a clean supply of drinking water, it encourages reuse of bottles (a green practice), reduces the carbon footprint of bottled water delivery (a very green practice) and provides drinking water in a manner that the public is obviously demanding. It's time for the code to recognize this new product and take a stance to provide complete access to safe drinking water.

And finally, the ASHRAE 18 standard is being proposed to replace the ARI 1010 standard that has not be used for many years for water cooling systems. ARI no longer maintains the standard (the last revision was 10 years ago). The code needs to stay abreast of current standards.

Cost Impact: None

Analysis: A review of the standard proposed for inclusion in the code, ASHRAE Standard 18-2008, 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, 2012.

410.1-WATSON

Public Hearing Results

Committee Action: Approved as Submitted

Committee Reason: The committee agreed with the proponent's written reason statement.

Assembly Action: None

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Dan Buuck, Dipl.-Ing. (FH), representing National Association of Home Builders (NAHB), requests Disapproval.

Commenter's Reason: This proposal eliminates the long-standing substitution of water coolers (bottled water dispensers) for drinking fountains allowed in the code.

More and more people are drinking bottled water these days. What people drink is a matter of personal preference and not a matter of which fixtures are installed. Bottled water is a welcome source of water to many people who do not care for the water provided by the municipality for reasons of taste, impurities or cleanliness. And there are times when some municipalities warn against drinking the water out of the tap. You can mandate more drinking fountains, but that does not mean people will actually use them.

Now the industry has developed bottle filling stations connected to the potable water supply. And they want to get that product in the code as an option while removing the ability to install bottled water dispensers as a replacement for a percentage of those more expensive fixtures. This does not change the fact that it is still water from the municipal water source with the same stigma attached to it as with drinking fountains. Of course a filtered version is also available, but that requires continued maintenance and extra cost—the same reasons used for removing bottled water dispensers from the code in the first place. Nothing is really gained by this code change—at least not for the occupant who will decide for themselves if they will drink bottled water or water from the municipal water system.

Also, because of what was struck in 410.4, bottled water dispensers could now be installed in public restrooms if this proposal becomes code.

Public Comment 2:

Roger Harper, Jr, Louisa County, VA, representing Virginia Plumbing & Mechanical Inspectors Association(VPMIA) & Virginia Building Code Officials Association (VBCOA), requests Disapproval.

Commenter's Reason: With the approval of both P53-12 and P54-12, a conflict will be created when these two proposals merge. P53-12 completely eliminates the ability to substitute water coolers or bottled water dispensers for the required number of drinking fountains, whereas P54-12 incorporates these fixtures. P53-12 limits these substitutions to ONLY bottle filling stations, whereas P54-12 will incorporate bottle filling stations as well. It is our belief that P54-12 provides a more accurately worded requirement (and intention) that also incorporates what P53-12 was attempting to achieve as well.

P53-12
Final Action: AS AM AMPC____ D

P54-12
202, 410.3, 410.4

Proposed Change as Submitted

Proponent: Roger Harper, Jr, Louisa County VA, representing, the Virginia Plumbing and Mechanical Inspectors Association (sharper@louisa.org)

Add new definitions as follows:

DRINKING FOUNTAIN. A plumbing fixture that is connected to the potable water distribution system and the drainage system. The fixture allows the user to obtain a drink directly from a stream of flowing water without the use of any accessories.

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 also 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.

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:

410.3 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 coolers or bottled~~ *water dispensers* shall be permitted to be substituted for not more than 50 percent of the required number of drinking fountains.

410.4 Prohibited location. *Drinking fountains, water coolers* and ~~bottle~~ *water dispensers* shall not be installed in public restrooms.

Reason: There is often confusion regarding what is or is not a water cooler. Some people think that a water cooler is a drinking fountain since typically, they do also cool the water that is being dispensed. Others think that a water cooler is a bottled water dispenser that is capable of cooling the water dispensed. Currently the code does not define any of the terms. In reality, drinking fountains are drinking fountains and everything else is some form of a water dispenser. Whether or not the water is cooled is irrelevant. The code does not require cooled water. The code can be simplified in Section 410.3 by referring only to drinking fountains or their alternative, water dispensers. The new definitions establish that a drinking fountain and a water dispenser that is connected to the potable water supply system are both plumbing fixtures by definition and a bottled water dispenser is not a plumbing fixture by definition. It is necessary to be clear as to what the code requires to be provided and also what the code intends to allow as an alternative. This proposal also paves the way for new technology that is being marketed and installed today, namely water dispensers that are built into a wall, connected to the potable water supply system and dispense water into cups, glasses and bottles. These units typically treat the potable water with additional filtering and/or reverse osmosis treatment.

Cost Impact: none

410.3-P-HARPER

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The committee voted approved as submitted for P53-12 and this proposal is an extension of that proposal that adds a needed definition for water coolers.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Dan Buuck, Dipl.-Ing. (FH), representing National Association of Home Builders (NAHB), requests Disapproval.

Commenter's Reason: This proposal would be unnecessary if P53 is approved. The committee's reason for approving this proposal was the addition of the definition for "water cooler". P53 eliminated all references to the term "water cooler" in the body of the code.

If P53 is disapproved in at the Final Action Hearings in Portland, this proposal would have the same effect of prohibiting bottled water dispensers from replacing some of the required drinking fountains. If that is the case, my comments for P53 would apply to this proposal.

P54-12

Final Action: AS AM AMPC____ D

P58-12
413.3

Proposed Change as Submitted

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

Revise as follows:

413.3 Commercial food waste grinder waste outlets. Commercial food waste grinders shall be connected to a drain not less than 11/2 inches (38 mm) in diameter. Commercial food waste grinders shall be connected and trapped separately from any other fixtures or sink compartments <u>and shall not discharge through a grease interceptor</u>.

Reason: This is a companion change to the change proposed to Section 1003. A food waste grinder should never discharge through a grease interceptor. The purpose of a food waste grinder is to pulverize food waste to small enough particles to discharge to the sewer. If a grinder connects to a grease interceptor, the food particles will separate out, defeating the purpose of a food waste grinder. Similarly, if a food waste grinder discharges to a solids interceptor, the food particles will be separated.

Cost Impact: This change does not increase the cost of construction.

413.3-P-BALLANCO

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: To be consistent with the committee's action on P198-12.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing InSinkErator, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

413.3 Commercial food waste grinder waste outlets. Commercial food waste grinders shall be connected to a drain not less than 11/2 inches (38 mm) in diameter. Commercial food waste grinders shall be connected and trapped separately from any other fixtures or sink compartments and shall not discharge through a <u>hydromechanical</u> grease interceptor.

Commenter's Reason: I would encourage the membership to overturn the motion to deny and vote to approve this change, as modified. One of the concerns expressed and discussed after the hearing was the discharge of food waste disposers to large outdoor gravity grease interceptors. The modification of this change will restrict the discharge of food waste disposers to being allowed through gravity grease interceptors only. This is accomplished by prohibiting the discharge to hydromechanical grease interceptors.

It has been well established that the addition of food particles added to hydromechanical grease interceptor is detrimental to the performance of the interceptor. This documentation has been submitted to the Code Committee and the membership in the past. The code currently does not require food waste disposers to discharge to a grease interceptor. It merely states that when they do, there should be a solids interceptor. The thought process is that the solids interceptor will capture the food waste particles. The problem with this thought process is that the food particles will always bypass the solids interceptor and foul up the grease interceptor. Modern food waste disposers are so efficient that the food particles are very small in size. A solids interceptor would not be capable of capturing all the food particles.

The other problem with this thought process is that it defeats the purpose of a food waste disposer. Food waste is clean waste that can be readily turned into energy at the wastewater treatment plant. If you intercept the food waste, it makes no sense to install a food waste disposer.

It is unfortunate that some of the discussion at the hearing before the Code Committee reverted to whether food waste disposers should be installed in commercial kitchens. This change has nothing to do with that. Food waste disposers are already permitted. The only point of discussion is whether they should discharge through a grease interceptor. Any professional knowledgeable on grease interceptors or food waste knows that food waste disposers should never discharge through a grease interceptor.

P58-12

Final Action: AS AM AMPC____ D

P62-12
419.4 (New)

Proposed Change as Submitted

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

<u>419.4 Nonwater urinal connection.</u> <u>The fixture drain for a nonwater urinal shall independently connect to a branch drain that serves one or more lavatories, water closets or water-using urinals that discharge upstream of such nonwater urinals.</u>

Reason: Nonwater urinals have such a concentrated discharge that fixture drains and branch drain lines carrying only urine have a tendency to accumulate urine salt deposits. Designing such systems with water using fixtures is a method that solves the potential clogging problem by keeping the drain lines washed out with the discharge of other types of fixtures.. The proposed language is adapted from what is currently in the IgCC.

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 an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

419.4 (NEW)-P-STRAUSBAUGH.PMGCAC

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The opposition testimony was compelling in stating that there is not any data to support that nonwater urinals are causing widespread problems. To write code language to be mandatory to fix a product that is not performing, is not an acceptable way to solve the problem. If the product does not perform properly then other action should be taken.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Shawn Strausbaugh, Arlington County, VA, representing International Code Council Plumbing, Mechanical, and Fuel Gas Code Action Committee (ICC PMG CAC), requests Approval as Submitted.

Commenter's Reason: The committee missed the important fact that the IgCC already requires what this proposal is putting in the IPC. IgCC Section 702.5 states: "The fixture drain for nonwater urinals shall connect to a branch drain that serves one or more lavatories, water closets or water-using urinals that discharge upstream of such urinals." The reason why this requirement was included in the IgCC was to *promote* the installation of nonwater urinals so that water could be conserved. The requirement does this by easing the concern of persons in the plumbing industry who are convinced, either by real evidence or hearsay, that nonwater urinals should not be installed because the lack of flushing water can cause a build-up of urine salt deposits in drain piping that, in turn, could lead to frequent drain line blockages. But the requirement, by itself, is strictly a plumbing system installation requirement that is more appropriate material for the IPC. If this proposal is successful, it is intended that a proposal will be submitted to remove the requirement from the IgCC.

P62-12
Final Action: AS AM AMPC____ D

P64-12
420.1.1 (New), Chapter 14

Proposed Change as Submitted

Proponent: Fred Constantino, American Society of Mechanical Engineers (ASME), representing the ASME A112 Plumbing Materials and Equipment Standards Committee.

Add new text as follows:

420.1.1 Dual flush devices. Dual flush devices for water closets shall comply with ASME A112.19.10.

Add new standard to Chapter 14 as follows:

ASME
A112.19.10–2003(R2008) Dual Flush Devices for Water Closets

Reason: Dual flush devices for water closets is a device that consist of a full flush of 1.6 gpf and a reduce flush of less than 1.1 gpf and these products do exist and should be required to comply with some performance requirements. This is a National standard (ANSI) which covers the performance requirements for these types of systems.

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

Analysis: A review of the standard proposed for inclusion in the code, ASME A112.19.10, 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, 2012.

420.1.1(NEW)-P-CONSTANTINO

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The standard is applicable to retrofit devices for 3.5 gallon per flush water closets and not 1.6 gpf water closets as the proponent's reason statement indicates.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing self, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

420.1.1 Dual flush devices. Dual flush devices for existing 3.5 gallon per flush water closets shall comply with ASME A112.19.10.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: This standard only applies to existing water closets that have a 3.5 gallon per flush flushing volume. The current code does not permit these water closets, however, there are millions still in existence in the United States. These existing water closets can be retrofitted with a dual flushing device that complies with the referenced standard.

P64-12

Final Action: AS AM AMPC____ D

P71-12
424.3

Proposed Change as Submitted

Proponent: Edward R. Osann, Natural Resources Defense Council, representing self (eosann@nrdc.org); Harry Misuriello, American Council for an Energy-Efficient Economy, representing self (misuriello@verizon.net)

Revise as follows:

424.3 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 or ASME A112.18.1/CSA B125.1 <u>when tested at a flow rate of 1.5 gpm ± 0.1 gpm (5.75 L/m ± 0.35 L/m).</u> ~~and~~ <u>Such</u> valves shall be installed at the point of use. <u>Such valves shall be factory marked with the manufacturer's minimum rated flow and such marking shall be visible at final inspection.</u> 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.

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. 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 rated for 2.5gpm 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."

Showerheads with maximum flow rates below 2.5 gpm are widely available on the market today, and simple replacement of a showerhead is typically not subject to code. Since shower valve components are located behind finished walls, replacement of showerheads is likely to be more frequent than replacement of shower valves. This proposed change seeks to reduce the likelihood that consumers replacing a showerhead will compromise the thermal protection offered by a building subject to this code by ensuring that shower valves can fully accommodate showerheads with lower flow rates than the current maximum federal standard of 2.5 gpm. The current EPA WaterSense specification for showerheads has a maximum flow rate of 2.0 gpm, and many showerheads are already 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 will help ensure that new buildings built to this code can safely accommodate showerheads with lower flow rates that may be selected by building occupants in future years.

Note that this language does not require that the showerhead itself have a flow rate of 1.5 gpm, but simply that the shower valve provide the thermal protection called for under the recognized standard when tested at a flow rate as low as 1.5 gpm.

Cost Impact: Conforming products are on the market today without a significant cost premium. The code change proposal will not increase the cost of construction.

424.3-P-OSANN

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The problems with shower valves not performing at flow rates lower than 2.5 gpm needs to be addressed by the product standards, not by the code.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Edward Osann, Natural Resources Defense Council, representing self, requests Approval as Submitted.

Commenter's Reason: The committee erred in deferring a health and safety concern with the performance of shower valves to another standard-setting body, when the issue could readily be remedied in the code. The "performance" at issue is the maintenance of thermal protection for the bather. The proliferation of showerheads in both the new installation and replacement markets that operate well below the current maximum flow rate of 2.5 gallons per minute (gpm) poses a challenge to the thermal protection offered by shower valves designed and tested at 2.5 gpm and no less. As of this filing, over 600 models of showerheads under 33 brands are certified in the US EPA WaterSense database as operating at 2.0 gpm or less. Undoubtedly more models are offered that operate at or below this range but are not WaterSense certified. And even more will be on the market by 2015 when this code is published. Under the proposal as submitted, shower valves must maintain the thermal protection called for by the ASSE test procedure when tested at 1.5 gpm, and valves must be factory marked with the tested flow rate to allow for ease of inspection. This proposal does not change the test procedure or the pass/fail criteria, only the flow rate at which the test is to be performed, in the interest of health and safety of building occupants.

P71-12
Final Action: AS AM AMPC____ D

P72-12
424.4

Proposed Change as Submitted

Proponent: Edward R. Osann, Natural Resources Defense Council, representing himself (eosann@nrdc.org); Harry Misuriello, American Council for an Energy-Efficient Economy, representing himself (misuriello@verizon.net)

Revise as follows:

424.4 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 <u>when tested at a flow rate of 1.5 gpm ± 0.1 gpm (5.75 L/m ± 0.35 L/m)</u>, or each shower head shall be individually controlled by a balanced-pressure, thermostatic or combination balanced-pressure/thermostatic valve that conforms to ASSE1016 or ASME A112.18.1/CSA B125.1 <u>when tested at a flow rate of 1.5 gpm ± 0.1 gpm (5.75 L/m ± 0.35 L/m)</u> and is installed at the point of use. <u>Such valves shall be factory marked with the manufacturer's minimum rated flow and such marking shall be visible at final inspection.</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.

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. 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 rated for 2.5gpm 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."

Showerheads with maximum flow rates below 2.5 gpm are widely available on the market today, and simple replacement of a showerhead is typically not subject to code. Since shower valve components are located behind finished walls, replacement of showerheads is likely to be more frequent than replacement of shower valves. This proposed change seeks to reduce the likelihood that consumers replacing a showerhead will compromise the thermal protection offered by a building subject to this code by ensuring that shower valves can fully accommodate showerheads with lower flow rates than the current maximum federal standard of 2.5 gpm. The current EPA WaterSense specification for showerheads has a maximum flow rate of 2.0 gpm, and many showerheads are already 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 will help ensure that new buildings built to this code can safely accommodate showerheads with lower flow rates that may be selected by building occupants in future years.

Note that this language does not require that the showerhead itself have a flow rate of 1.5 gpm, but simply that the shower valve provide the thermal protection called for under the recognized standard when tested at a flow rate as low as 1.5 gpm.

Cost Impact: Conforming products are on the market today without a significant cost premium. The code change proposal will not increase the cost of construction.

424.4-P-OSANN

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The problems with shower valves not performing at flow rates lower than 2.5 gpm needs to be addressed by the product standards, not by the code.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Edward Osann, Natural Resources Defense Council, representing self, requests Approval as Submitted.

Commenter's Reason: As with P71, the committee erred in deferring a health and safety concern with the performance of shower valves to another standard-setting body, when the issue could readily be remedied in the code. The "performance" at issue is the maintenance of thermal protection for the bather. The proliferation of showerheads in both the new installation and replacement markets that operate well below the current maximum flow rate of 2.5 gallons per minute (gpm) poses a challenge to the thermal protection offered by shower valves designed and tested at 2.5 gpm and no less. As of this filing, over 600 models of showerheads under 33 brands are certified in the US EPA WaterSense database as operating at 2.0 gpm or less. Undoubtedly more models are offered that operate at or below this range but are not WaterSense certified. And even more will be on the market by 2015 when this code is published. Under the proposal as submitted, shower valves must maintain the thermal protection called for by the ASSE test procedure when tested at 1.5 gpm, and valves must be factory marked with the tested flow rate to allow for ease of inspection. This proposal does not change the test procedure or the pass/fail criteria, only the flow rate at which the test is to be performed, in the interest of health and safety of building occupants.

P72-12
Final Action: AS AM AMPC____ D

P82-12
504.6

Proposed Change as Submitted

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

504.6 Requirements for discharge piping. The discharge piping serving a pressure relief valve, temperature relief valve or combination thereof shall:

(Items 1 through 13 remain unchanged)

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: PEX and PE-RT tubing use insert fittings for connections. The bore size for a ¾ inch male adapter fitting is small such that there is concern that the discharge from a T & P valve could be restricted. The proposed language requires that PEX and PE-RT tubing used for relief valve discharge piping be one size larger so that the insert fitting has a larger bore which would not restrict flow.

PEX and PE-RT tubing is somewhat flexible and where supplied from a coil, the tubing has a memory to stay in a coil shape. This flexibility and memory to a coil shape can cause the discharge end of the tubing to be displaced from its required or intended position. To prevent displacement, new language is being added to require that the outlet end of the tubing be fastened in place.

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 an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

504.6-P-STRAUSBAUGH.PMGCAC

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: There is no data given to support that ¾ inch PEX pipe or tube will not work for the application.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Shawn Strausbaugh, Arlington County, VA, representing International Code Council Plumbing, Mechanical, and Fuel Gas Code Action Committee (ICC PMG CAC), requests Approval as Modified by this Public Comment.

Replace proposal as follows:

504.6 Requirements for discharge piping. The discharge piping serving a pressure relief valve, temperature relief valve or combination thereof shall:

(Items 1 through 13 remain unchanged)

14. Have the outlet end of the piping fastened in place where such piping is constructed of PEX or PE-RT tubing.

Commenter's Reason: Because the committee found issue with the sizing limitation of the original proposal, this public comment changes the original proposal to only require that the end of flexible tubing (PEX and PE-RT) T & P valve discharge piping be fastened in place. The size of PEX and PE-RT tubing used for T&P discharge piping will be dictated by the tubing manufacturer's installation instructions.

P82-12

Final Action: AS AM AMPC____ D

P89-12
604.2

<u>Proposed Change as Submitted</u>

Proponent: Gary Klein, Affiliated International Management, LLC, representing self (gary@aim4sustainability.com)

Revise as follows:

604.2 System interconnection. At the points of interconnection between the hot and cold water supply piping systems and the individual fixtures, appliances or devices, provision shall be made to prevent flow between such piping systems.

<u>**Exception:** Hot or tempered water recirculation systems that pump water from a hot or tempered water pipe through a cold water pipe back to the hot water source shall be permitted provided that the system complies with all of the following:</u>

1. <u>The system is demand activated by a switch operated by the user of the fixture, a motion sensor triggered by the presence of the user of the fixture, a flow switch activated by the flow of hot water at a fixture or a door switch activated by the door to the room containing hot water-supplied fixtures. a fixture, a door switch activated by the door to the room containing hot water-supplied fixtures or a voice activated command.</u>
2. <u>After the pump starts, the controls shall allow the pump to operate until the water temperature in the return pipe rises not more than 10ºF (5.6 ºC) above the initial temperature of the water in the pipe. The controls shall not allow the pump to operate when the temperature in the pipe exceeds 102ºF (38.9 ºC). Controls shall limit pump operation to not more than 5 minutes for each activation in the event that both means of shutting off the pump have failed.</u>
3. <u>The manufacturer of the controls for the recirculation pump provides installation and operation instructions that provide details of the operation of the controls and such instructions are available at the jobsite for inspection by the code official.</u>

Reason: As I understand it, the intent of IPC Section 604.2 is to prevent interconnections between the hot and cold piping systems so that hot water is not drawn <u>unintentionally</u> into the cold-water piping and vice-versa. The two most obvious issues with such <u>unintentional</u> interconnections is that 1) hot water could flow from a cold water faucet which might cause a potential for scalding and 2) hot water might be prevented from ever reaching certain fixtures.

The reason for the proposed exception is to resolve the question of whether or not a "no return pipe" hot water recirculation system violates the intent of this code section.

Typical "no return pipe" hot water recirculation systems utilize a pump in the hot water line to cause flow of water from the hot water piping through a special valve and into the cold water piping near a fixture that is most remote from the water heater. Some systems have the pump operating continuously or on timer to run continuously during certain time periods of the day. Even though the pump might be running continuously or semi-continuously, the special valve controls the flow of water in the hot water pipe to the cold water pipe. Other systems are demand controlled such that the user activates the pump operation only when hot water is intended to be used.

When the temperature sensing mechanism determines that the temperature of the water in the hot water piping is either rising quickly (demand controlled) or is approximately 105 degrees F (aquastat controlled), the valve automatically closes to stop flow so that the cold water line is not continuously being filled with hot water. The valve also prevents the flow of hot water to the cold supply pipe while cold water is flowing from the faucet.

Regardless of the shut-off mechanism, the overall operation of "no return pipe" hot water systems is the same - a valve controls when flow is allowed to pass from the hot water piping to the cold-water piping.

In my opinion, even without the proposed revisions, these "no return pipe" hot water recirculation systems do not violate the intent of the code. Because the valve prevents water of a temperature greater than approximately 105 degrees F from being introduced into the cold-water piping, the potential for scalding is not an issue. The valve also prevents cold water from entering into the hot water piping so the issue of cold water replacing hot water in a water distribution system doesn't exist.

However, “no return pipe” hot water recirculation systems that use timers, aquastats or a combination of timers and aquastats to control the flow of hot water into the “temporary” cold-water return line can operate up to 24 hours a day, either intentionally or unintentionally; intentionally if the timer is set to allow the pump to run continuously. Unintentionally if the aquastat has been disconnected; or the valve is jammed open; or if the temperature drop between the water heater and the shut-off valve with aquastat is large enough to prevent the shut-off temperature from ever being reached. An example: the water heater is set at 125F, the aquastat is set to close the valve at 105F and the temperature drop between the water heater and the aquastat is 25F. This large temperature drop is possible when the pipes are installed in a vented crawl space or under a slab. The reason the pump was installed was to overcome a hot water delivery problem, which these applications almost certainly had! The problem is that with a 25F temperature drop, the temperature at the aquastat will never reach 105F (125-25 = 100F) and the valve will never close, allowing water to continually, and in some sense, unintentionally, pass into the cold-water line.

In contrast, demand controlled priming pumps shut off based on a temperature rise, rather than an absolute temperature. As an example, when the pump is activated, the controls determine the temperature of the water in the pipe, which is likely to be close to ambient room temperature or about 65-70F. The controls allow the pump to run until the temperature rises about 5F, and then shut off typically when the water temperature is between 70 and 75F. There are other safety mechanisms built into the controls that restrict operation to no more than 5 minutes or when the temperature rises to 105F. Since these pumps only operate on demand, when intentionally activated shortly before hot water is desired, they restrict the time hot water is flowing in the cold water piping to typically less than 20 minutes a day in residential occupancies served by their own water heater or boiler, and similarly small durations in other occupancies. In contrast, timer, aquastat and combination timer and aquastat controlled pumps typically operate 4-8 hours per day and often much longer, up to 24/7.

In addition to coming closest to meeting the intent of this section, which is to prevent unintentional flow between hot and cold water supply piping, demand controlled hot water priming pumps are significantly more energy efficient that the other options. The energy costs of operation are a combination of the heat losses in the piping and the electricity requirement of the pump: the heat losses dominate the energy costs. The energy costs of demand-controlled hot water priming pumps are at least 75 percent and typically 90 percent less than the alternatives.

It is for these reasons that I have proposed only allowing the exception for pumps that prime the hot or tempered water supply piping on demand.

I urge your support for this proposal. Thank you.

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

No new requirements have been added, only a clarification of an existing section.

604.2-P-KLEIN

Public Hearing Results

Committee Action: Disapproved

Committee Reason: The proposed language ties the designer's hands as to how he goes about providing a recirculation system for a building. This is overly restrictive.

Assembly Action: None

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Gary Klein, Affiliated International Management, LLC, representing self, requests Approval as Modified by this Public Comment.

Replace the proposal as follows:

604.2 System interconnection. At the points of interconnection between the hot and cold water supply piping systems and the individual fixtures, appliances or devices, provision shall be made to prevent flow between such piping systems.

> **Exception:** Recirculation systems that pump water from a hot or tempered water pipe through a cold water pipe back to the hot water source shall be permitted provided that the recirculation system has a demand activated control that complies with all of the following:
>
> 1. The control starts the pump upon sensing the presence of a user of a fixture or appliance, receiving a signal from the action of a user of a fixture or appliance or sensing the flow of hot or tempered water to a fixture or appliance.
>
> 2. The control limits the water temperature increase in the cold water supply piping to not more than 10ºF (5.6 ºC) greater than the initial temperature of the water in the pipe and limits the temperature entering the cold water supply pipe to 102ºF (38.9 ºC).

Commenter's Reason: The committee disapproved the original proposal, stating that: "The proposed language ties the designer's hands as to how he goes about providing a recirculation system for a building. This is overly restrictive."

This comment addresses the committee's concerns by simplifying the proposed language and making the requirements based on performance rather than prescription.

The reason for the exemption is to make it clear that it is allowable to install a recirculation pump demand activated controls that uses the cold water line as a temporary return back to the water heater. Demand activated recirculation pumps are installed in situations where it takes too long for hot or tempered water to arrive at that hot water location in a wide variety of occupancies including homes, apartments, offices and airports, to name a few. More than 150,000 such systems have been installed in the US over the past 20 years, the majority in existing buildings using the cold water line as the temporary return. Putting this exemption into the code will enable inspection of these installations so that we can ensure they are done safely.

The remainder of the reasons why under-sink demand activated recirculation pumps should be the only allowable exception for this section are contained in the original proposal.

I urge your support for these changes. Thank you for considering this comment.

P89-12

Final Action: AS AM AMPC____ D

P90-12
Table 604.3

Proposed Change as Submitted

Proponent: Edward R. Osann, Natural Resources Defense Council, representing self (eosann@nrdc.org); Harry Misuriello, American Council for an Energy-Efficient Economy, representing self (misuriello@verizon.net)

Revise as follows:

TABLE 604.3
WATER DISTRIBUTION SYSTEM DESIGN CRITERIA REQUIRED CAPACITY AT FIXTURE SUPPLY PIPE OUTLETS

FIXTURE SUPPLY OUTLET SERVING	FLOW RATE[a] (gpm)	FLOW PRESSURE (psi)
Bathtub, balanced-pressure, thermostatic or combination balanced-pressure/ thermo-static 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	~~2~~ 0.8	8
Lavatory, private, mixing valve	0.8	8
Lavatory, public	0.4	8
Shower	~~3~~ 2.5	8
Shower, balanced-pressure, thermostatic or combination balanced-pressure/ thermo-static mixing valve	~~3~~ 2.5[b]	20
Sillcock, hose bibb	5	8
Sink, residential	~~2.5~~ 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.

Reason: TABLE 604.3 WATER DISTRIBUTION SYSTEM DESIGN CRITERIA REQUIRED CAPACITY AT FIXTURE SUPPLY PIPE OUTLETS requires plumbing distribution system design to achieve flow rates of *at least* 3 gpm for showers, 2.5 gpm for sink faucets, and 2 gpm for lavatory faucets, all of which are excessive as minimum requirements. The *minimum* flow rate for a shower in this table is above the allowable *maximum* flow rate for a showerhead as specified by Table 604.4 of this code and by the nationwide standard that has been in effect for nearly 20 years. Similarly, the minimum flow rate for lavatories does not distinguish between public and private fixtures, and thus sets a minimum flow for public lavatories that is in excess of the maximum flow allowable under Table 604.4 of this code. And for residential sinks other than service sinks, the *minimum* flow rate is again set higher than the allowable *maximum* flow rate for a sink faucet as specified by Table 604.4. For applications at the low end of the acceptable range of water pressure, these excessive minimum flow values tend to encourage the oversizing of pipes leading to fixture outlets, leaving a larger volume of cooled hot water to purge before use, and thus exacerbating the problem of the energy and water lost while waiting for actual hot water to arrive at the fixture. In some installations, these excessive minimum values may require water pressure booster systems that might otherwise be unnecessary.

Under this proposal, public lavatories would be distinguished from private lavatories, single-handle mixing valves for private lavatories would be recognized, and the minimum flow rates for lavatory, residential sink, and shower supply pipes would be adjusted downward. Minimum flow rates for showers would be set at 2.5 gpm, or such lower flow rate as would match the manufacturer's minimum rated flow for the mixing valve to provide the level of thermal protection prescribed by the industry standard. The minimum flow rate for a residential sink, other than a service sink, would be set at 1.75 gpm, which is 80 percent of the value of the maximum flow rate allowed by this code under Table 604.4. The minimum flow rate for a public lavatory would be set at 0.4 gpm, 80 percent of the value of the maximum flow rate allowed by this code under Table 604.4. The minimum flow rate for a private lavatory would be set at 0.8 gpm, which is the minimum flow rate prescribed for private lavatory faucets by the US EPA's WaterSense specification (version 1.0, October 2007).

Cost Impact: This proposal will have the effect of reducing the diameter of pipe that is allowed to serve lavatories, sinks, and showers in some installations, and may also eliminate the need for water pressure booster systems in some applications. This code change proposal will not increase the cost of construction.

T604.3-P-OSANN

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed with the proponent's written reason statement. This will provide more flexibility to the industry.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Len Swatkowski, representing Plumbing Manufacturers International (PMI), requests Disapproval.

Commenter's Reason: We would move to reject this proposal based on the lack of overall coordination between flow rates, flow pressures and pipe diameters interacting with thermostatic and pressure control valves purposed for the prevention of thermal shock and scalding events. This patchwork of changes needs to be review by a committee of qualified plumbing engineers with the same level of accuracy as was used to originally create this table. There needs to be a much larger study of the plumbing system requirements before these changes can be understood.

P90-12

Final Action: AS AM AMPC____ D

P91-12
Table 604.4

Proposed Change as Submitted

Proponent: Edward R. Osann, Natural Resources Defense Council, representing self (eosann@ndrc.org); Harry Misuriello, American Council for an Energy-Efficient Economy, representing himself (misuriello@verizon.net)

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~~ 1.5 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~~ 2.0 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~~ 1.3 gallons per flushing cycle[c]

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. The effective flush volume for a dual-flush water closet is defined as the composite, average flush volume of two reduced flushes and one full flush.

Reason: The maximum flow rates and water consumption levels in the current Table 604.4 for water closets, urinals, shower heads, and lavatory faucets equate to nationwide standards enacted nearly 20 years ago. In December, 2010, the US Department of Energy determined that states were no longer preempted from adopting more stringent efficiency standards for these products. (*Federal Register*, Vol. 75, No. 245, December 22, 2010, p. 80289; this document is attached).

Today, fixtures and fittings that perform well at flush volumes and flow rates lower than the values currently shown in Table 604.4 are widely available. Since 2006, the establishment of the WaterSense voluntary labeling program for water efficient products and services by the Environmental Protection Agency has provided a framework for the recognition of products that are substantially more efficient than minimum federal requirements while maintaining full functionality and customer satisfaction. WaterSense criteria were established for tank-type toilets (1.28 gpf) in 2007; lavatory faucets (1.5 gpm @ 60 psi) in 2007; urinals (0.5 gpf) in 2009; and showerheads (2.0 gpm @ 80 psi) in 2010. Manufacturers have responded by bringing large numbers of models to market that meet or exceed WaterSense specifications. Based on the most recent reports by WaterSense partners, the following figures regarding the number of WaterSense labeled models available as of October 2011 indicate the widespread availability and commercial viability of plumbing products that are more efficient than the federal minimum standards shown in Table 604.4:

- Tank-type water closets 886 models from 60 brands
- Lavatory faucets and accessories 809 models from 86 brands
- Urinals
  - 47 models of fixtures from 9 brands
  - 41 models of valves from 4 brands
- Showerheads 402 models from 28 brands

With the pace of introduction of new models that meet WaterSense specifications, it is reasonable to expect that these figures will be substantially larger by 2015.

Improving the water efficiency of water closets, urinals, shower heads, and lavatory faucets in new construction will save building owners money and reduce the likelihood of municipal water and wastewater capacity constraints that can lead to moratoria on new connections.

NRDC estimates that nationwide adoption of the revised values in this proposal, effective 2016, can be expected to save:

- 243.1 million gallons of water per day by 2030;
- More than 2.8 billion kilowatt hours per year by 2030;
- More than 178 hundred million therms of natural gas per year by 2030; and
- Consumers will realize more than $2.18 billion dollars in reduced energy and water costs.

Cost Impact: While the costs of plumbing fixtures and fittings vary greatly due to style, trim, colors, and materials, the incremental cost of greater efficiency alone for products meeting the flush volumes and flow rates contained in this proposal is negligible. This code change proposal will not increase the cost of construction.

T604.4-P-OSANN

Public Hearing Results

Committee Action: Disapproved

Committee Reason: The committee believes that these changes are premature. More studies need to be done before a decision like this can be justified.

Assembly Action: None

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Edward Osann, Natural Resources Defense Council, representing self, requests Approval as Modified by this Public Comment.

Modify proposal 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	1.5 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 ~~2.0~~ gpm at 80 psi
Sink faucet	2.2 gpm at 60 psi
Urinal	0.5 gallon per flushing cycle
Water closet	1.6 ~~1.3~~ gallons per flushing cycle~~[c]~~

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. The effective flush volume for a dual-flush water closet is defined as the composite, average flush volume of two reduced flushes and one full flush. In public settings, the maximum water use of a dual flush toilet is based solely on its full flush operation, not an average of full and reduced volume flushes.~~

Commenter's Reason: The modifications recommended in this comment would remove the changes proposed in the original proposal regarding the maximum flush volume for toilets and the maximum flow rate for showerheads. Drain line carry studies are currently underway, but data on the efficacy of specific flush volumes for waste transport are unlikely to be completed in time for consideration at the final code action hearing in October. Committee action recommending rejection of P-71 and P-72 casts uncertainty over whether the code should reduce the maximum flow rate of showerheads, if not concurrently addressing the thermal protection afforded by shower valves. Nevertheless, the changes thus remaining from the original proposal – reducing the maximum flow rate for private lavatories from 2.2 to 1.5 gallons per minute and reducing the maximum flush volume for urinals from 1.0 gallons per flush to 0.5 gallons per flush – are widely attained by fixtures and fittings on the market today. If approved as modified by this comment, P91 will not increase construction costs, will save substantial amounts of water, save consumers money, and bolster the reliability of public water supplies.

P91-12
Final Action: AS AM AMPC____ D

P92-12
604.5

Proposed Change as Submitted

Proponent: Gary Klein, Affiliated International Management, LLC, representing self **(**gary@aim4sustainability.com)

Revise as follows:

604.5 Size of fixture supply. The minimum size of a fixture supply pipe shall be as shown in Table 604.5.The fixture supply pipe shall terminate not more than 30 inches (762 mm) from the point of connection to the fixture. A reduced size flexible water connector installed between the supply pipe and the fixture shall be of an *approved* type. The supply pipe shall extend to the floor or wall adjacent to the fixture. The minimum size of individual distribution lines utilized in gridded or parallel water distribution systems shall be as shown in Table 604.5.

Exceptions:

1. Where the developed length of a fixture supply pipe is 50 feet (15 240 mm) or less and the maximum fixture flow rate does not exceed 0.5 gpm (1.9 lpm), the minimum size of fixture supply pipe shall be 1/4 inch (6.4 mm).
2. Where the developed length of a fixture supply pipe is 50 feet (15 240 mm) or less and the maximum fixture flow rate does not exceed 1 gpm (3.8 lpm), the minimum size of fixture supply pipe shall be 5/16 inch (8 mm).
3. Where the developed length of a fixture supply pipe is 50 feet (15 240 mm) or less and the maximum fixture flow rate does not exceed 1.5 gpm (5.7 lpm), the minimum size of fixture supply pipe shall be 3/8 inch (9.5 mm).

Reason: The 2012 IGCC approved GEW 327 that contained a footnote to a table limiting the flow rate of hot or tempered water in small diameter piping (1/4, 5/16 and 3/8 inch) to 0.5, 1, and 1.5 gpm respectively. Putting a requirement in a footnote is not the best code language. The table also limited the length of these pipe diameters to 50 feet, or 50 feet of developed length, whichever is less (within the context of the 2012 IPC).

This proposal takes the requirement out of the footnote of a table and makes the flow rate and developed length requirements applicable to hot, tempered or cold-water distribution lines.

Why limit the maximum fixture flow rate when 1/4, 5/16 and 3/8 inch diameter piping is being used? The answer is that the flow rates were selected, using the Hazen-Williams formulas, to keep the velocity below 5 feet per second, which minimizes pressure drop, reduces noise and limits the rate of any internal corrosion. The same formulas were used to limit the pressure drop at these flow rates to not more than 5 psi in the 50 foot lengths of 1/4, 5/16 and 3/8 inch diameter piping.

Why limit the length of the small diameter tubing to 50 feet of developed length? The answer is that this restriction is necessary to correlate with the changes to Section 607.2 of the IPC that limited the distance between the source of hot or tempered water and the fixtures to no more than 50 feet of developed length. While this is particularly important in hot water supply piping, it is also a very reasonable restriction for cold water supply piping used for low flow rate fixtures. Pressure loss at lengths greater than 50 feet would be excessive and unacceptable, as would heat loss in the hot or tempered water supply piping. In addition, for the low flow rate fixtures used with the small diameter piping, limiting length to 50 feet reduces the time-to-tap and the amount of water wasted while waiting for hot or tempered water to arrive, thereby improving performance for the user as well as water and energy waste.

I urge your support for this proposal. Thank you.

Cost Impact: The code change proposal will not increase the cost of construction. In fact, if the smaller diameter piping becomes commonly used, it might decrease the costs of construction.

604.5-P-KLEIN

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The fitting inserts as well as the maximum velocities that haven't been shown could create hazards in the pipe and could be too small.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Gary Klein, Affiliated International Management, LLC, representing self, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

604.5 Size of fixture supply. The minimum size of a fixture supply pipe shall be as shown in Table 604.5.The fixture supply pipe shall terminate not more than 30 inches (762 mm) from the point of connection to the fixture. A reduced size flexible water connector installed between the supply pipe and the fixture shall be of an *approved* type. The supply pipe shall extend to the floor or wall adjacent to the fixture. The minimum size of individual distribution lines utilized in gridded or parallel water distribution systems shall be as shown in Table 604.5.

Exceptions:

1. Where the ~~developed length of a fixture supply pipe is 50 feet (15 240 mm) or less and the~~ maximum fixture flow rate does not exceed 0.5 gpm (1.9 lpm), the minimum size of fixture supply pipe shall be 1/4 inch (6.4 mm).
2. Where the ~~developed length of a fixture supply pipe is 50 feet (15 240 mm) or less and the~~ maximum fixture flow rate does not exceed 1 gpm (3.8 lpm), the minimum size of fixture supply pipe shall be 5/16 inch (8 mm).
3. Where the ~~developed length of a fixture supply pipe is 50 feet (15 240 mm) or less and the~~ maximum fixture flow rate does not exceed 1.5 gpm (5.7 lpm), the minimum size of fixture supply pipe shall be 3/8 inch (9.5 mm).

Commenter's Reason: The logic of the wording in the original proposal was incorrect. The 2012 IPC already requires that the distance between the source of hot water and the uses not exceed 50 feet of developed length, so it is not necessary to include it here. This comment corrects the logic.

The reason that the pipe diameters have been paired with flow rates is so that pressure drop due to friction and the velocity within the pipe can be kept within acceptable limits. The Hazen-Williams formula used by plumbing engineers to design water supply systems was used to calculate the pressure drop and velocity for each combination of flow rate and pipe diameter in the exception. Maximum flow rates were selected when the pressure drop was below 5 psi and the velocity was below 5 feet per second for each nominal pipe diameter. A safety factor was built into these numbers, as the flow rate shown is less than the calculated value.

This exception to the values in Table 604.5 has been proposed because it seems important to include provisions in the IPC for smaller diameter tubing and for lower flow rate devices.

I urge your support for these changes. Thank you for considering this comment.

P92-12

Final Action: AS AM AMPC____ D

P101-12
Table 605.5, Chapter 14

Proposed Change as Submitted

Proponent: Kevin Simko, Victaulic representing Victaulic (ksimko@victaulic.com)

Revise as follows:

TABLE 605.5
PIPE FITTINGS

MATERIALS	STANDARDS
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME 16.26; ASME B16.29<u>; ASTM B 75: ASTM B 152; ASTM B 584</u>
Gray iron and ductile iron	AWWA C110/A21.10; AWWA C153/A21.53<u>; ASTM A395; ASTM A 536; ASTM F 1476: ASTM F 1548</u>
Stainless steel (Type 304/304L)	ASTM A 312; ASTM A 778<u>; ASTM A 351; ASTM A403: ASTM A 743; ASTM A 744; ASTM A 890</u>
Stainless steel (Type 316/316L)	ASTM A 312; ASTM A 778<u>; ASTM A 351; ASTM A 403: ASTM A 743; ASTM A 744; ASTM A 890</u>
Steel	ASME B16.9; ASME B16.11; ASME B16.28<u>; ASTM A 53; ASTM A 106; ASTM A 234; ASTM A 395; ASTM A 536; ASTM F1476; ASTM F1548</u>

(Portions of table not shown remain unchanged.)

Add new standards to Chapter 14 as follows:

ASTM

<u>A106/A106M-11</u>	<u>Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service</u>
<u>A234/A234M-11a</u>	<u>Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service</u>
<u>A 351-10</u>	<u>Standard Specification for Castings, Austenitic, for Pressure-Containing Parts</u>
<u>A 395/A395M-99(2009)</u>	<u>Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures</u>
<u>A 403-11</u>	<u>Standard Specification for Wrought Austenitic Stainless Steel Piping Fittings</u>
<u>A 536-84(2009)</u>	<u>Standard Specification for Ductile Iron Castings</u>
<u>A 743/A743M-06(2010)</u>	<u>Standard Specification for Castings, Iron-Chromium, Iron-Chromium-Nickel, Corrosion Resistant, for General Application</u>
<u>A 744/A744M-10e1</u>	<u>Standard Specification for Castings, Iron-Chromium-Nickel, Corrosion Resistant, for Severe Service</u>
<u>A 890/A890M-10</u>	<u>Standard Specification for Castings, Iron-Chromium-Nickel-Molybdenum Corrosion-Resistant, Duplex (Austenitic/Ferritic) for General Application</u>
<u>B 584-11</u>	<u>Standard Specification for Copper Alloy Sand Castings for General Applications</u>
<u>F 1476-07</u>	<u>Standard Specification for Performance of Gasketed Mechanical Couplings for Use in Piping Applications</u>

<u>F1548-01(2006)</u>	<u>Standard Specification for the Performance of Fittings for Use with Gasketed Mechanical Couplings Used in Piping Applications</u>

Reason: The materials currently listed in Table 605.5 do not fully represent the materials being used for potable water systems in the industry. The code is overly-restrictive with regard to pipe materials and does not allow for the use of materials that offer improved mechanical and electrochemical properties compared with allowed materials. The additions of the standard materials will allows the use of high grade materials that provide improved performance. ,amy of these materials are also currently used in the International Mechanical Code and other piping codes.

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

T605.5-P-SIMKO

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Some of the proposed standards are inappropriate as they do not cover fittings but only cover the materials to make fittings (ASTM B 75, B 152 and the standards that cover castings). Some standards have non-mandatory language (ASTM A234, A395, A536).

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Kevin J. Simko, representing Victaulic, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

TABLE 605.5 PIPE FITTINGS

MATERIAL	STANDARD
Copper or copper alloy	ASSE 1061; ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME B16.26; ASME B16.29; ~~ASTM B 75; ASTM B 152; ASTM B 584~~ <u>ASTM F-1476; ASTM F-1548</u>
Gray iron and ductile iron	AWWA C110/A21.10; AWWA C153/A21.53; ~~ASTM A 395; ASTM A 536;~~ ASTM F-1476; ASTM F-1548
Stainless steel (Type 304/304L)	ASTM A 312; ASTM A 778; ~~ASTM A 351; ASTM A 403; ASTM A 743; ASTM A 744; ASTM A 890~~ <u>ASTM F-1476; ASTM F-1548</u>
Stainless steel (Type 316/316L)	ASTM A 312; ASTM A 778<u>;</u> ~~ASTM A 351; ASTM A 403; ASTM A 743; ASTM A 744; ASTM A 890~~ <u>ASTM F-1476; ASTM F-1548</u>
Steel Pipe	ASME B16.9; ASME B16.11; ASME B16.28; ~~ASTM A 53; ASTM A 106; ASTM A 234; ASTM A 395; ASTM A 536;~~ ASTM F-1476; ASTM F-1548

(Portions of proposal not shown remain unchanged)

Commenter's Reason: The standards listed in the table include a mix of actual fitting standards as well as a material specification for pipe (ASTM A-312). However, the standards currently listed in Table 605.5 do not fully represent the materials or products being used for potable water systems in the industry. The table does not address any standard for grooved mechanical joints or grooved fittings. The ASTM F-1476 and ASTM F-1548 standards outline these criteria. Grooved mechanical joints are currently being used for potable water systems and the addition of the ASTM F-1476 and ASTM F-1548 standards will provide a common criteria for grooved mechanical joints which are currently accepted for use by the code.

The goal here is to remove the material specifications originally proposed and replace them with two standards covering grooved mechanical joints.

No standards/specifications that were included in Table 605.5 in the 2012 IPC have been removed from the table.

Public Comment 2:

Jeremy Brown, representing NSF International, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

TABLE 605.5 PIPE FITTINGS

MATERIAL	STANDARD
Copper or copper alloy	ASSE 1061; ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME B16.26; ASME B16.29; ~~ASTM B 75; ASTM B 152; ASTM B 584~~ ASTM F-1476; ASTM F-1548
Gray iron and ductile iron	AWWA C110/A21.10; AWWA C153/A21.53; ~~ASTM A 395; ASTM A 536;~~ ASTM F-1476; ASTM F-1548
Stainless steel (Type 304/304L)	ASTM A 312; ASTM A 778; ~~ASTM A 351; ASTM A 403; ASTM A 743; ASTM A 744; ASTM A 890~~ ASTM F-1476; ASTM F-1548
Stainless steel (Type 316/316L)	ASTM A 312; ASTM A 778; ~~ASTM A 351; ASTM A 403; ASTM A 743; ASTM A 744; ASTM A 890~~ ASTM F-1476; ASTM F-1548
Steel Pipe	ASME B16.9; ASME B16.11; ASME B16.28; ~~ASTM A 53; ASTM A 106; ASTM A 234; ASTM A 395; ASTM A 536;~~ ASTM F-1476; ASTM F-1548

(Portions of proposal not shown remain unchanged)

Commenter's Reason: The code needs to address grooved mechanical joints and grooved fittings. The original proposal contained material standards (which don't normally get referenced in codes) and product standards. The proponent tried to fix this by a floor amendment in Dallas, but it was ruled out of order simply because of the amount of standards which needed to be removed from the proposal. ASTM F-1476 and ASTM F-1548 are the appropriate standards for reference in this section.

Since the ICC modification by public comment format can be confusing, let me clarify that in the end, only ASTM F1476 and ASTM F-1548 are being added to the existing code table. The strikeouts you see in the table above are being removed from the proposal only, and these standards were never in the previous code. In other words, no standards are being removed from the current code, this proposal only adds two new ones.

P101-12

Final Action: AS AM AMPC____ D

P103-12

605.14, 605.14.1, 605.14.2, 605.14.3, 605.14.4, 605.14.5, 605.14.6 (New), 605.14.7 (New), 605.14.8 (New), 605.15

Proposed Change as Submitted

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

Revise as follows:

605.14 Copper pipe and tubing. Joints between copper or copper-alloy pipe, tubing, and ~~or~~ fittings shall comply with Sections 605.14.1 through 605.14.~~5~~8.

605.14.1 Brazed joints. Brazed joints between copper pipe or tubing and fittings shall be made with a brazing alloy having a liquid temperature exceeding 1000˚F (538˚C). ~~All~~ Joint surfaces to be brazed shall be cleaned bright by manual or mechanical means. The ends of pipe or tubing shall be cut square and shall be reamed to the full inside diameter. Burrs on the outside end of the pipe or tubing shall be removed. Where required by the brazing alloy manufacturer's instructions, an approved brazing flux shall be applied to the joint surfaces. The joint shall be brazed with a brazing filler metal conforming to AWS A5.8. Brazing filler metal shall be applied at the point where the pipe or tubing enters the socket of the fitting.

605.14.2 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions. Mechanical joints shall include compression type, flanged type, grooved type and press type.

605.14.3 Soldered joints. Solder joints between copper pipe or tubing and fittings shall be made in accordance with the methods of ASTM B 828 with the following sequence of joint preparation and operation: measuring and cutting, reaming, cleaning, fluxing, assembly and support, heating, applying the solder, cooling and cleaning. ~~All cut~~ The ends of pipe or tub~~e~~ing shall be cut square and shall be reamed to the full inside diameter of the pipe or tub~~e~~ing. ~~end.~~ Burrs on the outside end of the pipe or tubing shall be removed. ~~All~~ Joint surfaces to be soldered shall be cleaned bright by manual or mechanical means. ~~A~~ Flux conforming to ASTM B 813 shall be applied to the pipe or tubing and fittings. Such flux shall be noncorrosive and nontoxic after soldering. ~~be applied.~~ Pipe or tubing shall be inserted to the base of the fitting. Excess flux shall be removed from the exterior of the joint. The assembled joint shall be supported to create a uniform capillary space around the joint. An LP gas or acetylene air /fuel torch shall be used to apply heat to the assembled joint. The heat shall be applied with the flame perpendicular to the pipe or tubing. The flame shall be moved alternately between the fitting cup and the pipe or tubing. Solder in compliance with ASTM B 32 shall be applied to the joint surfaces until capillary action draws the molten solder into the cup of the fitting. ~~The joint shall be soldered with a solder conforming to ASTM B 32.~~ The soldered joint shall not be disturbed until cool. Remaining flux residue shall be cleaned from the exterior of the joint.

605.14.4 Threaded joints. Threads shall conform to ASME B1.20.1. Pipe-joint compound or tape shall be applied on the male threads only.

605.14.5 Welded joints. ~~All~~ Welded joint surfaces shall be cleaned. The joint shall be welded with ~~an~~ *approved* filler metal.

605.14.6 Flared joints. Flared joints for water pipe shall be made by a tool designed for that operation.

605.14.7 Push-Connect joints. Removable and non-removable push fit fittings for copper tubing or pipe shall comply with ASSE 1061. Push fit fittings for copper pipe or tubing shall have an *approved* elastomeric O-ring that seals the joint. The end of pipe or tubing shall be cut square, chamfered and reamed to full inside diameter. The pipe or tubing shall be fully inserted into the fitting and the pipe or tubing shall be marked at the shoulder of the fitting. The fitting alignment shall be checked against the mark on the pipe or tubing to verify that the pipe or tubing is fully inserted into the fitting and the gripping mechanism has engaged on the pipe or tube.

605.14.8 Pressed-Connect joints. Pressed fittings for copper pipe or tubing shall have an elastomeric O-ring that seals the joint. The pipe or tubing shall be fully inserted into the fitting, and the pipe or tubing shall be marked at the shoulder of the fitting. Pressed fittings for copper pipe or tubing shall have an *approved* elastomeric O-ring that forms the joint. The ends of pipe or tubing shall be cut square, chamfered and reamed to full inside diameter. The fitting alignment shall be checked against the mark on the pipe or tubing to verify that the pipe or tubing is fully inserted into the fitting. The joint shall be pressed using the tool recommended by the manufacturer of the press fitting.

~~**605.15 Copper tubing.** Joints between copper or copper alloy tubing or fittings shall comply with Sections 605.15.1 through 605.15.4.~~

~~**605.15.1 Brazed joints.** Joint surfaces shall be cleaned. An *approved* flux shall be applied where required. The joint shall be brazed with a filler metal conforming to AWS A5.8.~~

~~**605.15.2 Flared joints.** Flared joints for water pipe shall be made by a tool designed for that operation.~~

~~**605.15.3 Mechanical joints.** Mechanical joints shall be installed in accordance with the manufacturer's instructions.~~

~~**605.15.4 Soldered joints.** Solder joints shall be made in accordance with the methods of ASTM B 828. All cut tube ends shall be reamed to the full inside diameter of the tube end. All joint surfaces shall be cleaned. A flux conforming to ASTM B 813 shall be applied. The joint shall be soldered with a solder conforming to ASTM B 32. The joining of water supply piping shall be made with lead-free solders and fluxes. "Lead free" shall mean a chemical composition equal to or less than 0.2-percent lead.~~

(Renumber subsequent sections)

Reason: The above language combines pipe and tubing into one section and provides the joining methods of copper and copper alloys as referenced in Table 605.5. In addition, important language from the standards has been added to aid the end user.

Cost Impact: This code change will not increase the cost of construction.

605.14-P-FEEHAN

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Manufacturer's guidelines are not enforceable as code language. The code official is not at the jobsite while joints are being made in order to verify that the steps indicated by the guidelines are being followed.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Pennie L. Feehan, Pennie L. Feehan Consulting, representing CDA – Copper Development Association, requests Approval as Modified by this Public Comment.

Replace proposal as follows:

605.12.1 Brazed joints. All joint surfaces shall be cleaned bright by manual or mechanical means. An approved flux shall be applied where required. The joint shall be brazed with ~~a~~ filler metals having a melting point range between 1,100°F (593°C) and 1500°F (815°C) conforming to AWS A5.8.

605.14.1 Brazed joints. All joint surfaces shall be cleaned bright by manual or mechanical means. An approved flux shall be applied where required. The joint shall be brazed with ~~a~~ filler metals having a melting point range between 1,100°F (593°C) and 1500°F (815°C) conforming to AWS A5.8.

605.14.3 Soldered joints. Solder joints shall be made in accordance with the methods of ASTM B 828. All ~~C~~cut tube ends shall be reamed to the full inside diameter of the tube end. All j~~J~~oint surfaces shall be cleaned bright by manual or mechanical means. ~~A f~~Flux conforming to ASTM B 813 shall be applied to all joint surfaces. The joint shall be soldered with a solder conforming to ASTM B 32. 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.

605.15.1 Brazed joints. Joint surfaces shall be cleaned bright by manual or mechanical means. An approved flux shall be applied where required. The joint shall be brazed with ~~a~~ filler metals having a melting point range between 1,100°F (593°C) and 1500°F (815°C) conforming to AWS A5.8.

605.15.4 Soldered joints. Solder joints shall be made in accordance with the methods of ASTM B 828. All cut tube ends shall be cut square and reamed to the full inside diameter of the tube end. All joint surfaces shall be cleaned bright by manual or mechanical means. ~~A f~~Flux conforming to ASTM B 813 shall be applied to all joint surfaces. The joint shall be soldered with a solder conforming to ASTM B 32. The joining of water supply piping shall be made with lead-free solders and fluxes. "Lead free" shall mean a chemical composition equal to or less than 0.2-percent lead.

Commenter's Reason: This proposal adds language that provides clear directions to the end user and provides uniformity with the IMC.

P103-12

Final Action: AS AM AMPC____ D

P107-12
605.16.2

Proposed Change as Submitted

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

Revise as follows:

605.16.2 Solvent cementing. Joint surfaces shall be clean and free from moisture~~,~~. Joints shall be made in accordance with the pipe manufacturer's installation instructions. Where such instructions require ~~and~~ that a~~n~~ ~~*approved*~~ primer be used, the primer shall be applied to the joint surfaces and a solvent cement, orange in color and conforming to ASTM F 493, shall be applied to the joint surfaces. Where such instructions allow for a one step solvent cement, yellow in color and conforming to ASTM F 493, to be used, the joint surfaces shall not require application of a primer before the solvent cement is applied. The joint shall be made while the cement is wet and in accordance with ASTM D 2846 or ASTM F 493. Solvent cemented joints shall be permitted above or below ground.

~~**Exception:** A primer is not required where all of the following conditions apply:~~

1. ~~The solvent cement used is third-party certified as conforming to ASTM F 493.~~
2. ~~The solvent cement used is yellow in color.~~
3. ~~The solvent cement is used only for joining ½ inch (12.7 mm) through 2 inch (51 mm) diameter CPVC pipe and fittings.~~
4. ~~The CPVC pipe and fittings are manufactured in accordance with ASTM D 2846.~~

Reason: This section is currently very convoluted. The requirements can be simplified by referencing the pipe manufacturer's installation instructions. The installation instructions are part of the listing which is required by the code. This will also recognize changes to the listing of the joining method, rather than requiring constant changing of this section.

The current requirements are incorrect since UL lists ASTM F442 for joining with one-step solvent cement. Furthermore, UL lists the joining for pipe up to 3 inch in diameter. Neither requirement is addressed in the current code text.

Cost Impact: This change does not increase the cost of construction.

605.16.2-P-BALLANCO

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed with the proponent's written reason statement. The revised language simplifies the code.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing self, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

605.16.2 Solvent cementing. Joint surfaces shall be clean and free from moisture. Joints shall be made in accordance with the pipe, fitting and solvent cement manufacturer's installation instructions. Where any of the ~~such~~ instructions require that a primer be used, the primer shall be applied to the joint surfaces and a solvent cement, orange in color and conforming to ASTM F 493, shall be applied to the joint surfaces. Where all of the ~~such~~ instructions allow for the use of a one step solvent cement, primer shall not be applied to the joint surfaces and a solvent cement, yellow or red in color and conforming to ASTM F 493, shall be applied to the joint surfaces. ~~to be used, the joint surfaces shall not require application of a primer before the solvent cement is applied.~~ The joint shall be made while the cement is wet and in accordance with ASTM D 2846 or ASTM F 493. Solvent cemented joints shall be permitted above or below ground.

Commenter's Reason: I submitted change P107 and P108. These were separate subject matters needing to be addressed individually. Since both changes were recommended for approval by the Plumbing Code Change Committee, I am submitting this comment to combine the requirements of the two changes. This will clarify how the coloring of the one step solvent cement applies. By approving this change, there is no need to correlate the two changes.

Public Comment 2:

Michael Cudahy, representing Plastic Pipe and Fittings Association (PPFA), requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

605.16.2 Solvent cementing. Joint surfaces shall be clean and free from moisture. Joints shall be made in accordance with the pipe and solvent cement manufacturer's installation instructions. Where any of the ~~such~~ instructions require that an *approved* primer be used, the primer shall be applied to the joint surfaces and a solvent cement, orange in color and conforming to ASTM F 493, shall be applied to the joint surfaces. Where all of the ~~such~~ instructions allow for a one step solvent cement, yellow in color and conforming to ASTM F 493, to be used, the joint surfaces shall not require application of a primer before the solvent cement is applied. The joint shall be made while the cement is wet and in accordance with ASTM D 2846 or ASTM F 493. Solvent cemented joints shall be permitted above or below ground.

Commenter's Reason: The pipe manufacturer's instructions may be lacking in some information. We recommend also following the solvent cement manufacturer's instructions. The revised wording requires that the more stringent of the instructions will apply.

P107-12
Final Action: AS AM AMPC____ D

P108-12
605.16.2

Proposed Change as Submitted

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

Revise as follows:

605.16.2 Solvent cementing. Joint surfaces shall be clean and free from moisture, and an approved primer shall be applied. Solvent cement, orange in color and conforming to ASTM F 493, shall be applied to joint surfaces. The joint shall be made while the cement is wet, and in accordance with ASTM D 2846 or ASTM F 493. Solvent cement joints shall be permitted above or below ground.

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

1. The solvent cement used is third-party certified as conforming to ASTM F 493.
2. The solvent cement used is yellow <u>or red</u> in color.
3. The solvent cement is used only for joining ½ inch (12.7 mm) through 2 inch (51 mm) diameter
   CPVC pipe and fittings.
4. The CPVC pipe and fittings are manufactured in accordance with ASTM D 2846 <u>or ASTM F442</u>.

Reason: ASTM F442 CPVC is used in sprinkler systems, as well as, plumbing systems. With the use of multipurpose piping systems in one and two family dwellings and townhouses, it has become common to see both ASTM F442 and ASTM D2846 pipe being installed. UL has listed ASTM F442 pipe for joining with one step solvent cement. However, UL requires the solvent cement to be red in color. The yellow and red one step solvent cement are the same, other than the color. This will allow the use of a single color solvent cement when doing a multipurpose residential sprinkler installation.

Cost Impact: This change does not increase the cost of construction.

605.16.2-P-BALLANCO

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed with the proponent's written reason statement.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Michael Cudahy, representing Plastic Pipe and Fittings Association (PPFA), requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

605.16.2 Solvent cementing. Joint surfaces shall be clean and free from moisture, and an approved primer shall be applied. Solvent cement, orange in color and conforming to ASTM F 493, shall be applied to joint surfaces. The joint shall be made while the cement is wet, and in accordance with ASTM D 2846 or ASTM F 493. Solvent cement joints shall be permitted above or below ground.

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

1. The pipe manufacturer's instructions allow for one step solvent cementing of joints.
~~1~~2. The solvent cement used ~~is third-party certified as~~ conform~~ing~~s to ASTM F 493.
~~2~~3. The solvent cement used is yellow or red in color.
~~3~~4. ~~The~~ Yellow-colored solvent cement is used for joining only 1/2 inch (12.7 mm) through 2 inch (51 mm) diameter ~~CPVC water distribution~~ pipe and fittings that comply with ASTM D 2846.
~~4. The CPVC pipe and fittings are manufactured in accordance with ASTM D 2846 or ASTM F442.~~

Commenter's Reason: The pipe manufacturer's instructions should be followed for one step cementing applicability as well as cement color. Yellow one-step is intended for use on CPVC CTS pipe, made to ASTM D 2846. Red one-step cement could be used as a transition on a multipurpose fire sprinkler and water distribution CPVC system.

P108-12
Final Action: AS AM AMPC____ D

P117 – 12
605.7.1 (New), Chapter 14

Proposed Change as Submitted

Proponent: Fred Constantino, American Society of Mechanical Engineers (ASME), representing the ASME A112 Plumbing Materials and Equipment Standards Committee.

Add new text as follows:

605.7.1 Quarter-turn shut-off valves. Manually operated, quarter-turn shut off valves, 2 inches (51mm) or less in size, shall conform to ASME A112.4.14.

Add new standard to Chapter 14 as follows:

ASME
A112.4.14–2004(R2010) Manually Operated, Quarter-Turn Shutoff Valves for Use in Plumbing Systems

Reason: ASME A112.4.14 Manually Operated, Quarter-Turn Shutoff Valves for Use in Plumbing Systems is a National standard (ANSI). These valves are intended for indoor installation as potable water shutoff valves between the meter and the supply stop. Valves governed by this Standard are intended for service at temperatures between 34°F (1°C) and 180°F (82°C), with an allowable working pressure rating not less than 125 psi (862 kPa).

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

Analysis: A review of the standard proposed for inclusion in the code, ASME A112.4.14-2004(R2010) 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, 2012.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed with the proponent's written reason statement.

Assembly Action: **Disapproved**

Individual Consideration Agenda

This code change proposal is on the agenda for individual consideration because the proposal received a successful assembly action of Disapproval.

P117-12
Final Action: AS AM AMPC____ D

P123-12
605.26 (New), Chapter 14

Proposed Change as Submitted

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Add new text as follows:

605.26 Brass fittings and brass valves for plastic piping systems. Where used as components of plastic piping systems and where made from copper alloys, brass fittings and brass valves shall comply with NSF14.

Reason: Dezincification of yellow brass piping components has become a real problem. There are 32,000 houses in Las Vegas that are being re-piped at a cost in excess of over $300 million due to dezincification of brass fittings in PEX domestic water systems. It is also occurring in other parts of the country (southern California and Hawaii to name just two). This also occurs in brass valves. 20 years ago Nibco had this problem when they started making brass valves in Taiwan. They figured out what they were doing wrong and it stopped. Now we have all these products being made abroad and the problem has come back times 10 or even 100.

The ASTM standards for these products allow several different alloys and since the codes are not specific as to which alloy to use for what, some manufacturers choose the least expensive one. Some of these alloys require more copper and allow less zinc (red brasses having the least amount of zinc) and other alloys require less copper and allow more zinc (yellow brasses). A poorly made yellow brass valve may be ok on a domestic water line in Chicago, or a drain line or air line or even a condenser water line in Las Vegas or San Diego. However, it will certainly fail in short order in a domestic water line in Las Vegas or San Diego or Honolulu. It is all about the local water and quality of the brass valve or PEX fitting. The brass valves and fittings that are failing meet the current codes. You can’t treat the water because people drink it. The only solution is to regulate better through the codes and local enforcement.

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 an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

Analysis: This code change proposal references NSF Standard 14, which is already referenced in the code. However, the proposed change to code text is written to correlate with a new edition of the standard NSF Standard 14-2010a, rather than the edition presently referenced in the code, which is the 2008e edition. The update to this standard will be considered by the Administrative Code Committee during the 2013 Code Development Cycle. Should this code change proposal be approved, but the update to the standard not be approved, the code text will revert to the text as it appears in the 2012 Edition of the Code.

605.26-P-STRAUSBAUGH.PMGCAC

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed with the proponent’s written reason statement.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing self, requests Disapproval.

Commenter's Reason: I would encourage the membership to vote against the motion to approve this change and vote to deny. NSF 14 is not a materials standard. This is unprecedented in the Plumbing Code. Never has there been a requirement added to a brass valve using a plastics standard. This would also result in a nightmare for inspectors.

Any brass valve installed when there is plastic pipe would require a listing to NSF 14. If the water distribution system is piped in copper tube and the faucet has PEX supply tubes, all of the valves would have to be listed to NSF 14. Yet, NSF 14 is a plastic certification standard, not a brass valve standard. For multipurpose piping systems, every residential sprinkler would have to be listed to NSF 14. That is ridiculous.

The justification given is dezincification. Yet, the CAC has not studied in depth the issue of dezincification the way many of us in the industry have. This is a knee jerk reaction to headlines, not a requirement based in technical fact.

The NSF 14 Committee added a dezincification test requirement to the standard. This is a major error made by the Committee. I have petitioned the NSF 14 Committee to remove this test from the standard. There is more technical support for the removal of this test requirement than there is to support such a test.

When the dezincification test was first proposed to NSF 14, the claim was that there needs to be some test since there are all these lawsuits regarding the matter. A lawsuit is not technical justification for adding a test requirement. Most claims made by the plaintiffs' attorney are wrong. We should not be adding requirements to the Plumbing Code to keep attorneys at bay.

NSF 14 should never have material requirements for copper alloys in the standard. The standard is a plastic standard. Yes, there are copper alloy components to plastic piping systems. However, the material requirements for copper alloys should be left to the committees responsible for that particular material. For many of the plastic products, that would be the ASTM standards. This is where a test requirement for copper alloy belongs, not NSF 14.

When dealing with metal components, it is a recognized fact that all metals in plumbing systems corrode. To think otherwise is foolishness. Copper alloys corrode, so does copper tube, so does galvanized steel, so does cast iron. In other words, corrosion is a part of life in the plumbing industry. What we attempt to do is reduce the rate of corrosion to extend the life of a product.

With metallic components, there are many ways to extend the life of the material. It often involves more than simply changing the formulation of the material. Heat treatment and cooling play an important role in developing a material that reduces the rate of corrosion. We have been using copper alloys, also known as yellow brasses, for more than 80 years in the plumbing industry. I might add - with much success. So, the question you need to ask is, "Why do we, all of the sudden, need a test on dezincification?"

ISO 6509 was developed after testing was conducted in Göteborg, Sweden. Water was circulated for 3-1/2 years at a temperature of 140 degrees F. The water used in the testing was Göteborg water. After the conclusion of this test, the researchers attempted to duplicate the same impact on brass in a 24 hour time period. In doing so, they did not develop any end point criteria. The researchers, however, suggested an end point criteria that, in their opinion, equated to 60 years of life. It should also be noted that the fittings being tested were already in service for a period of 4 years.

There are many problems with this research. There is no water in the United States or Canada that is of the same poor quality as that of Göteborg, Sweden in the 1970's when this research was conducted. Even today, Göteborg, Sweden has a poorer quality water than the water in the United States. So why should we use a test based on water that is not used in the United States?

The other problem with the requirement is the end point criteria. The engineering community in the United States has always used a time period of 30 years for longevity testing of construction products. Europe has used values of 50 years, 60 years, and 70 years. There is no engineering accuracy to these values. To choose a length of time of 60 years using Swedish water running continuously at 140 degrees F is ridiculous. Again, there is no technical basis for such a test requirement.

The researchers also assume a straight line rate of corrosion over the years. Research done by metallurgists over the last three years has proven this to be inaccurate. The rate of corrosion begins at one rate, than reduces. The corrosion rate occurs in a curve, not a straight line. Hence, the assumptions are again wrong by these researchers. Using their analysis, you would have a life of probably 250 years. That proves even more how ridiculous the end point criteria is that was chosen by the NSF 14 Committee.

ISO 6509 is only good for verifying that yellow brass corrodes by dezincification, which is technically de-alloying. That is somewhat of a "duh" statement. We already know the corrosion process. We don't have to prove it by a useless test.

Unfortunately, no one can equate ISO 6509 to performance in a plumbing system installed in the United States or Canada. That is because this has not been studied. All that has been done is analysis of what one "thinks" it equates to. That is not good enough to change a standard so significantly.

Another way to view this test requirement is to consider an equivalent test for galvanized steel products. Galvanized steel has a corrosion rate higher than copper alloy. If we had a galvanized steel equivalent corrosion test, there would be no galvanized steel permitted to be installed in plumbing systems. That does not make any sense. Similarly, the dezincification test does not make any sense.

Substantiation supporting the inclusion of a dezincification test should never be based on "I think it is a good idea" or "The attorneys think we should add this." There should be proper technical justification. There is none for the inclusion of ISO 6509 to NSF 14. If you review the ASME and ASTM standards on copper alloy, you will not find any requirement for a dezincification test using ISO 6509.

It was apparent that no testing was done on manufacturers' products prior to the inclusion of the dezincification test. Some recent tests proved how ineffective ISO 6509 is. To date, six manufacturers' PEX fittings were put through the ISO 6509 test for longer than 24 hours (the time required on the test). The dezincification ranged from 50 percent to 100 percent in the fittings. Yet the fittings passed the ASTM F877 test requirements. When brought to failure, the PEX tube failed, not the fittings.

Interestingly, NSF 14 assumes these fittings are not acceptable since they could not pass the dezincification test. How can we exclude perfectly acceptable fittings because of some made up testing of a certain grade of brass? This establishes a very poor precedence.

Before adding this test requirement to NSF 14, the Committee did not do any failure analysis of copper alloy in the United States and Canada. This is dangerous and often results in invalid tests being added to standards. There are billions of yellow brass fittings, faucets, valves, fixture fittings, and backflow preventers installed throughout the country. If yellow brass was such a problem, we would see millions of failures, not a handful, by comparison.

Unfortunately, the Plumbing Code Committee and the ICC membership has not been able to evaluate the alleged dezincification failures. I have for many projects. The vast majority of the failures were related to improper installation. This cannot be corrected by adding a dezincification test to the standard. It would appear that the NSF 14 Committee was completely unaware of this.

One manufacturer of yellow brass components for a particular adapter fitting could not pass the dezincification test. They conducted a survey of failures of that fitting. I should mention that they have manufactured thousands of those fittings over the last 35 years. They could not find one failure. Not one fitting was returned, not one fitting was identified as failing in the field. How can we make a perfectly good fitting unacceptable? What changed to make this fitting no longer permissible to install?

If there really was a problem, perhaps adding a test would be acceptable. But again, that test should be to the ASTM standards, not NSF 14. The dezincification test was added because of assumed problems with PEX fittings. However, it applies to any plastic piping component. The failure rate of PEX fittings manufactured by US manufacturers is insignificant. The failure rate of non-PEX products is nonexistent.

P123-12

Final Action: AS AM AMPC____ D

P126-12

202, 606.8 (New), 606.8.1 (New), 606.8.2 (New)

Proposed Change as Submitted

Proponent: Edward R. Osann, Natural Resources Defense Council, representing self (eosann@nrdc.org); Harry Misuriello, American Council for an Energy-Efficient Economy, representing himself (misuriello@verizon.net)

Add new definitions as follows:

WATER METER. A device that measures the volume of water supplied from a public water main to a building or to an irrigated landscape and that is used by a public water supplier to bill for water.

WATER SUB-METER. A device, other than a *water meter*, installed on a water distribution pipe or makeup water pipe that measures the volume of water supplied to a specified space or specified equipment within a building or at the building site.

Add new text as follows:

606.8 Water measurement required for multi-family residential occupancies. The volume of water supplied to buildings of R-2 residential occupancy or a mixed-use occupancy that includes an R-2 residential occupancy shall be measured as required by Sections 606.8.1 and 606.8.2.

606.8.1 Sub-meters for individual multi-family dwelling units. *Water sub-meters* shall be installed to measure the volume of water supplied to each dwelling unit. *Water sub-meters* shall be installed in accordance with the manufacturer's instructions. Where point of use *water sub-meters* capable of communicating water consumption data remotely are installed at every fixture within the dwelling unit, a dwelling unit *water sub-meter* shall not be required.

> **Exception**: *Water sub-meters* shall not be required for dormitories, fraternities, sororities, and boarding houses (non-transient).

606.8.2 Sub-meters for water features and landscaped areas. A *water sub-meter* shall be installed to measure the volume of water supplied to an outdoor water feature or to an automatically controlled irrigation system serving irrigated landscapes having a combined area exceeding 2,500 ft^2 (232 m^2). Such *water sub-meter* shall be installed in accordance with the manufacturer's instructions.

> **Exception:** A *water sub-meter* shall not be required for an irrigated landscape that is supplied through a *water meter* dedicated to the landscape irrigation system.

Reason: This proposal requires the installation of water sub-meters for individual units in newly constructed apartment buildings. Public water suppliers typically do not install meters of their own on water supply piping to individual units, and occupants typically pay for water and sewer service as part of their rent or condominium fee.

Sub-metering in new multi-family buildings, when used for allocating the cost of water and wastewater service to individual dwelling units, ensures that water users receive an appropriate signal regarding the volume and cost of their water use, and thus incentivizes residents to undertake responsible water use and prompt reporting of fixtures in need of repair. Sub-metering is also useful in identifying leakage or unintended use in unoccupied dwelling units within multifamily buildings.

The National Multiple Family Sub-metering and Allocation Study (2004), sponsored by the US EPA and thirteen public water suppliers in different parts of the country, demonstrated that sub-metering reduces indoor water consumption substantially, by about 16% or 7,960 gallons per household unit per year, as a mid-range estimate. Nationwide, an estimated 5.9 million additional households will be living in multifamily housing by 2030 compared with 2015 (US Energy Information Agency, *Annual Energy Outlook 2011*, Residential Sector Key Indicators and Consumption, Reference Case). If beginning in 2016 all new multifamily housing is equipped with sub-meters used for billing allocation, even a conservative savings estimate of 3,110 gallons per unit per year (the value at the lower bound of the confidence band of the 2004 National Study estimate) yields water savings of 388 million gallons per day by 2030. Additionally, the measurement of water used for landscape purposes and for outdoor water features, such as swimming pools, ornamental ponds, and fountains, is essential to the effective management and avoidance of waste in large landscape maintenance.

606.8-P-OSANN

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The requirement for meters and submeters is well above the code minimum for providing for health and safety of the buildings occupants. These requirements do not belong in the code.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Edward Osann, Natural Resources Defense Council, representing self, requests Approval as Submitted.

Commenter's Reason: The committee's action to disapprove this proposal was based on the assertion that submetering of new multi-family residential buildings provides no health and safety benefits for building occupants. To the contrary, submetering supports the early detection and repair of leaks and damaged fixtures which can contribute to hazardous and unsafe conditions such as mold growth, bathroom slip and fall, and ice accumulation. Submetering can accomplish this by a) alerting building managers to excessive use in individual units (occupied or unoccupied) that may be attributable to significant leakage that may go undetected or unreported until damage and unsafe conditions extends to multiple dwelling units or common areas; and, b) providing a financial incentive to building residents to more promptly report damaged or leaking fixtures and fittings to management for timely repair before hazardous conditions emerge. Additionally, the enormous estimated water savings attributable to submetering in new multi-family buildings – 388 million gallons per day nationwide by 2030 (undisputed by the committee) – is significant enough to enhance the reliability of public water supplies and the avoidance of water service curtailments.

P126-12

Final Action: AS AM AMPC____ D

P128-12
607.2, 607.2.1 (New), Table 605.2.1 (New)

Proposed Change as Submitted

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

607.2 Hot or tempered water supply to fixtures. The piping ~~developed length of hot or tempered water piping~~, from the source of hot water to the fixture ~~that require hot or tempered water,~~ shall ~~not exceed~~ <u>contain</u> not more than <u>75 fluid ounces</u> of water <u>and shall be not more than</u> 50 feet (15 240 mm) <u>in length</u>. Recirculating system piping and heat-traced piping shall be considered to be sources of hot or tempered water.

<u>**607.2.1**</u> <u>**Pipe volumes.**</u> <u>Table 605.2.1 shall be used to determine the water volume in piping.</u>

<u>**TABLE 605.2.1**</u>
<u>**PIPING VOLUME**</u>

<u>Size Nominal, Inch</u>	<u>Copper Type M</u>	<u>Copper Type L</u>	<u>Copper Type K</u>	<u>CPVC CTS SDR 11</u>	<u>CPVC SCH 40</u>	<u>CPVC SCH 80</u>	<u>PE-RT SDR 9</u>	<u>Composite ASTM F 1281</u>	<u>PEX CTS SDR 9</u>
<u>FLUID OUNCES OF WATER PER FOOT OF TUBE</u>									
<u>3/8”</u>	<u>1.06</u>	<u>0.97</u>	<u>0.84</u>	<u>N/A</u>	<u>1.17</u>	<u>N/A</u>	<u>0.64</u>	<u>0.63</u>	<u>0.64</u>
<u>1/2”</u>	<u>1.69</u>	<u>1.55</u>	<u>1.45</u>	<u>1.25</u>	<u>1.89</u>	<u>1.46</u>	<u>1.18</u>	<u>1.31</u>	<u>1.18</u>
<u>3/4”</u>	<u>3.43</u>	<u>3.22</u>	<u>2.90</u>	<u>2.67</u>	<u>3.38</u>	<u>2.74</u>	<u>2.35</u>	<u>3.39</u>	<u>2.35</u>
<u>1”</u>	<u>5.81</u>	<u>5.49</u>	<u>5.17</u>	<u>4.43</u>	<u>5.53</u>	<u>4.57</u>	<u>3.91</u>	<u>5.56</u>	<u>3.91</u>
<u>1 1/4</u>	<u>8.70</u>	<u>8.36</u>	<u>8.09</u>	<u>6.61</u>	<u>9.66</u>	<u>8.24</u>	<u>5.81</u>	<u>8.49</u>	<u>5.81</u>
<u>1 1/2</u>	<u>12.18</u>	<u>11.83</u>	<u>11.45</u>	<u>9.22</u>	<u>13.20</u>	<u>11.38</u>	<u>8.09</u>	<u>13.88</u>	<u>8.09</u>
<u>2”</u>	<u>21.08</u>	<u>20.58</u>	<u>20.04</u>	<u>15.79</u>	<u>21.88</u>	<u>19.11</u>	<u>13.86</u>	<u>21.48</u>	<u>13.86</u>

Reason: 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 an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

The 2012 IPC limits the run of hot water lines in Section 607.2 to 50’. The IgCC, however, limits hot water line length based on the volume in the pipe, therefore the maximum length is different for different sizes of pipe. The IPC should be revised to better correspond with the IgCC and provisions for recirculation systems should be updated to include demand-based recirculation. This method of reducing water waste is much more accurate than simply stated a “catch-all” maximum length.

Cost Impact: None

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee thought that the 75 fluid ounces limitation was too restrictive and unrealistic to apply to all buildings.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Shawn Strausbaugh, Arlington County, VA, representing International Code Council Plumbing, Mechanical, and Fuel Gas Code Action Committee (ICC PMG CAC), requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

607.2 Hot or tempered water supply to fixtures. The piping developed length of hot or tempered water piping, from the source of hot water to the fixture that requires hot or tempered water, shall not exceed contain not more than ~~75~~ 300 fluid ounces of water and shall be not more than 50 feet (15 240 mm) in length. Recirculating system piping and heat-traced piping shall be considered to be sources of hot or tempered water.

607.2.1 Pipe volumes. Table 60~~5~~7.2.1 shall be used to determine the water volume in piping.

TABLE 60~~5~~7.2.1
PIPING VOLUME

Size Nominal, Inch	TYPE OF PIPING								
	Copper Type M	Copper Type L	Copper Type K	CPVC CTS SDR 11	CPVC SCH 40	CPVC SCH 80	PE-RT SDR 9	Composite ASTM F 1281	PEX CTS SDR 9
	FLUID OUNCES OF WATER PER FOOT OF TUBE								
3/8	1.06	0.97	0.84	N/A	1.17	N/A	0.64	0.63	0.64
1/2	1.69	1.55	1.45	1.25	1.89	1.46	1.18	1.31	1.18
3/4	3.43	3.22	2.90	2.67	3.38	2.74	2.35	3.39	2.35
1	5.81	5.49	5.17	4.43	5.53	4.57	3.91	5.56	3.91
1 1/4	8.70	8.36	8.09	6.61	9.66	8.24	5.81	8.49	5.81
1 1/2	12.18	11.83	11.45	9.22	13.20	11.38	8.09	13.88	8.09
2	21.08	20.58	20.04	15.79	21.88	19.11	13.86	21.48	13.86

Commenter's Reason: The committee thought that the 75 fluid ounces limitation was too restrictive and unrealistic to apply to all buildings. Increasing the limit to 300 fluid ounces would allow for 50 feet of all one-inch pipe. The table number was incorrect in the original submission and is now corrected. The heading "TYPE OF PIPING" was added to the table for clarity.

Public Comment 2:

Michael Cudahy, representing Plastic Pipe and Fittings Association (PPFA), requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

607.2 Hot or tempered water supply to fixtures. The piping developed length of hot or tempered water piping, from the source of hot water to the fixture that requires hot or tempered water, shall not exceed contain not more than ~~75~~ 300 fluid ounces of water and shall be not more than 50 feet (15 240 mm) in length. Recirculating system piping and heat-traced piping shall be considered to be sources of hot or tempered water.

607.2.1 Pipe volumes. Table 60~~5~~7.2.1(1) or Table 607.2.1(2) shall be used to determine the water volume in piping.

TABLE 60~~5~~7.2.1(1)
PIPING VOLUME

Size Nominal, Inch	TYPE OF PIPING								
	Copper Type M	Copper Type L	Copper Type K	CPVC CTS SDR 11	CPVC SCH 40	CPVC SCH 80	PE-RT SDR 9	Composite ASTM F 1281	PEX CTS SDR 9
	FLUID OUNCES OF WATER PER FOOT OF TUBE								
3/8	1.06	0.97	0.84	N/A	1.17	N/A	0.64	0.63	0.64
1/2	1.69	1.55	1.45	1.25	1.89	1.46	1.18	1.31	1.18
3/4	3.43	3.22	2.90	2.67	3.38	2.74	2.35	3.39	2.35
1	5.81	5.49	5.17	4.43	5.53	4.57	3.91	5.56	3.91
1 1/4	8.70	8.36	8.09	6.61	9.66	8.24	5.81	8.49	5.81
1 1/2	12.18	11.83	11.45	9.22	13.20	11.38	8.09	13.88	8.09
2	21.08	20.58	20.04	15.79	21.88	19.11	13.86	21.48	13.86

TABLE 605.2.1(2)
AVERAGE PIPING VOLUME AND MAXIMUM PIPING LENGTH

NOMINAL PIPE SIZE (inch)	VOLUME (liquid ounces per foot of length)	MAXIMUM PIPE LENGTH (feet)
¼ [a]	0.33	50
5/16 [b]	0.5	50
3/8 [c]	0.75	50
1/2	1.5	50
5/8	2	50
3/4	3	50
7/8	4	50

NOMINAL PIPE SIZE (inch)	VOLUME (liquid ounces per foot of length)	MAXIMUM PIPE LENGTH (feet)
1	5	50
1 1/4	8	38
1 1/2	11	27
2	18	17

a. Flow rate shall not exceed 0.5 gpm.
b. Flow rate shall not exceed 1.0 gpm
c. Flow rate shall not exceed 1.5 gpm

Commenter's Reason: Based upon the committee's response that 75 ounces was too restrictive, I am proposing 300 ounces as this is the volume of 50 feet of an average 1 inch pipe. This is much less restrictive than 75 ounces. If a jurisdiction wishes to conserve additional hot water energy and reduction of potable water waste, they will adopt the IgCC where the volume limitation is 75 ounces. But for the IPC, a reasonable volume limit of 300 ounces provides a lot of design flexibility while preventing an unintended situation like 50 feet of 2 inch plus piping from being installed without consideration.

Table 607.2.1(1) provides volumes for specific types of piping for calculating the exact volume of hot water from the source to the fixture. Table 607.2.1 (2), which was proposed by Gary Klein, is being added to provide an alternative to volume calculation that does not require knowledge of the exact type of piping to be used. It is not necessary to be exact about the volume calculation as the volume limitation is arbitrary. The point is to provide some restriction on the volume of water that could be wasted while waiting for hot water to arrive at the fixture.

Also, with Gary Klein's suggestion, I have added footnotes to Table 607.2.1(2) to deal with pressure drop in smaller sized tubing.

P128-12

Final Action: AS AM AMPC____ D

P129-12
607.2.2 (New), 607.2.2.1(New), 607.2.2.2 (New)

Proposed Change as Submitted

Proponent: Gary Klein, Affiliated International Management, LLC, representing self

Add new text as follows:

607.2.2 Hot or tempered water recirculation systems. Hot or tempered water recirculation systems shall be provided with a recirculation pump. Gravity and thermo-syphon circulation systems shall be prohibited. Recirculation system pump controls shall comply with Sections 607.2.2.1 and 607.2.2.

607.2.2.1 Recirculating pump controls. Recirculating pump controls that allow timer-activated, water temperature-activated or continuous operation of the pump shall be prohibited. Recirculating pumps shall be demand activated by one of the following means:

1. A switch operated by the user of the fixture.
2. A motion sensor triggered by the presence of the user of the fixture.
3. A flow switch activated by the flow of hot water at a fixture.
4. A door switch activated by the door to the room containing hot water-supplied fixtures.
5. A voice activated command.

After the pump starts, the controls shall allow the pump to operate until the water temperature in the return pipe rises not more than 10ºF (5.6 ºC) above the initial temperature of the water in the pipe. The controls shall not allow the pump to operate when the temperature in the pipe exceeds 102ºF (38.9 ºC). Controls shall limit pump operation to not more than 5 minutes for each activation in the event that both means of shutting off the pump have failed.

607.2.2.2 Control manufacturer instructions . The manufacturer of the controls for the recirculation pump shall provide installation and operation instructions that provide details of the operation of the controls. Such instructions shall be available at the jobsite for inspection by the code official.

(Renumber subsequent section)

Reason:
1. This proposal was approved on consent at the 2012 IgCC Final Action Hearing in Phoenix. The wording in this proposal has the same content and has been modified for better correlation with the IPC. The description of the allowable pump control – on demand – has been drawn from the definition of Demand Recirculation Water System in the 2012 IECC.
2. Circulation systems with demand controlled pumps are significantly more energy efficient than any other type of hot water circulation system. The table below shows the relative energy consumption for all types of circulating systems covered in this section. The annual energy needed to keep the loop hot with water heated electrically or with natural gas are shown separately from the energy needed for the pump. The majority of the energy is lost in keeping the water in the loop at the desired temperature (all of it if there is a gravity loop). Two lengths of circulation loop are analyzed: 100 feet and 200 feet. The costs and savings remain proportional as the length of the circulation loop and the flow rate of the pump increase. Savings from demand controlled pumping systems have been documented by the Southern California Gas Company, which is now running an energy efficiency program that supports their installation.

Annual Energy Required for Operating Circulation Systems

		Recirculation						Demand Controlled Priming	
		Daily Hours of Operation							
		24	12	8	6	4	2		
1	**Small Hot Water System: Trunk, Branch, and Twig**								
	Loop Heat Losses							**Loop Heat Losses**	
	Natural Gas (therms)	292	146	97	73	49	24	Natural Gas (therms)	3
	Electric (kWh)	6,388	3,194	2,129	1,597	1,065	532	Electric (kWh)	67
	Pump Energy(kWh)	438	219	146	110	73	37	**Pump Energy(kWh)**	8
2	**Medium Hot Water System: Trunk, Branch, and Twig**								
	Loop Heat Losses							**Loop Heat Losses**	
	Natural Gas (therms)	584	292	195	146	97	49	Natural Gas (therms)	6
	Electric (kWh)	12,775	6,388	4,258	3,194	2,129	1,065	Electric (kWh)	133
	Pump Energy(kWh)	438	219	146	110	73	37	**Pump Energy(kWh)**	16

3. The IPC requires that the hot water piping in automatic temperature maintenance systems be insulated with at least 1 inch of pipe insulation. The water in the circulation loop will stay hot for a very long time – 45 minutes for ¾ inch nominal pipe up to 2 hours for 2-inch nominal pipe – if the circulating pump is shut off.
4. If this is the case, why run the pump? Why run the pump when no one is in the building or when no one is demanding hot water? The only time it makes sense to run the pump is shortly before hot water is needed: hence the requirement that the pump be controlled on-demand by one of the mechanisms in the section.

Thank you for considering this proposal.

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

607.2.2 (NEW)-P-KLEIN

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee thought the requirements were overly restrictive and confusing. This material is more appropriate for the IgCC.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Gary Klein, Affiliated International Management, LLC, representing self, requests Approval as Modified by this Public Comment.

Replace proposal as follows:

607.2.2 Hot or tempered water recirculation systems. Hot or tempered water recirculation systems shall be provided with a recirculation pump. Gravity and thermo-syphon circulation systems shall be prohibited. Recirculation pumps, recirculation pump controls and temperature sensors for recirculation pump controls shall be provided with access. Recirculation system pump controls shall be in accordance with Section 607.2.2.1 or Section 607.2.2.2.

607.2.2.1 Demand activated pump controls. Demand activated recirculation pump controls shall be provided. Such controls shall start the pump upon sensing the presence of a user of a fixture or appliance, receiving a signal from the action of an action of a user of a fixture or appliance or sensing the flow of hot or tempered water to a fixture or appliance. The controls shall limit the water temperature increase in the return water piping to not more than 10ºF (5.6 ºC) greater than the initial temperature of the water in the return pipe and shall limit the return water temperature to 102ºF (38.9 ºC).

607.2.2.2 Combined timer and water-temperature pump controls. Combined timer and water-temperature activated recirculation pump controls shall be provided. Such controls shall operate the pump not more than 15 minutes in any hour and shall prevent operation of the pump when the temperature set point is reached.

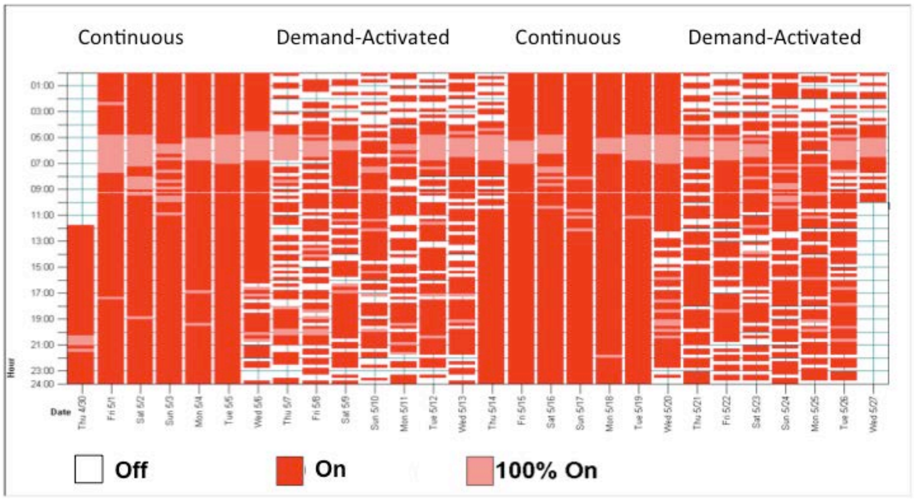
Commenter's Reason: The committee disapproved the original proposal because they "thought the requirements were overly restrictive and confusing." In order to be less restrictive, this comment revises the proposal to include an additional means of controlling recirculation pumps. In order to be less confusing, this comment simplifies the text describing demand activated recirculation pump controls, making it more performance based and less prescriptive.

The additional method of controlling circulation pumps is based on taking advantage of the fact that the IPC requires that recirculation piping be insulated. As discussed in the original reason statement, pipe insulation slows down the rate at which the water in the pipes cools down so that it is not necessary to run the pump continuously to maintain acceptable water temperatures in the loop. The requirements limiting pump operation to not more than 15 minutes in any hour will result in the pump running a maximum of 6 hours a day. Combining the timer with a water-temperature activated control will reduce the run time roughly 50 percent. In many cases the total hours of operation can be reduced still further by setting the timer to more closely match the building's operation schedule. Running the pump significantly fewer hours each day will also reduce the likelihood and rate of internal corrosion of the pipe. It will also reduce wear and tear on the water heater or boiler by reducing their run-time. Both of these factors will increase longevity of the system and reduce operational costs.

Figure 1 shows the differences in run-time at the water heater (or boiler) between a continuously pumped recirculation loop and one that has a demand activated recirculation pump control. The test results come from studies done by Southern California Gas Company on multi-family buildings with central water heaters and recirculation systems. Most systems tested were built before insulation was required on hot water recirculation loops. White means the water heater or boiler was off. Red means some percent of run-time between zero and continuous. Pink means the water heater or boiler was running continuously.

A recirculation pump with a combined timer and water-temperature activated recirculation pump control will have run-times between these two extremes.

Figure 1 Run-time of Water Heater (or Boiler) with Two Different Pump Controls



I urge your support for these changes. Thank you for considering this comment.

P129-12

Final Action: AS AM AMPC____ D

P130-12

607.2.3 (New), 607.2.3.1 (New), 607.2.3.2 (New), 607.2.3.2.1 (New), 607.2..3.2.2 (New), Table 607.2.3.1 (New)

Proposed Change as Submitted

Proponent: Gary Klein, Affiliated International Management, LLC, representing self (gary@aim4sustainability.com); Janine Snyder, Colorado Code Consulting, LLC representing self (janinesnyder@yahoo.com)

Add new text as follows:

607.2.3 Efficient hot and tempered water supply piping. Hot and tempered water supply piping shall comply with either the maximum allowable pipe length or maximum allowable pipe volume methods in this section.

607.2.3.1 Maximum allowable pipe length method. The maximum allowable pipe length from the source of hot or tempered water to the termination of the fixture supply pipe shall be in accordance with the maximum pipe length columns in Table 607.2.3.1. Where the length contains more than one size of pipe, the largest size pipe shall be used for determining the maximum allowable length of the pipe in Table 607.2.3.1.

607.2.3.2 Maximum allowable pipe volume method. The water volume in the piping shall be calculated in accordance with Section 607.2.3.3. The maximum volume of hot or tempered water in the piping to public lavatory faucets, metering or non-metering, shall be 2 ounces (0.06 L). For other fixtures the maximum volume shall be 64 ounces (1.89 L) for hot or tempered water from a water heater or boiler; and 24 ounces (0.7 L) for hot or tempered water from recirculating system or heat-traced piping.

607.2.3.2.1 Water volume determination. The volume shall be the sum of the internal volumes of pipe, fittings, valves, meters and manifolds between the source of hot water and the termination of the fixture supply pipe. The volume shall be determined from the liquid ounces per foot column of Table 607.2.3.1. The volume contained within fixture shut off valves, flexible water supply connectors to a fixture fitting or within a fixture fitting shall not be included in the water volume determination. Where hot or tempered water is supplied by recirculating system or heat-traced piping, the volume shall include the portion of the fitting on the source pipe that supplies water to the fixture.

607.2.3.3 Maximum flow rate. The flow rate of fixtures shall be limited to 0.5 gpm where connected to 1/4 inch piping; to 1 gpm where connected to 5/16 inch piping; and to 1.5 gpm where connected to 3/8 inch piping.

TABLE 607.2.3.1
MAXIMUM LENGTH OF PIPE

NOMINAL PIPE SIZE (INCH)	LIQUID OUNCES PER FOOT OF LENGTH	MAXIMUM PIPE LENGTH		
		SYSTEM WITHOUT A CIRCULATION LOOP OR HEAT TRACED LINE (FEET)	SYSTEM WITH A CIRCULATION LOOP OR HEAT TRACED LINE (FEET)	LAVATORY FAUCETS—PUBLIC (METERING AND NON-METERING) (FEET)
1/4	0.33	50	16	6
5/16	0.5	50	16	4
3/8	0.75	50	16	3
1/2	1.5	43	16	2

NOMINAL PIPE SIZE (INCH)	LIQUID OUNCES PER FOOT OF LENGTH	MAXIMUM PIPE LENGTH		
		SYSTEM WITHOUT A CIRCULATION LOOP OR HEAT TRACED LINE (FEET)	SYSTEM WITH A CIRCULATION LOOP OR HEAT TRACED LINE (FEET)	LAVATORY FAUCETS—PUBLIC (METERING AND NON-METERING) (FEET)
5/8	2	32	12	1
3/4	3	21	8	0.5
7/8	4	16	6	0.5
1	5	13	5	0.5
1 ¼	8	8	3	0.5
1 ½	11	6	2	0.5
2 or larger	18	4	1	0.5

Reason:

1. The 2012 IPC reduced the allowable distance from the source of hot or tempered water to the fixtures from100 to 50 feet. This was an excellent change. However, limiting the length did not get at the real issue, which is the volume from the source to the use, Limiting volume has the effect of limiting pressure losses due to length, reducing the time it takes for hot water to arrive (time-to-tap) and reducing the amount of water wasted while waiting for the hot water (volume-to-hot). Limiting the volume in the hot water supply system piping also has the effect of reducing the energy losses during use and when the water in the pipes eventually cools down.
2. This proposal builds on the 2012 IPC by limiting the volume, while staying within the 50 foot developed length restriction, which is the intent of the proponents.
   a. It is possible for a single pipe to be installed 50 feet long with no fittings in between the source and the fixture; in that case the developed length is the same as the actual length.
   b. When fittings and valves are needed, which is likely, the actual length may need to be reduced to accommodate the extra pressure drop. This is most likely to be necessary for nominal ¼, 5/16 and 3/8 inch pipe in hot water supplies without recirculation system or heat-traced piping, however, it may also be necessary for other diameters too if the fittings and valves create significant restrictions to flow.
3. The core of this proposal was approved at the 2012 IGCC Final Action Hearing in Phoenix. The wording has been revised so that it fits within context of Section 607.2 of the IPC. The footnote has been removed so that the language could be more appropriately worded as a requirement.
   a. The proposal that was approved at the IGCC FAH was revised from the original wording in IGCC Public Version 2. Improvements include clarifying the distinctions between two types of hot water supply systems; those with a recirculation system or heat traced trunk line and those without and providing for a means of compliance without it being necessary to calculate the volume for most applications. This makes it easier for everyone involved.
   b. The table in PV 2 contained ounces per foot of different types of hot or tempered water piping. Based on recommendations from several code officials around the country, the table was revised to
      I Simplify the calculations, when necessary, by averaging the volumes for the different types of piping for each nominal pipe diameter and then rounding off to a simple to use and easy to remember number. The volumes that were averaged were taken from the table in PV 2 and are also contained in Table E 202.1 of the IPC. The revised table is now applicable to all piping materials approved now or in the future for use with hot or tempered water.
      II Include 1/4, 5/16, 5/8 and 7/8 inch nominal diameters. Piping materials are available in these diameters, although they are not widely used. Including them in this table provides values that will enable their use.
      III Limit the maximum fixture flow rate when 1/4, 5/16 and 3/8 inch diameter piping is being used (Section 607.2.3.3). The flow rates in the footnote were selected, using the Hazen-Williams formulas, to keep the velocity below 5 feet per second, which minimizes pressure drop, reduces noise and limits the rate of any internal corrosion. The same formulas were used to limit the pressure drop at these flow rates to no more than 5 psi in the 50 foot lengths of 1/4, 5/16 and 3/8 inch diameter piping; the pressure drop will be much less in the shorter lengths in the other columns.
      IV Limit the length of the small diameter tubing (1/4 – 1/2 inch inclusive) at 50 feet in hot water supply piping without recirculation systems or heat-traced lines. This correlates with the changes adopted in the 2012 IPC. Another reason for not using the 64-ounce volume allowance in small tubing is that otherwise the maximum length of 5/16 inch tubing could be 128 feet and 1/4 inch tubing could be 192 feet! Pressure loss at these lengths would be excessive and unacceptable, as would heat loss. In addition, limiting length to 50 feet reduces the time-to-tap and the amount of water wasted while waiting for hot water to arrive, thereby improving performance for the user as well as water and energy waste.
      V Limit the length of the small diameter tubing (1/4 – 1/2 inch inclusive) at 16 feet in hot water supply piping with recirculation systems or heat-traced lines. The purpose of the circulation loop or heat-traced line is to bring the source of hot water close (in volume) to the fixtures, thereby reducing the time-to-tap and the waste of water and energy. Given typical floor-to-ceiling heights in the occupancies covered by this code, it is possible to reach the angle stop of a lavatory or a tub-shower valve with 16 feet of pipe coming down the wall from a recirculation system in the ceiling. Additionally, limiting the length of the smaller diameter tubing will improve the time-to-tap for the lower flow rate fixtures the tubing is intended to serve.

VI Limit the length serving lavatory faucets – public (metering and non-metering) in all hot water supply systems. These are the faucets where we wait a very long time for hot water to arrive – or we give up! Lavatory faucets are generally used for very short periods of time and hot water needs to arrive very quickly for it to be useful. Since the flow rates are so low, it is critical that there be very little volume between the source of hot water and these faucets. I know that 2 ounces, and the corresponding feet are <u>very</u> small, but if we do this, hot water will arrive in less than 5 seconds after we turn on the faucet. And, there are several cost effective, energy efficient ways to meet this requirement.

VII It is the intent of the proponents that either the maximum allowable volume or maximum allowable length method be allowed in any occupancy.

VII It is also the intent of the proponents that the contents of this section apply to all occupancies.

4. Adopting this proposal will improve the performance of hot water distribution systems by:
   a. Helping to ensure that the pressure drop from the source of hot water to the fixtures is not excessive.
   b. Reducing the time it takes to get hot water after opening a tap. This is particularly important for lavatory faucets-public, which, in accordance with Federal law that has been in effect since the mid-1990s, are required to have flow rates no larger than 0.5 gallons per minute (non-metering) or 0.25 gallons per cycle (metering).
   c. Reducing the waste of water while waiting for hot water to arrive.
   d. Reducing the energy losses during delivery, use and cool down phases of all hot water events.
5. We urge your support for this proposal. Thank you.

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

The 2012 IPC limits the distance from the source of hot water to the use to no more than 50 feet of developed length. There is no limit on the volume in this length of pipe. (By way of reference, the 2009 IPC had a limit of 100 feet and no limit on the volume, so the 2012 IPC is an improvement over 2009.)

This code change minimizes the volume in the piping between the source of hot water and the uses. It has the effect of eliminating long, large volume pipe runs resulting in sizable material and labor savings.

In most cases, reducing the volume between the sources of hot water and the fixtures will reduce costs. There are generally many more branches, and particularly fixture branches, than there are trunk lines, recirculation system or heat-traced piping in a building. Getting the source closer to the use reduces the number of feet in each of these branches and it will also reduce the diameter: both of these reduce costs of the hot water supply piping as well as any insulation that is required. In some cases it will be necessary to increase the length of the trunk or recirculation system piping to get closer to the fixtures. In others the architect and engineers will decide to locate the hot water uses more centrally: this will reduce the costs of the hot water, the cold water, the drain lines and any required insulation too!

There are two primary cases to be considered: (1) when the source of hot water is a water heater or boiler and (2) when the source of hot water is recirculation system or heat-traced piping.

Assuming that there is a bathroom group at the end of the 50 feet of length, it would be very common to see a 1-inch pipe, either from a water heater or from a circulation loop in any occupancy. This pipe contains approximately 2 gallons. In order for hot water to get to the bathroom group a minimum of 2 gallons will run down the drain before the hot water arrives. In practice, we observe 3-4 gallons will run down the drain. (If the pipe were 3/4-inch nominal, the volume would be closer to 1.25 gallons and the typical waste would range from 1.25 to 2.5 gallons. However, if someone decided to use a 1.5-inch branch line to the bathroom group, the volume in the pipe would be more than 4.25 gallons and the waste would range from 4.25 to more than 8 gallons.)

Based on the above example, it is reasonable to assume that the amount of water currently wasted while waiting for hot water to arrive ranges from 1 gallon (128 ounces) to more than 4 gallons (512 ounces), the savings from a water heater will range from 50% ((128-64)/128) for a branch from a water heater to the use to 95% ((512-24)/512) for a branch from recirculation system or heat-traced piping to the use.

In addition to lower first costs, there are significant savings in water, energy and time. All of this water came through the water heater, so there is energy attached to it. There is also energy lost as the hot water moves from the source to the use, even if it is insulated. If the hot water is on an upper story, there is energy expended in lifting it to that floor. In addition, there is energy embedded in the cold water that came to the building and to the water that is taken away for wastewater treatment.

607.2.3 (NEW)-P-KLEIN-SNYDER

<u>Public Hearing Results</u>

Committee Action: Disapproved

Committee Reason: The committee thought that the volume limitations were too restrictive and unrealistic to apply to all buildings.

Assembly Action: None

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Gary Klein, Affiliated International Management, LLC, representing self, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

607.2.3 Efficient hot and tempered water supply piping. Hot and tempered water supply piping shall be in accordance with Section 607.2.3.1 or Section 607.2.3.2. ~~comply with either the maximum allowable pipe length or maximum allowable pipe volume methods in this section.~~ The flow rate through ¼ inch piping shall not exceed 0.5 gpm (1.9 Lpm). The flow rate through 3/8 inch piping shall not exceed 1 gpm (3.8 Lpm). The flow rate through 5/16 inch piping shall not exceed 1.5 gpm (5.7 Lpm).

607.2.3.1 Maximum allowable pipe length method. The maximum allowable ~~pipe~~ piping length from the source of hot or tempered water to the termination of the fixture supply pipe shall be in accordance with the maximum ~~pipe~~ piping length column~~s~~ in Table 607.2.3.1. Where the ~~length~~ piping contains more than one size of pipe, the largest size of pipe within the piping shall be used for determining the maximum allowable length of the ~~pipe~~ piping in Table 607.2.3.1

607.2.3.2 Maximum allowable pipe volume method. The water volume in the piping shall be calculated in accordance with Section 607.2.3.~~3.~~2.1 The maximum volume of hot or tempered water in the piping ~~to~~ serving public lavatory faucets, metering or non-metering, shall be 2 ounces (0.06 L). For other fixtures, fixture supply fittings and appliances the maximum volume shall be 64 ounces (1.89 L) where the source of ~~for~~ hot or tempered water ~~from~~ is a water heater or boiler; and 24 ounces (0.7 L) where the source of ~~for~~ hot or tempered water ~~from~~ is a recirculating system or heat-traced piping.

607.2.3.2.1 Water volume determination. The volume shall be the sum of the internal volumes of pipe, fittings, valves, meters and manifolds between the source of hot or tempered water and the termination of the fixture supply pipe. The volume in the piping shall be determined from the ~~liquid ounces per foot~~ volume column ~~of~~ in Table 607.2.3.1. The volume contained within fixture shut off valves, within flexible water supply connectors to a fixture fitting ~~or~~ and within a fixture fitting shall not be included in the water volume determination. Where hot or tempered water is supplied by a recirculating system or heat-traced piping, the volume shall include the portion of the fitting on the source pipe that supplies water to the fixture.

~~**607.2.3.3 Maximum flow rate.** The flow rate of fixtures shall be limited to 0.5 gpm when connected to 1/4 inch piping; to 1 gpm when connected to 5/16 inch piping; and to 1.5 gpm when connected to 3/8 inch piping.~~

TABLE 607.2.3.1
PIPING VOLUME AND MAXIMUM PIPING LENGTHS ~~OF PIPE~~

NOMINAL PIPE SIZE (inch)	VOLUME (liquid ounces per foot length)	MAXIMUM ~~pipe~~ PIPING LENGTH ~~(feet)~~		
		WATER FROM A WATER HEATER OR BOILER ~~System without a Circulation Loop or Heat Traced Line (feet)~~	WATER FROM A RECIRCULATION LOOP OR HEAT TRACED PIPE ~~System with a Circulation Loop or Heat Traced Line (feet)~~	LAVATORY FAUCETS—PUBLIC ~~(metering and non-metering) (feet)~~
1/4	0.33	50	50 ~~16~~	6
5/16	0.5	50	48 ~~16~~	4
3/8	0.75	50	32 ~~16~~	3
1/2	1.5	43	16	2
5/8	2	32	12	1
3/4	3	21	8	0.5
7/8	4	16	6	0.5
1	5	13	5	0.5
1 ¼	8	8	3	0.5
1 ½	11	6	2	0.5
2 or larger	18	4	1	0.5

Commenter's Reason: As an I-code, the IPC specifies minimally acceptable requirements for plumbing. Delivery of hot water to a user in a timely manner is one measure of plumbing performance. The American Society of Plumbing Engineers (ASPE) specifies the delivery of hot water to the user in 10 seconds or less as "acceptable performance", delivery of hot water to the user in 30 seconds or less as "marginal performance", and delivery of hot water in more than 30 seconds as "unacceptable performance".

Implementing this proposal will improve health and safety by correlating the IPC with local health codes and with good plumbing engineering and plumbing practice. It will also result in satisfied users, including those in areas with low water pressure.

The core of this proposal is to make sure the volume of water in the pipes, which must be cleared out before hot water can be delivered, does not prevent the delivery of hot water in a timely manner. If you agree that delivery of hot water should be at least "marginally acceptable" in terms of time-to-tap, then you need to support this proposal.

Supporting Information:

The following documents the values in this proposal and demonstrates the response to the committee's comments. The committee disapproved P130 because the "volume limitations were too restrictive and unrealistic to apply to all buildings." In response, this comment increases the lengths for smaller diameter branches from circulation loops or heat-traced lines. It also improves the readability of the code text.

Why implementing the 2012 IPC often results in "Unacceptable Performance"

The 2012 IPC allows for 50 feet of developed length – of any diameter –from the source of hot or tempered water to the fixtures. However, the delivery of hot water is a question of volume (length and diameter) between the source and the uses and flow rate of the use. At current legal flow rates for faucets, showers and many appliances, 50 feet of piping contains more water than can be cleared out in the Marginally Acceptable time of 30 seconds or less, let alone the Acceptable Performance time of 10 seconds or less.

We are all familiar with the problem of waiting for hot water to arrive. When it takes too long at hand washing sinks, many of us just give up and use whatever temperature comes out. When it takes too long at a shower, we watch the water run down the drain until the water is hot enough to use. When it takes too long in public restrooms or at hand washing sinks in food service establishments, it becomes a concern for our public health code colleagues.

Providing hot or tempered water to public lavatory faucets is a special case, and the reason we have called it out in this proposal. The time-to-tap is particularly important for hand washing events, which tend to be of very short duration, generally 5-10 seconds long. Large volume in the fixture supply piping, low flow rates and short events result in it taking a very long time for the water to get warm. Correcting this requires keeping the volume small enough so that hot water arrives in a timely fashion when only one faucet with a maximum fixture fitting flow rate of 0.5 gpm or a maximum volume per cycle of 0.25 gallons is being used. Having even Marginally Acceptable performance requires piping lengths much less than 50 feet long.

Can a volume limit be applied to all buildings?

Yes. The specifics have to do with the configuration of the hot water system within the building. There are three typical configurations for a hot water system: a central water heater (or boiler) with trunks and branches serving each use or group of uses; a central water heater (or boiler) with a circulation loop or heat traced trunk line and branches to each use; distributed water heaters (or boilers) located close to the uses they serve. Buildings can have one or a combination of these systems as long as the 2012 IPC requirement of no more than 50 feet of developed length on any path from the source to the use is met.

The volume limitations in this proposal work in any building. Buildings with vertical risers will be able to comply by locating the fixture fittings and appliances close to a circulated riser; this should not be a problem as they are relatively close already. Buildings with a central corridor circulation loop will be able to comply by locating the hot water fixture fittings and appliances closer to the corridor or by moving the loop closer to the fixture fittings and appliances. Buildings with public lavatories can meet the volume and length limits in this proposal in several ways including bringing circulation loops closer to the faucets, priming the branch lines that run behind the wall when people enter the lavatory, heat tracing the branch lines or installing water heaters in the bathroom or under the sinks.

In some buildings, no changes to architectural design will be needed – it will only be necessary to design and install the plumbing to meet the new code. In other buildings changes in the architectural design will be needed so that the hot water system will meet the new code. It is likely that we will see more buildings with combinations of hot water delivery systems. Based on my experience with improving the performance of hot water systems throughout the US, costs for additional water heaters or for somewhat longer circulation loops and heat traced trunk lines will be more than offset by the savings in smaller diameter trunk lines and in shorter branches that are often of smaller diameter because their length is smaller too.

What should be the maximum allowable volume?

Implementing the IPC should result in at least marginally acceptable performance at legal flow rates, in all occupancies, even in areas with low water pressure. The American Society of Plumbing Engineers (ASPE) has established performance criteria for the timely delivery of hot or tempered water (Domestic Water Heating Design Manual – 2nd Edition, ASPE, 2003, page 234). Table 1, taken from text in ASPE's manual presents the time-to-tap performance criteria. According to this table, 30 seconds is the maximum amount of time to have Marginal Performance. Anything longer is unacceptable.

Table 1 ASPE Performance Criteria for Hot Water Delivery (Look for the color key in the rest of this comment.)

	Acceptable Performance	1 – 10 seconds
	Marginal Performance	11 – 30 seconds
	Unacceptable Performance	31+ seconds

So how much water is contained the IPC allowable limit of 50 feet of developed pipe length? Will clearing out this volume of water result in at least marginally acceptable performance? Table 2 shows the volume contained in 50 feet of pipe for nominal diameters up to 4 inches. (I realize that 50 feet of developed length is almost always shorter than 50 feet of pipe, but for simplicity, I have used 50 feet in the table.)

Let's look at a few examples: 50 feet of ¾ inch tubing contains 1.2 gallons, 50 feet of 1 inch contains just under 2 gallons, 50 feet of 2 inch contains 7 gallons and 50 feet of 4 inch contains more than 28 gallons. This is the minimum volume that must be cleared out of the pipe before hot water will get from the source to the use. (Based on research conducted by the California Energy Commission, the actual volume that will come out before hot water arrives is more than volume contained in the pipe. In ¾ inch nominal pipe, approximately 25 percent more water will come out at 2 gpm; 50 percent more will come out at 1 gpm and 100 percent more will come out at 0.5 gpm. The amount of additional water that comes out gets larger as the pipe diameter increases.)

Table 2 also shows the consequences of the volume in terms of the time-to-tap for flow rates of 2, 1 and 0.5 gpm. This range of flow rates is typical of showers, sinks and public lavatory faucets. Near the top of the table, the minimum time to clear out the cold water in the pipe is shown in seconds, further down it is shown in minutes. (NA is shown when we considered the flow rate to be excessive for the pipe diameter – either too much pressure drop or excessive velocity, or both – based on an analysis using the Hazen-Williams formula.)

The time-to-tap is particularly important for hand washing events in public lavatories, which tend to be of very short duration. It becomes essential to keep the volume from the source to the use very small when the fixture fitting flow rate is only 0.5 gpm. Looking at the row for ½ inch nominal tubing in Table 2, the minimum time to clear out the cold water would be 1.2 minutes. Assuming that each hot water draw lasts 5 seconds, and that all draws happen right after each other, the 15th user would get hot water. If the branch line were larger, say ¾ inch, the minimum time increases to 2.3 minutes and the 28th user would get hot water. If the branch line was 1 inch, the minimum time increases to 3.9 minutes and the 47th user would get hot water.

None of the times shown in Table 2 are within the Acceptable Performance range. This means that if plumbers or plumbing engineers design a hot water system to meet the minimum 2012 IPC, without also paying attention to the volume in the piping it will most often result in Unacceptable Performance. The best they can get is Marginal Performance in a limited number of cases.

Table 2 Volume in 50 feet of pipe of different nominal diameters. (This helps explain why it takes too long to get hot water in so many buildings.)

= 1 gallon of water

Nominal Pipe Size (inch)	Volume in the Pipe (gallons)	Time Until Hot Water Arrives At Selected Flow Rates (minutes unless noted)		
		2 gpm	1 gpm	0.5 gpm
1/4	0.13	NA	NA	15 sec
5/16	0.20	NA	12 sec	23 sec
3/8	0.29	NA	18 sec	35 sec
1/2	0.59	15 sec	35 sec	1.2
5/8	0.78	20 sec	47 sec	1.6
3/4	1.2	29 sec	1.2	2.3
7/8	1.6	39 sec	1.6	3.1
1	2.0	49 sec	2	3.9
1 1/4	3.1	1.6	3.1	6.3
1 1/2	4.3	2.1	4.3	8.6
2	7.0	3.5	7	14
2 1/2	12.5	6.3	13	25
3	17.2	8.6	17	34
4	28.1	14	28	56

Table 3 compares the time-to-tap performance different volumes that are being discussed at this Final Action Hearing. The flow rates in the table are typical of faucets and showerheads, and many appliances such as dishwashers and washing machines.

Table 3 Time-to-Tap Performances of Different Volumes in the Piping from the Source to the Use

Volume in the Pipe (ounces)	Minimum Time-to-Tap (seconds) at Selected Flow Rates					
	0.25 gpm	0.5 gpm	1 gpm	1.5 gpm	2 gpm	2.5 gpm
24	45	23	11	8	6	5
64	120	60	30	20	15	12
75	141	70	35	23	18	14
300	563	281	141	94	70	56

Using ASPE's criteria, only 3 data points in Table 3 have Acceptable Performance; 9 have Marginal Performance; all the rest have Unacceptable Performance. None of the volumes have Acceptable Performance for the low flow rates (0.5 gpm and smaller) found in public lavatory faucets. In addition, the Performance times shown in the 0.25 and 0.5 gpm columns are longer than the actual event itself, which is often only 5-10 seconds long. To make any sense at all, hot water must reach the faucet before the event is over, which is why there is a separate volume requirement in this proposal for the fixture fittings with these flow rates that are found in public lavatories.

We need to assess the performance when flow rates are between 1 and 1.5 gpm, not the maximum values of 2.2 and 2.5 gpm allowed by code for faucets and showers respectively. Why? One reason is that the flow rates of faucets and showers are rated at pressures of 60 and 80 psi respectively. In practice, operating pressures are often less than the rated pressure and the actual flow rate is less than the rated flow rate. In addition, hot water is only a portion of the total flow rate. The reduction in flow rate is most noticeable in areas with low water pressure to begin with. Another reason is that studies done in Indiana, California and Minnesota have found that even when full flow rate faucets and showers had been installed, the hot water portion of the flow was most often between 1 and 1.5 gpm. In this range of flow rates, the 300-ounce volume has Unacceptable Performance. The 75-ounce volume has both Unacceptable and Marginal Performance. The 64-ounce volume has Marginal Performance. The 24-ounce volume has both Marginal and Acceptable Performance. I believe the IPC should provide at least marginally acceptable performance at typical flow rates for all areas in the jurisdiction, including those with low pressure.

The delivery of hot water to public lavatory faucets needs to be considered separately because of potential health issues. The events are short and the flow rates are low. Table 4 shows the time-to-tap performance based on the requirements in the proposal. The 0.25 and 0.5 gpm columns show that even at very low flow rates this volume will result in Acceptable Performance according to ASPE criteria. Given the short amount of time people spend washing their hands in public restrooms, it does not make sense to Marginal Performance category for determining the volume from the source to the use for public lavatory faucets. The volume was chosen so that hot water would arrive in the first part of the hot water event so that every person who uses the public lavatory will have the benefits of hot water.

Table 4 Time-to-Tap Performance when the Volume in the Piping from the Source to the Use is 2 ounces

Volume in the Pipe (ounces)	Minimum Time-to-Tap (seconds) at Selected Flow Rates					
	0.25 gpm	0.5 gpm	1 gpm	1.5 gpm	2 gpm	2.5 gpm
2	3.8	1.9	0.9	0.6	0.5	0.4

Now to the decision:

The provisions in the 2012 IPC (and previous versions), which only limit the feet, do not give guidance on the volume and as we have shown, often as not result in Unacceptable Performance. Unfortunately, many of us have experienced this! In contrast, this proposal contains the provisions necessary to support the correlation of the plumbing and health codes with good plumbing engineering design and plumbing installation practice.

There are 3 key questions that we are asking you to answer:

1. Do you want the IPC to support the provisions in local health codes to supply hot or tempered water for hand washing for every user of public lavatory faucets?
2. Do you want the IPC to support the ability of plumbers and plumbing engineers to provide hot water within 30 seconds after opening the tap; this is the Acceptable and Marginal Performance ranges as defined the American Society of Plumbing Engineers. (See the arrows next to Tables 3 and 4.)
3. Do you want the IPC to provide these levels of performance in all parts of your jurisdiction, including those with low water pressure?

If so, please support this comment,

Thank you for considering this comment.

P130-12

Final Action: AS AM AMPC____ D

P131-12
607.3, 607.3.1, 607.3.2

Proposed Change as Submitted

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

607.3 Thermal expansion control. ~~A means of controlling increased pressure caused by thermal expansion shall be provided where required in accordance with Sections 607.3.1 and 607.3.2.~~ Where a storage water heater is supplied with cold water that passes through a check valve, pressure reducing valve or backflow preventer, a thermal expansion tank shall be 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 the tank manufacturer's instructions and shall be sized such that the pressure in the water distribution system shall not exceed that required by Section 604.8.

~~**607.3.1 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.~~

~~**607.3.2 Backflow prevention device or check valve.** Where a backflow prevention device, check valve or other device is installed on a water supply system utilizing storage water heating equipment such that thermal expansion causes an increase in pressure, a device for controlling pressure shall be installed.~~

Reason: Any time 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 604.8, which is unacceptable.

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 an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

607.3-P-STRAUSBAUGH.PMGCAC

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed with the proponent's written reason statement.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Gary Kozan, CPD, Ridgeway Plumbing, requests Disapproval.

Commenter's Reason: This ill-conceived proposal will require a thermal expansion tank at every water heater, eliminating all other options for controlling increased pressure caused by thermal expansion. The outcome would be expensive, overly-restrictive, and usually unnecessary.

The effect of thermal expansion on overall system pressure depends upon temperature rise, recovery rate, fixture usage, and volume of piping. In temperate climates, for example, water heaters typically recover only 30 – 50 degrees of temperature rise. Often, the amount of "expanded water" is insufficient to elevate the pressure above the code-induced limit of 80 psi. For such applications, a pressure relief valve affords adequate protection at less cost with no water wasted.

This is also the case in multi-family systems, where the brief operation of any plumbing fixture or appliance at any time anywhere in the building instantly dissipates any pressure buildup. The piping system never reaches 80 psi. This has been confirmed time and again in the field with a lazy-hand pressure gauge. A single pressure relief valve set for 80 psi, installed on the incoming water service, will "protect" the entire system without discharging a single drop of water.

Approval of this proposal will require football-sized thermal expansion tanks to be installed at every water heater in a multi-family building. This is pointless as well as impractical, with water heaters already being crammed into A/C closets.

The proponent's reasoning contains many false or misleading statements. Relief valves do not *"waste water for the life of the system."* Thermal expansion tanks are not *"required"* by most water heater manufacturers. Expansion tank manufacturers do not size their tanks so that the pressure will remain *"just shy of . . . 150 psi"*. And contrary to the proponent's statement, this proposal will have a significant cost impact as expensive expansion tanks are installed at every water heater.

Designers and contractors desire the flexibility to address thermal expansion by the most appropriate and economical means. The current code language provides choices; this proposal does not. I strongly urge DISAPPROVAL.

P131-12

Final Action: AS AM AMPC____ D

P135 – 12
608.8, 608.8.1

Proposed Change as Submitted

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

608.8 Identification of nonpotable water systems. Where *nonpotable* water systems are installed, the piping conveying the nonpotable water shall be identified either by color marking or metal tags in accordance with Sections 608.8.1 through 608.8.~~3~~2.

608.8.1 Signage Required. All nonpotable water outlets such as hose connections, open ended pipes, and faucets shall be identified ~~at the point of use for each outlet with the words, "Nonpotable-not safe for drinking~~ ." with signage that reads as follows: "Non-potable water is utilized for [application name]. Caution: non-potable water. DO NOT DRINK."The words shall be legibly and indelibly printed on a tag or sign constructed of corrosion-resistant waterproof material or shall be indelibly printed on the fixture. The letters of the words shall be not less than 0.5 inches in height and in colors in contrast to the background on which they are applied. In addition to the required wordage, the pictograph shown in Figure 608.8.1 shall appear on the signage required by this section.

608.8.~~1~~2 ~~Information~~. Distribution Pipe Labeling and Marking. Non-potable distribution piping shall be of the color purple and shall be embossed or integrally stamped or marked with the words: "CAUTION: NONPOTABLE WATER – DO NOT DRINK" or shall be installed with a purple identification tape or wrap. Pipe identification shall include the contents of the piping system and an arrow indicating the direction of flow. Hazardous piping systems shall also contain information addressing the nature of the hazard. Pipe identification shall be repeated at intervals not exceeding 25 feet (7620 mm) and at each point where the piping passes through a wall, floor or roof. Lettering shall be readily observable within the room or space where the piping is located.

608.8.2.1 Color. The color of the pipe identification shall be discernable and consistent throughout the building. The color purple shall be used to identify reclaimed, rain and gray water distribution systems.

608.8.2.2 Lettering Size. The size of the background color field and lettering shall comply with Table 608.8.2.2.

608.8.2.3 Identification Tape. Where used, identification tape shall be at least 3 inches wide and have white or black lettering on purple field stating "CAUTION: NON-POTABLE WATER – DO NOT DRINK". Identification tape shall be installed on top of non-potable rainwater distribution pipes, fastened at least every 10 feet to each pipe length and run continuously the entire length of the pipe.

Table 608.8.2.2
SIZE OF PIPE IDENTIFICATION

PIPE DIAMETER (inches)	LENGTH BACKGROUND COLOR FIELD (inches)	SIZE OF LETTERS (inches)
$^3/_4$ to $1^1/_4$	8	0.5
$1^1/_2$ to 2	8	0.75
$2^1/_2$ to 6	12	1.25
8 to 10	24	2.5
over 10	32	3.5

For SI 1 inch = 25.4 mm.

Figure 706.2 Pictograph – DO NOT DRINK

Figure 608.1.1 Pictograph – DO NOT DRINK

Reason: Water distribution systems of other than potable water are being installed in buildings and the code needs to require marking of the piping and signage for the outlets for safety reasons. The basis for this new language is text from the IgCC and is written to be in alignment with the IgCC requirements.

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 an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

Public Hearing Results

Committee Action: Disapproved

Committee Reason: The coloring requirements for nonpotable water piping should be expanded to differentiate between the different types of nonpotable water as each has different quality levels. Identification tape is mentioned in the last section of the proposal but the first section says that only color marking or metal tags shall be used. This needs corrected.

Assembly Action: Approved as Submitted

Individual Consideration Agenda

This code change proposal is on the agenda for individual consideration because the proposal received a successful assembly action of Approved as Submitted and a public comment was submitted.

Public Comment:

Shawn Strausbaugh, Arlington County, VA, representing International Code Council Plumbing, Mechanical, and Fuel Gas Code Action Committee (ICC PMG CAC), requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

608.8 Identification of nonpotable water systems. Where *nonpotable* water systems are installed, the piping conveying the nonpotable water shall be identified either by color marking ~~or~~ ,metal tags or tape in accordance with Sections 608.8.1 through 608.8.~~3~~2.

Remainder of proposal is unchanged.

Commenter's Reason: At the suggestion of the committee, the proposal was modified to add "tape" to Section 608.8 as one of the ways that piping could be identified because Section 608.8.2.3 Identification tape, specifies that piping can be identified with tape.

With respect to the committee's comment about that the color identification of different nonpotable waters should differ and not just all be identified with the color purple: One of the basic purposes of the IPC is to protect the potable water supply from contamination by nonpotable water supplies. Having various nonpotable water supplies differently colored does not provide for any increase in safety of the potable water supply. The water industry as a whole has been struggling for some time with the issue of colors of piping carrying various nonpotable waters and has yet to come to any conclusion for a variety of reasons (not enough available colors, consensus issues). The IPC only needs to be concerned about keeping water potable-all other waters are nonpotable and where color is used for identification, purple is the only color that is currently widely recognized as indicating nonpotable water. There is no need at this time for the IPC to try to break new ground to establish a color identification system for nonpotable waters, especially in the public comment phase of the code change process.

P135-12

Final Action: AS AM AMPC____ D

P139-12
608.13.6

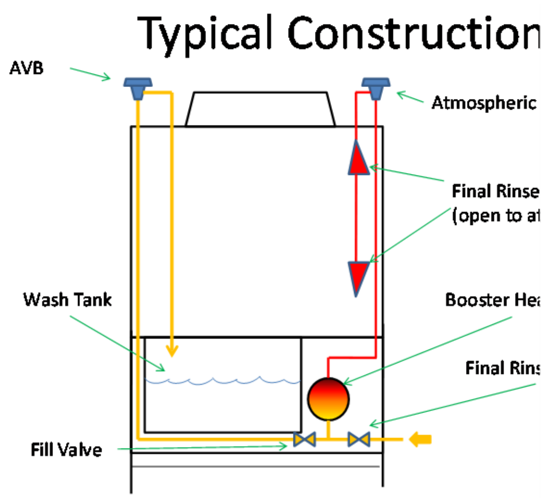
Proposed Change as Submitted

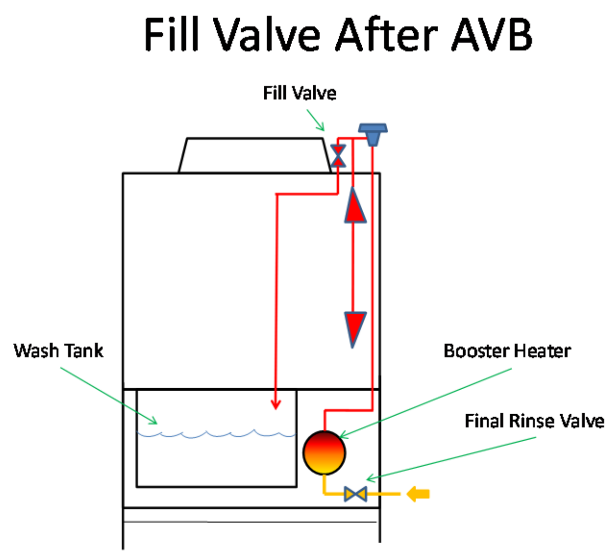
Proponent: Joel F. Hipp, Hobart Corporation representing Hobart Corporation (joel.hipp@hobartcorp.com)

Revise as follows:

608.13.6 Atmospheric-type vacuum breakers. Pipe applied atmospheric-type vacuum breakers shall conform to ASSE 1001 or CSA B64.1.1. Hose-connection vacuum breakers shall conform to ASSE 1011, ASSE 1019, ASSE 1035, ASSE 1052, CSA B64.2, CSA B64.2.1, CSA B64.2.1.1, CSA B64.2.2 or CSA B64.7. These devices shall operate under normal atmospheric pressure when the critical level is installed at the required height. <u>The outlet of a pipe applied atmospheric vacuum breaker shall not have a valve downstream except where there are multiple outlets where not less than one outlet is continuously open to atmosphere.</u>

Reason: Commentary for paragraph 608.13.6 of the 2006 IPC states, "The outlet of atmospheric vacuum breakers must remain open to the atmosphere by terminating with a pipe, spout or similar unobstructed opening. Valves must not be installed downstream of this device because this would subject the device to supply pressure, thereby rendering it inoperative." However, when designed properly, a valve can be located downstream from the AVB. The following figures illustrate this on a commercial dishwasher application.





Even though the fill valve is downstream from the atmospheric vacuum breaker, the "TEE" between the two allows pressure to remain atmospheric at all times. Although the commentary is not a substitute for the code, it is often interpreted and enforced as code language. For this reason we urge the committee to add the wording as proposed.

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

608.13.6-P-HIPP

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The change violates the standard as it would rely on a human to leave a valve open.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Joel Hipp representing Hobart, Div. ITW Food Equipment Group, LLC, requests Approval as Submitted.

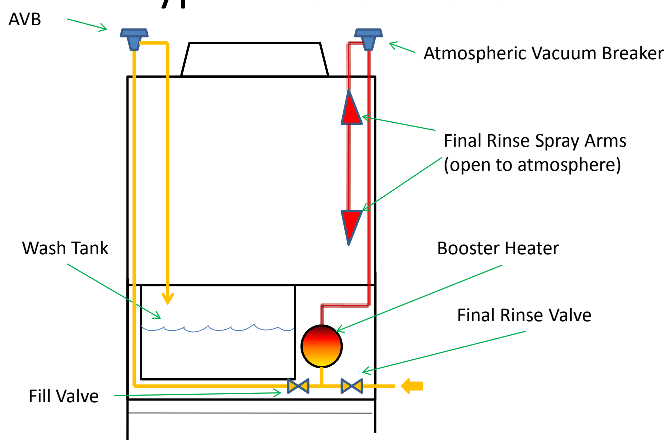
Commenter's Reason: The committee action for this issue was "DISAPPROVED" with the committee reason that "the change violates the standard as it would rely on a human to leave a valve open." When this issue was presented at the public hearing, there were no questions from the committee regarding the operation of the valve that could be located downstream from the AVB. However, after the public testimony, a committee member made the statement that he did not approve of the change because it "depended upon an operator to ensure a manual valve was open". This statement is not accurate and there was no opportunity for the presenter to explain the fact that the proposed wording requires the AVB to be open to atmosphere regardless of the position of the downstream valve.

Furthermore, a member of the assembly who claimed to be representing ASSE stated that ASSE was opposed to the proposed change. The individual did not provide any rationale for this dissention. A formal request for interpretation was submitted to ASSE and the official response is pending at the time of this writing. However, preliminary indications are that the proposed modification does indeed meet the intent of ASSE standard 1001 for atmospheric backflow preventers. The formal response from ASSE should be available by the start of the Final Action Hearings.

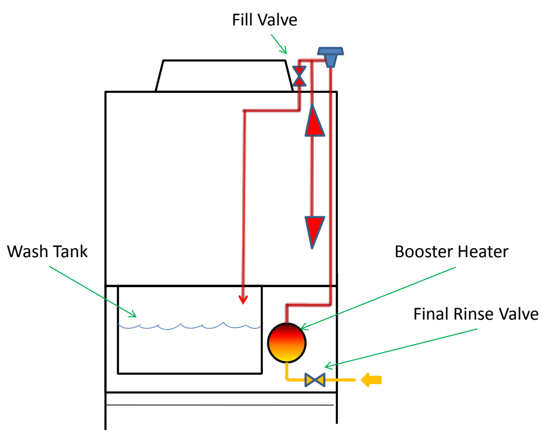
The basic premise of this proposed change is that there is more than one way to meet a requirement in the Code. The current wording of the Code is design restrictive in that it prescribes the method of meeting the objective rather than simply stating the objective itself. The intent of this code section is to ensure the AVB never has backpressure applied to it. The illustrations provided show that a valve can be located downstream of the AVB and still provide proper atmospheric venting to the device, without reliance on human intervention.

This plumbing configuration has been evaluated by NSF International and Certified as meeting the intent of the requirements on a commercial dishwasher application. A copy of the NSF email is attached. Also attached please find an ICC opinion from 2011 that states the design meets the intent of the Code. This design has been evaluated by many plumbing inspectors in end-use applications with the same conclusion. Not approving this proposal would be taking a step backwards in the evolution of innovative plumbing solutions.

Typical Construction



Fill Valve After AVB



P139-12

Final Action: AS AM AMPC____ D

P142-12
608.13.10 (New)

Proposed Change as Submitted

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Add new text as follows:

608.13.10 Dual check valve backflow preventer. Dual check valve backflow preventers shall conform to ASSE 1024 or CSA B64.6.

Reason: Table 608.1 lists ASSE 1024, CSA B64.6 (dual check valves) but currently there is no code text associated with these devices. This new section is added to correct this problem.

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 an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

608.13.10 (NEW)-P-STRAUSBAUGH.PMGCAC

Public Hearing Results

Committee Action: **Approved as Modified**

Modify the proposal as follows:

608.13.10 Dual check ~~valve~~ backflow preventer. Dual check ~~valve~~ backflow preventers shall conform to ASSE 1024 or CSA B64.6.

Committee Reason: The modification was made to correct the name of the device to be inline with the title of the standard. The committee agreed with the proponent's written reason statement.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Shawn Strausbaugh, Arlington County, VA, International Code Council Plumbing, Mechanical, and Fuel Gas Code Action Committee (ICC PMG CAC), requests Approval as Submitted.

Commenter's Reason: The committee modification to remove the word valve from the language so that the language matched the title of the ASSE standard was incorrect. The title of ASSE 1024 is "Performance Requirements for Dual Check Valve Type Backflow Preventers". The word valve is appropriate to be in the code language.

P142-12
Final Action: AS AM AMPC____ D

P145 – 12
608.15.4.3 (New)

Proposed Change as Submitted

Proponent: Bob Scott, Kye Lehr and Robert Gallegos, Colorado Department of Regulatory Agencies, Division of Registrations Electrical and Plumbing Boards

Add new text as follows:

608.15.4.3 Urinal Flushometers. Integral vacuum breakers for urinal flushometers shall be located with the critical level located not less than 6 inches (152 mm) above the highest portion of the fixture.

Reason: This added verbiage will remove confusion on installation of flushometers on urinals where the critical level must be a located at least 6 inches above the top of the fixture.

Cost Impact: None.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The change accurately depicts the flood level rim of the urinal because of the integral piping that goes all through the china or plastic of the fixture. The flood level rim is just not the lip of the urinal but is all the way to the top of the urinal.

Assembly Action: **Disapproved**

Individual Consideration Agenda

This code change proposal is on the agenda for individual consideration because the proposal received a successful assembly action of Disapproved.

P145-12
Final Action: AS AM AMPC____ D

P147-12
610.1

Proposed Change as Submitted

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

610.1 General. New ~~or repaired~~ potable water systems shall be purged of deleterious matter and disinfected prior to utilization. The method to be followed shall be that prescribed by the health authority or water purveyor having jurisdiction or, in the absence of a prescribed method, the procedure described in either AWWA C651 or AWWA C652, or as described in this section. This requirement shall apply to "on-site" or "in-plant" fabrication of a system or to a modular portion of a system.

1. The pipe system shall be flushed with clean, potable water until dirty water does not appear at the points of outlet.
2. The system or part thereof shall be filled with a water/chlorine solution containing not less than 50 parts per million (50 mg/L) of chlorine, and the system or part thereof shall be valved off and allowed to stand for 24 hours; or the system or part thereof shall be filled with a water/chlorine solution containing not less than 200 parts per million (200 mg/L) of chlorine and allowed to stand for 3 hours.
3. Following the required standing time, the system shall be flushed with clean potable water until the chlorine is purged from the system.
4. The procedure shall be repeated where shown by a bacteriological examination that contamination remains present in the system.

Reason: The current language seems to suggest that anytime a general repair is made to a potable water system that the entire system must then be disinfected. For example, one riser valve in a 35 story high rise is repaired or replaced. Is it the intent of the code to then require the entire potable water system to be disinfected? Repairs should not trigger the need for disinfection of an entire water system.

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 an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

610.1-P-STRAUSBAUGH.PMGCAC

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: Repairs are sometimes not permitted. It would be too costly and too interruptive to perform a system disinfection each time a repair is made.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Shawn Strausbaugh, Arlington County, VA, International Code Council Plumbing, Mechanical, and Fuel Gas Code Action Committee (ICC PMG CAC), requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

602.3.4 Disinfection of system. After construction ~~or major repair~~, the individual water supply system shall be purged of deleterious matter and disinfected in accordance with Section 610.

Remainder of proposal is unchanged.

Commenter's Reason: After the public hearing, it was realized that the approved proposal created a conflict with Section 602.3.4. This public comment corrects the conflict.

P147-12

Final Action: AS AM AMPC____ D

P152-12
701.7

Proposed Change as Submitted

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

Delete without substitution:

~~**701.7 Connections.** Direct connection of a steam exhaust, blowoff or drip pipe shall not be made with the building drainage system. Waste water where discharged into the building drainage system shall be at a temperature not greater than 140°F (60°C). Where higher temperatures exist, *approved* cooling methods shall be provided.~~

Reason: This section was added to be consistent with Section 803.1. Section 803.1 dates back to the A40.8-1955 National Plumbing Code. The requirement for limiting the temperature of the hot water was based on concerns that temperatures above 140 degrees will remove the galvanizing from galvanized steel pipe. Today, there are numerous other piping materials used for sanitary drainage systems. Most piping materials can handle waste temperatures in excess of 140 degrees.

The last sentence has no meaning since there are no approved cooling methods identified. The common method is adding cold water to the waste stream. However, this is an unnecessary waste of water.

Cost Impact: This change does not increase the cost of construction.

701.7-P-BALLANCO

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed with the proponent's written reason statement.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Michael Cudahy, representing Plastic Pipe and Fittings Association (PPFA), requests Disapproval.

Commenter's Reason: PPFA has issue with a number of potential problems with this proposal's increased discharge temperatures including, but not limited to; personal safety issues from contacting a hot DWV pipe, additional thermal expansion causing damage, thermal shock potentially causing damage, and potentially unintended damage to existing systems of unknown materials. PPFA believes the code will need some additional guidance in the section to safely limit discharge temperature based on material type, potentially require protective insulation and additional engineering calculations before such a change is accepted.

P152-12
Final Action: AS AM AMPC____ D

P155-12
702.5 (New), 803.1

Proposed Change as Submitted

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing self

Revise as follows:

702.5 Temperature rating. Where the wastewater temperature will be greater than 140°F (60°C), the sanitary drainage piping material shall be rated for the highest temperature of the wastewater.

~~**803.1 Waste water temperature.** Steam pipes shall not connect to any part of a drainage or plumbing system and water above 140°F (60°C) shall not be discharged into any part of a drainage system. Such pipes shall discharge into an indirect waste receptor connected to the drainage system.~~

Reason: Section 803.1 dates back to the A40.8-1955 National Plumbing Code. The requirement for limiting the temperature of the hot water was based on concerns that temperatures above 140 degrees will remove the galvanizing from galvanized steel pipe. Today, there are numerous other piping materials used for sanitary drainage systems. Most piping materials can handle waste temperatures in excess of 140 degrees.

In the 1950's, the means of cooling waste water was the addition of cold water. This is a waste of water that the code no longer permits.

Cost Impact: This change does not increase the cost of construction.

702.5 (NEW)-BALLANCO

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed with the proponent's written reason statement.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Michael Cudahy, representing Plastic Pipe and Fittings Association (PPFA), requests Disapproval.

Commenter's Reason: PPFA has issue with a number of potential problems with this proposal's increased discharge temperatures including, but not limited to; personal safety issues from contacting a hot DWV pipe, additional thermal expansion causing damage, thermalshock potentially causing damage, and potentially unintended damage to existing systems of unknown materials. PPFA believes the code will need some additional guidance in the section to safely limit discharge temperature based on material type, potentially require protective insulation and additional engineering calculations before such a change is accepted.

Public Comment 2:

Tim Mulvey, E. Ruff & Associates, representing self, requests Disapproval.

Commenter's Reason: This proposed code change will increase the cost of construction because the materials that are capable of handling temperatures above 140F are more expensive than normal drain materials and the cost of adding a tempering device. There are drain tempering solutions on the market that cool the waste water to below 140F while conserving cooling water.

P155-12
Final Action: AS AM AMPC____ D

P156-12
702.7

Proposed Change as Submitted

Proponent: William (Bill) LeVan, Cast Iron Soil Pipe Institute, representing self

Add new text as follows:

702.7 Cast iron soil pipe, fittings and mechanical joint hubless couplings. Upon request by the code official, certificates of conformance shall be provided by the manufacturer to the code official indicating that cast iron pipe, cast iron fittings and mechanical joint hubless couplings are in compliance with Sections 705 and 702.

Reason: This will ensure the purchaser and/or owner meet or exceed the requirements of the code and manufacturer requirements.

702.7 (NEW)-P-LEVAN

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The proposed language ensures safety and code compliance by providing the code official current and accurate ratings on the pipe that is used.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Roger Harper, Jr, Louisa County, VA, representing Virginia Plumbing & Mechanical Inspectors Association (VPMIA) & Virginia Building Code Officials Association (VBCOA), requests Disapproval.

Commenter's Reason: This language is already covered in this code and is absolutely redundant to provide a section dedicated to something already being enforced. This language is (1) an administrative issue that it already covered by Section 105 and (2) cast iron piping, fittings, and mechanical joint hubless couplings are already required to comply with Sections 705 and 702.

P156-12
Final Action: AS AM AMPC____ D

P159-12
705 (New)

Proposed Change as Submitted

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Add new text as follows:

SECTION 705
REPLACEMENT OF UNDERGROUND SEWERS
BY PIPE BURSTING METHODS

705.1 General. This section shall govern the replacement of existing building sewer piping by pipe-bursting methods.

705.2 Applicability. The replacement of building sewer piping by pipe bursting methods shall be limited to gravity drainage piping of sizes 6 inches and smaller. The replacement piping shall be of the same nominal size as the existing piping.

705.3 Pre-installation inspection. The existing piping sections to be replaced 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.

705.4 Pipe. The replacement piping shall be of extra high molecular weight PE3408 material and shall be manufactured with an SDR of 17 and in compliance with ASTM F 714.

705.5 Pipe fittings. Pipe fittings to be connected to the replacement piping shall be of extra high molecular weight PE3408 material and shall be manufactured with an SDR of 17 and in compliance with ASTM D2683.

705.6 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.

705.7 Installation procedure. The installation procedure shall be in accordance with the following steps:

1. The existing pipe section to be replaced shall be cleaned of debris.
2. The beginning and end of the piping section to be replaced shall be exposed as necessary to enable pulling equipment to be properly installed and the replacement piping to be inserted without bending of the pipe at less than the minimum allowable bending radius as recommended by the pipe manufacturer.
3. A pulling cable shall be retrieved from the pulling end of the piping to be replaced and pulled to the insertion end of the piping to be replaced.
4. A pipe bursting and pulling head shall be connected to one end of the replacement piping. The bursting/pulling head shall be connected to the pulling cable.
5. In accordance with the pulling equipment and pipe bursting head manufacturer's operating instructions, the pipe bursting/pulling head shall be simultaneously operated and pulled through the existing piping until the end of the new piping exits at the pulling end of the operation.
6. The pipe bursting/pulling head shall be disconnected from the new piping and the pulling equipment removed from the area. The replacement piping ends shall be cut to length as required and shall be connected to the existing piping beyond the pipe section that was replaced. Connections to the ends of the replacement piping shall be in accordance with Section 705.
7. Where a connection to the replacement piping at a point between the pulling end and the insertion end of the pipe section that was replaced is required, the replacement piping shall be

exposed at that location. A section of replacement piping shall be removed and a fitting of the appropriate configuration in accordance with Table 706.3 shall be installed. The connections between the fitting and the pipe shall be made in accordance with Section 705.16.

705.8 Post-installation inspection. The completed replacement piping section shall be inspected internally by a recorded video camera survey. The video survey shall be reviewed and approved by the code official prior to pressure testing of the replacement piping system.

705.9 Pressure testing. The replacement piping system as well as the connections to the replacement piping shall be tested in accordance with Section 312.

(Renumber subsequent sections)

Add new standards to Chapter 14 as follows:

ASTM

D2683-04	Standard Specification for Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing.
F 714-06a	Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) based on Outside Diameter.

Reason: The IPC lacks coverage concerning the replacement of sewer systems by pipe bursting methods. These methods are being widely used throughout the country. Proper guidance concerning this type of replacement provides additional value to the code.

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 an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

705 (NEW)-P-STRAUSBAUGH.PMGCAC

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This section is needed as this method is being successfully used. However, the installation procedures should not be included. The committee suggests bringing it back in a public comment without the installation procedures.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Michael Cudahy, Plastic Pipe and Fittings Association (PPFA), requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

705.4 Pipe. The replacement piping shall be ~~of extra high molecular weight PE3408 material and shall be~~ manufactured with an SDR of 17 and in compliance with ASTM F 714.

~~**705.7 Installation procedure.** The installation procedure shall be in accordance with the following steps:~~

1. ~~The existing pipe section to be replaced shall be cleaned of debris.~~
2. ~~The beginning and end of the piping section to be replaced shall be exposed as necessary to enable pulling equipment to be properly installed and the replacement piping to be inserted without bending of the pipe at less than the minimum allowable bending radius as recommended by the pipe manufacturer.~~
3. ~~A pulling cable shall be retrieved from the pulling end of the piping to be replaced and pulled to the insertion end of the piping to be replaced.~~
4. ~~A pipe bursting and pulling head shall be connected to one end of the replacement piping. The bursting/pulling head shall be connected to the pulling cable.~~
5. ~~In accordance with the pulling equipment and pipe bursting head manufacturer's operating instructions, the pipe bursting/pulling head shall be simultaneously operated and pulled through the existing piping until the end of the new piping exits at the pulling end of the operation.~~
6. ~~The pipe bursting/pulling head shall be disconnected from the new piping and the pulling equipment removed from the area. The replacement piping ends shall be cut to length as required and shall be connected to the existing piping beyond the pipe section that was replaced. Connections to the ends of the replacement piping shall be in accordance with Section 705.~~
7. ~~Where a connection to the replacement piping at a point between the pulling end and the insertion end of the pipe section that was replaced is required, the replacement piping shall be exposed at that location. A section of replacement piping shall be removed and a fitting of the appropriate configuration in accordance with Table 706.3 shall be installed. The connections between the fitting and the pipe shall be made in accordance with Section 705.16.~~

705.8 7 Post-installation inspection. The completed replacement piping section shall be inspected internally by a recorded video camera survey. The video survey shall be reviewed and approved by the code official prior to pressure testing of the replacement piping system.

705.~~9~~ 8 Pressure testing. The replacement piping system as well as the connections to the replacement piping shall be tested in accordance with Section 312.

Remainder of proposal is unchanged.

Commenter's Reason: The committee found issues with the language of the instructions, so I am deleting them, but I have a concern over section 705.4 limiting the pipe to only one resin type when ASTM F714 allows several to be used

Public Comment 2:

Shawn Strausbaugh, Arlington County, VA, representing International Code Council Plumbing, Mechanical, and Fuel Gas Code Action Committee (ICC PMG CAC, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

~~**705.7 Installation procedure.** The installation procedure shall be in accordance with the following steps:~~

1. ~~The existing pipe section to be replaced shall be cleaned of debris.~~
2. ~~The beginning and end of the piping section to be replaced shall be exposed as necessary to enable pulling equipment to be properly installed and the replacement piping to be inserted without bending of the pipe at less than the minimum allowable bending radius as recommended by the pipe manufacturer.~~
3. ~~A pulling cable shall be retrieved from the pulling end of the piping to be replaced and pulled to the insertion end of the piping to be replaced.~~

4. ~~A pipe bursting and pulling head shall be connected to one end of the replacement piping. The bursting/pulling head shall be connected to the pulling cable.~~
5. ~~In accordance with the pulling equipment and pipe bursting head manufacturer's operating instructions, the pipe bursting/pulling head shall be simultaneously operated and pulled through the existing piping until the end of the new piping exits at the pulling end of the operation.~~
6. ~~The pipe bursting/pulling head shall be disconnected from the new piping and the pulling equipment removed from the area. The replacement piping ends shall be cut to length as required and shall be connected to the existing piping beyond the pipe section that was replaced. Connections to the ends of the replacement piping shall be in accordance with Section 705.~~
7. ~~Where a connection to the replacement piping at a point between the pulling end and the insertion end of the pipe section that was replaced is required, the replacement piping shall be exposed at that location. A section of replacement piping shall be removed and a fitting of the appropriate configuration in accordance with Table 706.3 shall be installed. The connections between the fitting and the pipe shall be made in accordance with Section 705.16.~~

705.8 7 Post-installation inspection. The completed replacement piping section shall be inspected internally by a recorded video camera survey. The video survey shall be reviewed and approved by the code official prior to pressure testing of the replacement piping system.

705.~~9~~ 8 Pressure testing. The replacement piping system as well as the connections to the replacement piping shall be tested in accordance with Section 312.

Remainder of proposal is unchanged

Commenter's Reason: Based upon the committee's recommendation, the installation procedures have been removed from the original code change proposal.

P159-12

Final Action: AS AM AMPC____ D

P164 – 12
705.8.2, 705.14.2

Proposed Change as Submitted

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

Revise as follows:

705.8.2 Solvent cementing. Joint surfaces shall be clean and free from moisture. A purple primer that conforms to ASTM F 656 shall be applied. Solvent cement not purple in color and conforming to ASTM D2564, CSA B137.3, CSA B181.2 or CSA B182.1 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 permitted above or below ground.

Exception: A primer is not required where both 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 inch (102 mm) in diameter.

705.14.2 Solvent cementing. Joint surfaces shall be clean and free from moisture. A purple primer that conforms to ASTM F 656 shall be applied. Solvent cement not purple in color and conforming to ASTMD2564, CSA B137.3, CSA B181.2 or CSA B182.1 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 permitted above or below ground.

Exception: A primer is not required where both 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 inch (102 mm) in diameter

Reason: To introduce an exception in chapter 7, Sanitary Drainage, allowing for the practice of one-step solvent cementing of non-pressure DWV systems 4" and under.

This exception allows for an optional one-step procedure for joining non-pressure DWV PVC piping systems 4" in diameter and below with solvent cement conforming to ASTM D 2564. This method is practiced, and the code should include specific language to indicate when it is acceptable.

Pressure testing completed by NSF International has shown that solvent cement conforming to ASTM D 2564, when used without primer on PVC DWV pipe and fittings, both solid wall and cell core, generates bonding forces well in excess of what is required for these systems. The strength of the joint often exceeds the pipe and fitting pressure capacity.

Bibliography: NSF International report J-00036842.can be found on the PPFA website, www.ppfahome.org//ICC09/PPFA_NSF_J-00036842.pdf

Cost Impact: None

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Pipe in the real world is not as pristine as it would be in a laboratory setting when testing without primer. The code should continue requiring primer to ensure that good joints are made consistently.

Assembly Action: **Approved as Submitted**

Individual Consideration Agenda

This code change proposal is on the agenda for individual consideration because the proposal received a successful assembly action of Approved as Submitted.

P164-12
Final Action: AS AM AMPC____ D

P165-12

705.9, 705.9.1, 705.9.2, 705.9.3, 705.9.4, 705.9.5, 705.10, 705.10.1, 705.10.2, 705.10.3

Proposed Change as Submitted

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

Revise as follows:

705.9 Copper pipe and tubing. Joints between copper or copper-alloy pipe, tubing, and ~~or~~ fittings shall comply with one of the methods indicated in Sections 705.9.1 through 705.9.5.

705.9.1 Brazed joints. Brazed joints between copper pipe or tubing and fittings shall be made with a brazing alloy having a liquid temperature exceeding 1000˚F (538˚C). ~~All~~ Joint surfaces to be brazed shall be cleaned bright by manual or mechanical means. The ends of pipe or tubing shall be cut square and shall be reamed to the full inside diameter. Burrs on the outside end of the pipe or tubing shall be removed. Where required by the brazing alloy manufacturer's instructions, an approved brazing flux shall be applied to the joint surfaces. The joint shall be brazed with a brazing filler metal conforming to AWS A5.8. Brazing filler metal shall be applied at the point where the pipe or tubing enters the socket of the fitting.

705.9.2 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions. Mechanical joints shall include compression type, flanged type, grooved type and press type.

705.9.3 Soldered joints. Solder joints between copper pipe or tubing and fittings shall be made in accordance with the methods of ASTM B 828 with the following sequence of joint preparation and operation: measuring and cutting, reaming, cleaning, fluxing, assembly and support, heating, applying the solder, cooling and cleaning. ~~All cut~~ The ends of pipe or tub~~e~~ing shall be cut square and shall be reamed to the full inside diameter of the pipe or tub~~e~~ing. ~~end.~~ Burrs on the outside end of the pipe or tubing shall be removed. ~~All~~ Joint surfaces to be soldered shall be cleaned bright by manual or mechanical means. ~~A~~ Flux conforming to ASTM B 813 shall be applied to the pipe or tubing and fittings. Such flux shall be noncorrosive and nontoxic after soldering. ~~be applied.~~ Pipe or tubing shall be inserted to the base of the fitting. Excess flux shall be removed from the exterior of the joint. The assembled joint shall be supported to create a uniform capillary space around the joint. An LP gas or acetylene air /fuel torch shall be used to apply heat to the assembled joint. The heat shall be applied with the flame perpendicular to the pipe or tubing. The flame shall be moved alternately between the fitting cup and the pipe or tubing. Solder in compliance with ASTM B 32 shall be applied to the joint surfaces until capillary action draws the molten solder into the cup of the fitting. ~~The joint shall be soldered with a solder conforming to ASTM B 32.~~ The soldered joint shall not be disturbed until cool. Remaining flux residue shall be cleaned from the exterior of the joint.

705.9.4 Threaded joints. Threads shall conform to ASME B1.20.1. Pipe-joint compound or tape shall be applied on the male threads only.

705.9.5 Welded joints. ~~All~~ Welded joint surfaces shall be cleaned. The joint shall be welded with ~~an~~ *approved* filler metal.

~~**705.10 Copper tubing.** Joints between copper or copper alloy tubing or fittings shall comply with Sections 705.10.1 through 705.10.3.~~

~~**705.10.1 Brazed joints.** All joint surfaces shall be cleaned. An *approved* flux shall be applied where required. The joint shall be brazed with a filler metal conforming to AWS A5.8.~~

~~**705.10.2 Mechanical joints.** Mechanical joints shall be installed in accordance with the manufacturer's instructions.~~

~~**705.10.3 Soldered joints.** Solder joints shall be made in accordance with the methods of ASTM B 828. All cut tube ends shall be reamed to the full inside diameter of the tube end. All joint surfaces shall be cleaned. A flux conforming to ASTM B 813 shall be applied. The joint shall be soldered with a solder conforming to ASTM B 32.~~

(Renumber subsequent sections)

Reason: The above language combines pipe and tubing into one section and provides the joining methods of copper and copper alloys as referenced in Table 702.4. In addition, important language from the standards has been added to aid the end user.

Cost Impact: This code change will not increase the cost of construction.

705.9-P-FEEHAN

Public Hearing Results

Committee Action: Disapproved

Committee Reason: To be consistent with committee's action on P103-12.

Assembly Action: None

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Pennie L. Feehan, Pennie L. Feehan Consulting representing CDA – Copper Development Association, requests Approval as Modified by this Public Comment.

Replace proposal as follows:

705.9.1 Brazed joints. All joint surfaces shall be cleaned bright by manual or mechanical means. An approved flux shall be applied where required. The joint shall be brazed with ~~a~~ filler metals having a melting point range between 1,100°F (593°C) and 1500°F (815°C) conforming to AWS A5.8.

705.9.3 Soldered joints. Solder joints shall be made in accordance with the methods of ASTM B 828. All cut tube ends shall be cut square and reamed to the full inside diameter of the tube end. All joint surfaces shall be cleaned bright by manual or mechanical means. ~~A f~~Flux conforming to ASTM B 813 shall be applied to all joint surfaces. The joint shall be soldered with a solder conforming to ASTM B 32.

705.10.1 Brazed joints. All joint surfaces shall be cleaned bright by manual or mechanical means. An approved flux shall be applied where required. The joint shall be brazed with ~~a~~ filler metals having a melting point range between 1,100°F (593°C) and 1500°F (815°C) conforming to AWS A5.8.

705.10.3 Soldered joints. Solder joints shall be made in accordance with the methods of ASTM B 828. All cut tube ends shall be cut square and reamed to the full inside diameter of the tube end. All joint surfaces shall be cleaned bright by manual or mechanical means. ~~A~~ Flux conforming to ASTM B 813 shall be applied to all joint surfaces. The joint shall be soldered with a solder conforming to ASTM B 32.

Commenter's Reason: This proposal adds language that provides clear directions to the end user and provides uniformity with the IMC.

P165-12
Final Action: AS AM AMPC____ D

P166-12
706.3, Table 706.3

Proposed Change as Submitted

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee (Sstrausbaugh@arlingtonva.us)

Delete and substitute 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. 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.~~

706.3 Installation of fittings. Changes in the direction of flow in drainage piping shall be made by fittings installed in an orientation that directs the drainage in the direction of flow. The following are prohibited applications of fittings:

1. A cast iron quarter bend or short sweep elbow smaller than 3 inches shall not be used for a vertical-to-horizontal or horizontal-to-horizontal change in direction of flow except where conveying flow from a single fixture drain.
2. A cast iron quarter bend or short sweep elbow that is 3 inches and larger shall not be used for a horizontal-to-horizontal change in direction of flow.
3. A plastic quarter bend elbow smaller than 3 inches, other than a long sweep quarter bend elbow, shall not be used for a vertical-to-horizontal or horizontal-to-horizontal change in direction of flow except where conveying flow from a single fixture drain.
4. A plastic quarter bend elbow that is 3 inches and larger, other than a long sweep quarter bend elbow, shall not be used for a horizontal-to-horizontal change in direction of flow.
5. A heel inlet of a quarter bend elbow shall not receive the discharge from any fixture where the elbow receives the discharge of a water closet and changes the flow direction from vertical-to-horizontal .
6. A low-heel inlet of a quarter bend elbow shall not be used as a connection for a wet vent or wet vented fixture where the elbow changes the flow direction from vertical-to-horizontal.
7. The side inlet of a quarter bend elbow shall not be used as a drainage connection where the elbow changes the flow direction from horizontal to horizontal.
8. A sanitary tee shall not be used in an orientation where the run of the tee is in the horizontal plane, or an angle less than 45 degrees thereto, except where the branch of the tee serves as a dry vent.
9. A double sanitary tee shall not receive the discharge of water closets through both branches nor shall it receive pumped waste flow in either branch.

   Exception: Water closets shall be permitted to connect to both branches of a double sanitary tee where the horizontal developed length between the outlet of each water closet and the connection to the double sanitary tee is 18 inches (457 mm) or greater.

Reason: The existing section and accompanying table are unclear as to how the table is to be used and exactly what the prohibitions of fitting uses are. The problem is that the table is too limiting and does not address the materials of the fittings relative to the pattern (i.e. short sweep versus quarter bend). Also, the table doesn't address the use of a drainage fitting where a branch is used as vent connection (e.g. sanitary tee). The text proposed clearly indicates the specific prohibitions and uses in mandatory language.

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 an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

706.3-P-STRAUSBAUGH.PMGCAC

Public Hearing Results

Committee Action: Disapproved

Committee Reason: Consistency with committee's action on P103-12.

Assembly Action: None

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Shawn Strausbaugh, Arlington County, VA, representing International Code Council Plumbing, Mechanical, and Fuel Gas Code Action Committee (ICC PMG CAC), requests Approval as Submitted.

Commenter's Reason: At the public hearings, one of the committee members incorrectly made a motion to disapprove the code change based on their decision on a previous code change, P103. This code change took language from Table 706.3 and put it into written format. The table was too limiting and did not address all of the materials of the fittings relative to the pattern (i.e. short sweep versus quarter bend). Code change P103 proposed that manufacturer's guidelines for joints became code language and had no bearing or connection to this proposed code change.

P166-12

Final Action: AS AM AMPC____ D

P167-12
707.1

Proposed Change as Submitted

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

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.
6. Saddle-type fittings.
7. <u>Where a pipe or fitting is inserted inside of another pipe.</u>

Reason: This proposed new item intends to prevent the misapplication of fittings and pipe of all materials. The IRC already prohibits the installation of a 4 x 3 plastic closet flange into the inside of a 4 inch plastic pipe. (Section P3003.19) . The reason for this is that the internal diameter of DWV plastic pipe is not controlled during manufacturing which results in a non-uniform and sometimes wavy surface inside of the pipe. Such surface was never intended to be part of solvent welded joint. The inside surface of fitting sockets are precisely controlled during manufacturing because they are designed to be part of a solvent welded joint, but this is not for the ID of pipe. If pipe or fittings are misapplied by attempting solvent weld joints in the inside of pipe, poorly made joints will result which are mechanically weak and prone to failure or leakage in service. Leakage may not be detected during DWV testing because closet flanges are commonly installed *after* testing and also because a poorly made weak joint could survive the test and fail at a later time as the piping system expands and contracts, ages and moves from building settlement. This problem is not limited to closet flanges as installers have attempted to install other fittings such as wyes inside of pipe.

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 an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

707.1-P-STRAUSBAUGH.PMGCAC

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed with the proponent's written reason statement.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Chris Ismert, Sioux Chief Manufacturing, requests Disapproval.

Commenter's Reason: As stated, the proposed change would prohibit joints where pipe or fitting is inserted inside of another pipe – specifically the installation of closet flanges into 4" pipe.

This is an unnecessary change that will prohibit a widely used/accepted practice, and will increase the cost of construction.

The tools, processes and quality guidelines used by manufacturers of DWV pipe have improved greatly in recent years, and although the ID of pipe is not described explicitly in ASTM standards, the two dimensions resulting in the ID dimension (OD and wall thickness) are controlled, and have become very consistent.

Similarly, manufacturers of fittings (specifically closet flanges) consider these same ASTM standards. Closet flanges intended to be installed inside 4" pipe have a modified hub OD, with a carefully designed taper which is able compensate for the small variation possible in pipe ID.

Closet flanges designed to be installed inside 4" pipe have been widely used for decades. The simple fact that these joints have been used this long is a testament to two points: 1) they do work, and are not weak or prone to leaks and failure, and 2) they provide a solution to the potentially difficult installation of a closet flange on pre-poured slab. Prohibiting the installation of closet flanges inside 4" pipe will leave plumbing contractors with few, undesirable options. These include 1) installing the flange over 3" pipe before the slab pour – which typically results in flanges set too low (covered in concrete, poor seal between wax ring and toilet), or too high (unstable toilet); or 2) wrapping the pipe to create an annular space between the pipe and slab – which can result in a "hole" in the slab through which pests (termites, etc.) can enter the dwelling, and which does not allow for a proper glue joint to be made as the OD of the pipe cannot be applied with primer/glue. Further, both of the above alternatives will increase the difficulty and cost associated with the installation.

The proposed change seeks to unnecessarily prohibit a joint that has been used for decades by plumbing professionals, and which will greatly increase the difficulty/cost associated with the installation of flanges on concrete slabs. I urge the committee to Disapprove the code change proposal.

Public Comment 2:

Gary Kozan, CPD, Ridgeway Plumbing, requests Disapproval.

Commenter's Reason: The primary purpose of this proposal is to outlaw the common practice of solvent welding closet flanges inside of plastic pipe. This is a solution in search of a problem.. Inside-fit flanges are the industry standard – because they work.

For a proper water closet installation, the bottom of the closet flange must be precisely flush with finished floor. Flanges set too high cause shimming and rocking; flanges set too low result in leaks at the wax seal. The correct time to set the flange is just prior to setting the toilet, after finished floor has been established. This has always been part of my company's quality practices. Inside-fit flanges require no annular space, enabling the closet stub to be cut flush with finished floor and the flange glued inside of the pipe – the perfect height every time.

Since both the outside diameter and the wall thickness of PVC pipe are manufactured to close tolerances, the inside diameter varies only slightly. Inside-fit flanges have a mild taper to compensate for this. So long as the pipe is manufactured to ASTM spec, the flange will fit properly with no leakage. The current IRC seems to prohibit inside-fit flanges, but two wrongs don't make a right. This will be addressed at next year's IRC hearings.

In addition to prohibiting inside-fit closet flanges, this proposal would also ban a multitude of other popular products. Most plumbing specialty manufacturers make floor drains, cleanouts, repair flanges, trap guards, etc. specifically for inserting inside of plastic pipe. These products are used extensively in both new and existing construction. Furthermore, the poor wording of this proposal could be construed as prohibiting bell-end plastic pipe, and even the use of slip joints or Fernco adaptors, "where a pipe or fitting is inserted inside of another pipe."

Without inside-fit flanges, the plumber is left with two unpleasant alternatives – either install the flange early (guesstimating where finished floor will be), or revert to digging out stub wrappers with hammer and chisel in order to create the annular space necessary to make a shoddy "outside" glue joint.

The proponent's unsubstantiated claims of weak joints and failures are grossly exaggerated. Most water closets today are set on inside-fit flanges. They have a proven 40-year track record and offer the best solution on the market. On behalf of all of the plumbers who successfully use inside-fit flanges and fittings, I respectfully urge DISAPPROVAL of this unnecessary change.

P167-12

Final Action: AS AM AMPC____ D

P168-12
708

Proposed Change as Submitted

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Delete and substitute as follows:

~~**SECTION 708**~~
~~**CLEANOUTS**~~

SECTION 708
CLEANOUTS

708.1 Cleanouts required. Cleanouts shall be provided for drainage piping in accordance with Sections 708.1.1 through 708.1.11.

708.1.1 Horizontal drains and building drains. Horizontal drainage pipes in buildings shall have cleanouts located at intervals of not more than 100 feet (30 480 mm). Building drains shall have cleanouts located at intervals of not more than100 feet (30 480 mm) except where manholes are used instead of cleanouts, the manholes shall be located at intervals of not more than 400 feet (122 m). The interval length shall be measured from the cleanout or manhole opening, along the developed length of the piping to the next drainage fitting providing access for cleaning, the end of the horizontal drain or the end of the building drain.

> **Exception:** Horizontal fixture drain piping serving a nonremovable trap shall not be required to have a cleanout for the section of piping between the trap and the vent connection for such trap.

708.1.2 Building sewers. Building sewers smaller than 8 inches (203 mm) shall have cleanouts located at intervals of not more than 100 feet (30 480 mm). Building sewers 8 inches (203 mm) and larger shall have a manhole located not more than 200 feet (60 960 mm) from the junction of the building drain and building sewer and at intervals of not more than 400 feet (122 m). The interval length shall be measured from the cleanout or manhole opening, along the developed length of the piping to the next drainage fitting providing access for cleaning, a manhole or the end of the building sewer.

708.1.3 Building drain and building sewer junction. The junction of the building drain and the building sewer shall be served by a cleanout that is located at the junction or within 10 feet (3048 mm) developed length of piping upstream of the junction. For the requirements of this section, the removal of water closet shall not be required to provide cleanout access.

708.1.4 Changes of direction. Where a horizontal drainage pipe, a building drain or a building sewer has a change of horizontal direction greater than 45 degrees (0.79 rad), a cleanout shall be installed at the change of direction. Where more than one change of horizontal direction greater than 45 degrees (0.79 rad) occurs within 40 feet (12 192 mm) of developed length of piping, the cleanout installed at the first change of direction shall serve as the cleanout for all changes in direction within that 40 feet (12 192 mm) of developed length of piping.

708.1.5 Cleanout size. Cleanouts shall be the same size as the piping served by the cleanout except cleanouts for piping larger than 4 inches (102 mm) need not be larger than 4 inches (102 mm).

Exceptions:

1. A removable P- trap with slip or ground joint connections can serve as a cleanout for drain piping that is one size larger than the P-trap size.
2. Cleanouts located on stacks can be one size smaller than the stack size.
3. The size of cleanouts for cast-iron piping can be in accordance with the referenced standards for cast iron fittings as indicated in Table 702.4.

708.1.6 Cleanout plugs. Cleanout plugs shall be brass, plastic or other approved materials. Cleanout plugs for borosilicate glass piping systems shall be of borosilicate glass. Brass cleanout plugs shall conform to ASTM A74 and shall be limited for use only on metallic piping systems. Plastic cleanout plugs shall conform to the referenced standards for plastic pipe fittings as indicated in Table 702.4. Cleanout plugs shall have a raised square head, a countersunk square head or a countersunk slot head. Where a cleanout plug will have a trim cover screw installed into the plug, the plug shall be manufactured with a blind end threaded hole for such purpose.

708.1.7 Manholes. Manholes and manhole covers shall be of an approved type. Manholes located inside of a building shall have gas-tight covers that require tools for removal.

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.

708.1.9 Required clearance. Cleanouts for 6-inch (153 mm) and smaller piping shall be provided with a clearance of not less than 18 inches (457 mm) from, and perpendicular to, the face of the opening to any obstruction. Cleanouts for 8-inch (203 mm) and larger piping shall be provided with a clearance of not less than 36 inches (914 mm) from, and perpendicular to, the face of the opening to any obstruction.

708.1.10 Cleanout access. Required cleanouts shall not be installed in concealed locations. For the purposes of this section, concealed locations include, but are not limited to, the inside of plenums, within walls, within floor/ceiling assemblies, below grade and in crawl spaces where the height from the crawl space floor to the nearest obstruction along the path from the crawl space opening to the cleanout location is less than 24 inches (610 mm). Cleanouts with openings at a finished wall shall have the face of the opening located within 1-1/2 inches (38 mm) of the finished wall surface. Cleanouts located below grade shall be extended to grade level so that the top of the cleanout plug is at or above grade. A cleanout installed in a floor or walkway that will not have a trim cover installed shall have a countersunk plug installed so the top surface of the plug is flush with the finished surface of the floor or walkway.

708.1.10.1 Cleanout plug trim covers. Trim covers and access doors for cleanout plugs shall be designed for such purposes and shall be approved. Trim cover fasteners that thread into cleanout plugs shall be corrosion resistant. Cleanout plugs shall not be covered with mortar, plaster or any other permanent material.

708.1.10.2 Floor cleanout assemblies. Where it is necessary to protect a cleanout plug from the loads of vehicular traffic, cleanout assemblies in accordance with ASME A112.36.2M shall be installed.

708.1.11 Prohibited use. The use of a threaded cleanout opening to add a fixture or extend piping shall be prohibited except where another cleanout of equal size is installed with the required access and clearance.

Reason: Section 708 is disorganized. For example, the second Section 708.2 discusses requirements for cleanout plugs. The more significant sections of the section are scattered throughout the remainder of the section in a disorganized fashion. This proposal reorganizes this section in a more logical format for ease of understanding.

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 an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

708-P-STRAUSBAUGH.PMGCAC

Public Hearing Results

Committee Action: Disapproved

Committee Reason: The proposed language inappropriately removes the requirement for a cleanout at the base of each stack. One hundred feet between cleanouts is too long.

Assembly Action: None

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Shawn Strausbaugh, Arlington County, VA, representing International Code Council Plumbing, Mechanical, and Fuel Gas Code Action Committee (ICC PMG CAC), requests Approval as Submitted.

Commenter's Reason: One of the committee's arguments for disapproving this code change was that the proposed language inappropriately removed the requirement for a cleanout at the base of each stack. The other argument was that one hundred feet between cleanouts is too long.

The language for the base of stack is covered through the horizontal drain requirement. A cleanout is required within each horizontal drain at intervals not more than 100 feet. When cleanouts are provided in the horizontal drain at this interval, there is no need for a cleanout at the base of each stack.

As far as the distance between cleanouts being too long, the 100 foot requirement has been in the IPC since the 1997 edition.

P168-12

Final Action: AS AM AMPC____ D

P170-12
712.3.2

Proposed Change as Submitted

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

712.3.2 Sump pit. The sump pit shall be not less than 18 inches (457 mm) in diameter and not less than 24 inches (610 mm) in depth, unless otherwise approved. The pit shall be accessible and located such that all drainage flows into the pit by gravity. The sump pit shall be constructed of tile, concrete, steel, plastic or other approved materials. The pit bottom shall be solid and provide permanent support for the pump. The sump pit shall be fitted with a gas-tight removable cover that is <u>installed flush with grade or above grade. The cover shall be </u>adequate to support anticipated loads in the area of use. The sump pit shall be vented in accordance with Chapter 9.

Reason: The cover for sump pits needs to be located at grade or above grade. Otherwise, there is nothing to prevent an installation where the cover is located below grade in a well such that in order to service the pump, someone has to stand on his head in order to just remove the sump pit cover. Requiring the cover to be at or above grade eliminates this problem.

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 an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

712.3.2-P-STRAUSBAUGH.PMGCAC

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The added text about being flush with grade appears to address sumps that are on the exterior of a building. Sumps could also be inside a building. The language doesn't address that situation.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Shawn Strausbaugh, Arlington County, VA, representing International Code Council Plumbing, Mechanical, and Fuel Gas Code Action Committee (ICC PMG CAC), requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

712.3.2 Sump pit. The sump pit shall be not less than 18 inches (457 mm) in diameter and not less than 24 inches (610 mm) in depth, unless otherwise approved. The pit shall be accessible and located such that all drainage flows into the pit by gravity. The sump pit shall be constructed of tile, concrete, steel, plastic or other approved materials. The pit bottom shall be solid and provide permanent support for the pump. The sump pit shall be fitted with a gas-tight removable cover that is installed flush with grade <u>or floor level,</u> or above grade <u>or floor level</u>. The cover shall be adequate to support anticipated loads in the area of use. The sump pit shall be vented in accordance with Chapter 9.

Commenter's Reason: The committee's reason for disapproval was that the added text did not address sump pits that could be located inside a building. For all installations the same provisions should apply. The sump pit contains electrical and mechanical components that require periodic maintenance and or replacement. The sump pit cover is the means of *access* to the sump pit so the cover must be accessible as well and not be concealed by floor coverings or any amount of earth.

P170-12
Final Action: AS AM AMPC____ D

P173-12
716 (New), Chapter 14

Proposed Change as Submitted

Proponent: Jeremy Brown, NSF International (brown@nsf.org)

Add new text as follows:

SECTION 716
CURED-IN-PLACE PIPE LINERS

716.1 Approval. Cured-in-place pipe liner materials shall conform to NSF-14.

716.2 Installation. Installation of cured-in-place pipe liners shall be in accordance with the manufacturer's instructions and ASTM F1216, ASTM F1783 or ASTM F 2019.

Add new standards to Chapter 14 as follows:

ASTM

F1216-09	Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin Impregnated Tube
F1743-08	Standard Practice for Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation of Cured-In-Place Thermosetting Resin Pipe (CIPP)
F2019-11	Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass reinforced Plastic (GRP) Cured-in-Place Thermosetting Resin Pipe (CIPP).

Reason: Trenchless technology is commonly used to rehabilitate existing drain and sewer lines. This proposal establishes requirements by referring to appropriate standards for the materials and installation.

Cost Impact: This will not increase the cost of construction.

Analysis: A review of the standards proposed for inclusion in the code, ASTM F1216-09, ASTM F1743-08 and ASTM F2019-11 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, 2012.

716 (NEW)-P-BROWN

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed with the proponent's written reason statement.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Shawn Strausbaugh, Arlington County, VA, representing VA Plumbing and Mechanical Inspectors Assoc. (VPMIA), and VA Building Code Officials Association (VBCOA), requests Disapproval.

Commenter's Reason: This newly proposed code section contains numerous different types of "tube" and pipe as referenced under the new standards however the pipe and tube as proposed does not appear to conform to any of the required pipe standards as contained in section 702.2 or 702.3 nor any of the fitting standards contained in 702.4. Due to the application of this material inside of the existing piping material how is the interior reduction in the pipe size taken in to account? If this is to be used on any portion of the plumbing drainage system this reduction in may create further drainage issues where the specific section of piping may be at its intended DFU limit and further would appear to conflict section 704.2 which states "The size of the drainage piping shall not be reduced in size in the direction of flow." The cured in place pipe liner material is required to conform to NSF 14 however is this a quality control standard or a material standard in regard to this specific material?

P173-12

Final Action: AS AM AMPC____ D

P177-12
802.1.1

Proposed Change as Submitted

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

802.1.1 Food handling. Equipment and fixtures utilized for the storage, preparation and handling of food shall discharge through an indirect waste pipe by means of an air gap. <u>Each well of a multi-compartment sink shall discharge independently to a waste receptor.</u>

Reason: An all too common practice for drain connections to a multi-compartment sink is to manifold the drain piping together and run a single indirect waste pipe to the waste receptor. If one compartment is draining and another compartment is empty or less full , the waste flow can back up into the empty or less full compartment and contaminate that compartment. Requiring each well to discharge independently to the waste receptor prevents this potential for contamination.

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 an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

802.1.1-P-STRAUSBAUGH.PMGCAC

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed with the proponent's written reason statement.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Roger Harper, Jr, Louisa County, VA, representing Virginia Plumbing & Mechanical Inspectors Association(VPMIA) & Virginia Building Code Officials Association (VBCOA), requests Disapproval.

Commenter's Reason: To require each well be separately piped would 1) Require a floor sink instead of an open site or hub type drain because of the number of drain pipes running to such, 2) Create a nuisance under the sink for cleaning purposes such as mopping of the floors 3) A trap is required if an indirect waste pipe exceeds 30"' horizontally and or 54" in total developed length and this would certainly require the trap if approved thus creating the possibility of a stoppage but only because of the trap.

P177-12
Final Action: AS AM AMPC____ D

P181-12
802.3

Proposed Change as Submitted

Proponent: Shawn Strausbaugh, Arlington County VA, representing, the Virginia Plumbing and Mechanical Inspectors Association and The Virginia Building Code Officials Association and ICC Region 7 (Sstrausbaugh@arlingtonva.us)

Revise as follows:

802.3 Waste receptors. ~~Waste receptors shall be of an approved type.~~ For other than standpipes and hub drains, a removable strainer or basket shall cover the waste outlet of waste receptors. Waste receptors shall not be installed in ~~ventilated~~ concealed spaces. Waste receptors shall not be installed in ~~bathrooms, toilet rooms~~, plenums, crawl spaces, attics, interstitial spaces above ceilings and below floors ~~or in any inaccessible or unventilated space such as a closet or storeroom~~. Ready access shall be provided to waste receptors.

Reason: This is a companion proposal with a newly added definition of waste receptor. We have attempted to identify exactly what constitutes an 'approved type" of waste receptor. The code fails to provide guidance as to what is a ventilated space, so we suggest removing the terms. This proposal takes the provisions in the direction of clear mandatory language that provides the user with terminology that clearly explains where a waste receptor is not permitted to be located. Further, there is no real problem associated with having a hub drain in a closet or storeroom where items such as water heaters and condensate producing appliances are located so that text has been removed.

Cost Impact: None

802.3-P-STRAUSBAUGH

Public Hearing Results

Committee Action: Disapproved

Committee Reason: Bathrooms and toilet rooms should not have waste receptors because of the potential for people using them as a location to urinate. A waste receptor is not intended for such use.

Assembly Action: None

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Shawn Strausbaugh, Arlington County, VA, representing VA Plumbing and Mechanical Inspectors Assoc. (VPMIA), VA Building Code Officials Association (VBCOA), and ICC Region VII, requests Approval as Submitted.

Commenter's Reason: The committee's reasoning for not allowing waste receptors in toilet rooms lacks merit as numerous other fixtures such as floor drains, not used as waste receptors, service sinks, and lavatories are located in toilet rooms. These fixtures would also be a potential for people to urinate in. Are we then supposed to limit these fixtures from being located within toilet rooms? The committee did not comment on the removal of inaccessible or unventilated spaces such as a closet or storeroom, for this change however for P182 which was a companion change the committed did state closet or storerooms are rarely visited so any backups could go undetected and create an insanitary condition. As stated in the original reason statement appliances such as water heaters and condensing appliances are typically located in closets or storerooms and this section would then not allow a waste receptor to be installed were other portions of the code may require such a waste receptor.

P181-12
Final Action: AS AM AMPC____ D

P182-12
202, 802.3, 802.3.2, 802.4

Proposed Change as Submitted

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Add new definition as follows:

WASTE RECEPTOR. A floor sink, standpipe, hub drain or a floor drain that receives the discharge of one or more indirect waste pipes.

Revise as follows:

802.3 Waste receptors. ~~Waste receptors shall be of an approved type.~~ For other than hub drains that receive only clear-water waste and standpipes, a removable strainer or basket shall cover the waste outlet of waste receptors. Waste receptors shall not be installed in ~~ventilated~~ concealed spaces. Waste receptors shall not be installed in ~~bathrooms, toilet rooms~~, plenums, crawl spaces, attics, interstitial spaces above ceilings and below floors. ~~or in any inaccessible or unventilated space such as a closet or storeroom~~. Ready access shall be provided to waste receptors.

802.3.2 ~~Open~~ Hub drains ~~waste receptors.~~ A hub drain~~Waste receptors~~ shall be ~~permitted~~ in the form of a hub or a pipe extending not less than 1 inch (25.4 mm) above a water-impervious floor. ~~and are not required to have a strainer.~~

~~802.4~~ **802.3.3 Standpipes.** Standpipes shall be individually trapped. Standpipes shall extend not less than 18 inches (457 mm) but not greater than 42 inches (1066 mm) above the trap weir. *Access* shall be provided to all standpipes and drains for rodding.

Reason: A definition for "waste receptor" is needed. The term is found in the code 24 times with no exact description. The proposed definition identifies exactly what constitutes an 'approved type" of waste receptor. The code fails to provide guidance as to what is a ventilated space so the language was changed to prevent waste receptors from being installed in a concealed space. There is no logical reason to prohibit waste receptors from being installed in a bathroom or toilet room. It is not unusual for a clothes washing machine (requiring a standpipe) to be placed in a bathroom or a toilet room in a multifamily residential occupancy. Waste receptors (typically a hub drain) are frequently needed in closets or storerooms where appliances discharge condensate or where relief valve discharge pipes are located.. The term "open hub waste receptor" is redundant and unclear and was eliminated in favor of the more common term "hub drain". As a hub drain is a waste receptor, a strainer is required except where the hub drain receives only clear water wastes. Standpipes are just another breed of waste receptors and should be included as a subsection under the waste receptor section.

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 an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

802.3-P-STRAUSBAUGH.PMGCAC

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Bathrooms and toilet rooms should not have waste receptors because of the potential for people using them as a location to urinate. Closets and storerooms are rarely visited so any backups could go undetected and create insanitary conditions.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Shawn Strausbaugh, Arlington County, VA, representing International Code Council Plumbing, Mechanical, and Fuel Gas Code Action Committee (ICC PMG CAC), requests Approval as Submitted.

Commenter's Reason: The committee's reasoning for not allowing waste receptors in toilet rooms has no merit as numerous other fixtures such as floor drains, not used as waste receptors, service sinks, and lavatories are located in toilet rooms. These fixtures would also be a potential for people to urinate in based upon this reasoning. Are we then supposed to limit these fixtures from being located within toilet rooms? As stated in the original reason statement appliances such as water heaters and condensing appliances are typically located in closets or storerooms and this section would then not allow a waste receptor to be installed were other portions of the code may require such a waste receptor.

P182-12
Final Action: AS AM AMPC____ D

P189-12
915.1

Proposed Change as Submitted

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

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 grinder or~~ clinical sink.

Reason: There is no technical justification for prohibiting a food waste grinder from discharging to a combination waste and vent system. A food waste grinder does not change the pressure in the piping system any differently than a sink operating without a food waste grinder. The food waste grinder will not impact the performance of the combination waste and vent system. A video was made showing the discharge from a food waste grinder. The video of the clear pipe shows the flow from a food waste grinder as being the same as the flow from the sink without a food waste grinder.

Cost Impact: This change does not increase the cost of construction.

915.1-P-BALLANCO

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: If food grinders are allowed to be installed on a combination waste and vent system, then this would lead the way for showers and urinals to be added to these systems. The prohibition has been in the code for a long time and it will not hurt to be in there longer until research is completed to show that food grinder waste is not a problem for these systems.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing InSinkErator, requests Approval as Submitted.

Commenter's Reason: I would encourage the membership to overturn the motion to deny and vote to approve this change as submitted. The Committee Reason is completely inappropriate when dealing with a technical change. Furthermore, it is in error. The restriction to not allow food waste disposers on combination waste and vent systems was only added to the Code in the 2003 edition. That is not a long time. There was no technical justification provided to add this restriction to the 2003 code. The reason given was that they thought there would be a problem. However, no problem was specifically identified. It was permitted by the code from 1995 through the publication of the 2003 code. It was also permitted in the legacy plumbing codes. If there was a problem, it would have surfaced.

The other reason given was that this could lead to showers and urinals being added. First, showers are already vented by this method since shower rooms utilize floor drains, which are permitted to be installed on a combination waste and vent system. With regard to urinals, there is no change to add urinals. This should have never been included in the Reason statement.

InSinkErator has done video clips of the inside of the pipe showing the discharge of a food waste disposer. The flow in a 2 inch drain, which is the minimum permitted for a combination waste and vent, is as slow as a normal sink drain. There is no difference.

Hence, if a kitchen sink can discharge by a combination waste and vent system, then a kitchen sink with a food waste disposer should also be permitted. The discharge of the waste is the same. The video can be viewed by going to http://www.youtube.com/watch?v=5l8FeTi6Wm4.

P189-12
Final Action: AS AM AMPC____ D

P195-12

1002.4. 1002.4.1 (New), 1002.4.1.1 (New), 1002.4.1.2 (New), 1002.4.1.3 (New), 1002. 4.1.4 (New), Chapter 14

Proposed Change as Submitted

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

Revise as follows:

1002.4 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), or deeper for special designs relating to accessible fixtures. ~~Where a trap seal is subject to loss by evaporation, a trap seal primer valve shall be installed. Trap seal primer valves shall connect to the trap at a point above the level of the trap seal. A trap seal primer valve shall conform to ASSE 1018 or ASSE 1044.~~

1002.4.1 Trap seal protection. Traps seals of emergency floor drain traps and traps subject to evaporation shall be protected by one of the methods in Sections 1002.4.1.1 through 1002.4.1.4.

1002.4.1.1 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 discharge pipe from the trap seal primer valve shall connect to the trap above the trap seal on the inlet side of the trap. Water supplied trap seal primer valves shall discharge not more than 8 gallons of water per year.

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 discharge pipe from the trap seal primer valve shall connect to the trap above the trap seal on the inlet side of the trap. The yearly discharge volume from reclaimed or gray water supplied trap seal primer valves shall not be limited.

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.

1002.4.1.4 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 and shall have an ASSE 1072 rating of AF-GW. The devices shall be installed in accordance with the manufacturer's instructions.

Add new standard to Chapter 14 as follows:

ASSE
1072-07 Performance Requirements for Barrier Type Floor Drain Tap Seal Protection Devices

Reason: This modification adds language to identify all of the methods available for protecting the trap seal of emergency floor drain traps or traps subject to evaporation. The four methods available are: water supplied trap seal primers, waste supplied trap primer devices, trap seal protection devices, and reclaimed water. A water supplied trap seal primer that is unrestricted can discharge 300 to 500 gallons a year to a trap. A 2" trap requires less than ½ gallon a year to maintain the trap seal. There are now devices available that limit the amount of water discharging to 8 gallons per year. The IPC currently has many water conservation measures. This is another water conservation measure.

Waste supplied trap primer devices divert water from a sink or lavatory to the trap. There is no need to limit the flow on these devices since they use waste water.

Trap seal protection devices do not require any water. They are tested for providing protection of the trap seal. By requiring a rating of AF-GW, all of the tests in ASSE 1072 become required. There were previous objections to not requiring all of the tests in the standard.

Reclaimed water can also be used to maintain the trap seal. Since the water is reclaimed, there is no need to limit the annual discharge.

Cost Impact: This change does not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASSE 1072-07 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, 2012.

1002.4-P-BALLANCO

Public Hearing Results

Committee Action: Disapproved

Committee Reason: The proposal has design restrictive language with respect to gray water supplied trap primer valves. There is uncertainty about what type of waste water is being used in Section 1002.4.1.2. It appears that there is only one manufacturer that can meet the ASSE 1072 standard rating of AF-GW.

Assembly Action: None

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing Sure Seal, requests Approval as Modified by this Public Comment.

Modify the proposal 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. 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. ~~Water supplied trap seal primer valves shall discharge not more than 8 gallons of water per year.~~

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. ~~The yearly discharge volume from reclaimed or gray water supplied trap seal primer valves shall not be limited.~~

1002.4.1.4 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. ~~and shall have an ASSE 1072 rating of AF-GW.~~ The devices shall be installed in accordance with the manufacturer's instructions.

Remainder of proposal is unchanged.

Commenter's Reason: This modification responds to the issues presented by the Plumbing Code Committee. An attempt was made to add water conservation requirements for trap seal primer valves. While this is a good idea, the Committee thought this was premature. I have acquiesced and removed the water conservation provisions.

Another concern was with regard to the use of water supplied trap seal primer valves with reclaimed water. My intent all along was the use of treated reclaimed water. I have clarified this requirement in Section 1002.4.1.2. Some manufacturers have claimed that water supplied trap seal primer valves require the use of potable water. That is not correct. Reclaimed water has been used for many years. Water supply trap seal primer valves have been used to supply the reclaimed water to the trap seal. Hence, the modification merely clarifies the practice used in the field. Furthermore, it correlates with Chapter 13, which allows the use of reclaimed water for resealing the traps.

Finally, the Committee was opposed to having a rating requirement for barrier type trap seal protection devices. The reason for adding the rating requirement was in response to the previous code committee's demands. I agree with the current code committee that a rating should not be included in the code. The standard should be permitted to regulate the use and installation of these devices.

Public Comment 2:

Chuck Lott, representing JL Industries, requests Disapproval.

Commenter's Reason: I urge rejection of this proposed code change.

Section 1002.4.1.1 mandates a maximum of 8 gallons of water discharge for annual trap primer valve output. This can be done, but it can only be guaranteed with electronic valves. This mandate will unnecessarily increase the cost of construction.

Section 1002.4.1.2 allows gray water for use with ASSE 1018 valves. Grey water will clog pressure drop activated vales covered in ASSE 1018.

Section 1002.4.1.3 allows waste water for use with ASSE 1044 valves. Waste water will clog many valves listed under ASSE 1044.

P195-12

Final Action: AS AM AMPC____ D

P196– 12
1002.4, Chapter 14

<u>Proposed Change as Submitted</u>

Proponent: David R. Scott, AIA, representing Target Corporation.

Revise as follows:

1002.4 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), or deeper for special designs relating to accessible fixtures. Where a trap seal is subject to loss by evaporation, ~~a trap seal primer valve~~ <u>one of the following</u> shall be installed~~.~~<u>:</u> ~~Trap seal primer valves shall connect to the trap at a point above the level of the trap seal. A trap seal primer valve shall conform to ASSE 1018 or ASSE 1044.~~

1. <u>A trap seal primer valve conforming to ASSE 1018 or ASSE 1044. The discharge pipe from a trap seal primer valve shall terminate at a point that is above the level of the trap seal.</u>
2. <u>Barrier type floor drain trap seal protection device complying with ASSE 1072.</u>

Add new standard to Chapter 14 as follows:

ASSE
<u>1072-2007 Performance requirements for Barrier Type Floor Drain Trap Seal Protection Devices</u>

Reason: Some locations of floor drains and water source do not allow for proper trap seal primer valve installation. There is no easy way to verify if the trap seal primer valve has failed. A barrier-type device is much more accessible to verify proper operation and is easy to replace if needed. Water conservation measures make the barrier-type device more appealing as well.

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

Analysis: A review of the standard proposed for inclusion in the code, ASSE 1072-2007 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, 2012.

1002.4-P-SCOTT

<u>Public Hearing Results</u>

Committee Action: **Approved as Submitted**

Committee Reason: The barrier type floor drain trap seal device is needed in certain applications. There is a standard to cover these products. The ASSE 1018 devices do fail frequently and are subject to clogging. The barrier-type trap seal protection device provide a good alternative method to trap primer valves.

Assembly Action: **Disapproved**

Individual Consideration Agenda

This code change proposal is on the agenda for individual consideration because the proposal received a successful assembly action of Disapproved and a public comment was submitted.

Public Comment 1:

David Scott, AIA, representing Target Corporation, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

1002.4 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), or deeper for special designs relating to accessible fixtures. Where a trap seal is subject to loss by evaporation, one of the following shall be installed:

1. A trap seal primer valve ~~conforming to~~ complying with ASSE 1018 or ASSE 1044. The discharge pipe from a trap seal primer valve shall terminate at a point that is above the level of the trap seal.
2. Barrier type floor drain trap seal protection device complying with ASSE 1072.

Remainder of proposal is unchanged.

Commenter's Reason: Revise wording from "conforming to" to "compliance with" to reflect wording in ASSE standard. Previous statements about the barrier type seal being a mechanical device and concerns about not relying on a mechanical device are unwarranted. The plumbing industry relies heavily on mechanical devices including pumps, valves and the backflow preventers that protect our water supply. Both trap seal primers and barrier type trap seal devices are 'mechanical devices' and need to be maintained, however a barrier-type device is easier to inspect for proper operation and is easy to clean if needed. There is no simple way to verify if a trap seal primer valve is operating properly and failure of the device or excess water consumption may result. Water conservation measures make the barrier-type device a more sustainable alternative.

Public Comment 2:

Chuck Lott, representing JL Industries, requests Disapproval.

Commenter's Reason: I urge rejection of this proposed code change.

Section 1002.4 allows for barrier type floor drain trap seal protection. This is in violation of several exiting code provisions put in place to protect buildings from the harmful effects of sewer gas.

Chapter 7, Section 706.2 prohibits fittings with ledges, shoulders or reductions capable of retarding or obstructing flow. One manufacturer reduces flow diameter by 25% and more depending on drain size, while another places a horizontal support bar directly across the entire diameter of the fitting.

Chapter 10, Section 1002.3 prohibits traps that rely on moving parts to maintain the seal. All barrier type devices rely on elastomeric obstructions that must move with each discharge of the drain.

Chapter 10, Section 1002.4 requires each trap to have a liquid seal of not less 2". Utilization of these barriers in lieu of trap primer valves replacing the liquid seal lost by evaporation will insure dry traps throughout every building into which they are allowed.

P196-12 also adopts ASSE Standard 1072. The standard lists the most rigorous testing protocols as optional, and is wholly inadequate in its treatment of the elastomeric membrane testing.

P196-12

Final Action:	AS	AM	AMPC____	D

P198-12
1003.3 (New), 1003.3.2

Proposed Change as Submitted

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

Revise as follows:

1003.3 Grease interceptors required. A grease interceptor shall be required to receive the drainage from fixtures and equipment with grease-laden waste from food service establishments, such as restaurants, hotel kitchens, bars, factory cafeterias or restaurants, school cafeterias, and clubs. The discharge from a food waste grinder shall not be classified as grease-laden waste and shall not discharge through a grease interceptor.

~~**1003.3.2 Food waste grinders.** Where food waste grinders connect to grease interceptors, a solids interceptor shall separate the discharge before connecting to the grease interceptor. Solids interceptors and grease interceptors shall be sized and rated for the discharge of the food waste grinder. Emulsifiers, chemicals, enzymes and bacteria shall not discharge into the food waste grinder.~~

(Renumber subsequent sections)

Reason: The legacy codes were much clearer in establishing when a grease interceptor is requirement. This text was extracted from the BOCA National Plumbing Code/1993. There are a few changes including the addition of "school cafeterias" to the list and the revision of the facilities to "food service establishments". The other change was the modification of the last sentence to state that the discharge from food waste grinders is not classified as grease laden waste, which was the intent of the legacy codes. The SBCCI Standard Plumbing Code had similar text. The current section 1003.1 and 1003.2 are very unclear as to when grease interceptors are necessary. This will assist the inspector with necessary language for mandating grease interceptors.

The deletion of Section 1003.3.2 will also clarify that food waste grinders are not permitted to discharge through a grease interceptor. This, again, was the intent of the legacy codes. A food waste grinder should never discharge through a grease interceptor. The purpose of a food waste grinder is to pulverize food waste to small enough particles to discharge to the sewer. If a grinder connects to a grease interceptor, the food particles will separate out, defeating the purpose of a food waste grinder. Similarly, if a food waste grinder discharges to a solids interceptor, the food particles will be separated.

Cost Impact: This change does not increase the cost of construction.

1003.3 (NEW)-P-BALLANCO

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The food waste grinder discharge is going to contribute to the fats, oils and greases problem and should be directed through the grease interceptor.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing InSinkErator, requests Approval as Modified by this Public Comment.

Replace proposal as follows:

1003.3.2 Food waste ~~grinders~~ disposers. ~~Where food waste grinders connect to grease interceptors, a solids interceptor shall separate the discharge before connecting to the grease interceptor. Solids interceptors and grease interceptors shall be sized and rated for the discharge of the food waste grinder. Emulsifiers, chemicals, enzymes and bacteria shall not discharge into the food waste grinder.~~ Food waste disposers shall not discharge through a hydromechanical grease interceptor.

Commenter's Reason: I would encourage the membership to overturn the motion to deny and vote to approve this change as modified. One of the concerns expressed and discussed after the hearing was the discharge of food waste disposers to large outdoor gravity grease interceptors. The modification of this change will restrict the discharge of food waste disposers to being allowed through gravity grease interceptors only. This is accomplished by prohibiting the discharge to hydromechanical grease interceptors.

It has been well established that the addition of food particles added to hydromechanical grease interceptors is detrimental to the performance of the interceptor. This documentation has been submitted to the Code Committee and the membership in the past. The code currently does not require food waste disposers to discharge to a grease interceptor. It merely states that, when they do, there should be a solid interceptor. The thought process is that the solids interceptor will capture the food waste particles. The problem with this thought process is that the food particles will always bypass the solids interceptor and foul up the grease interceptor. Modern food waste disposers are so efficient that the food particles are very small in size. A solid interceptor would not be capable of capturing all the food particles.

The other problem with this thought process is that it defeats the purpose of a food waste disposer. Food waste is clean waste that can be readily turned into energy at the wastewater treatment plant. If you intercept the food waste, it makes no sense to install a food waste disposer.

It is unfortunate that some of the discussion at the hearing before the Code Committee reverted to whether food waste disposers should be installed in commercial kitchens. This change has nothing to do with that. Food waste disposers are already permitted. The only point of discussion is whether they should discharge through a grease interceptor. Any professional knowledgeable on grease interceptors or food waste knows that food waste disposers should never discharge through a grease interceptor.

P198-12

Final Action: AS AM AMPC____ D

P205-12
1003.4

Proposed Change as Submitted

Proponent: Andy Neuman, Assistant Chief, Plumbing Division, Bureau of Construction Codes, Department of Licensing and Regulatory Affairs, State of Michigan representing The Bureau of Construction Codes.(konyndykr@michigan.gov)

Revise as follows:

1003.4 Oil separators required. At repair garages, car washing facilities, <u>and</u> at factories where oily and flammable liquid wastes are produced ~~and in hydraulic elevator pits,~~ separators shall be installed into which all oil-bearing, grease bearing or flammable wastes shall be discharged before emptying into building drainage system or other point of disposal.

> ~~**Exception:** An oil separator is not required in hydraulic elevator pits where an approved alarm system is installed~~.

Reason: This code change revision will improve the code by correcting overly restrictive text which is addressed by practical elevator preventive maintenance. Adoption of the American Society of Mechanical Engineers (ASME) A17.1 Edition 2007, Safety Code for Elevators and Escalators, 2.2.2.5, requires elevators for Firefighters Emergency Operation to have a drain or pump capacity to remove 50 gallons per minute. The removal capacity provides consideration for fire suppression discharges. The consideration assures elevator operations for life safety matters by having identified discharge capacities and operations.

The IPC Commentary discussion mistakenly only considers the subsoil water presence for drainage. Elevator pits are designed to allow a very minimal amount of subsoil water if any. Additionally elevator pits are generally required to be inspected which would identify the presence of hydraulic fluid. Requiring oil separators for an emergency fire sprinkler discharge is impractical. Further the sizing of an oil separator in this case is not clarified by code. Is it sized by potential amounts? Who can predict the number of head discharges? Is it sized by the floor area per Section 1003.4.2.2? That floor area could be the pit area only or the entire floor area divided by the number of serving elevators.

This proposed revision mirrors concerns expressed by the design community and welcomes any sizing clarification from hearing attendees.

Cost Impact: Construction cost will be reduced by the proposed revision.

1003.4-P-NEUMAN

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The revised language doesn't require any provision for oil separation for the discharge from a hydraulic elevator pit.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Robert G. Konyndyk, Chief, Plumbing Division, Bureau of Construction Codes, representing Sate of Michigan, requests Approval as Submitted.

Commenter's Reason: This code change revision will improve the code by correcting overly restrictive text which is addressed by practical elevator preventive maintenance. Adoption of the American Society of Mechanical Engineers (ASME) A17.1 Edition 2007, Safety Code for Elevators and Escalators, 2.2.2.5, requires elevators for Firefighters Emergency Operation to have a drain or pump capacity to remove 50 gallons per minute. The removal capacity provides consideration for fire suppression discharges. The consideration assures elevator operations for life safety matters by having identified discharge capacities and operations.

The IPC Commentary discussion mistakenly only considers the subsoil water presence for drainage. Elevator pits are designed to allow a very minimal amount of subsoil water if any. Additionally elevator pits are generally required to be inspected which would identify the presence of hydraulic fluid. Requiring oil separators for an emergency fire sprinkler discharge is impractical. Further the sizing of an oil separator in this case is not clarified by code. Is it sized by potential amounts? Who can predict the number of head discharges? Is it sized by the floor area per Section 1003.4.2.2? That floor area could be the pit area only or the entire floor area divided by the number of serving elevators.

This proposed revision mirrors concerns expressed by the design community.

In summary oil separators should not be required for the discharge from elevator pits.

P205-12

Final Action: AS AM AMPC____ D

P206-12
1003.4

Proposed Change as Submitted

Proponent: Shawn Strausbaugh representing the ICC PMG Code Action Committee

Revise as follows:

1003.4 Oil separators required. At repair garages where floor or trench drains are provided, carwashing facilities, ~~at~~ factories where oily and flammable liquid wastes are produced and ~~in~~ hydraulic elevator pits, oil separators shall be installed into which ~~all~~ oil-bearing, greasebearing or flammable wastes shall be discharged before emptying into the building drainage system or other point of disposal.

> **Exception:** An oil separator is not required in a hydraulic elevator pit where an approved alarm system is installed.

Reason: The current text appears to assume that repair garages have floor drains, trench drains or some drains into which oily wastes are being discharged. If a repair garage has no such drains, what is the purpose of an oil separator? The requirement for a separator should be triggered by the presence of fixtures that are a source of oily waste. A repair garage with only a toilet facility has no need for a separator.

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 an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the PMGCAC has held 2 open meetings, multiple conference calls and multiple workgroup calls which included members of the PMGCAC. Interested parties also participated in all of the meetings and conference calls to discuss and debate the proposed changes.

Cost Impact: None

1003.4-P-STRAUSBAUGH.PMGCAC

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed with the proponent's written reason statement.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Gilbert Gonzales, Murray City, representing Utah Chapter of ICC, requests Disapproval.

Commenter's Reason: The current language does not need to be changed. The question should not be whether a floor or trench drain is installed, but whether an oil separator is required.

Where is the accidental spill discharging too if no floor drains or an oil separator is installed? The purpose of an oil separator is to catch an accidental spill of fuel, oil or grease and prevent it from discharging into the drainage system.

It is not the intent of the code to require an oil separator to serve all plumbing fixtures in a repair garage only to those serving areas where oily, grease bearing and flammable wastes are present e.g. the repair areas.

P206-12
Final Action: AS AM AMPC____ D

P209-12
202, 1101.2

Proposed Change as Submitted

Proponent: Karen Hobbs, Natural Resources Defense Council, representing herself (khobbs@nrdc.org); Eddie Van Giesen, BRAE Rainwater Technologies, representing himself (vangig@watts.com); Harry Misuriello, American Council for an Energy-Efficient Economy, representing self (misuriello@verizon.net)

Add new definitions as follows:

RAINWATER: Precipitation on any public or private parcel that has not entered an offsite storm drain system or channel, a flood control channel, or any other stream channel, and has not previously been put to beneficial use.

RAINWATER CAPTURE SYSTEM: A system designed to capture and store rainwater flowing off of a building, parking lot, or any other manmade, impervious surface for the purposes of using the rainwater for beneficial onsite use.

STORMWATER. Precipitation that has contacted a surface at grade or below grade and has not been put to beneficial use.

Revise as follows:

1101.2 Where required. *Rainwater* from ~~all~~ roofs, paved areas, yards, courts and courtyards shall drain onto open, unpaved areas for infiltration or evapotranspiration where such drainage will not cause or contribute to health, geotechnical or other hazards; or rainwater shall drain to a *rainwater capture system*. Where drainage onto open unpaved areas is not possible and a *rainwater capture system* would not provide beneficial use for the building, *rainwater* from ~~all~~ roofs, paved areas, yards, courts and courtyards shall drain into a separate storm *sewer* system, a combined *sewer* system or to an *approved* place of discharge. ~~For one- and two-family dwellings, and where approved,~~ *Storm water* is permitted to discharge onto flat areas, such as streets or lawns, provided that the storm water flows away from the building.

Reason:

1. The costs to repair and replace our nation's aging water infrastructure are enormous, with investment needs of $298 billion or more over the next 20 years, according to the U.S. Environmental Protection Agency (USEPA, 2008; http://water.epa.gov/scitech/datait/databases/cwns/upload/cwns2008rtc.pdf). In 2009, the American Society of Civil Engineers gave the nation's wastewater facilities a grade of D-minus due to their condition (American Society of Civil Engineers, 2009; http://www.infrastructurereportcard.org/sites/default/files/RC2009_full_report.pdf).
2. As NRDC recently documented in its "Rooftops to Rivers II" report (available at http://www.nrdc.org/water/pollution/rooftopsii/files/rooftopstoriversII.pdf), many cities recognize the unnecessary stress to their wastewater systems caused by having roofs and other paved areas draining directly into the sewer system, when other options exist, such as having those same surfaces drain to open, unpaved areas or captured for reuse through a rainwater harvesting system. Cities often require that roofs and paved areas drain into open, unpaved areas where the rainwater can either be infiltrated into the ground, evapotranspirated, or captured for later reuse. Many cities also have mandatory downspout disconnection programs for existing construction and many are considering mandatory downspout disconnections for new construction.
3. There are also a range of benefits that communities accrue when rainwater is either captured or reused. In a study conducted by NRDC and the University of California, Santa Barbara, *A Clear Blue Future (*http://www.nrdc.org/water/lid) found that implementing practices that emphasize on-site infiltration or capture and reuse had the potential to increase local water supplies by up to 405,000 acre-feet per year by 2030 at new and redeveloped residential and commercial properties in Southern California and the San Francisco Bay area. This represents roughly two-thirds of the volume of water used by the entire city of Los Angeles each year. These water savings translate into electricity savings of up to 1,225,500 megawatt-hours—which would decrease the release of carbon dioxide (CO_2) into the atmosphere by as much as 535,500 metric tons per year—because more plentiful local water reduces the need for energy-intensive imported water. And, perhaps most importantly, these benefits would increase every year.

Cost Impact: There is no cost impact to this proposal.

1101.2-P-HOBBS

Public Hearing Results

Committee Action: Disapproved

Committee Reason: This type of guidance should be in an appendix to the code. This doesn't belong in the IPC as it is already in the IgCC.

Assembly Action: None

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Karen Hobbs, Natural Resources Defense Council, representing self (khobbsnrdc.org); Eddie Van Giesen, BRAE Rainwater Technologies, representing self; Maureen Traxler, representing City of Seattle Dept of Planning & Development; Dave Cantrell, Public Health-Seattle and King County; Harry Misuriello. American Council for an Energy-Efficient Economy, representing self, requests Approval as Modified by this Public Comment.

Replace proposal as follows:

Add new definitions as follows:

<u>**RAINWATER**. Water from natural precipitation.</u>

<u>**STORMWATER**: Natural precipitation, including snowmelt, that has contacted a surface at grade or below grade.</u>

Revise as follows:

1101.2 ~~Where required.~~ <u>Disposal.</u> ~~All~~ <u>Rainwater from</u> roofs, <u>and stormwater from</u> paved areas, yards, courts and courtyards shall drain ~~into a separate storm *sewer* system, or a combined *sewer* system, or~~ to an *approved* place of disposal. For one- and two-family dwellings, and where *approved*, storm water is permitted to discharge onto flat areas, such as streets or lawns, provided that the storm water flows away from the building.

Commenter's Reason:

1. We respectfully disagree with the committee's reason for disapproval, which was that, "This type of guidance should be in an appendix to the code. This doesn't belong in the IPC as it is already in the IgCC." The current IPC language requires that ALL downspouts be connected to a separate storm sewer system or a combined sewer system, ignoring the fact that many jurisdictions either actively discourage connecting downspouts to the sewer system, or, in some cases, even make those connections illegal (see below for a summary of example jurisdictions). The suggested change does not mandate the use of rainwater, it simply recognizes that many municipalities and states are actively encouraging its use. Thus, the proposed change will make it easier for local adoption.
2. Many municipalities and states recognize the beneficial use of rainwater. For example:

   - The State of Georgia, in 2009, after experiencing extreme drought conditions in 2007 and 2008, amended its state plumbing codes and issued detailed rainwater harvesting guidelines to authorize the use of captured rooftop rainwater for both indoor and outdoor non-potable applications.
   - The State of Texas established a Rainwater Harvesting Evaluation Committee in 2005 and directed the state's Water Development Board and other agencies to formulate recommendations for minimum water quality standards for potable and non-potable indoor use and ways in which the state can further promote rainwater harvesting.
   - The City of Portland, Oregon allows the use of rainwater for indoor and outdoor non-potable applications, and, when properly treated, to replace potable water supply.
   - The City of Tuscon, Arizona, in 2010, put into effect a rainwater harvesting ordinance that requires new developments to meet 50 percent of their landscaping water requirements by harvesting rainwater.
   - The states of Virginia, Oregon, and Washington have all also adopted guidelines for design and use of rainwater harvesting systems, and an estimated 30,000 to 60,000 people in the state of Hawaii (up to nearly 5 percent of the state's population) rely on rainwater to meet their water supply needs.

This information is contained in a report the Natural Resources Defense Council (NRDC) issued last year, “Capturing Rainwater from Rooftops,” which is available here: http://www.nrdc.org/water/rooftoprainwatercapture.asp.

3. The costs to repair and replace our nation’s aging water infrastructure are enormous, with investment needs of $298 billion or more over the next 20 years, according to the U.S. Environmental Protection Agency (USEPA, 2008; http://water.epa.gov/scitech/datait/databases/cwns/upload/cwns2008rtc.pdf). In 2009, the American Society of Civil Engineers gave the nation’s wastewater facilities a grade of D-minus due to their condition (American Society of Civil Engineers, 2009; http://www.infrastructurereportcard.org/sites/default/files/RC2009_full_report.pdf).
2. As NRDC recently documented in its “*Rooftops to Rivers II*” report (available at http://www.nrdc.org/water/pollution/rooftopsii/files/rooftopstoriversII.pdf), many cities recognize the unnecessary stress to their wastewater systems caused by having roofs and other paved areas draining directly into the sewer system, when other options exist, such as having those same surfaces drain to open, unpaved areas or captured for use through a rainwater harvesting system. Cities often require that roofs and paved areas drain into open, unpaved areas where the rainwater can either be infiltrated into the ground, evapotranspirated, or captured for later use. Many cities also have mandatory downspout disconnection programs for existing construction and many are considering mandatory downspout disconnections for new construction.
3. There are also a range of benefits that communities accrue from rainwater. In a study conducted by NRDC and the University of California, Santa Barbara, *A Clear Blue Future (*http://www.nrdc.org/water/lid), found that implementing practices that emphasize on-site infiltration or capture had the potential to increase local water supplies by up to 405,000 acre-feet per year by 2030 at new and redeveloped residential and commercial properties in Southern California and the San Francisco Bay area. This represents roughly two-thirds of the volume of water used by the entire city of Los Angeles each year. These water savings translate into electricity savings of up to 1,225,500 megawatt-hours—which would decrease the release of carbon dioxide (CO2) into the atmosphere by as much as 535,500 metric tons per year—because more plentiful local water reduces the need for energy-intensive imported water. And, perhaps most importantly, these benefits would increase every year.

P209-12
Final Action: AS AM AMPC____ D

P211-12
1101.7

Proposed Change as Submitted

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

Revise as follows:

1101.7 Roof design. Roofs shall be designed for the maximum possible depth of water that will pond thereon as determined by the relative levels of roof deck and overflow weirs, scuppers, edges or serviceable drains in combination with the deflected structural elements. In determining the maximum possible depth of water, all primary roof drainage means shall be assumed to be blocked. The maximum possible depth of water on the roof shall include the height of the water required above the inlet of the secondary roof drainage means to achieve the required flow rate of the secondary drainage means to accommodate the design rainfall rate as required by Section 1106.

Reason: Quite often, structural engineers are using the lower edge of a secondary roof drain to be the determining factor for establishing the maximum depth of water that can pond on the roof. However, the drain requires a certain head height to achieve a particular flow rate. That additional head height of water adds to the structural load. This change merely clarifies the intent of the current requirement. This change is consistent with the load requirements in the Building Code.

Cost Impact: This change does not increase the cost of construction.

1101.7-P-BALLANCO

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed with the proponent's written reason statement.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Roger Harper, Jr, Louisa County, VA, representing Virginia Plumbing & Mechanical Inspectors Association(VPMIA) & Virginia Building Code Officials Association (VBCOA), requests Disapproval.

Commenter's Reason: This requirement, language, intent, design criteria (however the wording) is already found in the 2012 IBC Section 1611 with more precise language and calculations. This is a structural design issue, IBC 1611 covers this structural design, and this language is not necessary in plumbing code for it to be applicable, designable, and enforceable.

P211-12
Final Action: AS AM AMPC____ D

P218-12
1105.2 (New)

Proposed Change as Submitted

Proponent: Julius Ballanco, P.E., CPD, FASPE, JB Engineering and Code Consulting, P.C. representing self (JBEngineer@aol.com)

Add new text as follows:

1105.2 Roof drain flow rate. The published roof drain flow rate based upon 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.

(Renumber subsequent sections)

Reason: The code currently requires the storm drainage system to be sized based on the roof area. The sizing never considered the flow rate through a roof drain, nor the ponding around the roof drain required to achieve that flow rate. A study by the ASPE Research Foundation discovered that the flow rates through roof drain vary based on the design of the roof drain. The study also found that for certain roof drains, there were different flow rates depending on which strainer was installed. As a result, some smaller drains are allowing more water through the drain than the pipe is designed to handle under open channel flow.

The only proper way to size a storm drainage system is to apply the known flow rates through the roof drain such that the piping is properly sized. Without knowledge of the flow rate through a roof drain, a storm drainage system can be either undersized or oversized.

Cost Impact: This change will increase the cost of construction.

1105.2 (NEW)-P-BALLANCO

Public Hearing Results

Committee Action: Disapproved

Committee Reason: The report is not yet complete and the final data needs to be put in public comment for the final action.

Assembly Action: None

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing self, requests Approval as Submitted.

Commenter's Reason: The Committee had a valid concern when they stated that the research report had not been issued regarding storm drainage. All attempts were made to have the report completed prior to the first hearing, but to no avail. As this Public Comment is being prepared, the ASPE Research Foundation, Storm Drainage System Research Project, Flow Rate Through Roof Drains report is in the final week of peer review. The report will be published shortly after the completion of the peer review. The report is over 180 pages in length in Word format. It will be typeset for publication, probably resulting in fewer pages.

With the issuance of this research report, it is imperative that the International Plumbing Code be updated for sizing storm drainage systems. The report points out that storm drainage systems have been sized incorrectly for the last 80 years. The new sizing method will result in properly designed storm drainage systems. The proposed code change is consistent with the recommendations in the ASPE RF report.

I will make this report available to anyone wishing to review it. Please contact me at JBEngineer@aol.com. I will also have a copy of the report available for review at the Annual Conference.

P218-12

Final Action: AS AM AMPC____ D

P219-12

1106.2, Table 1106.2 (New), Table 1106.2(1), Table 1106.2(2), 1106.3, Table 1106.3 (New), 1106.6, Table 1106.6

Proposed Change as Submitted

Proponent: Julius Ballanco, P.E., CPD, FASPE, JB Engineering and Code Consulting, P.C. representing himself (JBEngineer@aol.com)

Revise as follows:

~~**1106.2 Vertical conductors and leaders.** Vertical conductors and leaders shall be sized for the maximum projected roof area, in accordance with Table 1106.2(1) and Table 1106.2(2).~~

~~**TABLE 1106.2(1)**~~
~~**SIZE OF CIRCULAR VERTICAL CONDUCTORS AND LEADERS**~~

~~**TABLE 1106.2(2)**~~
~~**SIZE OF RECTANGULAR VERTICAL CONDUCTORS AND LEADERS**~~

~~**1106.3 Building storm drains and sewers.** The size of the building *storm drain*, building storm *sewer* and their horizontal branches having a slope of one-half unit or less vertical in 12 units horizontal (4-percent slope) shall be based on the maximum projected roof area in accordance with Table 1106.3. The slope of horizontal branches shall be not less than one-eighth unit vertical in 12 units horizontal (1-percent slope) unless otherwise *approved*.~~

~~**TABLE 1106.3**~~
~~**SIZE OF HORIZONTAL STORM DRAINGE PIPING**~~

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 in storm drain piping shall not exceed that specified in Table 1106.2.

TABLE 1106.2
STORM DRAIN PIPE SIZING

PIPE SIZE (inches)	CAPACITY (gpm)				
	VERTICAL DRAIN	SLOPE OF HORIZONTAL DRAIN			
		1/16 inch per ft	1/8 inch per ft	¼ inch per ft	½ inch per ft
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

1106.3 Vertical leader sizing. Vertical leaders shall be sized based on the flow rate from horizontal gutters or the maximum flow rate through roof drains. The flow rate through vertical leaders shall not exceed that specified in Table 1106.3.

TABLE 1106.3
VERTICAL LEADER SIZING

SIZE OF LEADER (inches)	CAPACITY (gpm)
2	30
2 × 2	30
1½ × 2½	30
2½	54
2½ × 2½	54
3	92
2 × 4	92
2½×3	92
4	192
3 × 4¼	192
3½×4	192
5	360
4 × 5	360
4½ × 4½	360
6	563
5 × 6	563
5½ × 5½	563
8	1208
6 × 8	1208

1106.6 Size of roof gutters. ~~The size of semicircular gutters shall be based on the maximum projected roof area in accordance with Table 1106.6.~~ Horizontal gutters shall be sized based on the flow rate from the roof surface. The flow rate in horizontal gutters shall not exceed that specified in Table 1106.6.

~~**TABLE 1106.6**~~
~~**SIZE OF SEMICIRCULAR ROOF GUTTERS**~~

TABLE 1106.6
HORIZONTAL GUTTER SIZING

GUTTER DIMENSIONS[a] (inches)	SLOPE (inch/foot)	CAPACITY (gpm)
1½ × 2½	1/4	26
1½ × 2½	1/2	40
4	1/8	39
2¼ × 3	1/4	55
2¼ × 3	1/2	87
5	1/8	74

GUTTER DIMENSIONS[a] (inches)	SLOPE (inch/foot)	CAPACITY (gpm)
4 × 2½	1/4	106
3 × 3½	1/2	156
6	1/8	110
3 × 5	1/4	157
3 × 5	1/2	225
8	1/16	172
8	1/8	247
4½ × 6	1/4	348
4½ × 6	1/2	494
10	1/16	331
10	1/8	472
5 × 8	1/4	651
4 × 10	1/2	1055

a. Dimensions are width by depth for rectangular shapes.
Single dimensions are diameters of a semicircle.

Reason: The ASPE Research Foundation completed a research project on the flow rates through roof drains. What was uncovered was the fact that storm drainage systems have been improperly designed since the code requirements inception. The code requirements date back to the original National Plumbing Code recommendations from the National Bureau of Standards published in 1940. The current code assumes that the water will gradually flow to a roof drain and flow into the piping, never to exceed the amount of flow permitted in the drain.

What is occurring is the rain water flows at different rates depending on the pitch of the roof. The more ponding of water at the roof drain, the greater the quantity of flow through the roof drain. The research discovered that for smaller roof drains, the roof drain often allowed a much greater quantity of water to flow in the drain than is permitted by pipe sizing. The end result is the storm drain becomes a pressurized piping system. There are many occurrences of pipe failures resulting from storm drainage piping blowing apart inside the building. This can be attributed to improper sizing of the storm drainage system. Either a smaller roof drain was required, or a larger storm drain pipe.

By changing the method of sizing, the flow through the roof drain is finally considered when sizing the piping system. This is no different than sizing a sanitary drainage system whereby the system is sized based on the flow rate from a given fixture drain.

There is no need to indicate roof areas since the slope and shape of the roof will impact the sizing of the storm drainage system. An engineer will have to evaluate the amount of ponding around the roof drain during a 100 year storm of one hour duration. Once the ponding is known, the drain can be selected based on the flow rate of that particular drain. The piping is then sized based on the flow through the roof drain.

The sizing for all of the tables was taken from the ASPE Sizing Tables Application. Schedule 40 PVC was used for the pipe sizes, with the exception of 5 inch. Cast iron was used to develop the 5 inch numbers. The flow rates are maximum flows using one third full for the stacks and full flow for the horizontal drains. One third full stacks was identified by the National Bureau of Standards as a flow amount that will assure open channel flow in the piping system.

Gutter sizing was also taken from the ASPE Sizing Table Application.

The ASPE Research Foundation report has not been published as of the date of code change submittal deadline. However, the testing has been completed. The flow rate through roof drains varies with manufacturer, type of strainer, and head height. There is no one size fits all result from the testing. An engineer must know the flow through the roof drain they select in order to properly size the system.

Cost Impact: This change will increase the cost of construction.

1106.2-P-BALLANCO

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The report is not yet complete and the final data needs to be put in public comment for the final action and consistency with the committee's action on P218-12.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing self, requests Approval as Submitted.

Commenter's Reason: The Committee had a valid concern when they stated that the research report had not been issued regarding storm drainage. All attempts were made to have the report completed prior to the first hearing, but to no avail. As this Public Comment is being prepared, the ASPE Research Foundation, Storm Drainage System Research Project, Flow Rate Through Roof Drains report is in the final week of peer review. The report will be published shortly after the completion of the peer review. The report is over 180 pages in length in Word format. It will be typeset for publication, probably resulting in fewer pages.

With the issuance of this research report, it is imperative that the International Plumbing Code be updated for sizing storm drainage systems. The report points out that storm drainage systems have been sized incorrectly for the last 80 years. The new sizing method will result in properly designed storm drainage systems. The proposed code change is consistent with the recommendations in the ASPE RF report.

I will make this report available to anyone wishing to review it. Please contact me at JBEngineer@aol.com. I will also have a copy of the report available for review at the Annual Conference. I will make this report available to anyone wishing to review it. Please contact me at JBEngineer@aol.com. I will also have a copy of the report available for review at the Annual Conference.

P219-12
Final Action: AS AM AMPC____ D

P221-12
1108.3

Proposed Change as Submitted

Proponent: Julius Ballanco, P.E., CPD, FASPE, JB Engineering and Code Consulting, P.C. representing self (JBEngineer@aol.com)

Revise as follows:

1108.3 Sizing of secondary drains. Secondary (emergency) roof drain systems shall be sized in accordance with Section 1106 based on the rainfall rate for which the primary system is sized ~~in Tables 1106.2(1), 1106.2(2), 1106.3 and 1106.6~~. Scuppers shall be sized to prevent the depth of ponding water from exceeding that for which the roof was designed as determined by Section 1101.7. Scuppers shall have an opening dimension of not less than 4 inches (102 mm). The flow through the primary system shall not be considered when sizing the secondary roof drain system.

Reason: This is a companion change to the change to Section 1106. There is no need to reference the tables in Section 1106. By merely referencing the section, the code adequately identifies the requirements for sizing the secondary drainage system.

1108.3-P-BALLANCO

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The report is not yet complete and the final data needs to be put in public comment for the final action and consistency with the committee's action on P218-12.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing self, requests Approval as Submitted.

Commenter's Reason: The Committee had a valid concern when they stated that the research report had not been issued regarding storm drainage. All attempts were made to have the report completed prior to the first hearing, but to no avail. As this Public Comment is being prepared, the ASPE Research Foundation, Storm Drainage System Research Project, Flow Rate Through Roof Drains report is in the final week of peer review. The report will be published shortly after the completion of the peer review. The report is over 180 pages in length in Word format. It will be typeset for publication, probably resulting in fewer pages.

With the issuance of this research report, it is imperative that the International Plumbing Code be updated for sizing storm drainage systems. The report points out that storm drainage systems have been sized incorrectly for the last 80 years. The new sizing method will result in properly designed storm drainage systems. The proposed code change is consistent with the recommendations in the ASPE RF report.

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P221-12
Final Action: AS AM AMPC____ D

P222-12
1110, 1110.1

Proposed Change as Submitted

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

Delete without substitution:

~~SECTION 1110~~
~~VALUES FOR CONTINUOUS FLOW~~

~~**1110.1 Equivalent roof area.** Where there is a continuous or semicontinuous discharge into the building *storm rain* or building storm *sewer*, such as from a pump, ejector, air conditioning plant or similar device, each gallon per minute (L/m) of such discharge shall be computed as being equivalent to 96 square feet (9 m2) of roof area, based on a rainfall rate of 1 inch (25.4 mm) per hour.~~

Reason: This is a companion change to the change in sizing in Section 1106. Since the new sizing method uses gpm for sizing, there is no need to convert numbers for adding values for continuous flow. The gpm is simply added to the rainfall gpm.

Cost Impact: This change does not increase the cost of construction.

1110-P-BALLANCO

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The report is not yet complete and the final data needs to be put in public comment for the final action and consistency with the committee's action on P218-12.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing self, requests Approval as Submitted.

Commenter's Reason: The Committee had a valid concern when they stated that the research report had not been issued regarding storm drainage. All attempts were made to have the report completed prior to the first hearing, but to no avail. As this Public Comment is being prepared, the ASPE Research Foundation, Storm Drainage System Research Project, Flow Rate Through Roof Drains report is in the final week of peer review. The report will be published shortly after the completion of the peer review. The report is over 180 pages in length in Word format. It will be typeset for publication, probably resulting in fewer pages.

With the issuance of this research report, it is imperative that the International Plumbing Code be updated for sizing storm drainage systems. The report points out that storm drainage systems have been sized incorrectly for the last 80 years. The new sizing method will result in properly designed storm drainage systems. The proposed code change is consistent with the recommendations in the ASPE RF report.

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P222-12
Final Action: AS AM AMPC____ D

P223-12

1302.2, Chapter 14

Proposed Change as Submitted

Proponent: Jeremy Brown, NSF International (Jeremy@nsf.org)

Revise as follows:

1302.2 Disinfection and treatment. ~~Gray water shall be disinfected by an approved method that employs one or more disinfectants such as chlorine, iodine or ozone that are recommended for use with the pipes, fittings and equipment by the manufacturer of the pipes, fittings and equipment.~~ Gray water shall be disinfected and treated by an on-site water reuse treatment system complying with NSF 350.

Add new standard to Chapter 14 as follows:

NSF

350-2011 Onsite Residential and Commercial Water Reuse Treatment Systems

Reason: In addition to microbiological contaminants that need disinfection, gray water contains organic compounds, suspended solids, turbidity, surfactants, and other contaminants that have the potential to accumulate and negatively impact the functioning of water closets and urinals if not treated properly. NSF/ANSI-350 *Onsite Residential and Commercial Water Reuse Treatment Systems* establishes the minimum materials, design and construction, and performance requirements for systems that disinfect and treat gray water for non-potable reuse applications, including flushing water for closets and urinals. Rigorous testing with gray water as defined by the standard ensures the treatment systems meet strict effluent quality requirements suitable for reuse applications, along with providing protection of public health and the environment. NSF 350 is currently referenced in the IGCC and IAPMO Green Supplement. Copies of this document may be obtained from the proponent.

Cost Impact: This will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, NSF 350-2011, 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, 2012.

1302.2-P-BROWN

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed with the proponent's written reason statement.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Shawn Strausbaugh, Arlington County, VA, representing International Code Council Plumbing, Mechanical, and Fuel Gas Code Action Committee (ICC PMG CAC), requests Disapproval.

Commenter's Reason: If proposal P11 is approved at the final action hearing, then this proposal would need to be disapproved because the section that this proposal revises will no longer exist.

P223-12
Final Action: AS AM AMPC____ D

P225-12
1308.1.1 (New), Chapter 14

Proposed Change as Submitted

Proponent: Lorri Grainawi, STI/SPFA Representing the Steel Tank Institute / Steel Plate Fabricators Association (lgrainawi@steeltank.com)

Add new text as follows:

1308.1.1 Design and construction. Reservoirs shall be designed and constructed in accordance with Chapters 16 through 22 of the International Building Code and in accordance with the following standards as appropriate for the material of the reservoir: AWWA D100, AWWA D115, AWWA D120, UL 58, UL 1746, UL 1316, UL 142, API 12F or API 12D.

Add new standards to Chapter 14 as follows:

American Petroleum Institute
1220 L Street, NW
Washington, DC 20005

API

API 12F-2008	Specification for Shop Welded Tanks for Storage of Production Liquids, effective April 1, 2009
API 12D-2008	Specification for Field Welded Tanks for Storage of Production Liquids, effective April 1, 2009

AWWA

D100-05	AWWA Standard for Welded Carbon Steel Tanks for Water Storage
D115-06	AWWA Standard for Tendon Prestressed-Concrete Water Tanks
D120-09	AWWA Standard for Thermosetting Fiberglass-Reinforced Plastic Tanks

UL

UL 58-1996	Steel Underground Tanks for Flammable and Combustible Liquids with revisions through July 27, 1998
UL 1746-2007	External Corrosion Protection Systems for Steel Underground Storage Tanks
UL 1316-1994	Glass-Fiber Reinforced Plastic Underground Storage Tanks for Petroleum Products, Alcohols, and Alcohol Gasoline Mixtures with revisions through May 12, 2006
UL 142-2006	Steel Aboveground Tanks for Flammable and Combustible Liquids with revisions through February 12, 2010

Reason: The Steel Tank Institute is proposing the above language in response to the fact that there are no specific references to allow the designer the ability to directly reference the appropriate provisions for the design and construction of reservoirs.

In addition, we would note that the graywater and rainwater reservoir market today is unregulated. We have experienced this through the number of communications to the Institute, were it has been found that the inquiries were citing an inconsistent application for the design and construction of reservoirs.

Our position is that some form of structural provisions needs to be incorporated in order to ensure that this subject is, at the very least, addressed. These provisions are not intended, nor do they, favor one or more materials or types of constructions of reservoirs. We simply feel that basic structural and foundation provisions of the International Building Code should be used to provide for the safe storage and installation of reservoirs holding gray water and rainwater.

With respect to the listing of standards, STI has simply employed those standards used in other applications, such as automatic fire suppression reservoirs and fuel tank reservoirs. Unfortunately, until either these standards are enhanced, or new standards are created, to handle gray water and rain water applications we felt these the most appropriate since they do cover the structural design of a reservoir.

Cost Impact: We do not anticipate significant additional costs.

Analysis: A review of the standards proposed for inclusion in the code, API 12F-2008, API 12D-2008, AWWA D100-05, AWWA

D115-06, AWWA D120-09, UL 58-1996, UL 1746-2007, UL 1316-1994 and UL 142-2006, 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, 2012.

1308.1.1-P-GRAINAWI

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed with the proponent's written reason statement.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Roger Harper, Jr, Louisa County, VA, representing Virginia Plumbing & Mechanical Inspectors Association (VPMIA) & Virginia Building Code Officials Association (VBCOA), requests Disapproval.

Commenter's Reason: Some of the referenced standards for the storage tanks are for flammable and combustible liquids, alcohol and alcohol/gasoline mixture which subsurface water is not. These types of tanks could cost more than a standard underground water storage tank and as such I believe this needs to be cleaned up before becoming code.

P225-12
Final Action: AS AM AMPC____ D

P229-12
PSD 505.8.2

Proposed Change as Submitted

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

Revise as follows:

505.8.2 Soldered joints. Solder joints between copper pipe or tubing and fittings shall be made in accordance with the methods of ASTM B 828 with the following sequence of joint preparation and operation: measuring and cutting, reaming, cleaning, fluxing, assembly and support, heating, applying the solder, cooling and cleaning. ~~All cut~~ The ends of pipe or tub~~e~~ing shall be cut square and shall be reamed to the full inside diameter of the pipe or tub~~e~~ing. ~~end.~~ Burrs on the outside end of the pipe or tubing shall be removed. ~~All~~ Joint surfaces to be soldered shall be cleaned bright by manual or mechanical means. ~~A~~ Flux conforming to ASTM B 813 shall be applied to the pipe or tubing and fittings. Such flux shall be noncorrosive and nontoxic after soldering. ~~be applied.~~ Pipe or tubing shall be inserted to the base of the fitting. Excess flux shall be removed from the exterior of the joint. The assembled joint shall be supported to create a uniform capillary space around the joint. An LP gas or acetylene air /fuel torch shall be used to apply heat to the assembled joint. The heat shall be applied with the flame perpendicular to the pipe or tubing. The flame shall be moved alternately between the fitting cup and the pipe or tubing. Solder in compliance with ASTM B 32 shall be applied to the joint surfaces until capillary action draws the molten solder into the cup of the fitting. ~~The joint shall be soldered with a solder conforming to ASTM B 32.~~ The soldered joint shall not be disturbed until cool. Remaining flux residue shall be cleaned from the exterior of the joint.

Reason: The above proposal provides important language from the standards to aid the end user.

Cost Impact: None

505.8.2-P-FEEHAN

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: To be consistent with the committee's actions on P103-12 and P165-12.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Pennie L. Feehan, Pennie L. Feehan Consulting representing CDA – Copper Development Association, requests Approval as Modified by this Public Comment.

Replace proposal as follows:

505.8.2 Soldered joints. Solder joints shall be made in accordance with the methods of ASTM B 828. All cut ends shall be cut square and reamed to the full inside diameter of the tube end. All joint surfaces shall be cleaned bright by manual or mechanical means. ~~A~~ Flux conforming to ASTM B 813 shall be applied to all joint surfaces. The joint shall be soldered with a solder conforming to ASTM B 32.

Commenter's Reason: This proposal adds language that provides clear directions to the end user and provides uniformity with the IPC & IMC.

P229-12
Final Action: AS AM AMPC____ D

P231-12
202

Proposed Change as Submitted

Proponent: Bob Gulick, representing Mazzetti Nash Lipsey Burch (bobg@mazzetti.com)

Revise as follows:

SECTION 202
GENERAL DEFINITIONS

TEMPERED WATER. Water having a temperature range between ~~85°F (29°C)~~ <u>70°F (21°C)</u> and 110°F (43°C).

Add new text as follows:

<u>**422.11 Tempered water for hand washing.** It is acceptable to serve sinks and lavatories used primarily for hand washing with a single pipe supply of tempered water at a temperature between 70°F (21°C) and 85°F (29°C).</u>

Reason: To allow tempered water systems at lower than 85°F (29°C) for hand washing in health care facilities – see second code change proposal

To reduce exposure to infection by mitigating the propagation of Legionella with lower temperature; to reduce water consumption; to reduce energy consumption and greenhouse gas emissions; and to reduce first costs. A single reduced temperature hand washing tempered water system will reduce water consumption by eliminating “warm up” time. Energy will be saved, reducing green house gas emissions, via less tempered water use and lower standby losses at lower temperatures.

Cost Impact: No direct cost impact, but indirectly facilitates cost savings. The code change proposal will not increase the cost of construction. A single pipe low temperature tempered water system with point of use heating for higher temperatures will reduce piping and insulation, which will more than offset the cost of point of use heating.

422.11 (NEW)-P-GULICK

Public Hearing Results

This code change proposal was contained in the <u>Updates to the 2012 Proposed Changes</u> posted on the ICC website. Please go to http://www.iccsafe.org/cs/codes/Pages/12-13-ProposedChanges-A.aspx

Committee Action: **Disapproved**

Committee Reason: Tempered water is already required in the code and there is no data given for reducing the tempered water low end temperature.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Gary Klein, Affiliated International Management, LLC representing self, requests Approval as Modified by this Public Comment.

Replace the proposal as follows:

TEMPERED WATER. Water having a temperature that is ~~range between~~ ~~85°F (29°C)~~ 70°F (21°C) or greater and less than 110°F (43°C).

422.11 Tempered water for hand washing. Where sinks used primarily for hand washing and lavatories are served by only a single pipe supplying tempered water, the tempered water temperature shall not exceed 80°F (27°C).

Commenter's Reason:

The committee disapproved the original proposal because no data was provided to support lowering the temperature threshold for tempered water. This comment provides information to support lowering the threshold.

The reason for lowering the temperature to 70F is because this temperature is essentially room temperature and is used by most hospital staff to wash their hands in now. Since the temperature of cold water entering a building is 50F or less in many parts of the country for much of the year, it will be necessary to heat the water to bring it up to the 70-80F range.

Why don't' people in healthcare facilities use hotter water now? Having asked healthcare professionals and facilities engineers from around the country about this topic, the reason seems to be that their hot water systems contain too large a volume between the source and the sinks to provide hot water on most occasions, even though health care workers have been trained to scrub their hands for at least 20 seconds (not the 5 seconds most of us spend when in public restrooms). The Center for Disease Control and others have found that scrubbing with soap for 20 seconds is more effective at removing bacteria and dirt than shorter times and tempered water of 105-110F.

I spoke with the proponents before submitting this comment and they agreed that the upper temperature should be limited to 80F instead of the 85F in the original proposal. The reason for limiting the upper temperature of a single pipe tempered water system for hand washing to 80F is so that the temperature remains low enough so that the growth rate of Legionella colonies will be very low. Please remember that Legionella comes into the building in the cold water supply and the colonies grow slowly until they approach body temperature.

The original proposal was made by representatives from the health care industry for use their facilities. This comment should be approved because it provides a workable alternative to the current practice of heating the water to a high temperature (at least 140F) and then mixing it with cold water to arrive at an acceptable temperature for hand washing.

Thank you for considering this comment.

P231-12

Final Action: AS AM AMPC____ D