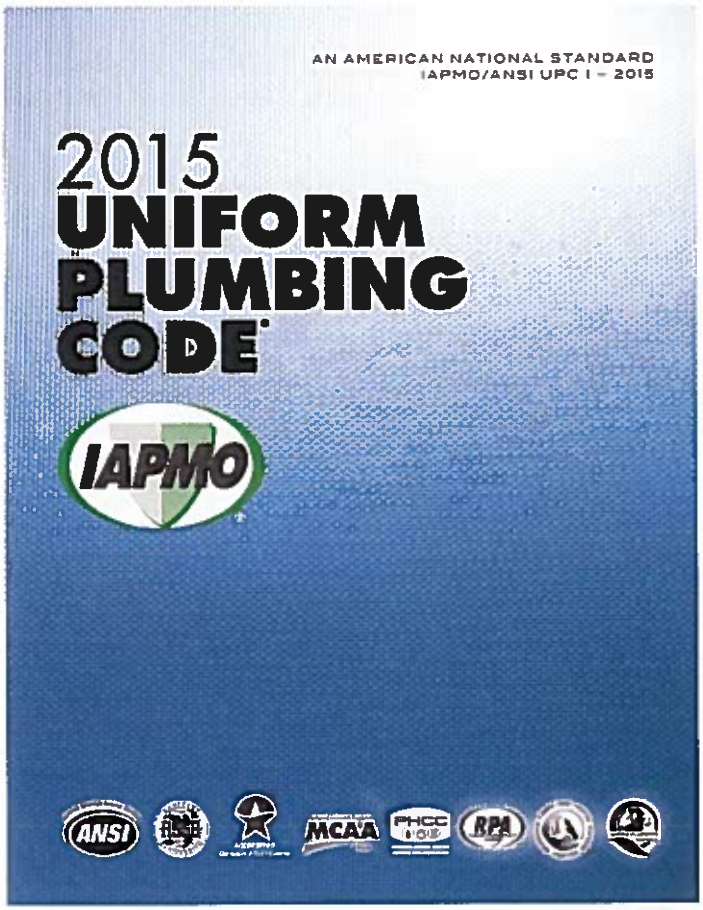


2015 Uniform Plumbing Code®

Guide to Important Code Changes

Chapter 2 Definitions

What Changed

203.0
Accepted Engineering Practice. That which conforms to technical or scientific-based principles, tests, or standards that are accepted by the engineering profession.

205.0
Combination Temperature and Pressure-Relief Valve. A relief valve that actuates when a set temperature, pressure, or both is reached. Also known as a T&P Valve.

207.0
Expansion Joint. A fitting or arrangement of pipe and fittings that permits the contraction and expansion of a piping system.

Why It Changed

Accepted Engineering Practice
The term "accepted engineering practice" was previously used in Sections 309.1, 501.1, 911.1, 1208.7.5.1, 1314.1, and E 35.1 without being defined. This definition assists the end user in applying and enforcing this term, and is consistent with terminology used in other industry standards.

Combination Temperature and Pressure-Relief Valve
The term "combination temperature and pressure relief valve" was used in Sections 505.2 and 608.3 without being defined. This new definition also defines the industry shortened and often used term "T & P."

Expansion Joint
The term "expansion joint" was used in Sections 705.10 and 1101.4 without being defined. These joints allow for movement when temperature fluctuations in piping systems are present and must be addressed.

What It Means To Me

Accepted Engineering Practice
This definition clearly defines the parameters required to substantiate a plumbing system will meet the minimum requirements accepted by known practices. These requirements are no longer ambiguous and will require the designer to prove that the proper engineering practices have been met with quantifiable and proven results. This may include references to established design principles and other testing data. American Society of Plumbing Engineers (ASPE) publishes design handbooks that are generally accepted by the industry.

Combination Temperature and Pressure-Relief Valve
This relief valve combines both temperature relief and pressure relief in one valve and is an important safety feature for storage type water heating systems and inspectors and installers must verify the installation of such valve. Other methods and mechanical devices that only meet one such requirement may not be used.

When the water system is equipped with a storage water heater, pressures rise even more because of the increase in temperature and the high volume of water contained in the tank. All storage water heaters are required to be equipped with a combination temperature and pressure relief valve (T&P valve). Note in figure 1, the combination T&P valve has a temperature sensing tube. The pressure relief valve does not. Storage water heaters must be manufactured to the ANSI Z21.10 series of standards.

Expansion Joint
Where required for piping systems, specifically ABS and PVC systems, expansion joints may be accounted for by using offsets. Although a listed expansion joint may be installed according to their installation instructions this is not the only way to achieve allowance for expansion and contraction. Frequent changes in direction, or offsets, will meet the intent of the code to allow for thermal expansion.

204.0 Bottle Filling Station and 206.0 Drinking Fountain

What Changed

204.0

Bottle Filling Station. A plumbing fixture connected to the potable water distribution system and sanitary drainage system that is designed and intended for filling personal use drinking water bottles or containers not less than 10 inches (254 mm) in height. Such fixtures can be separate from or integral to a drinking fountain and can incorporate a water filter and a cooling system for chilling the drinking water.

206.0

Drinking Fountain. A plumbing fixture connected to the potable water distribution system and sanitary drainage system that provides drinking water in a flowing stream so that the user can consume water directly from the fixture without the use of accessories. Drinking fountains should also incorporate a bottle filling station and can incorporate a water filter and a cooling system.

Why It Changed

This definition was added to define bottle filling stations in code since additional language has been added 415.2 regarding the installation of these fixtures. Please see the code change information in section 415.2 for more detailed information.

What It Means To Me

Code users must be able to properly identify bottle filling stations from drinking fountains. More information regarding bottle filling stations can be found in section 415.2, which is also cover later in this document.

220 Registered Design Professional

What Changed

220.0 **Registered Design Professional.** An individual who is registered or licensed by the laws of the state to perform such design work in the jurisdiction.

Why It Changed

This addition provides a definition and correlates the industry recognized term "registered design professional" with the related terms currently used in the Uniform Plumbing Code (UPC) and other industry related codes. The term had been used within the UPC in previous editions of the code, but was undefined.

What It Means To Me

As a code official or an installer/contractor the term Registered Design Professional can be confusing and have different meanings based on the state where the code is applied. By defining the term and meaning of "Registered Design Professional" the code change gives more clarity to the end user of the code.

312.6 Freezing Protection

What Changed

312.6 Freezing Protection. No water, soil, or waste pipe shall be installed or permitted outside of a building, in attics or crawl spaces, or in an exterior wall unless, where necessary, adequate provision is made to protect such pipe from freezing.

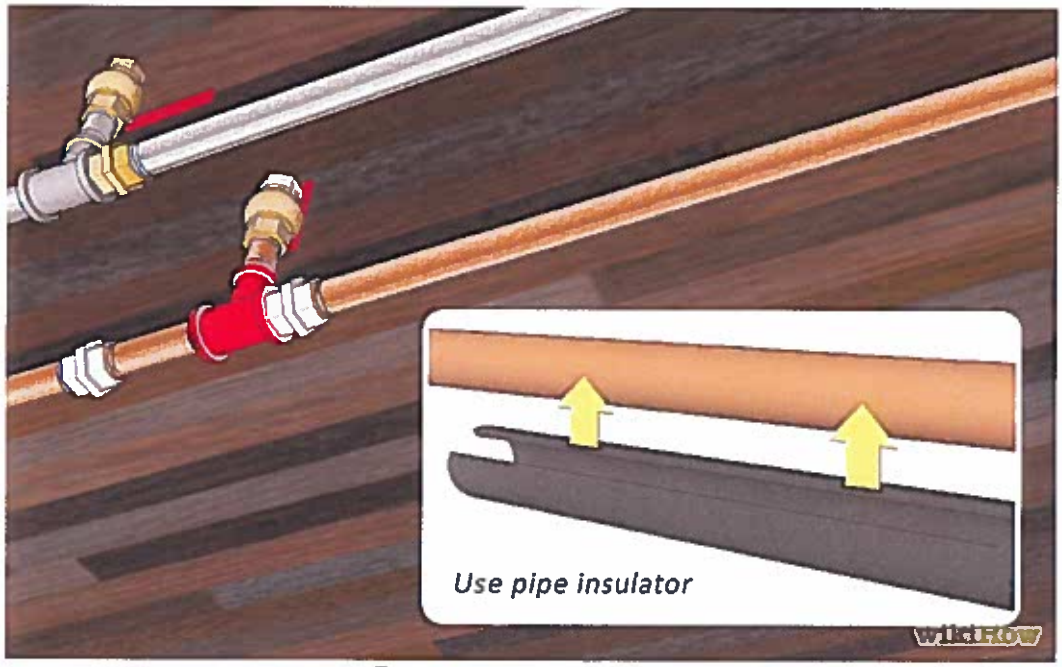
Why It Changed

The current text does not account for locations such as attics and crawl spaces that may be susceptible to freezing temperatures. Therefore, the revision is necessary to protect piping installed in such locations from freezing.

What It Means To Me

The installer and inspectors must be aware of locations that may allow piping to be exposed to freezing. Piping shall not be installed in these areas unless provisions are in place to prevent freezing. The addition of attics and crawl spaces clarifies such locations.

Piping can be protected by using insulation or heat tapes. However, local conditions and the authority having jurisdiction have the final say over how protection is deemed "adequate."



Example of Pipe Insulation
Image Courtesy of wikiHow

312.14 Exposed PVC Piping

What Changed

312.14 Exposed PVC Piping. PVC piping shall not be exposed to direct sunlight.
Exceptions:
(1) PVC piping exposed to sunlight that is protected by water based synthetic latex paints.
(2) PVC piping wrapped with not less than 0.04 inch (1.02 mm) thick tape or otherwise protected from UV degradation

Why It Changed

The installation standards and manufacturer's instructions did not allow for PVC pipe to be exposed to direct sunlight except for short periods of time during construction. Many jurisdictions do not adopt the installation standards. This protection is now found in the body of the code and complies with the requirements of the manufacturer.

What It Means To Me

Over time PVC installed in direct sunlight will break down and deteriorate and, eventually fail. Installers will now have guidelines for the installation of PVC in direct sunlight as long as certain specific conditions are met. Installers and inspectors must ensure that PVC piping exposed to direct sunlight comply with the methods of protection detailed in this section. Lack of enforcement will cause increased cost to the end user and possible liability issues as system failure could occur resulting in damages. The local AHJ will have the responsibility to require the improperly installed system to be replaced properly.

Inspectors will need to identify that the paint used is water based and synthetic latex. Oil based paints are not compatible with PVC. Inspectors should be familiar with the appropriate types of paint and be able to identify it when applied to PVC piping in the field. If unsure, it would not be unreasonable for the inspector to ask to see a can of the paint used. When tape meeting the specifications of this section is used, the inspector should verify that the piping is completely covered and no gaps in the tape are present. For piping that does not have some sort of paint or tape protection, the inspector should examine the piping for indications that the PVC piping is listed for exposure to direct sunlight.

314.1 Trenches

What Changed

314.1 Trenches. Trenches deeper than the footing of a building or structure, and paralleling the same, shall be located not less than 45 degrees (0.79 rad) ~~there from~~ from the bottom exterior edge of the footing, or as approved in accordance with Section 301.0 ~~of this code~~.

Why It Changed

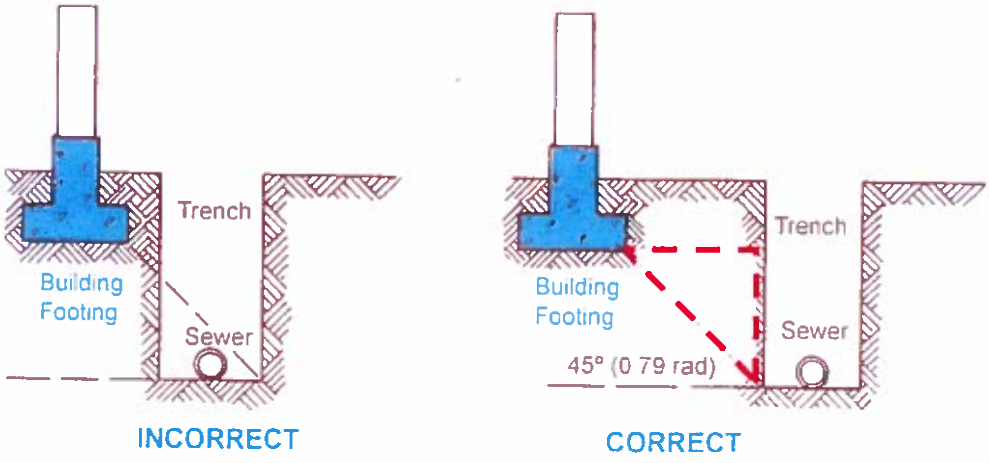
The text in this section was not clear and was commonly misunderstood. This led to many installers and inspectors performing this measurement from the wrong point. The new text clarifies the intent of the section.

What It Means To Me

The code now gives a clear understanding that the measurement starts the bottom edge of the footing. Installers must be sure that they are measuring appropriately. Due the frequency in which this section was misapplied previously, inspectors are going to have to be aware that this is likely to be the source of frequent violations until the standard practice is well understood.

If the measurement that this section calls for is done incorrectly, it is compromising the integrity of the ground supporting the load transferred through the footing. This could lead to foundation failure, not pipe failure. The main point is to protect the foundation of the building.

Since the relation of the 45 degree angle to the vertical height of the trench creates an isosceles triangle where the two legs are equal, we know that the height from the bottom of the trench to the bottom edge of the footing will equal the horizontal distance from the bottom edge of the footing to the closest edge of the trench. Therefore, if the horizontal distance is equal to or greater than the vertical distance, then the trench is at an approved distance from the footing.



What Changed

314.4 Excavations. Excavations shall be completely backfilled as soon after inspection as practicable. Precaution shall be taken to ensure compactness of backfill around piping without damage to such piping. Trenches shall be backfilled in thin layers to 12 inches (305mm) above the top of the piping with clean earth, which shall not contain stones, boulders, cinderfill, frozen earth, construction debris, or other materials that will damage or break the piping or cause corrosive action. Mechanical devices such as bulldozers, graders, etc., shall be permitted to then be used to complete backfill to grade. Fill shall be properly compacted. Precautions shall be taken to ensure permanent stability for pipe laid in filled or made ground.

Underground thermoplastic pipe and fittings for sewers and other gravity flow applications shall be installed in accordance with this code and Section 314.4.1.

314.4.1 Installation of Thermoplastic Pipe and Fittings. Trench width for thermoplastic sewer pipe shall be 1.25 times the outside diameter of the piping plus 12 inches (305 mm) or the outside diameter of the piping plus 16 inches (406 mm). Thermoplastic piping shall be bedded in not less than 4 inches (102 mm) of granular fill supporting the piping. The backfill for thermoplastic piping shall be compacted along the sides of the piping in 6 inch (152 mm) layers and continue to not less than 12 inches (305 mm) above the piping. Compaction shall be not less than a 85 percent standard proctor density.

Why It Changed

This change to the installation requirements will help to clarify the correct installation of thermoplastic piping in trenches.

What It Means To Me

This change provides for prescriptive methods and or procedures to guide the installer and the inspector in the proper installation of thermoplastic piping systems.

The reason for controlling the trench width is to enable the thermoplastic piping to gain side fill support from the compaction. If the trench width is wider, the side fill support is more difficult to maintain and, if it is narrower than the requirement, there is not enough room to compact the side fill support in 6 inch layers.

The reason for granular fill support is to enable the thermoplastic piping to embed itself in the fill, and increase the bedding angle which takes advantage of the side fill support to prevent the piping from flattening due to the load of the backfill on top of the pipe. A cubic foot of dirt weighs about 45 pounds and if wet the weight increases. Because plastic piping is flexible the weight exerted on the top of the pipe forces the sides of the pipe to deflect outward.

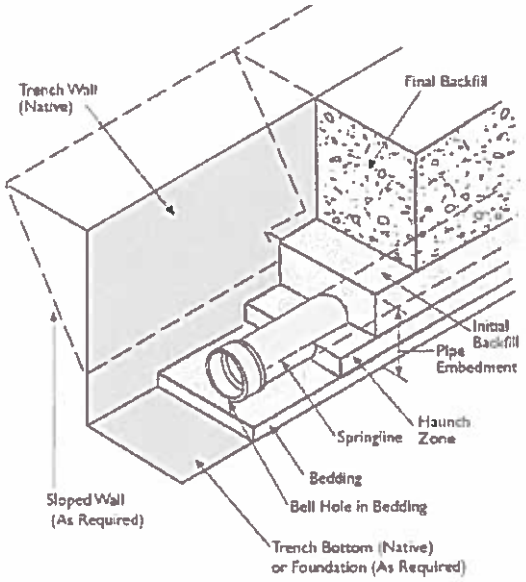


Image Courtesy of Georg Fischel Harvel

The compaction is necessary to prevent the deflection of the pipe from the weight of the backfill. Compaction of the side fill prevents the weight on top of the pipe from causing the pipe to become oval and leak or fail because of the fracture of pipe walls. Undisturbed native soil is considered to be 100% standard proctor density so the 85% compaction attempts to restore the soil back to its original state.

320.0 Rehabilitation of Piping Systems

What Changed

320.0 Rehabilitation of Piping Systems.
320.1 General. Where pressure piping systems are rehabilitated using an epoxy lining system it shall be in accordance with ASTM F2831.

Why It Changed

ASTM F2831-2011 (Standard Practice for Internal Non Structural Epoxy Barrier Coating Material Used in Rehabilitation of Metallic Pressurized Piping Systems) is a National Standard and was accepted by the membership during the last cycle and included in Table 1401.1 of the 2012 code. This standard is intended to cover products used in the rehabilitation of metallic pressurized piping systems. Similar wording has been accepted in the IAPMO Green Code Supplement for 2012. Accordingly, wording was added in the body of the code to reinforce the necessity of complying with ASTM F2831 when using epoxy lining to rehabilitate pressure piping systems.

Until the development of ASTM F2831 there has been no uniform enforcement of requirements for installing, testing, and quality control of epoxy lining systems used in the rehabilitation of pressure piping systems even though they have been listed by various organizations, including IAPMO.

What It Means To Me

The addition of the requirements in the body of the code will reinforce compliance with this standard and give the Authority Having Jurisdiction more tools to assure proper installation and use of these procedures. Installers should be aware of this requirement for products installed in the rehabilitation of metallic pressurized piping systems, as these requirements are now enforceable by the Authority Having Jurisdiction. Inspectors will have to be aware of and familiar with ASTM F2831-2011 to ensure it is properly followed. If these requirements are not met, the result could be pipe failure and lead to added cost to either the contractor to repair any damage or the owner, who is likely to seek damages from the contractor. To prevent this, installers should be trained on the standard and the appropriate skills needed for proper installation.

ASTM F2831 gives the inspector the authority to require third party testing to ensure the provisions of the standard are followed properly. Third party testing includes visual inspection at the opening and exit of piping. Hand held probes may be used on piping up to 2" and any piping over 2" a CCTV shall be used to verify a 4' maximum length of piping. The pipe shall be tested to 150 psig or 1-1/2 times the working pressure. Flow rates must also be verified to ensure the piping meets the minimum flow rate requirements of local model codes. When used for potable water systems an annual chemical extraction test must be performed to verify continued compliance with Section 5 of NSF/ANSI 61.

What Changed

407.0 Lavatories.
407.1 Application. Lavatories shall comply with ASME A112.19.1/CSA B45.2, ASME A112.19.2/CSA B45.1, ASME A112.19.3/CSA B45.4, ASME A112.19.12, CSA B45.5/IAPMO Z124, CSA B45.11./IAPMO Z401.

407.2 Water Consumption. The maximum water flow rate of faucets shall comply with Section 407.2.1 and Section 407.2.2.

407.2.1 Maximum Flow Rate. The maximum flow rate for public lavatory faucets shall not exceed 0.5 gpm at 60 psi (1.9 L/m at 414 kPa) and 2.2 gpm at 60 psi (8.3 L/m at 414 kPa) for private lavatory faucets in accordance with ASME A112.18.1/CSA B125.1.

~~403.4~~ **407.2.2 Metered~~ing~~ Faucets.** ~~Self-closing or self-closing metering faucets shall be installed on lavatories intended to serve the transient public, such as those in, but not limited to, service stations, train stations, airports, restaurants, and convention halls.~~ Metered faucets shall deliver a maximum of 0.25 gallons (1.0 L) per metering cycle in accordance with ASME A112.18.1/CSA B125.1.

~~421.2~~ **407.3 Limitation of Hot Water Temperature for Public Lavatories.** Hot water delivered from public-use lavatories shall be limited to a maximum temperature of 120°F (49°C) by a device that is in accordance with ASSE 1070 or CSA B125.3. The water heater thermostat shall not be considered a control for meeting this provision.

~~405.2 Continuous Wastes~~ **407.5 Waste Outlet.** Lavatories shall have a waste outlet and fixture tailpiece not less than $1\frac{1}{4}$ inches (32 mm) in diameter. Continuous wastes and fixture tailpieces shall be constructed from the materials specified in Section 701.~~1~~4. ~~for drainage piping, provided, however, that such connections where exposed or accessible shall be permitted to be of seamless drawn brass not less than No. 20 B & S Gauge (0.032 inches) (0.8 mm). Each such tailpiece, continuous waste, or waste and overflow shall be not less than one and one-half (1-1/2) inches (40 mm) O.D. for sinks, dishwashers, laundry tubs, bathtubs, urinals, and similar fixtures, and not less than one and one-quarter (1-1/4) inches (32 mm) for lavatories, drinking fountains, and similar small fixtures.~~
~~**405.0 Strainers and Connections. 405.1 Strainers.** Plumbing fixtures, other than water closets and urinals, shall be equipped with approved strainers having an approved waterway area. Strainers serving shower drains shall have a waterway equivalent to the area of the tailpiece.~~ Waste outlets shall be provided with an approved stopper or strainer.

407.6 Overflow. Overflows shall be installed in accordance with Section 404.1.

Why It Changed

These changes places all material, water consumption, and application requirements for lavatories into a single section of code that is similar in format to what was approved during the 2012 cycle for other fixtures, such as: showers, bathtubs, bidets, dishwashing machines, drinking fountains, floor drains, and sinks. This format will be more user-friendly for the end user than having to search throughout Chapter 4 to obtain such requirements.

Mandatory reference standards have been added to Sections 406.1, 406.2.1, and 406.2.2 to assist the end user in identifying lavatories and toilets that are approved based on material and performance requirements without having to search throughout Table 1701.1. Adding mandatory reference standards to the body of the code is one of the recommendations that has been made to the Technical Committee by the Standards Task Group.

The provisions in Section 701.4 (Continuous Wastes) have been incorporated in Section 406.4 (Waste Outlet) as such provisions are already addressed for other types of fixtures, except lavatories, throughout Chapter 4

What It Means To Me

Adding references to this section allows the user to get the information without searching the tables for the requirements. This will make it more user friendly and incorporating the language will combine and simplify provisions already addressed. Inspectors and installers should be sure to use the language and references here instead of trying to find them where they were previously located. This will be especially important when documenting any potential violations.

412.1.1 Nonwater Urinals

What Changed

4031~~2~~2.3~~1~~1.1 Nonwater Urinals. ~~Nonwater urinals shall be listed and comply with the applicable standards refereneed in Table 1401.1.~~ Nonwater urinals shall have a barrier liquid sealant to maintain a trap seal. Nonwater urinals shall permit the uninhibited flow of waste through the urinal to the sanitary drainage system. Nonwater urinals shall be cleaned and maintained in accordance with the manufacturer's instructions after installation. Where nonwater urinals are installed ~~they shall have a water distribution~~, not less than one water supplied fixture rated at not less than 1 water supply fixture unit (WSFU) shall be installed upstream on the same drain line to facilitate drain line flow and rinsing. Where nonwater urinals are installed they shall have a water distribution line rough-in to the urinal location to allow for the installation of an approved backflow prevention device in the event of a retrofit.

Why It Changed

Water is needed to clean the waste line from the nonwater urinals in the horizontal position. Without it, sediment matter from urine, known as struvite, will collect and solidify in the drain piping leading away from the fixture. Over time, this can create a blockage in the pipe requiring either a mechanical cleaning out of the pipe or replacement. The new language is based on similar language that was already found in Section L 402.3.1 of the UPC and is intended to mitigate this issue.

What It Means To Me

The installer must now install a water supplied fixture upstream of the urinals in this application. Doing so will add some material cost and labor time. However, installations of nonwater urinals have been shown to be problematic much sooner than expected due to the amount of use and lack of proper maintenance. Often, this results in complaints made to the installer/contractor, even if the actual problem is not due to the installation. The water from the upstream fixture will help flush these waste pipes and helps mitigate these problems. Because the required water distribution water line is required and the waterless urinal is not noted until the time of final inspection, this requirement can lead to additional costs to install the fixture upstream of the waterless urinal.

Inspectors need to verify that these installations comply with this new code requirement to help manage the collection of deposits stemming from the high urine concentration these fixtures can produce. Enforcing this new requirement can be tricky since the inspector may not know, at the time of rough inspection, if a waterless urinal is to be used. Sometimes, they are on the plans and sometimes they are not.

The upstream fixture required in this code section must be 1 WSFU or greater. Water is needed to clean the waste line from the nonwater urinals. Technically, a WSFU assumes a fixture that has a probability distribution for frequency of use. With an upstream fixture, the amount of water used to facilitate drain rinsing will correspond to the frequency of use. There will be greater frequency of use during times of congestion. When there is congestion, there is more use of the upstream fixture and therefore greater volume is provided to rinse the drain. When there is no congestion, there will be less use of the upstream fixture, reducing the volume amount needed to rinse the drain.

413.0 Flushing Devices

What Changed

413.0 Flushing Devices ~~for Water Closets and Urinals.~~

413.1 ~~Application~~ Where Required. ~~Flushometer valves, flushometer tanks, or flush tanks shall comply with the applicable standards referenced in Table 1401.1.~~

~~413.2 Flushing Devices~~ ~~Required.~~ Each water closet, urinal, ~~clinic~~ clinical sink, or other plumbing fixture that depends on trap siphonage to discharge its waste contents shall be provided with a flushometer valve, flushometer tank, or flush tank designed and installed so as to supply water in sufficient quantity and rate of flow to flush the contents of the fixture to which it is connected, to cleanse the fixture, and to refill the fixture trap, without excessive water use. Flushing devices shall meet antisiphon requirements in accordance with Section 603.5.

413.~~3~~2 Flushometer Valves. Flushometer valves and tanks shall comply with ASSE 1037 or CSA B125.3, and shall be installed in accordance with Section 603.5.1. No manually controlled flushometer valve shall be used to flush more than one urinal, and each such urinal flushometer valve shall be an approved, self-closing type discharging a predetermined quantity of water. Flushometers shall be installed so that they will be accessible for repair. Flushometer valves shall not be used where the water pressure is insufficient to properly operate them. Where the valve is operated, it shall complete the cycle of operation automatically, opening fully, and closing positively under the line water pressure. Each flushometer shall be provided with a means for regulating the flow through it.

413.3 Flush Tanks. Flush tanks for manual flushing shall be equipped with a flush valve in accordance with ASME A112.19.5/CSA B45.15 or CSA B125.3, and an antisiphon fill valve (ballcock) that is in accordance with ASSE 1002 or CSA B125.3 and installed in accordance with Section 603.5.2.

(remaining text unchanged)

Why It Changed

The title of Section 413.0 was revised as this section deals with other fixtures besides water closets and urinals such as clinical sinks. In Section 413.1 (Where Required), the correct terminology for a fixture used to receive the wastes from a bedpan, etc. within a health care facility is a "clinical sink" and not a "clinic sink". The provisions in Section 413.1 was also combined in the appropriate sections that address flushometer valves and tanks (Section 413.2 Flushometer Valves), and flush tanks (Section 413.3 Fill Valves) for ease of use.

Mandatory reference standards have been added to Sections 413.2 & 413.3 to assist the end user in identifying flushometer valves and tanks, and the components within a flush tank, that are approved based on material and performance requirements without having to search throughout Table 1701.1. Adding mandatory reference standards to the body of the code is one of the recommendations that have been made to the Technical Committee by the Standards Task Group.

The references made to Sections 603.5.1 & 603.5.2 are necessary to ensure that such installations are done in accordance with the applicable backflow prevention requirements of Chapter 6.

What It Means To Me

Adding proper terminology and mandatory reference standards in the code will help the installer and inspector to ensure compliance with the code. Backflow protection is always a priority and inspectors and installers must ensure that an appropriate antisiphon fill valve is properly installed. As with other sections in which the mandatory references have been moved to the body of the code, inspectors should be sure to document the code section rather than Table 1701.1 if an inappropriate fixture is used.

What Changed

415.2 Drinking Fountain Alternatives. Where food is consumed indoors, water stations shall be permitted to be substituted for drinking fountains. Bottle filling stations shall be permitted to be substituted for drinking fountains up to 50 percent of the requirements for drinking fountains. Drinking fountains shall not be required for an occupant load of 30 or less.

Why It Changed

This change will allow the use of standalone bottle filling stations (without being attached to a drinking fountain) as the market trends towards the use of these drinking water devices. In addition, these devices are preferred because they are: (1) more hygienic, (2) save up to 50 percent of the water that is generated as wastewater when compared to using a traditional drinking fountain, and (3) will aide in diverting waste generated from plastic bottles by providing a method to refill them or other drinking containers.

What It Means To Me

The installer will not have to install a drinking fountain when bottle filling stations are being used. The inspector must verify that the bottle filling stations are in place at the time of final inspection. Everyone involved should be aware that bottle filling stations are also subject to the Americans With Disabilities Act (ADA) requirements for plumbing and installations must meet those requirements as well.

Bottle Filling Station

418.3 Location of Floor Drains

What Changed

418.3 Location of Floor Drains. Floor drains shall be installed in the following areas:

(1) Toilet rooms containing two or more water closets or a combination of one water closet and one urinal, except in a dwelling unit.

(2) Commercial kitchens and in accordance with Section 704.3.

(3) Laundry rooms in commercial buildings and common laundry facilities in multi-family dwelling buildings.

(4) Boiler rooms.

Why It Changed

Floor drains in boiler rooms have been required by the UMC for years. Floor drains and associated piping are plumbing items and they are now represented in the plumbing code. These drains are mistakenly omitted by plumbers and plumbing engineers because they are not familiar with the requirements of the Uniform Mechanical Code.

What It Means To Me

The addition of "boiler room" to this section in the UPC will make the inspector, installers and engineers of these plumbing systems more aware of this requirement and the floor drain less likely to be overlooked. It will now also be the responsibility of the plumbing inspector to ensure that floor drains are not overlooked during the installation process.

Boiler rooms require a floor drain for disposing of the accumulation of liquid wastes incident to cleaning, recharging, and routine maintenance. Single-dwelling units (homes, apartments or condos) are not required to have a floor drain.

What Changed

421.0 Floor Sinks.
421.1 Application. Floor sinks shall comply with ASME A112.6.7.

421.2 Strainers. The waste outlet of a floor sink shall be provided with an approved strainer or grate that is removable and accessible.

Why It Changed

The UPC now contains provisions for floor sinks since they are commonly used as indirect waste receptors. Section 421.1 assists the end user in identifying floor sinks that are approved based on material and performance requirements without having to search throughout Table 1701.1. Strainers and grates must be accessible and removable for cleaning and maintenance purposes.

What It Means To Me

Strainers and grates must be accessible and removable for cleaning and maintenance purposes. The presence of a strainer in this application is to prevent the entrance of large object and creating a stoppage of the floor sink drainage system, thus preventing flooding. It is important that inspectors and installers remember that part of this code section is to ensure that the strainer or grate is removable and accessible.

Floor Sink with Strainer
Image Courtesy of MIFAB

501.1 Applicability, 505.1 Water Heaters, and 505.4 Indirect-Fired Water Heaters

What Changed

501.1 Applicability. The regulations of this chapter shall govern the construction, location, and installation of fuel-burning and other types of water heaters heating potable water, together with chimneys, vents, and their connectors. The minimum capacity for storage water heaters shall be in accordance with the first hour rating listed in Table 501.1(1). ~~Design, construction, and workmanship shall be in accordance with accepted engineering practices, manufacturer's instructions, and applicable standards and shall be of such character as to secure the results sought to be obtained by this code.~~ No water heater shall be hereinafter installed that does not comply with the manufacturer's installation instructions and the type and model of each size thereof approved by the Authority Having Jurisdiction. A list of accepted ~~gas~~ water heater appliance standards are referenced in Table ~~1401.1~~ 501.1(2). Listed appliances shall be installed in accordance with the manufacturer's installation instructions. Unlisted water heaters shall be permitted in accordance with Section 504.3.2.

505.1 Water Heaters. Water heaters deriving heat from fuels or types of energy other than gas shall be constructed and installed in accordance with the approved standards referenced in Sections 501.1(2), 505.3, or Section 505.4. Vents or chimneys for such appliances shall be approved types. An adequate supply of air for combustion and for adequate ventilation of heater rooms or compartments shall be provided. Each such appliance shall be installed in a location approved by the Authority Having Jurisdiction and local and state fire-prevention agencies.

505.4 Indirect-Fired Water Heaters. Indirect-fired water heaters shall comply with the applicable sections of the ASME Boiler and Pressure Vessel Code, or to one of the other applicable standards shown in ~~Table 1401.1~~ Section 501.1(2). Each water heater shall bear a label in accordance with ASME requirements, or an approved testing agency, certifying and attesting that such an appliance has been tested, inspected and meets the requirements of the applicable standards or code.

Why It Changed

Section 501.1 was revised as the scope of the chapter encompasses all types of water heaters (ex: fuel gas-fired, oil-fired, electric, etc.), including applicable chimney, venting, and connector requirements The third sentence was struck out, but did not negate the requirement for water heaters to meet approved standards and be installed in accordance with manufacturer's instructions. There is now a new Table 501.1(b) in this chapter that shows a list of accepted water heater appliance standards rather than referring to the Referenced Standards. Unlisted water heaters must meet the clearance requirements of Section 504.3.2.

Where listed water heaters are required, such appliances shall conform to the applicable mandatory reference standards, and should be listed to assist the end user in identifying water heaters that are approved based on material and performance requirements without having to search throughout Table 1701.1. Adding mandatory reference standards to the body of the code was one of the recommendations that were made to the Technical Committee by the Standards Task Group.

Oil-fired water heaters are to be listed to UL 732, but as required by UL 732 and Section 505.3, should be installed in accordance with NFPA 31.

Section 505.1 was also modified to provide correlation with the applicable non-fuel gas standards referenced in Section 501.1 (UL 732, UL 174, or UL 1453), Section 505.3 (NFPA 31), or Section 505.4 (ASME Boiler and Pressure Vessel Code).

Section 505.4 was revised to provide correlation with the applicable standards referenced in Section 501.1.

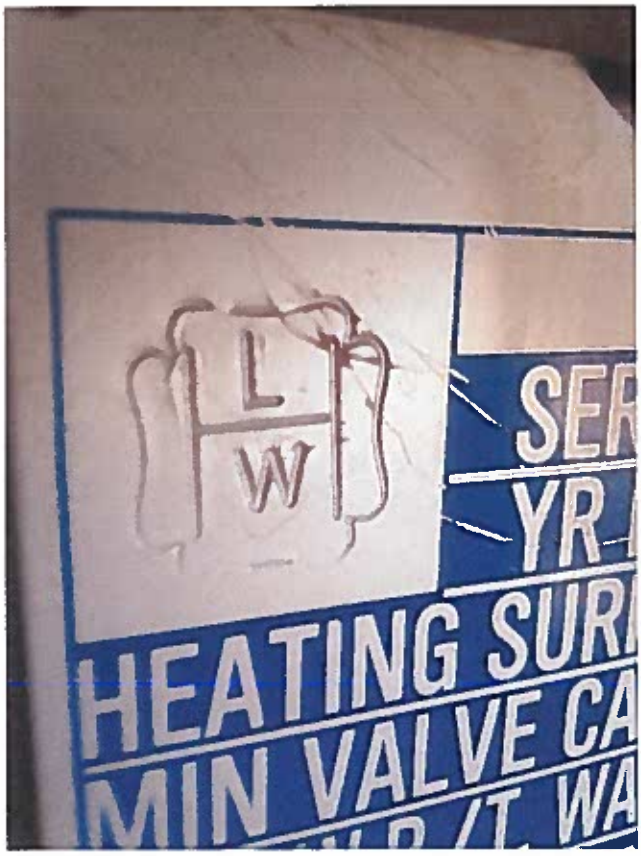
What It Means To Me

Water heaters that are listed comply to referenced standards and are in compliance only if they are installed per the manufacturer's installation instructions. Due to the number of different manufacturers it is imperative that the installation instructions for the particular water heater be followed. The installer should leave these instructions with the water heater for the home owner and for the inspector to verify these were heeded.

If the water heater is not installed properly the manufacturer may void any warranty if problems should arise from an improper installation. Furthermore, deadly consequences can occur from not installing the mandatory safety features.

Please note that some items are "recommended" by the manufacturer and not necessarily mandatory. These instructions usually reference that the installer "comply with local code requirements."

Pressure Vessels nameplates for hot water storage tanks over 120 gallons will contain a "U" symbol which stands for "**Unfired Pressure Vessel.**" Another symbol you will encounter is "**HLW**", where "**L**" is inside the top part of "**H**" in "**HLW**," and "**W**" is inside the bottom part of "**H**" in that "**HLW**" symbol. The rules in "Part HLW" of the ASME Code apply to water heaters and water storage tanks with corrosion resistance for supplying potable hot water. You will see the "U" symbol if the nameplate is welded to the tank (on the side), and "**HLW**" is just a label attached on the side of the tank.



505.4.1 Single-Wall Heat Exchanger

What Changed

505.4.1 Single-Wall Heat Exchanger. An ~~i~~ndirect-fired water heater that incorporates a single-wall heat exchanger shall ~~meet~~ be in accordance with the following requirements:

~~(1) Connected to a low-pressure hot water boiler limited to a maximum of 30 pounds-force per square inch gauge (psig) (207 kPa) by an approved safety or relief valve.~~

(~~2~~1) The ~~H~~heater transfer medium ~~is~~ shall be either potable water or contains fluids ~~having a toxicity rating or Class of 1~~ recognized as safe by the Food and Drug Administration (FDA) as food grade.

(~~3~~2) Bear a label with the word "Caution," followed by the following statements:

(a) The heat-transfer medium shall be potable water or other nontoxic fluid ~~having a toxic rating or Class of 1 as listed in Clinical Toxicology of Commercial Products, 5th edition~~ recognized as safe by the FDA.

(b) The maximum operating pressure of the heat ~~transfer medium~~ exchanger shall ~~be limited to a~~ not exceed the maximum operating pressure of ~~30 psig (207 kPa) by an approved safety or relief valve~~ the potable water supply.

(3) The word "Caution" and the statements in letters shall have an uppercase height of not less than 0.120 of an inch (3.048 mm). The vertical spacing between lines of type shall be not less than 0.046 of an inch (1.168 mm). Lowercase letters shall be compatible with the uppercase letter size specification.

Why It Changed

This change brings consistency between the Uniform Solar Energy Code (USEC) and the Uniform Plumbing Code (UPC).

What It Means To Me

Installers and contractors will be able to be consistent among all single wall heat exchanger systems whether it be an indirect fired water heater or a hydronic solar installation. Users who are primarily familiar with the UPC will have to take note that the heat transfer medium must now be considered safe by the FDA rather than have a toxicity rating of class of 1. Also, the pressure requirement is now shifted to the maximum operating pressure of the potable water supply rather than the static 30psig. Inspectors will now have to ensure pressure testing is done accordingly.

507.5 Drainage Pan

What Changed

507.~~4~~5 Drainage Pan. Where a water heater is located in an attic, in or on an attic-ceiling assembly, floor-ceiling assembly, or floor-subfloor assembly where damage results from a leaking water heater, a watertight pan of corrosion-resistant materials shall be installed beneath the water heater with not less than ¾ of an inch (20 mm) diameter drain to an approved location. Such pan shall be not less than 1½ inches (38 mm) in depth.

Why It Changed

The previous language did not clearly address installations on an attic-ceiling assembly, floor-ceiling assembly, or floor-subfloor assembly which is the intent of this section of code, and has caused confusion within the industry in regards to the application and enforcement of this section. The depth of the pan is important for ensuring that enough space is provided for the drain connection fitting generally located on the side of the pan.

What It Means To Me

The addition of the words "in or on an" more clearly defines the need of a safe pan and the intent of the code to protect structural elements of a building. The addition of language defining the depth of the safe pan provides clarity to this code section for the code official or installer/contractor.

604.1 Pipe, Tube, and Fittings and 605.9.1 Fittings

What Changed

604.1 Pipe, Tube, and Fittings. Pipe, tube, fittings, solvent cements, thread sealants, solders, and flux used in potable water systems intended to supply drinking water shall be in accordance with the requirements of NSF 61. Where fittings and valves are made from copper alloys containing more than 15 percent zinc by weight and are used in plastic piping systems, they shall be resistant to dezincification and stress corrosion cracking in accordance with NSF 14.

Materials used in the water supply system, except valves and similar devices, shall be of a like material, except where otherwise approved by the Authority Having Jurisdiction.

Materials for building water piping and building supply piping shall comply with the applicable standards referenced in Table 604.1.

605.409.1 Fittings. Fittings for PEX tubing shall comply with the applicable standards referenced in Table 604.1. PEX tubing in accordance with ASTM F876 shall be marked with the applicable standard designation for the fittings, specified by the tubing manufacturer for use with the tubing.

Why It Changed

Dezincification of yellow brass piping components including various valves has become a significant problem, with failures documented in various areas throughout the United States. Water varies from area to area and may be from wells, rivers, lakes, or any number of other sources. The code treats all water fittings and valves the same.

It should also be emphasized that the change is applicable for only plastic pipe systems, since that is the scope of NSF 14. If it is a copper pipe system, the dezincification resistance requirement does not apply.

A new standard for copper alloy fittings was included in Table 604.1, ASME B16.51. This standard allows for copper alloys having a chemical composition containing a minimum of 84% copper and a maximum of 16% zinc. So if it is a plastic pipe system with copper alloy fittings and valves that comply with ASME B16.51 in Table 604.1, you will not know with certainty if the zinc content is less than 16% unless you request a UNS (United Numbering System) for copper and copper alloys from the manufacturer. The UNS number will be a C+5digits. The Copper Development Association provides a full datasheet of UNS numbers for copper and copper alloys with the all the percentages of chemical compositions.

What It Means To Me

It is not practical to treat the water as people drink it and there are already extensive Federal regulations governing its treatment. The solution is to regulate the products through the code. Installers and officials must ensure installed plastic piping products meet the dezincification requirements by verifying that approved, listed products that have been rigorously tested are installed.

This code change will be a little tricky to enforce. Brass fittings have a wide range of alloy variations, so not all brass fittings will need NSF 14 testing. Typically red brasses will be compliant whereas yellow brasses will not. There are some silicon brasses and bismuth alloys in brass that exceed 15% zinc. Again, the only way to know if the zinc alloy in the brass fitting exceeds 15% is to request a UNS (United Numbering System) for copper and copper alloys from the manufacturer. If the UNS shows the zinc content greater than 15%, than NSF 14 will be required.

A new standard for copper alloy fittings was included in Table 604.1, ASME B16.51. This standard allows for copper alloys having a chemical composition containing a minimum of 84% copper and a maximum of 16% zinc. So if it is a plastic pipe system with copper alloy fittings and valves that comply with ASME B16.51 in Table 604.1, you will not know with certainty if the zinc content is less than 16% unless you request a UNS (United Numbering System) for copper and copper alloys from the manufacturer. The UNS number will be a C+5digits. The Copper Development Association provides a full datasheet of UNS numbers for copper and copper alloys with the all the percentages of chemical compositions.

What Changed

604.~~1~~2 Lead Content. ~~Water pipe and fittings with a lead content which exceeds 8 percent shall be prohibited in piping systems used to convey potable water.~~ The maximum allowable lead content in pipes, pipe fittings, plumbing fittings, and fixtures intended to convey or dispense water for human consumption shall be not more than a weighted average of 0.25 percent with respect to the wetted surfaces of pipes, pipe fittings, plumbing fittings, and fixtures. For solder and flux, the lead content shall be not more than 0.2 percent where used in piping systems that convey or dispense water for human consumption.

Exceptions:

(1) Pipes, pipe fittings, plumbing fittings, fixtures, or backflow preventers used for nonpotable water systems.

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

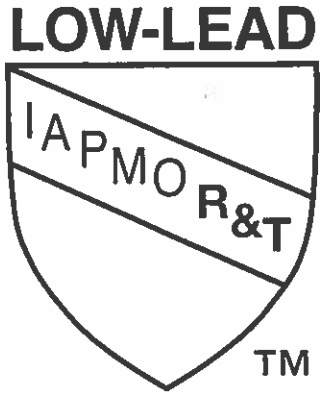
Why It Changed

Section 1417 of the Safe Drinking Water Act (42 U.S.C. 300g–6) was amended by Senate Bill 3874 - 2010 (http://www.gpo.gov/fdsys/pkg/BILLS-111s3874enr/pdf/BILLS-111s3874enr.pdf). This bill changed the definition of lead free in the Safe Drinking Water Act from not more than 8 percent lead to not more than a weighted average of 0.25 percent. The effective date of the SDWA revision is January 4, 2014. Furthermore, NSF 372 is the American National Standard for Drinking Water System Components-Lead Content that indicates how the new requirements are to be determined.

What It Means To Me

Installers will need to make sure that when installing potable water systems for human consumption they are using material (pipe, valves, fittings and fixtures) that comply with the new lead free law. In addition to the material solder and fluxes will need to comply. Depending on what type of system they are installing selection of a flux that is appropriate for a particular lead free alloy is critical to soldering success along with being familiar with the different technique needed to solder with the new materials. It is highly recommended that installers solder test pieces and cut them open to determine solder penetration depth.

Inspectors will need to learn how to identify lead free components by the lead-free certification symbols from the various certification bodies to verify they are being installed in the proper application. Verification of the proper flux presents a potential verification problem with the inspector as flux is used in the joining method prior to inspections. A tip for inspectors is during all of their inspections be aware of what plumbing material is stored on sight and maybe take a look in the plumbers soldering tool box.



IAPMO Lead Free Mark of Conformity

606.5 Control Valve

What Changed

606.5 Control Valve. A control valve shall be installed immediately ahead of each water-supplied appliance and immediately ahead of each slip joint or appliance supply.

Parallel water distribution systems shall provide a control valve either immediately ahead of each fixture being supplied or installed at the manifold, and shall be identified with the fixture being supplied. Where parallel water distribution system manifolds are located in attics, crawl spaces, or other locations not readily accessible a separate shutoff valve shall be required immediately ahead of each individual fixture or appliance served.

Why It Changed

The 2012 language allowed for the installation of a manifold in an attic or crawl space with no shut-off valve at the fixture. This can result in a condition whereas a homeowner may develop a leak in a faucet or supply pipe, and not be able to shut off the water to that fixture or appliance. For example, a leak develops at the connection of the supply tubing and the faucet. The homeowner observes water flowing out from under the sink and does not know that the manifold is located in the attic to shut the faucet off. This new requirement requires water shut off to the fixture by the control valve when the manifold shutoff valve is not readily accessible.

What It Means To Me

Installers and inspectors should remember that, no matter what system is being installed, a readily accessible means to shut water off to fixtures is required, whether it is control valves ahead of fixtures or valves on a readily accessible manifold.

608.3 Expansion Tanks and Combination Temperature and Pressure-Relief Valves

What Changed

608.3 Expansion Tanks, and Combination ~~Pressure, and~~ Temperature ~~relief valves~~ and Pressure-Relief Valves. A water system provided with a check valve, backflow preventer, or other normally closed device that prevents dissipation of building pressure back into the water main, independent of the type of water heater used, shall be provided with an approved, listed, and adequately sized expansion tank or other approved device having a similar function to control thermal expansion. Such expansion tank or other approved device shall be installed on the building side of the check valve, backflow preventer, or other device and shall be sized and installed in accordance with the manufacturer's installation instructions.

A water system containing storage water heating equipment shall be provided with an approved, listed, adequately sized combination ~~pressure and~~ temperature and pressure-relief valve, except for listed nonstorage instantaneous heaters having an inside diameter of not more than 3 inches (80 mm). Each such approved combination temperature and pressure relief-valve shall be installed on the water-heating device in an approved location based on its listing requirements and the manufacturer's installation instructions. Each such combination temperature and pressure relief-valve shall be provided with a drain in accordance with Section 608.5.

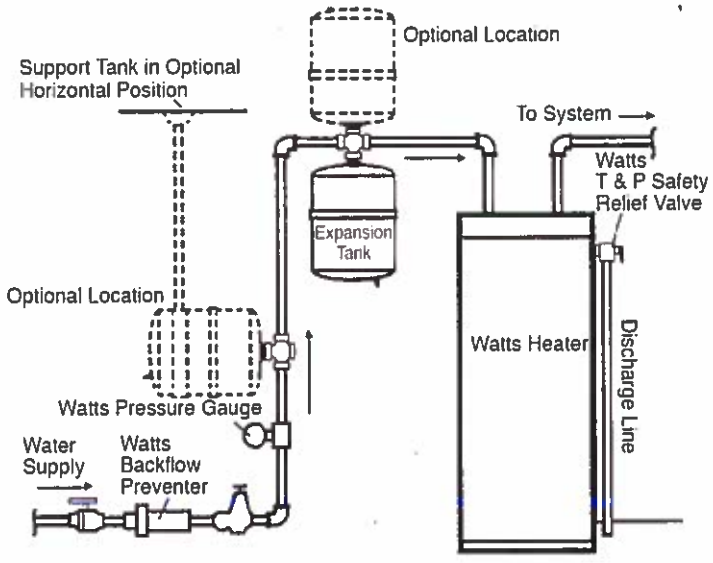
Why It Changed

There is a misunderstanding throughout the industry that, if a tankless water heater is installed, an expansion tank is not necessary; this is not true except for instantaneous heaters having an inside diameter of not more than 3-inches. These small units having practically no storage capacity do not have significant thermal expansion. Other than this exception, the above revision clarifies that, regardless of the type of water heater that is installed, thermal expansion can still occur in the cold water supply line. Therefore, an approved expansion tank or other approved device needs to be installed.

What It Means To Me

This language addition indicates to the installer and inspector that expansion tanks and Temperature and Pressure relieve valves must be installed on every type of water heater that is installed, except for instantaneous heaters having an inside diameter of not more than 3-inches. Otherwise, thermal expansion can occur when water is heated no matter the type of heater used.

These water heaters are protected in three stages. The primary stage is the thermostat.



Optional Expansion Tank Locations

Should the thermostat fail, the secondary stage or highlimit switch will turn off the source of energy to the heater. If the high-limit switch fails, the combination T&P valve opens to prevent a catastrophic failure of the water heater. Instantaneous water heaters having an inside diameter of three inches or less are exempt from having a T&P valve. These small units are without a storage reservoir, having only a heating coil that does not allow significant thermal expansion. When the need for hot water has been met the instantaneous water heater shuts off. It does not cause a great amount of expansion because there is not a large volume of water to heat or expand.

608.3 Expansion Tanks and Combination Temperature and Pressure-Relief Valves (continued)

When installing a T&P valve it is critical that the installer check the rating plate on the combination T&P valve before installation to make sure that the Btu input rating of the water heater does not exceed the maximum Btu rating of the valve. The use of an undersized combination T&P valve could result in a catastrophic water heater failure should both the water heater thermostat and the water heater high-limit switch fail. In instances where there are two separate Btu ratings on the valve plate, the smaller of the two is used in making this determination.

Manufacturers of T&P valves require that the valve be installed with its temperature-sensing element immersed within the top 6 inches of the tank since this is where the hottest water in the tank is located. Manufacturers recommend that they be manually opened at least once a year to ensure that they are functioning. In areas that have a high mineral content in the water, scale can form around the valve seat and render the valve inoperable. In such areas, it may be necessary to manually open the valve every three months or less. A water heater is a potential bomb that is prevented from exploding by three separate safety devices. The combination T&P valve is a lifesaver and is treated accordingly.

What Changed

612.0 Residential Fire Sprinkler Systems.

612.1 ~~General~~ Where Required. Where residential ~~fire~~ sprinkler systems are ~~installed, they~~ required in one and two family dwellings or townhouses, the systems shall be installed by an ASSE/IAPMO Series 7000 certified installer in accordance with ~~the standards listed in Table 1401.1.~~ this section or NFPA 13D. This section shall be considered equivalent to NFPA 13D. Partial residential sprinkler systems shall be permitted to be installed in buildings not required to be equipped with a residential sprinkler system.

612.2 Types of Systems. This section shall apply to stand-alone and multipurpose wet-pipe sprinkler systems that do not include the use of antifreeze. A multipurpose fire sprinkler system shall provide potable water to both fire sprinklers and plumbing fixtures. A stand-alone sprinkler system shall be separate and independent from the potable water distribution system. A backflow preventer shall not be required to separate a stand-alone sprinkler system from the water distribution system where the sprinkler system material is in accordance with the requirements of Section 604.0.

612.3 Sprinklers. Sprinklers shall be installed in accordance with Section 612.3.1 through Section 612.3.7.

612.3.1 Required Sprinkler Locations. Sprinklers shall be installed to protect all floor areas of a dwelling unit in one and two family dwellings or townhouses.

Exceptions:

(1) Attics, crawl spaces, and normally unoccupied concealed spaces that do not contain fuel-fired appliances do not require sprinklers. In attics, crawl spaces, and normally unoccupied concealed spaces that contain fuel-fired equipment, a sprinkler shall be provided to protect the equipment; however, sprinklers shall not be required in the remainder of the space.

(2) Clothes closets, linen closets and pantries that do not exceed 24 square feet (2.2 m^2) in area, with the smallest dimension not exceeding 3 feet (914 mm) and having wall and ceiling surfaces of gypsum board.

(3) Bathrooms and toilet rooms not greater than 55 square feet (5.1 m^2) in area.

(4) Garages; carports; exterior porches; unheated entry areas, such as mud rooms, that are adjacent to an exterior door; and similar areas.

(5) Covered unheated projections of the building at entrances/exits provided it is not the only means of egress from the dwelling unit.

(6) Ceiling pockets that meet the following requirements:

(a) The total volume of an unprotected ceiling pocket does not exceed 100 cubic feet (2.83 m^3).

(b) The entire floor under the unprotected ceiling pocket is protected by the sprinklers at the lower ceiling elevation.

(c) Each unprotected ceiling pocket is separated from an adjacent unprotected ceiling pocket by not less than a 10 feet (3048 mm) horizontal distance.

(d) The interior finish of the unprotected ceiling pocket is noncombustible material.

(e) Skylights not exceeding 32 square feet (2.97 m^2).

Note: This is only a sampling of the changes regarding residential fire sprinklers as they are very numerous and not practical to show in this format. Please see the 2015 UPC Illustrated Training Manual and the 2015 Uniform Plumbing Code for more information.

Why It Changed

Residential sprinklers are required for all one- and two- family dwellings and townhouses in the International Residential Code and International Building Code. These new sections add the appropriate requirements for residential sprinklers to the UPC. The requirements are consistent with NFPA 13D and the IRC. Section 612.1 references ASSE series 7000 which is a standard for certified installers and inspectors of these systems.

What It Means To Me

These changes simplify and coordinate differing regulations in one cohesive prescriptive set of requirements. This can only help different trades using different regulations achieve the same result and system configuration. By having the requirements in the plumbing code, the plumbing or sprinkler contractor has access to the design and installation requirements. Having the requirements, and not references to other codes and standards, simplifies the requirement by having the prescriptive requirements that are consistent with NFPA 13D and the IRC Plumbing section. Given that these requirements are new to the UPC, the inspector will have to ensure that these requirements are being applied and installations comply with all subsections.

This addition provides the installers, inspectors and others a qualification and an ANSI approved certification by a third party to reference for installation and certification for installers of these systems in the above listed dwellings. As the rate of residential fire sprinkler systems installed continues to increase, it will be vital that any installer wishing to do this type of work earn the ASSE 7000 certification. Failure to do so can result in either not being selected for such work or the system being rejected by the AHJ if it is discovered the system was installed by non-certified personnel. It would be advised that certified individuals keep their certification card on them to prove their certification if it is called into question.

Inspectors should be vigilant in verifying that the individuals that install residential sprinkler systems are indeed certified to the ASSE 7000 standard. When in doubt, the inspector should seek proof from the contractor demonstrating that they were in compliance with this new language.

Section 216.1 references ASSE series 7000 which is a standard for certified installers and inspectors of these systems.

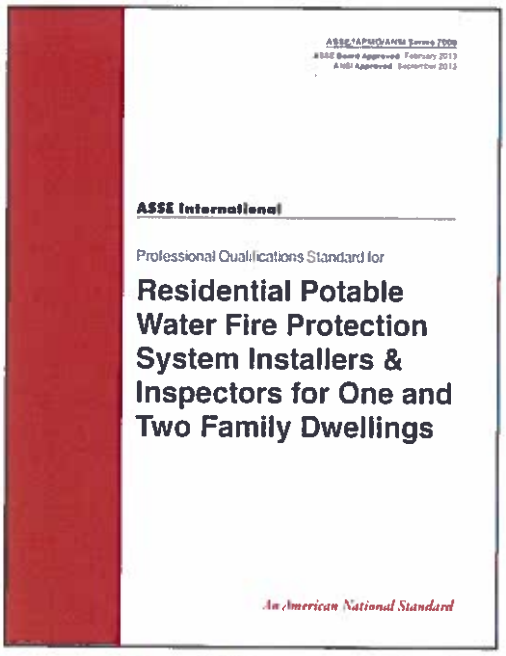


Image Courtesy of ASSE International

What Changed

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

Exceptions:

(1) & (2) (remaining text unchanged)

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

(4) (remaining text unchanged)

Why It Changed

Regardless of the location of the urinal in a building there continues to be a problem of stoppages immediately downstream of the fixture connection fitting outlet. Using a "urinal auger" has limited effect and range for thoroughly cleaning the urinal drain lines. This condition has been exasperated with the smaller diameter trap area of the "high efficiency urinals," and/or "waterless urinals."

Removing the urinal from the wall has been necessary for most mechanical cleaning of the vertical and horizontal urinal drains. Installing a cleanout above the fixture connection fitting serving each urinal will provide access for mechanically cleaning the drain line without having to remove the urinal from the wall. A code required cleanout installed above the fixture connection fitting of the urinal expedites cleaning of the drain lines and is less inconvenient to who purchased and must maintain those fixtures. An accessible cleanout will also promote ongoing preventative maintenance of the urinal drain system.

What It Means To Me

The installer must provide a cleanout above each urinal on installation. This cleanout will serve for clearing the drain or routine maintenance of the urinal. Despite this new code section, routine maintenance is still required. The owner should be aware that they have not been excused from this responsibility. The routine maintenance will also serve to cut down on the interruption of use by a blockage. Inspectors will need to ensure that a cleanout is provided for each urinal and at the upper terminal of the horizontal pipe serving the urinals.

707.9 Clearance

What Changed

707.9 Clearance. Each cleanout in piping 2 inches (50 mm) or less in size shall be so installed that there is a clearance of not less than ~~12~~ 18 inches (~~305~~ 457 mm) in front of the cleanout. Cleanouts in piping exceeding 2 inches (50 mm) shall have a clearance of not less than ~~18~~ 24 inches (~~457~~ 610 mm) in front of the cleanout. Cleanouts in under-floor piping shall be extended to or above the finished floor or shall be extended outside the building where there is less than 18 inches (457 mm) vertical overall, allowing for obstructions such as ducts, beams, and piping, and 30 inches of (762 mm) horizontal clearance from the means of access to such cleanout. No under-floor cleanout shall be located exceeding ~~20~~ 5 feet (~~6096~~ 1524 mm) from an access door, trap door, or crawl hole.

Why It Changed

Having a requirement for additional access clearance for cleanouts will enable clean outs to be utilized without risking damage to the surroundings. Additional clearances will also ease the use of sewer cleaning machines which cannot be easily utilized in crawl spaces. In addition, cleanouts farther than 5 feet from access openings are difficult to open and utilize to clear stoppages in sewer and building drains.

What It Means To Me

This code change allows for additional clearance for the use of sewer cleaning machines and in requiring cleanouts to be closer to access points will ease the use of sewer cleaning machines for clearing stoppages in below floor plumbing systems. The above clearances are for the benefit of the service plumber. They allow enough room for a repair to be completed without too much disruption to the occupants in the building and so the job can be done quickly and efficiently.

710.4 Discharge Line

What Changed

710.4 Discharge Line. The discharge line from such ejector, pump, or other mechanical device shall be of approved pressure rated material and be provided with an accessible backwater or swing check valve and gate or ball valve. Where the gravity drainage line to which such discharge line connects is horizontal, the method of connection shall be from the top through a wye branch fitting. The gate or ball valve shall be located on the discharge side of the backwater or check valve.

Gate or ball valves, where installed in drainage piping, shall be fullway type with working parts of corrosion-resistant metal. Sizes 4 inches (100 mm) or more in diameter shall have cast-iron bodies, and sizes less than 4 inches (100 mm), cast-iron or ~~brass~~ copper alloy bodies.

Why It Changed

The UPC now requires pressure rated fittings and material for discharge lines. This had not been addressed in the past, and will allow for ease in application and enforcement.

What It Means To Me

Installers and inspectors now have a clear understanding that pressure fittings must be used on discharge lines and are now responsible for ensuring they are installed where necessary. The inspector and installer should examine the material to be used to verify that it is indeed an approved pressure rated material. In the event of a blockage in the sewer system downstream of the pump discharge, a positive pressure situation could arise. The addition of pressure rated fittings alleviates the risk of breakage do to this pressure.

More specifically, the inspector will need to know the meaning of the standards marking on the pipe. For example, an inspector noting that the piping is marked, "ASTM F 891 Coextruded Cellular Core PVC Pipe" will need to know that particular pipe is for non-pressure use only.

814.0 Condensate Wastes and Disposal

What Changed

814.0 Condensate Wastes and Disposal.

814.1 Condensate Disposal. Condensate from air washers, air-cooling coils, ~~fuel-burning~~ condensing appliances, and the overflow from evaporative coolers, and similar water supplied equipment or similar air-conditioning equipment shall be collected and discharged to an approved plumbing fixture or disposal area. Where discharged into the drainage system, equipment shall drain by means of an indirect waste pipe. The waste pipe shall have a slope of not less than $\frac{1}{8}$ inch per foot (10.4 mm/m) or 1 percent slope and shall be of approved corrosion-resistant material not smaller than the outlet size in accordance with ~~Table~~ Section 814.~~1~~3 or Section 814.4 for air-cooling coils or condensing ~~fuel-burning~~ appliances, respectively. Condensate or wastewater shall not drain over a public way.

814.1.1 Condensate Pumps. Where approved by the Authority Having Jurisdiction, condensate pumps shall be installed in accordance with the manufacturer's installation instructions. Pump discharge shall rise vertically to a point where it is possible to connect to a gravity condensate drain and discharged to an approved disposal point. Each condensing unit shall be provided with a separate sump and interlocked with the equipment to prevent the equipment from operating during a failure. Separate pumps shall be permitted to connect to a single gravity indirect waste where equipped with check valves and approved by the Authority Having Jurisdiction.

814.2 Condensate Control. Where an equipment or appliance is installed in a space where damage is capable of resulting from condensate overflow, other than damage to replaceable lay-in ceiling tiles, a drain line shall be provided and shall be drained in accordance with Section 814.1. An additional protection method for condensate overflow shall be provided in accordance with one of the following:

(1) A water level detecting device that will shut off the equipment or appliance in the event the primary drain is blocked.

(2) An additional watertight pan of corrosion-resistant material, with a separate drain line, installed beneath the cooling coil, unit, or the appliance to catch the overflow condensate due to a clogged primary condensate drain.

(3) An additional drain line at a level that is higher than the primary drain line connection of the drain pan.

(4) An additional watertight pan of corrosion-resistant material with a water level detection device installed beneath the cooling coil, unit, or the appliance to catch the overflow condensate due to a clogged primary condensate drain and to shut off the equipment.

The additional pan or the additional drain line connection shall be provided with a drain pipe of not less than 3/4 of an inch (20 mm) nominal pipe size, discharging at a point that is readily observed.

814.2.1 Protection of Appurtenances. Where insulation or appurtenances are installed where damage is capable of resulting from a condensate drain pan overfill, such installations shall occur above the rim of the drain pan with supports. Where the supports are in contact with the condensate waste, the supports are in contact with the condensate waste, the supports shall be of approved corrosion-resistant material.

814.23 Condensate Waste Pipe Material and Sizeing. Condensate waste pipes from air-cooling coils shall be sized in accordance with the equipment capacity as specified in Table 814.3. The material of the piping shall comply with the pressure and temperature rating of the appliance or equipment, and shall be approved for use with the liquid being discharged.

TABLE 814.~~1~~3
MINIMUM CONDENSATE PIPE SIZE

EQUIPMENT CAPACITY IN TONS OF REFRIGERATION	MINIMUM CONDENSATE PIPE DIAMETER (inches)
Up to 20	¾
21 – 40	1
41 – 90	1¼
91 – 125	1½
126 – 250	2

For SI units: 1 ton of refrigerant = 3.52 kW, 1 inch = 25 mm

The size of condensate waste pipes is for one unit or a combination of units, or as recommended by the manufacturer. The capacity of waste pipes assumes a ⅛ inch per foot (10.4 mm/m) or 1 percent slope, with the pipe running three-quarters full at the following pipe conditions:

(remaining text unchanged)

814.3.1 Cleanouts. Condensate drain lines shall be configured or provided with a cleanout to permit the clearing of blockages and for maintenance without requiring the drain line to be cut.

814.4 Appliance Condensate Drains. Condensate drain lines from individual fuel-burning condensing appliances shall be sized as required by the manufacturer's instructions. Condensate drain lines serving more than one appliance shall be approved by the Authority Having Jurisdiction prior to installation.

814.~~3~~5 Point of Discharge. Air-conditioning condensate waste pipes shall connect indirectly, except where permitted in Section 814.6, to the drainage system through an air gap or air break to ~~properly~~ trapped and vented receptors, dry wells, leach pits, or the tailpiece of plumbing fixtures.

A ~~C~~condensate ~~waste shall not~~ drain ~~over a public way.~~ shall be trapped in accordance with the appliance manufacturer's instructions or as approved.

814.6 Condensate Waste From Air-Conditioning Coils. Where the condensate waste from air-conditioning coils discharges by direct connection to a lavatory tailpiece or to an approved accessible inlet on a bathtub overflow, the connection shall be located in the area controlled by the same person controlling the air-conditioned space.

814.7 Plastic Fittings. Female plastic screwed fittings shall be used with plastic male fittings and plastic threads.

Why It Changed

Sections 814.1 and 814.3 were modified to correlate with Sections 312.1 and 312.3 of the UMC. Sections 814.2, 814.4, and 814.6 were added since provisions for air cooling coils, fuel-burning condensing appliances, and similar water-supplied equipment are addressed in the UPC, and therefore relevant condensate waste provisions should be included as well. These additions correlate the UPC with the UMC. The text "condensate waste shall not drain over a public way" was deleted from Section 814.5 of the UPC since similar provisions are already addressed in Section 814.1, and therefore are redundant.

814.0 Condensate Wastes and Disposal (continued)

What It Means To Me

This code section was added to correlate with the Uniform Mechanical Code. The inspector will need to verify the overflow pan and the condensate discharge termination point to the unit that controls the equipment or other approved locations.

When appliances or equipment that produce condensate are located in a space where damage may result from a blocked primary condensate drain, an overflow or secondary drain must be provided in accordance with Section 814.1. In addition, a secondary means of protection for condensate overflow must be provided in accordance to one of the four methods provided in Section 814.2.

The pan is required to prevent any damage that could occur in a concealed location. A small leak could cause significant damage over time without the occupant's knowledge. If multiple units are tied together on a high rise and discharge to the first floor fixture the first floor unit owner will have difficulty in changing their fixture out while the upper units are discharging condensate waste.

Condensate Waste Disposal

What Changed

906.3 Use of Roof. Vent pipes shall be extended separately or combined, of full required size, not less than 6 inches (152 mm) above the roof or fire wall. Flagpoling of vents shall be prohibited except where the roof is used for assembly purposes ~~other than weather protection.~~ or parking. Vents within 10 feet (3048 mm) of a part of the roof that is used for ~~such other~~ assembly purposes or parking shall extend not less than 7 feet (2134 mm) above such roof and shall be securely stayed.

Why It Changed

The text "purposes other than weather protection" does not clearly address the intent of this section as it could be misinterpreted to include roofs that are used for equipment installation only. The intent of this section is where a roof area is used for assembly purposes (ex: promenade, sunbathing, observation deck, etc.), vents located adjacent to such an area should be installed not less than 7 feet above the roof to prevent harmful sewer gases from polluting the occupied area.

Roofs used for parking purposes are not intended for "assembly purposes." However, they need to be treated in the same manner to protect people from exposure to sewer gases.

What It Means To Me

By defining the use of a roof deck, it will help the installer and inspector determine the height of the vent termination. The user of the roof will not only be protected when necessary but it may reduce the height of the vent which may have esthetic value. Installers and the Authority Having Jurisdiction may need to come to some agreement, in some cases, where the roof surface is located. For example, if the roof is being used for certain types of assembly use, there may also be raised roof areas, platforms, or additional decking. Defining whether vents must be measured from the surface of the roof assembly or the highest installed flooring area on the roof will be necessary.

908.2 Horizontal Wet Venting for a Bathroom Group

What Changed

908.2 Horizontal Wet Venting for a Bathroom Groups. ~~Water closets, bathtubs, showers, and floor drains within one or two bathroom groups located on the same floor level and for private use shall be permitted to be vented by a wet vent. The wet vent shall be considered the vent for the fixtures and shall extend from the connection of the dry vent along the direction of the flow in the drain pipe to the most downstream fixture drain or trap arm connection to the horizontal branch drain. Each wet-vented fixture drain or trap arm shall connect independently to the wet-vented horizontal branch drain. Each individual fixture drain or trap arm shall connect horizontally to the wet-vented horizontal branch drain or shall be provided with a dry vent. The trap to vent distance shall be in accordance with Table 1002.2. Only the fixtures within the bathroom groups shall connect to the wet-vented horizontal branch drain. The water closet fixture drain or trap arm connection to the wet vent shall be downstream of the fixture drain or trap arm connections. Additional fixtures shall discharge downstream of the wet vent system and be conventionally vented.~~ A bathroom group located on the same floor level shall be permitted to be vented by a horizontal wet vent where all of the conditions of Section 908.2.1 through Section 908.2.5 are met.

908.2.1 Vent Connection. The dry vent connection to the wet vent shall be an individual vent ~~or common vent~~ for the ~~lavatory, urinal,~~ bidet, shower, or bathtub. One or two vented lavatory(s) shall be permitted to serve as a wet vent for a bathroom group. Only one wet-vented fixture drain or trap arm shall discharge upstream of the dry-vented fixture drain connection. Dry vent connections to the horizontal wet vent shall be in accordance with Section 905.2 and Section 905.3.

908.2.2 Size. The wet vent shall be sized based on the fixture unit discharge into the wet vent. The wet vent shall be not less than 2 inches (50 mm) in diameter for 4 drainage fixture units (dfu) or less, and not less than 3 inches (80 mm) in diameter for 5 dfu or more. The dry vent shall be sized in accordance with Table 702.1 and Table 703.2 based on the total fixtures units discharging into the wet vent.

908.2.3 Trap Arm. The length of the trap arm shall not exceed the limits in Table 1002.2. The trap size shall be in accordance with Section 1003.3. The vent pipe opening from the horizontal wet vent, except for water closets and similar fixtures, shall not be below the weir of the trap.

908.2.4 Water Closet. The water closet fixture drain or trap arm connection to the wet vent shall be downstream of fixture drain or trap arm connections to the horizontal wet vent.

908.2.5 Additional Fixtures. Additional fixtures shall discharge downstream of the wet vent system and be conventionally vented. Only the fixtures within the bathroom group shall connect to the wet-vented horizontal branch.

204.0
Bathroom. A room equipped with a shower, bathtub, or combination bath/shower.

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

206.0
Dry Vent. A vent that does not receive the discharge of any sewage or waste.

Why It Changed

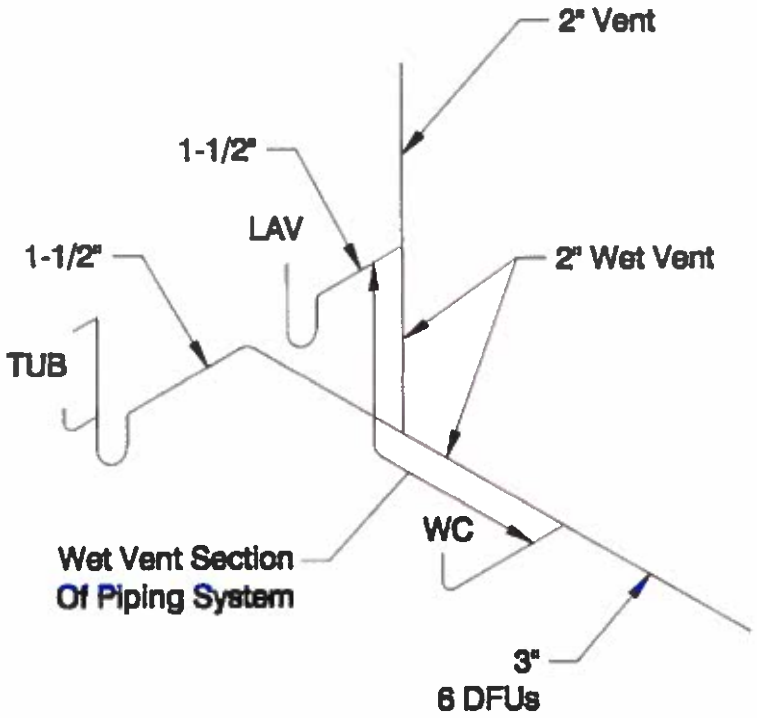
The previous code language implied, by the absence of language to the contrary, that an unvented lavatory may be utilized in a horizontally wet vented system. This would allow an unvented lavatory to connect independently to the wet vented horizontal branch as long as the distance of the lavatory trap arm to the wet vented horizontal branch is in accordance with Table 1002.2. This

would allow the lavatory trap arm to form an S-trap, which is in conflict with Section 1004.1 that prohibits S-traps. The revision has further added a factor of safety to prevent siphonage or self-siphonage of fixtures by limiting the number of bathroom groups to one on a horizontal wet vent, and by limiting the number of fixtures allowed on a horizontal wet vent. Therefore, the committee revised the definition of bathroom group to reflect this factor of safety.

The change in the definition of a Bathroom Group further clarifies what type and the number of fixtures that are allowed to be utilized in a horizontal wet vent installation, in addition the change in the definition of a Bathroom Group changes the use of horizontally wet vented systems from two (2) bathrooms to one (1) bathroom. This is a significant change from the previous interpretation; however this change does clear up the question of how a water closet (WC) can be the lowest fixture in a group with two water closets (WC).

What It Means To Me

When horizontal wet venting first came into the UPC, it proved to be very controversial as many did not understand the code language and were concerned that these systems would not function as intended. To address this, IAPMO convened an ad hoc committee to review the language and this resulted in a Tentative Interim Amendment (TIA). This TIA served as the basis for the new 2015 language in this section, which greatly clarifies these issues. Code users need to ensure they are familiar with the new language. They should also be aware of the new definitions that apply to these systems since much of the previous confusion was related to unclear definitions. Some of the early hesitation regarding the admittance of horizontal wet vent was concern of the proper function of these systems. Installing them in a manner that is not compliant with these sections can lead to the siphonage of the traps, leading to sewer gas being allowed into the structure. Stoppages resulting in flooding could also occur.



Horizontal Wet Vent Diagram
Image Courtesy of ASPE

911.0 Circuit Venting

What Changed

~~C~~ 8911.0 **Circuit Venting.**

~~C~~ 8911.1 **Circuit Vent Permitted.** ~~Circuit venting shall be designed by a registered professional engineer as an engineered design.~~ A maximum of eight fixtures connected to a horizontal branch drain shall be permitted to be circuit vented. Each fixture drain shall connect horizontally to the horizontal branch being circuit vented. The horizontal branch drain shall be classified as a vent from the most downstream fixture drain connection to the most upstream fixture drain connection to the horizontal branch.

~~C~~ 8911.1.1 **Multiple Circuit-Vented Branches.** Circuit-vented horizontal branch drains are permitted to be connected together. Each group of a maximum of eight fixtures shall be considered a separate circuit vent and shall be in accordance with the requirements of this section.

~~C~~ 8911.2 **Vent Size and Connection.** The circuit vent shall be not less than 2 inches (50 mm) in diameter and the connection shall be located between the two most upstream fixture drains. The vent shall connect to the horizontal branch on the vertical. The circuit vent pipe shall not receive the discharge of a soil or waste.

~~C~~ 8911.3 **Slope and Size of Horizontal Branch.** The ~~maximum~~ slope of the vent section of the horizontal branch drain shall be not more than 1 inch per foot (83.3 mm/m). The entire length of the vented section of the horizontal branch drain shall be sized for the total drainage discharge to the branch.

~~C~~ 8911.3.1 **Size of Multiple Circuit Vent.** Multiple circuit vented branches shall be permitted to connect on the same floor level. Each separate circuit-vented horizontal branch that is interconnected shall be sized independently in accordance with Section ~~C~~ 8911.3. The downstream circuit-vented horizontal branch shall be sized for the total discharge into the branch, including the upstream branches and the fixtures within the branch.

~~C~~ 8911.4 **Relief Vent.** A 2 inch (50 mm) relief vent shall be provided for circuit-vented horizontal branches receiving the discharge of four or more water closets and connecting to a drainage stack that receives the discharge of soil or waste from upper horizontal branches.

~~C~~ 8911.4.1 **Connection and Installation.** The relief vent shall connect to the horizontal branch drain between the stack and the most downstream fixture drain of the circuit vent. The relief vent shall be installed on the vertical to the horizontal branch.

~~C~~ 8911.4.2 **Fixture Drain or Branch.** The relief vent is permitted to be a fixture drain or fixture branch for a fixture located within the same branch interval as the circuit-vented horizontal branch. The discharge to a relief vent shall not exceed 4 fixture units.

~~C~~ 8911.5 **Additional Fixtures.** Fixtures, other than the circuit-vented fixtures, are permitted to discharge to the horizontal branch drain. Such fixtures shall be located on the same floor as the circuit-vented fixtures and shall be either individually or common vented.

Why It Changed

These changes relocate the circuit venting requirements of Appendix C to Chapter 9 with all of the other venting methods, so that provisions that have been proven to safeguard public health can be applied and enforced. In Section 911.1 (Circuit Vent Permitted), the text "circuit venting shall be designed by a registered professional engineer as an engineered design" was deleted as the text already provided prescriptive language for the safe installation of such a system without the need for an engineer. Furthermore, the code language prescriptively describes the installation of circuit venting similar to other code sections which describe the installation of wet venting or combination waste and venting methods that already have provisions located within the body of the code without being required to be designed by an engineer.

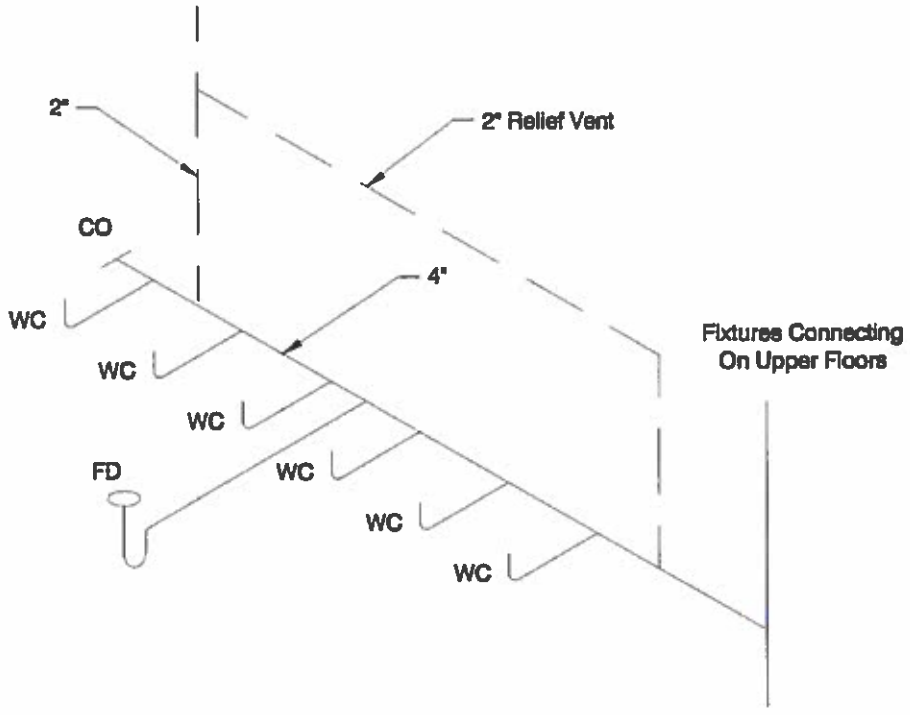
What It Means To Me

The addition of Circuit venting provides another installation method to install multiple fixtures in residential and commercial construction that will save labor and materials. This system has been widely used and allowed in many jurisdictions. The addition of this method to the body of the code would assure wider adoption that for it to remain in the appendices, which must be adopted selectively by jurisdictions.

Circuit venting has been a common venting practice used in plumbing in the United States since the 1920's. Dr. Hunter included circuit venting in the Plumbing Manual BMS 66 published in 1940. By this time, circuit venting had become widely accepted and recognized throughout the United States. Circuit venting is an effective and efficient method of venting a battery of fixtures connected to a horizontal branch. Without the turbulent action of a vertical stack, maintaining the pressure within a horizontal branch becomes less demanding. The vent for a circuit vent is typically 2 inch in diameter providing more than an adequate amount of air for venting the battery of fixtures. One vent for every 8 fixtures is all that is required to maintain the pressure within the branch to plus or minus 1 inch of a water column.

Horizontal batteries of fixtures may be vented with a circuit vent. The horizontal branch may serve a mixture of two to eight water closets, floor drains, bathtubs and shower stalls. The entire length of the horizontal branch drain must be sized for the total drainage fixture load for the branch.

There are two conditions that mandate the installation of a relief vent for a circuit-vented horizontal branch: 1) when the circuit-vented horizontal branch receives the discharge of four or more water closets, and 2) when the circuit-vented horizontal branch connects to a stack that receives discharges from upper floor fixtures.



Circuit Venting
Image Courtesy of ASPE

1009.1 Where Required

What Changed

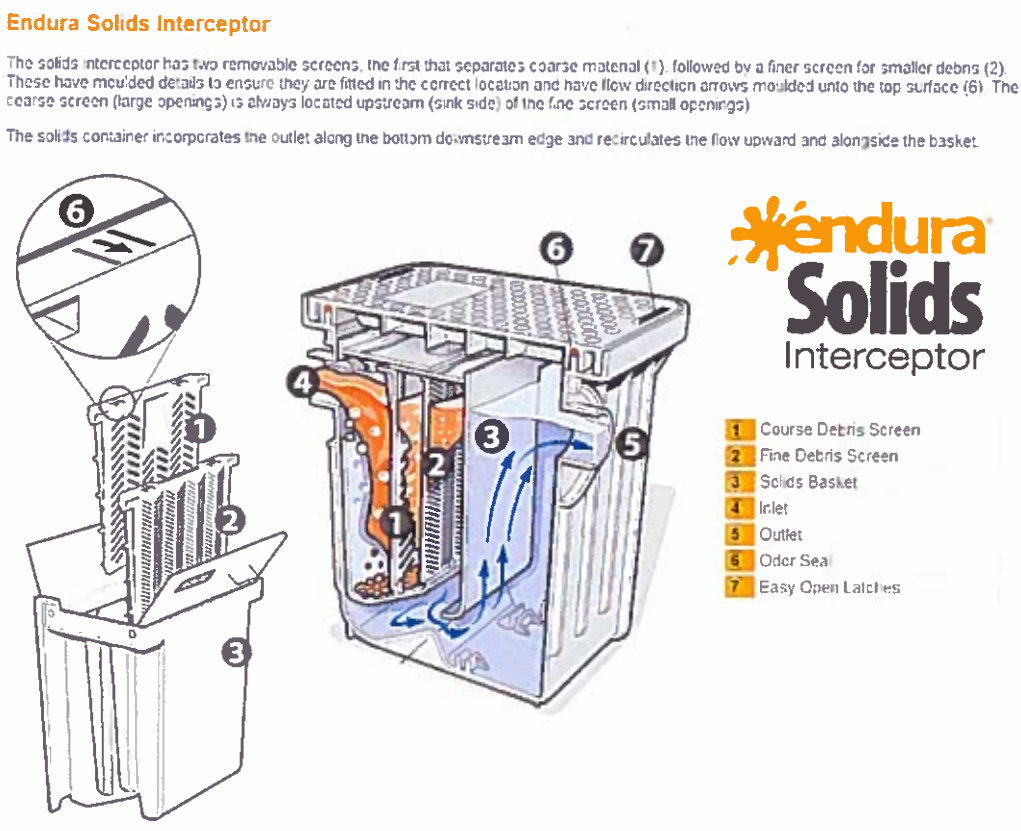
1009.1 Where Required. Interceptors (clarifiers) (including grease, oil, sand, solid interceptors ~~[clarifiers]~~, etc.) shall be required by the Authority Having Jurisdiction where they are necessary for the proper handling of liquid wastes containing grease, flammable wastes, sand, solids, acid or alkaline substances, or other ingredients harmful to the building drainage system, the public or private sewer, or to public or private sewage disposal.

Why It Changed

In addition to grease, oil and sand, interceptors are also commonly used to prevent solids from entering the drainage system. Solids can include glass particles, hair, sand, etc. The addition of the word "solid" brings this to light.

What It Means To Me

There has been an increase in the number of interceptors being produced that can properly handle solids and an increase in their use has been noticed. The determination of the requirement for an interceptor will be identified during the code review process. Inspectors will have to verify that an interceptor designed to handle solids is present if it is deemed necessary. Installers must be aware of this requirement early on in the construction process. Failure to install an interceptor can result in damage to the sewage system and increased liability to the installer and/or contractor.



Sample Solids Interceptor
Image Courtesy of Canplas Plumbing

1208.5.9.2, 1208.7, and 1212.5 Gas Joints, Pressure Regulators, and Valves

What Changed

1208.5.9.2 Heat-Fusion Joint. Heat-fusion joints shall be made in accordance with ~~AWS B2.4~~ qualified procedures that have been established and proven by test to produce gastight joints as strong as the pipe or tubing being joined. Joints shall be made with the joining method recommended by the pipe manufacturer. Heat-fusion fittings shall be marked "ASTM D 2513." [NFPA 54:5.6.9(2)]

1208.7 Gas Pressure Regulators. A line ~~gas~~ pressure regulator or gas appliance pressure regulator, as applicable, shall be installed where the gas supply pressure exceeds that at which the branch supply line or appliances ~~is~~ are designed to operate or ~~varies~~ vary beyond design pressure limits. [NFPA 54~~-12~~:5.8.1]

121~~1~~2.5 Appliance Shutoff Valves and Connections. Appliances connected to a piping system shall have an accessible, approved manual shutoff valve with a nondisplaceable valve member, or a listed gas convenience outlet. Appliance shutoff valves and convenience outlets shall serve a single appliance and shall be installed within 6 feet (1829 mm) of the appliance it serves. Where a connector is used, the valve shall be installed upstream of the connector. A union or flanged connection shall be provided downstream from ~~this~~ the valve to permit removal of appliance controls. Shutoff valves serving decorative ~~gas~~ appliances shall be permitted to be installed in fireplaces where listed for such use. [NFPA 54:9.6.4, 9.6.4.1]

Why It Changed

These sections within Chapter 12 of the UPC have been revised to correlate with NFPA 54-2012 in accordance with IAPMO's Regulations Governing Committee Projects (Extract Guidelines), and the UMC.

What It Means To Me

Heat fusion joints being performed by installers will no longer look to the American Welding Society joining procedures but rely only on the manufactures qualified procedures that have been established and proven by test to produce gastight joints as strong as the pipe or tubing being joined. Installers familiar with the previously accepted practice must ensure they are using the qualified procedures to avoid piping failures and hazardous situations.

1212.8 Sediment Trap

What Changed

1211212.8 Sediment Trap. Where a sediment trap is not incorporated as a part of the appliance, a sediment trap shall be installed downstream of the appliance shutoff valve as close to the inlet of the appliance as practical, but before the flex connector, where used at the time of appliance installation. The sediment trap shall be either a tee fitting with a capped nipple in the bottom outlet, as illustrated in Figure 1211212.8, or other device recognized as an effective sediment trap. Illuminating appliances, ranges, clothes dryers, decorative appliances for installation in vented fireplaces, gas fireplaces, and outdoor grills shall not be required to be so equipped. ~~[NFPA 54:9.6.7]~~

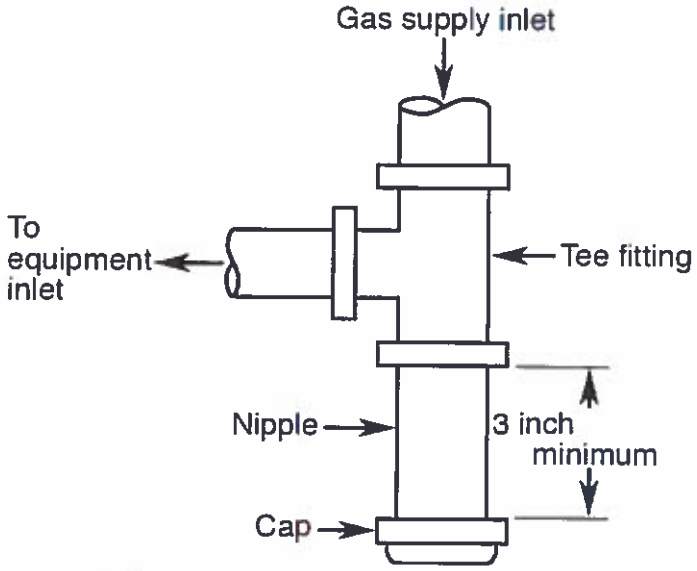
Why It Changed

This code section was added to clarify the language referring to sediment trap placement. Downstream of the shut-off and as close as practical to the appliance would not mean after the flex connector due to the sediment resting in the corrugated appliance connector before it had a chance to settle into the sediment trap. This would mean the entire connector would need to be replaced. By placing the drip leg prior to the connector the sediment can settle into the bottom of the tee and actually be removed or serviced.

What It Means To Me

First, the inspector and installer should ensure that a sediment trap is installed. Although the general requirement for a sediment trap is not new, it is often observed that they are not installed even though the code and many manufacturers require them. This is especially true in new residential construction. The gas coming from the utilities is usually acceptably clean, but there are other things that make sediment traps a necessary safeguard. Often, debris makes its way into the piping prior to installation whether it is from small debris on the job site or even insects making their way into the tubing. Sediment traps are there to prevent this debris from clogging the orifice.

Placing the sediment trap according to the new language helps maximize the protective nature of the trap by putting it in the optimal location in the system. Inspectors and installers need to verify that the sediment is properly located. Otherwise, the potential for sediment to get into the appliance and cause damage is increased.



Method of Installing a Tee Fitting Sediment Trap

1303.8 Water Supply for Hospitals

What Changed

1303.8 Water Supply for Hospitals. Hospitals shall be provided with not less than two approved potable water sources that are installed in such a manner as to prevent the interruption of water service.

Why It Changed

Sources of potable water, such as a building supply line and emergency potable water tank(s) need to be provided for hospitals as approved by the AHJ. If there is a failure with the water main or building supply, the hospital would still have one source of potable water for patient care. This language is also consistent with provisions found in the Centers for Disease Control and Prevention's (CDC), "Emergency Water Supply Planning Guide for Hospitals and Health Care Facilities."

What It Means To Me

Designers, engineers and installers will need to be ready to make provisions for pressure fluctuations between a pressure system and emergency reservoir tank gravity system. Measures will need to be in place to assure proper pressure is being delivered to all fixtures regardless of what system is online. Protecting the potable water serving the care facility should always be the priority and proper backflow prevention devices must be installed in each system.

Emergency Water Supply Planning Guide for Hospitals and Health Care Facilities

Image Courtesy of the Centers for Disease Control

1501.2 System Design

What Changed

16501.2 System Design. Alternate water source systems shall be designed in accordance with this chapter ~~shall be designed~~ by a ~~person~~ registered ~~or licensed to perform plumbing~~ design ~~work~~ professional or who demonstrates competency to design the alternate water source system as required by the Authority Having Jurisdiction. Components, piping, and fittings used in an alternate water source system shall be listed.

Exceptions:

~~(1) A person registered or licensed to perform plumbing design work is not required to design rainwater catchment systems used for irrigation with a maximum storage capacity of 360 gallons (1363 L).~~

~~(2) A person registered or licensed to perform plumbing design work is not required to design rainwater catchment systems for single family dwellings where outlets, piping, and system components are located on the exterior of the building.~~

(~~3~~1) A ~~person~~ registered ~~or licensed to perform plumbing~~ design~~work~~ professional is not required to design gray water systems having a maximum discharge capacity of 250 gallons per day (gal/d) (0.011 L/s) for single family and multi-family dwellings.

(~~4~~2) A ~~person~~ registered ~~or licensed to perform plumbing~~ design ~~work~~ professional is not required to design an on-site treated nonpotable water system for single family dwellings having a maximum discharge capacity of 250 gal/d (0.011 L/s).

Why It Changed

In 1501.2, the new language gives the AHJ authority to determine the competency of person(s) authorized to design alternate water systems in accordance with this chapter. This change was brought about to incorporate and consolidate language from the IAPMO Green Plumbing and Mechanical Code Supplement (GPMCS).

It should be noted that the information deleted from this sections was moved to Chapter 16 which discusses the rainwater catchment provisions.

What It Means To Me

Most jurisdictions will allow landscape architects to design the downstream side of gray water systems (after alterations to the existing plumbing system). They have a thorough understanding of soil types, root zones of specific plants, erosion control, and are one of the professional categories to become SWPPP (Storm Water Pollution Prevention Plan developers and practitioners). This type of expertise is required to prevent gray water from ponding and runoff potential.

Many gray water systems are very simple, often gravity based with no tanks or pumps. Even the small pumped and filtered manufactured type gray water systems are very simple to install, and can be installed in just a few hours. If the system has larger volumes of water, or is from commercial buildings, a licensed person would be required to design the system.

Since there currently is not an accreditation for the design of these systems, standards exist to follow, civil engineers with training in watershed/storm water and or rainwater collection and Storm water Pollution Prevention Plans, as well as NPDES, and ground water may be qualified, but without an accreditation program the language leaves open a hole where jurisdictions will be argued with over the section. Potential advice is to create an accreditation program.

What Changed

16503<u>1</u>.11 Inspection and Testing. ~~Reclaimed (recycled)~~ <u>Alternate</u> water <u>source</u> systems shall be inspected and tested in accordance with Section 16503<u>1</u>.11.1 and Section 16503<u>1</u>.11.2.

16503<u>1</u>.11.1 Supply System Inspection and Test. ~~Reclaimed (recycled)~~ <u>Alternate</u> water <u>source</u> systems shall be inspected and tested in accordance with this code for testing of potable water piping.

16503<u>1</u>.11.2 Annual Cross-Connection Inspection and Testing. An initial and subsequent annual inspection and test shall be performed on both the potable and ~~reclaimed (recycled)~~ <u>alternate</u> water <u>source</u> systems. The potable and ~~reclaimed (recycled)~~ <u>alternate</u> water <u>source</u> system shall be isolated from each other and independently inspected and tested to ensure there is no cross-connection in accordance with Section 16503<u>1</u>.11.2.1 through Section 16503<u>1</u>.11.2.4.

16503<u>1</u>.11.2.1 Visual System Inspection. Prior to commencing the cross-connection testing, a dual system inspection shall be conducted by the Authority Having Jurisdiction and other authorities having jurisdiction as follows:
(1) Meter locations of the ~~reclaimed (recycled)~~ <u>alternate</u> water <u>source</u> and potable water lines shall be checked to verify that no modifications were made, and that no cross-connections are visible.
(2) Pumps and equipment, equipment room signs, and exposed piping in equipment room shall be checked.
(3) Valves shall be checked to ensure that valve lock seals are still in place and intact. Valve control door signs shall be checked to verify that no signs have been removed.

16503<u>1</u>.11.2.2 Cross-Connection Test. The procedure for determining cross-connection shall be followed by the applicant in the presence of the Authority Having Jurisdiction and other authorities having jurisdiction to determine whether a cross-connection has occurred as follows:
(1) The potable water system shall be activated and pressurized. The ~~reclaimed (recycled)~~ <u>alternate</u> water <u>source</u> system shall be shut down, depressurized, and drained.
(2) The potable water system shall remain pressurized for a minimum period of time specified by the Authority Having Jurisdiction while the ~~reclaimed (recycled)~~ <u>alternate</u> water <u>source</u> system is empty. The minimum period the ~~reclaimed (recycled)~~ <u>alternate</u> water <u>source</u> system is to remain depressurized shall be determined on a case-by-case basis, taking into account the size and complexity of the potable and the ~~reclaimed (recycled)~~ <u>alternate</u> water <u>source</u> distribution systems, but in no case shall that period be less than 1 hour.
(3) The drain on the ~~reclaimed (recycled)~~ <u>alternate</u> water <u>source</u> system shall be checked for flow during the test and fixtures, potable and ~~reclaimed (recycled)~~ <u>alternate</u> water <u>source</u>, shall be tested and inspected for flow. Flow from an ~~reclaimed (recycled)~~ <u>alternate</u> water <u>source</u> system outlet indicates a cross-connection. No flow from a potable water outlet shall indicate that it is connected to the ~~reclaimed (recycled)~~ <u>alternate</u> water <u>source</u> system.
(4) The potable water system shall then be depressurized and drained.
(5) The ~~reclaimed (recycled)~~ <u>alternate</u> water <u>source</u> system shall then be activated and pressurized.
(6) The ~~reclaimed (recycled)~~ <u>alternate</u> water <u>source</u> system shall remain pressurized for a minimum period of time specified by the Authority Having Jurisdiction while the potable water system is empty. The minimum period the potable water system is to remain depressurized shall be determined on a case-by-case basis, but in no case shall that period be less than 1 hour.
(7) Fixtures, potable and ~~reclaimed (recycled)~~ <u>alternate</u> water <u>source</u>, shall be tested and inspected for flow. Flow from a potable water system outlet indicates a cross-connection. No flow from an ~~reclaimed (recycled)~~ <u>alternate</u> water <u>source</u> outlet will indicate that it is connected to the potable water system.
(8) The drain on the potable water system shall be checked for flow during the test and at the end of the test.
(9) Where there is no flow detected in the fixtures which would indicate a cross-connection, the potable water system shall be repressurized.

16503~~1~~1.11.2.3 Discovery of Cross-Connection. In the event that a cross-connection is discovered, the following procedure, in the presence of the Authority Having Jurisdiction, shall be activated immediately:
(1) The ~~reclaimed (recycled)~~ alternate water source piping to the building shall be shut down at the meter, and the ~~reclaimed (recycled)~~ alternate water source riser shall be drained.
(2) Potable water piping to the building shall be shut down at the meter.
(3) The cross-connection shall be uncovered and disconnected.
(4) The building shall be retested ~~following procedure listed~~ in accordance with Section 16503~~1~~1.11.2.1 and Section 16503~~1~~1.11.2.2.
(5) The potable water system shall be chlorinated with 50 parts-per-million (ppm) chlorine for 24 hours.
(6) The potable water system shall be flushed after 24 hours, and a standard bacteriological test shall be performed. Where test results are acceptable, the potable water system shall be permitted to be recharged.

16503~~1~~1.11.2.4 Annual Inspection. An annual inspection of the ~~reclaimed (recycled)~~ alternate water source system, following the procedures listed in Section 16503~~1~~1.11.2.1 shall be required. Annual cross-connection testing, following the procedures listed in Section 16503~~1~~1.11.2.2 shall be required by the Authority Having Jurisdiction, unless site conditions do not require it. In no event shall the test occur less than once in 4 years. Alternate testing requirements shall be permitted by the Authority Having Jurisdiction.

Why It Changed

These sections add language to provide the end user regulations for inspection and testing for alternate water systems, supply inspection and testing, annual cross connection inspection and testing, visual system inspection, and cross connection testing. This language follows the same protocols as the IAPMO Green Plumbing and Mechanical Code Supplement (GPMCS). They guide the AHJ and end user with prescriptive measures in each heading of the section.

Previously, there were 2 identical code provisions for Inspection and Testing in this chapter. One was in the reclaimed water section; the other was in the onsite treated water section. Instead of having 2 sections saying the exact same thing, Inspection and Testing was moved to General provisions and now is only referenced in both sections. All this change did was remove duplication of text.

What It Means To Me

There is no debate as to the need for healthy and safe potable water to safeguard the public. Inspectors and jurisdictions in general need to ensure that the required inspections and testing take place at the appropriate times. Without verifying that all measures are in place to safeguard the potable water systems from graywater, the situation could arise where the potable water becomes compromised leading to a wide range of negative results that range from poor tasting water on the mild end to illness and even death at the severe end. If this situation were to occur, the installer, inspector, and jurisdiction could be exposed to liability for any damages.

1501.12 Separation Requirements

What Changed

1501.12 Separation Requirements. Underground alternate water source service piping other than gray water shall be separated from the building sewer in accordance with this code. Treated nonpotable water pipes shall be permitted to be run or laid in the same trench as potable water pipes with a 12 inch (305 mm) minimum vertical and horizontal separation where both pipe materials are approved for use within a building. Where horizontal piping materials do not comply with this requirement the minimum separation shall be increased to 60 inches (1524 mm). The potable water piping shall be installed at an elevation above the treated nonpotable water piping.

Why It Changed

This change was brought about to incorporate and consolidate language from the IAPMO Green Plumbing and Mechanical Code Supplement (GPMCS).

What It Means To Me

There are 2 separate scenarios in 1501.12.

One – when the alternate water source piping is separated from the building sewer. Where this is the case, Section 609.2 in this Code applies. Section 609.2 does not address the materials for the water piping. This section stipulates that both sewer and water piping both must be approved within the building to be laid in the same trench. Any piping not approved within the building still requires twelve inches of separation for crosses, see section 609.2 (2).

Two – when the alternate water source piping is separated from potable water pipes. Where this is the case, this section applies. Both the treated nonpotable water pipe and the potable water pipe must be approved material for use within a building. This means that both pipe materials have to comply with Table 604.1 for Water Distribution Pipe.

1504.7 On-Site Treated Nonpotable Water Devices and Systems

What Changed

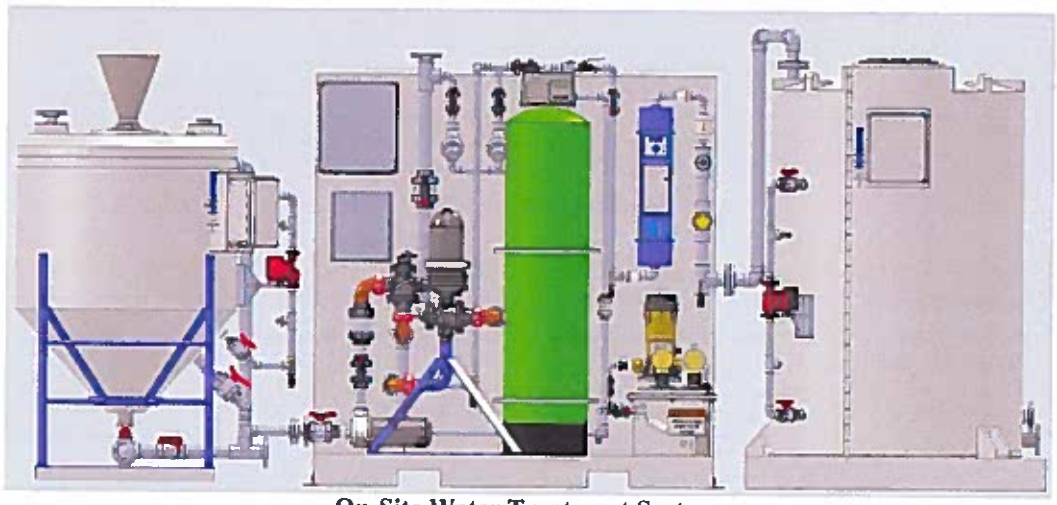
1504.7 On-Site Treated Nonpotable Water Devices and Systems. Devices or equipment used to treat on-site treated nonpotable water in order to maintain the minimum water quality requirements determined by the Authority Having Jurisdiction shall be listed or labeled (third-party certified) by a listing agency (accredited conformity assessment body) ~~and~~ or approved for the intended application. Devices or equipment used to treat on-site treated nonpotable water for use in water closet and urinal flushing, surface irrigation, and similar applications shall be listed or labeled to NSF 350, or approved by the Authority Having Jurisdiction.

Why It Changed

This additional language gives guidance for the standards used for components in devices and equipment used to treat non-potable water for above and below grade irrigation, toilet and urinal flushing.

What It Means To Me

This section gives more guidance to on-site treated non potable water. It helps consolidate and provide consistency with the IAPMO Green Plumbing and Mechanical Supplement (GPMCS). The AHJ still has the authority to use more stringent standards based on State and Local water quality standards. The standard NSF 350 is cited for devices and components.



On-Site Water Treatment System
Image Courtesy of Wahaso

Chapter 16 Nonpotable Rainwater Catchment Systems General Changes

What Changed

1601.0 General.

1601.1 Applicability. The provisions of this chapter shall apply to the installation, construction, alteration, and repair of nonpotable rainwater catchment systems.

1601.1.1 Allowable Use of Alternate Water. Where approved or required by the Authority Having Jurisdiction, rainwater shall be permitted to be used in lieu of potable water for the applications identified in this chapter.

1601.2 System Design. Rainwater catchment systems shall be designed in accordance with this chapter by a person registered or licensed to perform plumbing design work or who demonstrates competency to design the rainwater catchment system as required by the Authority Having Jurisdiction. Components, piping, and fittings used in a rainwater catchment system shall be listed.
Exceptions:
(1) A person registered or licensed to perform plumbing design work is not required to design rainwater catchment systems used for irrigation with a maximum storage capacity of 360 gallons (1363 L).
(2) A person registered or licensed to perform plumbing design work is not required to design rainwater catchment systems for single family dwellings where outlets, piping, and system components are located on the exterior of the building.

1601.3 Permit. It shall be unlawful for a person to construct, install, alter, or cause to be constructed, installed, or altered a rainwater catchment system in a building or on a premise without first obtaining a permit to do such work from the Authority Having Jurisdiction.
Exceptions:
(1) A permit is not required for exterior rainwater catchment systems used for outdoor drip and subsurface irrigation with a maximum storage capacity of 360 gallons (1363 L).
(2) A plumbing permit is not required for rainwater catchment systems for single family dwellings where outlets, piping, and system components are located on the exterior of the building. This does not exempt the need for permits where required for electrical connections, tank supports, or enclosures.

1601.4 Component Identification. System components shall be properly identified as to the manufacturer.

1601.5 Maintenance and Inspection. Rainwater catchment systems and components shall be inspected and maintained in accordance with Section 1601.5.1 through Section 1601.5.3.

1601.5.1 Frequency. Rainwater catchment systems and components shall be inspected and maintained in accordance with Table 1601.5 unless more frequent inspection and maintenance is required by the manufacturer.

1601.5.2 Maintenance Log. A maintenance log for rainwater catchment systems is required to have a permit in accordance with Section 1601.3 and shall be maintained by the property owner and be available for inspection. The property owner or designated appointee shall ensure that a record of testing, inspection, and maintenance in accordance with Table 1601.5 is maintained in the log. The log will indicate the frequency of inspection and maintenance for each system.

1601.5.3 Maintenance Responsibility. The required maintenance and inspection of rainwater catchment systems shall be the responsibility of the property owner, unless otherwise required by the Authority Having Jurisdiction.

What Changed

TABLE 1601.5
MINIMUM ALTERNATE WATER SOURCE TESTING, INSPECTION, AND MAINTENANCE FREQUENCY

DESCRIPTION	MINIMUM FREQUENCY
Inspect and clean filters and screens, and replace (where necessary).	Every 3 months
Inspect and verify that disinfection, filters, and water quality treatment devices and systems are operational and maintaining minimum water quality requirements as determined by the Authority Having Jurisdiction.	In accordance with manufacturer's instructions, and the Authority Having Jurisdiction.
Inspect and clear debris from rainwater gutters, downspouts, and roof washers.	Every 6 months
Inspect and clear debris from roof or other aboveground rainwater collection surfaces.	Every 6 months
Remove tree branches and vegetation overhanging roof or other aboveground rainwater collection surfaces.	As needed
Inspect pumps and verify operation.	After initial installation and every 12 months thereafter
Inspect valves and verify operation.	After initial installation and every 12 months thereafter
Inspect pressure tanks and verify operation.	After initial installation and every 12 months thereafter
Clear debris from and inspect storage tanks, locking devices, and verify operation.	After initial installation and every 12 months thereafter
Inspect caution labels and marking.	After initial installation and every 12 months thereafter
Cross-connection inspection and test*	After initial installation and every 12 months thereafter
Test water quality of rainwater catchment systems required by Section 1602.9.4 to maintain a minimum water quality	Every 12 months. After system renovation or repair.

* The cross-connection test shall be performed in the presence of the Authority Having Jurisdiction in accordance with the requirements of this chapter.

1601.6 Operation and Maintenance Manual. An operation and maintenance manual for rainwater catchment systems required to have a permit in accordance with Section 1601.3 shall be supplied to the building owner by the system designer. The operating and maintenance manual shall include the following:

(1) Detailed diagram of the entire system and the location of system components.
(2) Instructions on operating and maintaining the system.
(3) Details on maintaining the required water quality as determined by the Authority Having Jurisdiction.
(4) Details on deactivating the system for maintenance, repair, or other purposes.
(5) Applicable testing, inspection, and maintenance frequencies in accordance with Table 1601.5.
(6) A method of contacting the manufacturer(s).

Chapter 16 Nonpotable Rainwater Catchment Systems General Changes

What Changed

1601.7 Minimum Water Quality Requirements. The minimum water quality for rainwater catchment systems shall comply with the applicable water quality requirements for the intended application as determined by the Authority Having Jurisdiction. Water quality for nonpotable rainwater catchment systems shall comply with Section 1602.9.4.

Exceptions:

(1) Water treatment is not required for rainwater catchment systems used for aboveground irrigation with a maximum storage capacity of 360 gallons (1363 L).

(2) Water treatment is not required for rainwater catchment systems used for subsurface or drip irrigation.

1601.8 Material Compatibility. Rainwater catchment systems shall be constructed of materials that are compatible with the type of pipe and fitting materials, water treatment, and water conditions in the system.

1601.9 System Controls. Controls for pumps, valves, and other devices that contain mercury that come in contact with rainwater supply shall not be permitted.

1601.10 Separation Requirements. Underground rainwater catchment service piping shall be separated from the building sewer in accordance with Section 609.2. Treated nonpotable water pipes shall be permitted to be run or laid in the same trench as potable water pipes with a 12 inch (305 mm) minimum vertical and horizontal separation where both pipe materials are approved for use within a building. Where horizontal piping materials do not meet this requirement the minimum separation shall be increased to 60 inches (1524 mm). The potable water piping shall be installed at an elevation above the treated nonpotable water piping.

1601.11 Abandonment. Rainwater catchment systems that are no longer in use or fail to be maintained in accordance with Section 1601.5 shall be abandoned. Abandonment shall comply with Section 1601.11.1 and Section 1601.11.2.

1601.11.1 General. An abandoned system or part thereof covered under the scope of this chapter shall be disconnected from remaining systems, drained, plugged, and capped in an approved manner.

1601.11.2 Underground Tank. An underground water storage tank that has been abandoned or otherwise discontinued from use in a system covered under the scope of this chapter shall be completely drained and filled with earth, sand, gravel, concrete, or other approved material or removed in a manner satisfactory to the Authority Having Jurisdiction.

1601.12 Sizing. Unless otherwise provided for in this chapter, rainwater catchment piping shall be sized in accordance with Chapter 6 for sizing potable water piping.

Why It Changed

These changes were made to consolidate and add consistency with the 2012 Green Plumbing and Mechanical Code Supplement.

What It Means To Me

These sections add a road map of design, maintenance, maintenance frequency, responsibility water quality inspection and testing, controls, maintenance logs, sizing, permits, abandonment, underground tanks, component identification and persons qualified to design rain water systems. It is a more comprehensive set of prescriptive requirements than in the previous code. It will add the end user prepare and install systems and give inspectors a clear guideline for inspections testing and the required logs to be kept by the owner of rain water systems. Again, most of these changes were the result of moving provisions from the Alternate Water Sources chapter to the Rainwater Chapter. The provisions were already in the 2012 UPC. The 2012 UPC did not accurately divide between these two chapters.

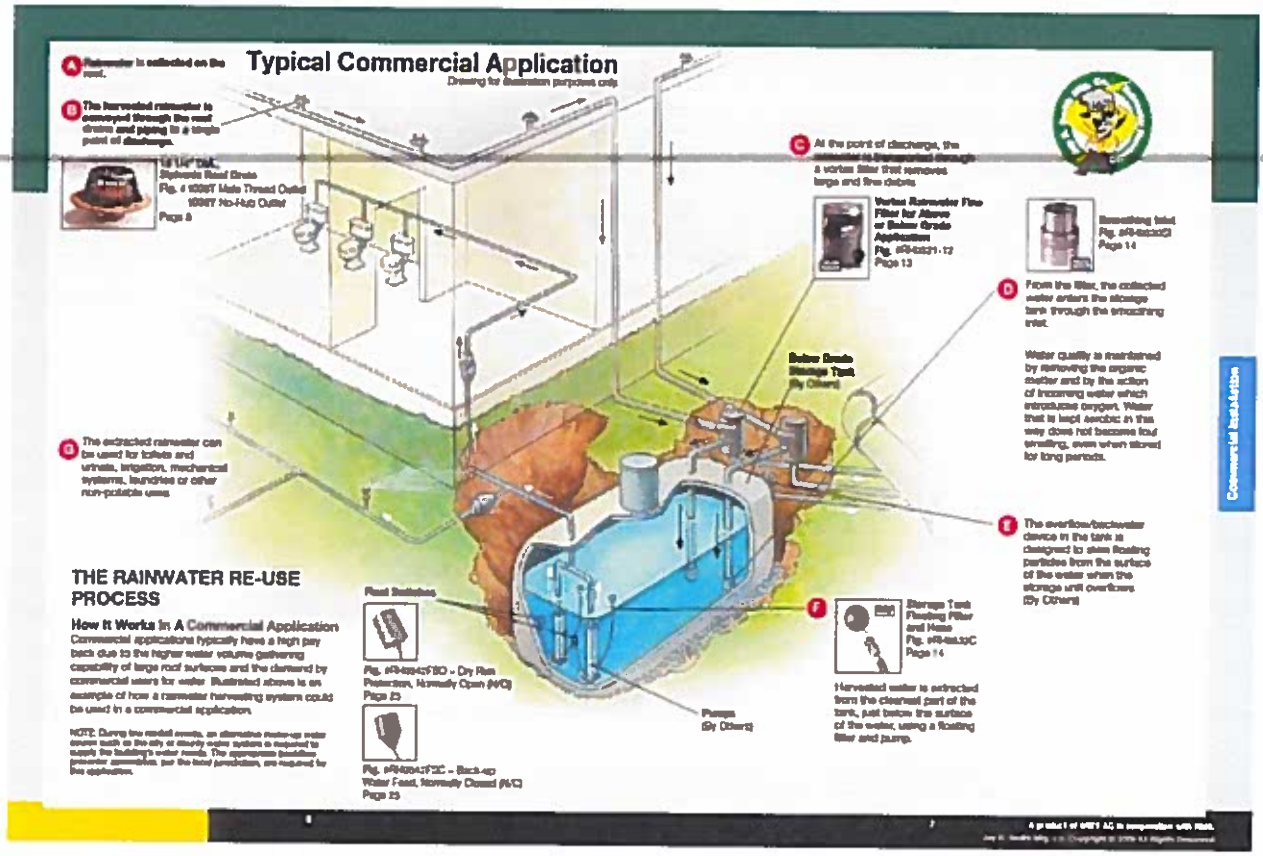


Image Courtesy of the US Green Building Council (USGBC)

What Changed

1760~~1~~2.6 Sizing. ~~Rainwater catchment system distribution piping for indoor applications shall be sized as outlined in this code for sizing potable water piping.~~ The design and size of rainwater drains, gutters, conductors, and leaders shall comply with Chapter 11 of this code.

Why It Changed

This section clarifies the sizing requirements of leader and gutter.

What It Means To Me

By clarifying that sizing shall be Chapter 11 of the UPC, the designer and end user have a clear path to size these systems. Improper sizing of the rainwater catchment system components can lead to a wasting of water that could have otherwise been captured or utilized or can lead to inefficient or slow roof drainage. Over time, this overloading could lead to the failure of these components or even property damage resulting from additional water not being managed away from the structure.

1602.9.3 Rainwater Catchment System Surfaces

What Changed

1~~7~~602.9.3 ~~Collection~~ Rainwater Catchment System Surfaces. Rainwater shall be collected from roof surfaces. ~~A rainwater catchment system shall not collect rainwater:~~ or other manmade, above ground collection surfaces.
~~(1) Vehicular parking surfaces~~
~~(2) Surface water runoff~~
~~(3) Bodies of standing water~~

1~~7~~602.9.3.1 ~~Prohibited Discharges~~ Other Surfaces. ~~Overflows and blood off pipes from roof mounted equipment and appliances shall not discharge onto roof surfaces that are intended to collect rainwater.~~ Natural precipitation collected from surface water runoff, vehicular parking surfaces, or manmade surfaces at or below grade shall be in accordance with the stormwater requirements for on-site treated nonpotable water systems in Section 1504.0.

Why It Changed

This section gives a clear understanding of what surfaces are allowed to be collected from and provides clarity to other surfaces and the code section that applies to storm water and other non-potable on-site treated water.

What It Means To Me

The owner and inspector have a clear roadmap of approved collection surfaces. This section gives clear direction to the different applications and approved collection surfaces other than those approved for rainwater. The requirements for other surfaces can be found in Section 1504. By limiting the collection of rainwater to above ground surfaces the code is guarding against more toxic contaminants from being collected from areas exposed to vehicle traffic, fertilizer, other waste, and other chemicals and contaminants that may be present at ground level.

1602.9.5.8 Storage Tank Venting

What Changed

1602.9.5.8 Storage Tank Venting. Where venting by means of drainage or overflow piping is not provided, or is considered insufficient, a vent shall be installed on each tank. The vent shall extend from the top of the tank and terminate not less than 6 inches (152 mm) above grade and shall be not less than 1 1/2 inches (40 mm) in diameter. The vent terminal shall be directed downward and covered with a 3/32 of an inch (2.4 mm) mesh screen to prevent the entry of vermin and insects.

Why It Changed

This section was added to reflect consistency with IAPMO Green Plumbing and Mechanical Code Supplement. Clear guidance on tank venting is provided.

What It Means To Me

This section gives the owner and end user clear guidance to venting requirement of storage tanks as well as bug screens to prevent insect intrusion. Venting of the tank will allow the tank to function as designed and the inclusion of the mesh screen reduces the potential for contamination from bugs and other small animals that could lead to the damage of otherwise vulnerable components in the system.

Vent with .125 inch or 3175 micron bug screen to prevent mosquitos and insects

Image Courtesy of Buildingincalifornia.com

1602.11.1 Supply System Inspection and Test

What Changed

1~~7~~602.11.1 Supply System Inspection and Test. Rainwater catchment systems shall be inspected and tested in accordance with the applicable provisions of this code for testing of potable water and storm drainage systems. Storage tanks shall be filled with water to the overflow opening for a period of 24 hours, and during inspection, or by other means as approved by the Authority Having Jurisdiction. Seams and joints shall be exposed during inspection and checked for water tightness.

Why It Changed

This section was added to reflect consistency with IAPMO Green Plumbing and Mechanical Code Supplement.

What It Means To Me

Supply system inspection and test can only mean that cross connection likely hood has been minimized and the health and safety of a building's occupants will not be compromised. The added language is beneficial to the end user and owners as the possibility of cross connection has been minimized for the health and safety of the occupants. Clearer guidelines make a much improved and organized section.