

**IAPMO Green Plumbing and Mechanical Code Supplement (GPMCS)
Proposed Changes for Public Comment**

AS=Approved as submitted
AM=Approved as amended

Item #	Submitter	Proposed Change	Reason Statement	GTC Action
1	GTC	<p>Add new sections as follows:</p> <p><u>101.6.5 Solar.</u> Solar energy systems shall be installed in accordance with the Uniform Solar Energy Code (USEC) promulgated by the International Association of Plumbing and Mechanical Officials (IAPMO).</p> <p><u>101.6.6 Swimming Pool.</u> The provisions of the swimming pool code shall apply to the erection, installation, alteration, repair, relocation, replacement, addition to, use and maintenance of swimming pools, spas, or hot tub systems. Where a swimming pool code is not adopted or where the content of the swimming pool code adopted by the jurisdiction is not applicable, then swimming pool code shall mean the Uniform Swimming Pool, Spa & Hot Tub Code (USPSHTC) promulgated by the International Association of Plumbing and Mechanical Officials (IAPMO).</p>	Adding the referenced codes missing from the text.	AS
2	Alternate Water Sources TG	<p>Add new text as follows:</p> <p>Section 206.0 <u>Dry Weather Runoff.</u> Water that flows along a surface, in a channel or sub-surface including groundwater seepage, and is not associated with a rainwater catchment system or stormwater harvesting.</p>	New definition because of its inclusion as a source for On-Site Treated Non-Potable Water.	AM
3	Plumbing Water Efficiency TG	<p>Add new definition as follows:</p> <p>Section 214.0 <u>Lavatory.</u> A sink or washbasin intended primarily for the purpose of personal hygiene.</p>	A new definition for lavatory added to clarify a lavatory faucet.	AM
4	Irrigation TG	<p>Add sections as follows:</p> <p>Section 214.0 <u>Low volume irrigation (also called micro-irrigation).</u> A means of irrigating at water emission rates equal to or less than the soil absorption rates to minimize evaporation and runoff. Includes, but is not limited to, use of the following: drip (also known as trickle) irrigation, micro-spray jets, micro-sprinklers, or bubbler irrigation. <u>Sprinkler heads:</u> A combination of the sprinkler body and appropriate nozzle for the area to be irrigated.</p> <p><u>413.0 Landscape Irrigation Systems</u> <u>413.1 General.</u> Where landscape irrigation systems are installed in commercial and</p>	New sections on lawn irrigation systems provisions are added.	AM

residential buildings, they shall comply with Sections 413.2 through 413.7. Requirements that limit the amount or type of plant material used in landscapes shall be established by the Authority Having Jurisdiction.

Exception: landscape irrigations systems serving botanical gardens, arboretums or other plant collections open to the public.

413.2 Backflow Protection. Potable water and reclaimed water supplies to landscape irrigation systems shall be protected from backflow in accordance with the plumbing code.

413.3 Use of Alternate Water Sources for Landscape Irrigation. Where available and approved by the Authority Having Jurisdiction, alternative water source(s) complying with Chapter 5 shall use be utilized for landscape irrigation.

413.4 Irrigation Control Systems. Where installed as part of a landscape irrigation system, irrigation control systems shall:

413.4.1 Automatically adjust the irrigation schedule to respond to plant water needs determined by weather or soil moisture conditions;

413.4.2 Utilize sensors to suspend irrigation during a rainfall event and when adequate soil moisture is present for plant growth.

413.4.3 Have multiple programs and multiple start times to enable implement cycle and soak scheduling starts to eliminate irrigation water runoff.

413.4.4 The site specific settings for the irrigation control system that affects the irrigation shall be posted at the control system location. The posted data, where applicable to the settings of the controller, shall include:

- a. Precipitation rate for each zone
- b. Plant evapotranspiration coefficients for each zone
- c. Soil absorption rate for each zone
- d. Rain sensor settings
- e. Soil moisture setting
- f. Peak demand schedule including run times for each zone and the number of cycles to mitigate runoff and monthly adjustments or percentage

413.5 Low Volume Irrigation. Irrigation zones using low volume irrigation shall be equipped with filters, flushing assemblies and pressure regulator installed as necessary to reduce the static pressure to 40 psi (275.8 kPa) or less.

413.6 Mulched Planting Areas. In mulched planting areas, the use of low volume irrigation is required to maximize water infiltration into the root zone.

413.7 System Performance Requirements. The landscape irrigation system shall be designed and installed to prevent runoff, and supply-line drainage. Irrigation water shall not be applied to or enter non targeted areas including: adjacent property and vegetation areas, non-vegetative areas, impermeable surfaces, roadways, and structures.

413.8 Narrow or Irregularly Shaped Landscape Areas. Narrow or irregularly shaped landscape areas, less than four (4) feet in any direction, shall not be irrigated by sprinkler heads.

413.9 Sloped Areas. Where soil surface rises more than one (1) foot per four (4) feet of length, the irrigation system water application rate shall not exceed 0.50 inches per hour.

413.10 Sprinkler Heads. Sprinkler heads consist of a sprinkler body and nozzle and shall comply with Sections 413.9.1 through 413.9.4.

413.10.3.1 Sprinkler Heads in Common Zones. Sprinkler heads installed in zones served by a common valve shall be limited to plant materials with similar irrigation needs, and shall have matched precipitation rates (identical inches of water application per hour).

413.10.3.2 Sprinkler Head Pressure Regulation. Sprinkler heads shall utilize pressure regulating devices to maintain manufacturers recommend operating pressure for each sprinkler and nozzle type.

413.10.3.3 Pop-up Type Sprinkler Heads. Where pop-up type sprinkler heads are used, the sprinkler head shall rise to a height of not less than four (4) inches (101 mm) above the soil level when emitting water.

413.10.3.5 Nozzle Performance Criteria. Irrigation zones containing turfgrass shall be designed and installed to assure the average precipitation rate of the sprinkler nozzles over the irrigated area does not exceed 200% of the soil absorption rate, and shall not exceed a water application rate of 1.0 inches per hour

413.11 Landscape Irrigation System Maintenance Schedule and Repairs. Landscape irrigation systems shall be maintained and repaired in accordance with Section 413.10.1 and 413.10.2.

413.11.1 Maintenance. Landscape irrigation systems shall be maintained in proper operating condition in accordance with the original design to retain water use efficiency. A regular maintenance schedule shall be available for submission to the Authority Having Jurisdiction and kept on site. A landscape irrigation system maintenance schedule shall include, but not be limited to, monthly inspection, adjustment and repair of the irrigation system and its components; and removing any obstruction to emission devices. Operation of the landscape irrigation system outside the irrigation schedule is permitted for auditing and system maintenance purposes only.

413.11.2 Repair and Replacement. Repair and replacement of landscape irrigation equipment and components shall be performed using parts that are equivalent to the originally installed components in order to retain the original water use efficiency of the system.

413.12 Qualifications. The Authority Having Jurisdiction shall have the authority to require landscape irrigation contractors, installers, or designers to demonstrate competency. Where required by the Authority Having Jurisdiction, the contractor, installer, or designer shall be certified to perform such work. Note: certification programs, such as those operated by US EPA and the Irrigation Association are examples of certification programs that provide a demonstration of competency in water-efficient irrigation designs and technology.

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GTC

Revision definitions as follows:

215.0 Mechanical Code. The mechanical code that is adopted by the jurisdiction. ~~Where a mechanical code is not adopted or where the content of the mechanical code adopted by the jurisdiction is not applicable, then mechanical code shall mean the Uniform Mechanical Code (UMC) promulgated by the International Association of Plumbing and Mechanical Officials (IAPMO).~~

Removing mandatory language from definitions in accordance with IAPMO's Manual of Style.

AS

		<p>218.0 Plumbing Code. The plumbing code that is adopted by the jurisdiction. Where a plumbing code is not adopted or where the content of the plumbing code adopted by the jurisdiction is not applicable, then mechanical code shall mean the Uniform Plumbing Code (UPC) promulgated by the International Association of Plumbing and Mechanical Officials (IAPMO).</p> <p>220.0 Reclaimed (Recycled) Water. Non-potable water provided by a water/wastewater utility that, as a result of tertiary treatment of domestic wastewater, meets requirements of the public health Authority Having Jurisdiction for its intended uses. The level of treatment and quality of the reclaimed (recycled) water shall be approved by the public health Authority Having Jurisdiction.</p>		
6	GTC	<p>Revise sections as follows:</p> <p>217.0 On-Site Treated Non-Potable Water. Non-potable water, including gray water that has been collected, treated, and intended to be used on-site and is suitable for direct beneficial use. The level of treatment and quality of the on-site treated non-potable water shall be approved by the public health Authority Having Jurisdiction.</p> <p>220.0 Reclaimed (Recycled) Water. Non-potable water provided by a water/wastewater utility that, as a result of tertiary treatment of domestic wastewater, meets requirements of the public health Authority Having Jurisdiction for its intended uses. The level of treatment and quality of the reclaimed (recycled) water shall be approved by the public health Authority Having Jurisdiction.</p> <p>501.7 Minimum Water Quality Requirements. The minimum water quality for alternate water source systems shall meet the applicable water quality requirements for the intended application as determined by the public health Authority Having Jurisdiction. In the absence of water quality requirements, the EPA/625/R-04/108 contains recommended water reuse guidelines to assist regulatory agencies develop, revise, or expand alternate water source water quality standards.</p> <p>504.10.2 Minimum Water Quality. On-site treated non-potable water supplied to toilets or urinals or for other uses in which it is sprayed or exposed shall be disinfected. Acceptable disinfection methods shall include chlorination, ultraviolet sterilization, ozone, or other methods as approved by the Authority Having Jurisdiction. The minimum water quality for on-site treated non-potable water systems shall meet the applicable water quality requirements for the intended applications as determined by the public health Authority Having Jurisdiction.</p> <p>505.9.4 Minimum Water Quality. The minimum water quality for harvested rainwater shall meet the applicable water quality requirements for the intended applications as determined by the public health Authority Having Jurisdiction. No treatment is required for rainwater</p>	Editorial revision deleting “public health” as a modifier to “Authority Having Jurisdiction” since it is inclusive in the definition of Authority Having Jurisdiction.	AS

		<p>used for subsurface or non-sprinkled surface irrigation where the maximum storage volume is less than 360 gallons (1363 L).</p> <p>B 101.7 Minimum Water Quality Requirements. The minimum water quality for all potable rainwater catchment systems shall meet the applicable water quality requirements as determined by the public health Authority Having Jurisdiction. In the absence of water quality requirements, the guidelines EPA/625/R-04/108 contains recommended water reuse guidelines to assist regulatory agencies develop, revise, or expand alternate water source water quality standards.</p> <p>B 104.2 Minimum Water Quality. The minimum water quality for harvested rainwater shall meet the applicable water quality requirements for the intended applications as determined by the public health Authority Having Jurisdiction, Health Department or other department having jurisdiction.</p>		
7	Alternate Water Sources TG	<p>Revise text as follows:</p> <p>Section 217.0</p> <p>On-Site Treated Non-Potable Water. Non-potable water, including gray water that has been collected, treated, and intended to be used on-site and is suitable for direct beneficial use. <u>Sources for on-site treated non-potable water include but are not limited to gray water; black water; rainwater; stormwater; reclaimed (recycled) water; swimming pool backwash; condensate; cooling tower blow-down water; foundation drainage; fluid cooler discharge water; food steamer discharge water; combination oven discharge water; industrial process water; fire pump test water and dry weather runoff.</u> The level of treatment and quality of the on-site treated non-potable water shall be approved by the public health Authority Having Jurisdiction.</p>	<p>Add to the definition a list of approved sources.</p> <p>Last clause in "On-Site Non-Potable Water" is struck out because IAPMO Manual of Style prohibits mandatory language in definitions.</p>	AM
8	Alternate Water Sources TG	<p>Add new text as follows:</p> <p>Section 221.0</p> <p>Stormwater. <u>Precipitation that has contacted a surface at grade or below grade and has not been put to beneficial use.</u></p> <p>Stormwater Harvesting. <u>The collection, storage and treatment of stormwater for beneficial use.</u></p>	<p>New definitions because of its inclusion as a source for On-Site Treated Non-Potable Water.</p>	AM
9	Sidney Cavanaugh, Cavanaugh Consulting	<p>Add new sections as follows:</p> <p>303.2 Rehabilitation of Piping Systems. <u>When pressure piping systems are rehabilitated using an epoxy linings system it shall meet ASTM F2831.</u> [renumber remaining sections]</p> <p>Add new Standard reference to Table 110.1.1 as follows:</p>	<p>Added a new section to include the approved standard for pipe rehabilitation.</p>	AS

ASTM F2831-11, Standard Practice for Internal Non Structural Epoxy Barrier Coating Material Used in Rehabilitation of Metallic Pressurized Piping Systems.

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GTC

Revise Appendix A: Delete in entirety and replace with **Appendix A - Reserved**

Revision section 402.0 as follows:

402.0 Water-Conserving Plumbing Fixtures and Fittings. – Revised –

402.1 General. ~~The installation and water consumption for plumbing fixtures and fixture fittings shall be in accordance with Section 402.1 through Section 402.8, applicable standards referenced in Table 1401.1, and the plumbing code.~~

The maximum water consumption of fixtures and fixture fittings shall comply with one of the following:

1. The maximum flow rates of fixtures and fixture fittings shall comply with the flow rates specified in Table 402.1 and Sections 402.2 through Section 402.8.
2. The aggregate consumption of all fixtures and fixture fittings shall be at least 20 percent reduction of the calculated total daily water use in accordance with Tables 402.1.3(1) and 402.1.3(2).

402.1.1 Water Savings Calculation.

402.1.2 Purpose. The purpose of this Section is to provide a means of estimating the water savings when installing plumbing fixtures and fixture fittings that use less water than the maximum required by Energy Policy Act of 1992 and 2005 and the plumbing code.

402.1.3 Calculation of Water Savings. Table 402.1.3(1) and Table 402.1.3(2) shall be used to establish the aggregate consumption of all fixtures and fittings. Table 402.1.3(1) shall be used to establish the baseline water use and Table 402.1.3(2) shall be used to calculate the required reduction according to Section 402.1.

TABLE 402.1
MAXIMUM FIXTURE AND FITTINGS FLOW RATES FOR REDUCED WATER USING FIXTURES

<u>FIXTURE TYPE</u>	<u>FLOW RATE</u>
Showerheads	2.0 gpm @ 80 psi ¹
Lavatory faucets residential	1.5 gpm @ 60 psi
Lavatory faucets other than residential	.5 gpm @ 60 psi
Metering faucets	0.25 gallons/cycle
Metering faucets for wash fountains	.25 [rim space (in.) / 20 gpm @ 60 psi]
Wash fountains	2.2 [rim space (in.) / 20 gpm @ 60 psi]
Gravity, Pressure Assisted and Electro-Hydraulic Tank Type Water Closets	1.28 gallons/flush ²
Flushometer-Valve Activated Water Closets	1.6 gallons/flush

Water savings calculation was moved into the body of the code with modification. A baseline calculation table is included with a water savings calculator to determine the minimum 20% reduction path of compliance.

AM

Urinals	.5 gallons/flush ³
Commercial Pre-Rinse Spray Valves	1.6 gpm @ 60 psi

¹For multiple showerheads serving one shower compartment see Section 402.5.2

²Shall also be listed to EPA WaterSense Tank-Type High Efficiency Toilet Specification.

³ Shall also be listed to EPA WaterSense Flushing Urinal Specification. Nonwater urinals shall meet the specifications listed in Section 402.3.1.

**TABLE 402.1.3(1)
WATER USE BASELINE⁵**

FIXTURE TYPE	MAXIMUM FLOW-RATE CONSUMPTION²	DURATION	ESTIMATED DAILY USES PER PERSON	OCCUPANTS^{3,4}	DAILY WATER USES (gallons)
Showerheads	2.5 gpm @ 80 psi	8 minutes	1		
Private or Private Use Lavatory Faucets	2.2 gpm @ 60 psi	0.25 minutes	4		
Residential Kitchen Faucets	2.2 gpm @ 60 psi	4 minutes	1		
Wash Fountains	2.2 gpm / 20 [rim space (inches) @ 60 psi]	=	=		
Lavatory Faucets in other than Residences, Apartments, and Private Bathrooms in Lodging Facilities (See Section 402.4.2)	0.5 gpm	0.25 minutes	4		
Metering Faucets	0.25 gallons /cycle	=	3		
Metering Faucets for Wash Fountains	0.25 gpm / 20 [rim space (inches) @ 60 psi]	=	=		
Water Closets	1.6 gallons per flush	1 flush	1 male ¹ 3 female		
Urinals	1.0 gallons per flush	1 flush	2 male		
Total Daily Volume					

Annual Work Days

Total Annual Usage

For SI units: 1 gallon per minute = 0.06 L/s, 1 gallon = 3.785 L

For SI units: 1 gallon per minute = 0.06 L/s, 1 pound-force per square inch = 6.89 kPa, 1 gallon = 3.785 L

Consumption = (Flow rate) x (Duration) x (Occupants) x (Daily uses)

1 The daily use number shall be increased to three if urinals are not installed in the room.

2 The maximum flow rate or consumption is from the Energy Policy Act (lavatories excepted).

3 For residential occupancies, the number of occupants shall be based on two persons for the first bedroom, and one additional person for each additional bedroom.

4 For non-residential occupancies, refer to the plumbing code, for occupant load factors.

5 When determining calculations, assume one use per person for metering or self-closing faucets.

**TABLE 402.1.3(2)
WATER SAVINGS CALCULATOR**

<u>FIXTURE TYPE</u>	<u>CONSUMPTION (gallons per minute or gallons per cycle)</u>	<u>DURATION (minutes)</u>	<u>DAILY USES</u>	<u>OCCUPANTS^{2,3}</u>	<u>DAILY WATER USES (gallons)</u>
<u>Showerheads</u>		<u>8 minutes</u>	<u>1</u>		
<u>Private or Private Use Lavatory Faucets</u>		<u>0.25 minutes</u>	<u>4</u>		
<u>Residential Kitchen Faucets</u>		<u>4 minutes</u>	<u>1</u>		
<u>Wash Fountains</u>		<u>=</u>	<u>=</u>		
<u>Lavatory Faucets in other than Residences, Apartments, and Private Bathrooms in Lodging Facilities (See Section 402.4.2)</u>		<u>0.25 minutes</u>	<u>4</u>		
<u>Metering Faucets</u>		<u>0.25 minutes</u>	<u>1 Cycle</u>		
<u>Metering Faucets for Wash Fountains</u>		<u>0.25 minutes</u>	<u>=</u>		

<u>Water Closets</u>		<u>1 flush</u>	<u>1 male¹</u> <u>3 female</u>		
<u>Urinals</u>		<u>1 flush</u>	<u>2 male</u>		
			<u>Total Daily Volume</u>		
			<u>Annual Work Days</u>		
			<u>Total Annual Usage</u>		
			<u>Annual Savings</u>		
			<u>% Reduction⁴</u>		

For SI units: 1 gallon per minute = 0.06 L/s, 1 gallon = 3.785 L

- 1 The daily use number shall be increased to three if urinals are not installed in the room.
- 2 For residential occupancies, the number of occupants shall be based on two persons for the first bedroom, and one additional person for each additional bedroom.
- 3 For non-residential occupancies, refer to the plumbing code, for occupant load factors.
- 4 To calculate % Reduction use: $[(TDV_B - TDV_S) / TDV_B] \times 100$ Where: $TDV_B =$ Baseline Total Daily Volume and $TDV_S =$ Water Savings Total Daily Volume

Notes and instructions for Table 402.1.3(2):

Table 402.1.3(1) is a calculator that can help estimate water savings in residential and nonresidential structures. The "Duration" of use and "Daily Uses" values that appear in the table are estimates only and based on previous studies. To obtain and use a working copy of this calculator, follow the download and use instructions below.

Instructions for download:

- 1. Go to the IAPMO web site at www.iapmogreen.org in order to download the water-savings calculator. The calculator is a Microsoft Office Excel file (1997 or later), your computer must be capable of running MS Excel.
- 2. Follow the instructions for downloading and running the file.

Instructions for use:

- 1. In the Baseline Case section, insert the number of total occupants, male occupants and female occupants that apply for the building in the "Occupants" column. Unless specific gender ratio values are provided, assume a 50/50 gender ratio.
- 2. Copy and paste these same values in the "Occupants" column of the Calculator section.
- 3. In the Calculator section only, insert the consumption values (flow rates in gpm or gallons per flush or per cycle) in the "Consumption" column.
- 4. Estimated water savings in terms of percent savings versus baseline values, gallons per day and gallons per year will be automatically calculated.

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GTC

Revised section as follows:

402.3.1 Nonwater Urinals. Nonwater urinals shall comply with ASME A112.19.3/CSA B45.4, ASME A112.19.19/CSA B45.4 or IAPMO Z124.9. Nonwater urinals shall be cleaned and maintained in accordance with the manufacturer's instructions after installation. Where nonwater urinals are installed they shall have a water distribution line roughed-in to the urinal location at a height not less than 56 inches (1422 mm) above finished floor to allow for the installation of an approved backflow prevention device in the event of a retrofit. Such water distribution lines shall be installed with shutoff valves located as close as possible to the distributing main to prevent the creation of dead ends. Where nonwater urinals are installed, not less than one water supplied fixture rated at not less than 1 ~~water supply~~ drainage fixture

A change was made to clarify that the water supply rough-in height is from finished floor.
A correction was made to indicate drainage fixture units instead of water supply fixture units.

AS

		unit (WSDFU) shall be installed upstream on the same drain line to facilitate drain line flow and rinsing.		
12	Plumbing Water Efficiency TG	Revise section as follows: 402.6 Commercial Pre-Rinse Spray Valves. The flow rate for a pre-rinse spray valve installed in a commercial kitchen to remove food waste from cookware and dishes prior to cleaning shall not be more than <u>1.63</u> gpm (0.408 L/s) at 60 psi (414 kPa). Where pre-rinse spray valves with maximum flow rates of <u>1.30</u> gpm (0.086 L/s) or less are installed, the static pressure shall be not less than 30 psi (207 kPa). Commercial kitchen pre-rinse spray valves shall be equipped with an integral automatic shutoff.	A revision was made to reduce the pre-rinse spray valves to a maximum flow rate of 1.3gpm at 60psi and to address flow rates of 1.0 gpm and less.	AS
13	GTC	Revised section as follows: 404.1 Maximum. <u>In low rise residential buildings</u> where static water pressure in the water supply piping is in excess of 65 psi (448 kPa) in single pressure zone systems, pressure regulators preceded by an adequate strainer shall be installed at points in the system to reduce the static pressure to 60 psi (414 kPa) or less.	A consensus was reached in applying this provision beyond low rise residential construction would create design difficulties and hardships for high rise and other multi-zone buildings. This is also consistent with the scope of the EPA WaterSense New Homes Specification.	AS
14	GTC	Add new section as follows: 404.2 Installation. <u>Pressure regulators shall be installed in accordance with the plumbing code.</u>	A new section added to direct pressure regulator installation requirements to the plumbing code.	AS
15	Dave Zabrowski, Fisher- Nickel, Inc.	Revise section as follows: 406.1.2 Food Steamers. Food <u>All</u> steamers shall <u>consume not use</u> more than <u>52.0</u> gallons per hour (gph) (7.6 L/h 19 liters) per compartment <u>hour per steamer pan in the full operational mode.</u> Add Food Steamers to Chapter 2 Definitions: 208.0 Food Steamers (Steam Cookers). A cooking appliance wherein heat is imparted to food in a closed compartment by direct contact with steam. The compartment can be at or above atmospheric pressure. The steam can be static or circulated.	The changes made are consistent with the size of the industry-standard 12x20x2.5-inch hotel pans that the appliance can accommodate at one time. A new definition for food steamers is added.	AM
16	Plumbing Water Efficiency TG	Revise section as follows: 406.1.3 Combination Ovens. Combination ovens shall not consume more than 40 <u>3.5</u> gph (38 13L/h) per pan in the full operational mode. Add combination ovens to Chapter 2 Definitions: 205.0	The changes made are consistent with the size of the industry-standard 12x20x2.5-inch hotel pans that the appliance can accommodate at one time. A new definition for combination ovens is added.	AS

		<p>Combination Ovens. A device that combines the function of hot air convection (oven mode) and saturated and superheated steam heating (steam mode), or both, to perform steaming, baking, roasting, rethermalizing, and proofing of various food products. In general, the term combination oven is used to describe this type of equipment, which is self contained. The combination oven is also referred to as a combination oven/steamer, combi or combo.</p>		
17	Plumbing Water Efficiency TG	<p>Revise section as follows:</p> <p>406.1.5 Dipper Well Faucets. Reserved. Where dipper wells are installed, the water supply to a dipper well shall have a shutoff valve and flow control. The flow of water into a dipper well shall be limited by at least one of the following methods:</p> <ol style="list-style-type: none"> 1. <u>Maximum continuous flow.</u> Water flow shall not exceed the water capacity of the dipper well in one minute at supply pressure of 60 psi (413.7 kPa) and the maximum flow shall not exceed 2.2 gpm (8.32 lpm) at a supply pressure of 60 psi (413.7 kPa). The water capacity of a dipper well shall be the maximum amount of water that the fixture can hold before water flows into the drain. 2. <u>Metered flow.</u> The volume of water dispensed into a dipper well in each activation cycle of a self closing fixture fitting shall not exceed the water capacity of the dipper well and the maximum flow shall not exceed 2.2 gpm (8.32 lpm) at a supply pressure of 60 psi (413.7 kPa). 	The reserved section for dipper wells was developed that was consistent with industry standards.	AS
18	Plumbing Water Efficiency TG	<p>Add new section as follows: [and renumber remaining sections accordingly]</p> <p>410.4 Evaporative Cooler Water Use: <u>Evaporative cooling systems (sometimes called swamp coolers) shall utilize use less than 3.5 gallons of water per ton-hour of cooling when system controls are set to maximum water use. Water use, expressed in maximum water use per ton-hour of cooling, shall be marked on the device and included in product user manuals, product information literature and installation instructions. Water use information shall be readily available at the time of code compliance inspection.</u></p> <p>410.4.1 Overflow Alarm. <u>Cooling system shall be equipped with an overflow alarm to alert building owners, tenants or maintenance personnel when water refill valve continues to allow water to flow into the reservoir when reservoir is already full. The alarm shall have a minimum sound pressure level rating of 85 dB measured at a distance of ten feet.</u></p> <p>410.4.2 Automatic Pump Shut-off. <u>Cooling system shall automatically cease pumping water to the evaporation pads when airflow across evaporation pads ceases.</u></p> <p>410.4.3 Cooler Reservoir Discharge. <u>A water quality management system (either timer or water quality sensor) is required. Where timers are used, the time interval between discharge of reservoir water shall be set to six hours or greater of cooler operation. Where water quality sensors are used, the discharge of reservoir water shall be set for greater 800 ppm or greater of TDS. Continuous discharge or continuous bleed systems are prohibited.</u></p> <p>410.4.4 Discharge Water Reuse. <u>Discharge water shall be reused where appropriate applications exist on site. Where a nonpotable water source system exists on site, evaporative cooler discharge water shall be collected and discharged to such collection system.</u></p> <p>Exception: Where the reservoir water will adversely affect the quality of the nonpotable</p>	New section for water efficiency provisions for evaporative cooling systems that tend to waste large quantities of water. Overflow alarms needed since faulty valves cause reservoirs to overflow undetected wasting large quantities of water. Provisions include discharge non-potable reuse.	AS

		<p>water supply making the nonpotable water unusable for its intended purposes.</p> <p>410.4.5 Discharge Water to Drain. Where discharge water is not required to be recovered for reuse, the sump overflow line shall not be directly connected to a drain. Where the discharge water is put into a sanitary drain, a minimum 6 inch air gap is required between the termination of the discharge line and the drain opening. The discharge line shall terminate in a location that is readily visible to the building owner, tenants or maintenance personnel.</p>		
19	Plumbing Water Efficiency TG	<p>Revise section as follows:</p> <p>412.0 Water-Powered Sump Pumps. Sump pumps powered by potable or reclaimed (recycled) water pressure are not permitted shall only be used as an emergency backup pump. The water-powered pump shall be equipped with a battery powered alarm having a minimum rating of 85 dBA at ten feet. Water-powered pumps shall have a water efficiency factor of pumping at least 2 gallons of water to a height of 8 feet for every gallon of water used to operate the pump, measured at a water pressure of 60 psi. Pumps shall be clearly labeled as to the gallons of water pumped per gallon of potable water consumed.</p>	Water-powered sump pumps were reconsidered by the committee and allowed under the new provisions.	AM
20	Plumbing Water Efficiency TG	<p>Add new section as follows:</p> <p>413.0 Trap Primers. Trap primers shall be electronic or pressure activated and shall use no more than thirty (30) gallons (114 L) per year per drain. Where an alternate water source, as defined by this code, is used for fixture flushing or other uses in the same room, the alternate water source shall be used for the trap primer water supply.</p> <p>Exception: Flushometer tailpiece trap primers complying with IAPMO PS 76 are exempted from the provisions of this section</p>	A new section was added to include water efficiency provisions for trap primers as well as alternative water sources.	AS
21	GTC	<p>Add new section as follows:</p> <p>414.0 Condensate Recovery. Condensate is permitted to be used as on-site treated non-potable water where collected, stored and treated in accordance with Section 504.0.</p>	A new provision added to allow the collection of condensate for reuse.	AM
22	Plumbing Water Efficiency TG	<p>Add new section as follows:</p> <p>415.0 Automated Vehicle Wash Facilities. The maximum make-up water use for automobile washing shall not exceed 40 gallons per vehicle for in-bay automatic car washes and 35 gallons for conveyor and express type car washes. Spray wands and foamy brushes shall use no more than 3.0 gallons per minute. Spot-free reverse osmosis discharge (reject) water shall be recycled. Towel ringers shall have a positive shut-off valve. Spray nozzles shall be replaced annually.</p> <p>Exemption: Bus and large commercial vehicles washes are exempt from the requirements in this section.</p>	A new section to include water efficiency provisions for automated vehicle wash facilities.	AS

23	Alternate Water Sources TG	<p>Revise section as follows:</p> <p>501.2 System Design. Alternate water source systems complying with this chapter shall be designed by a person registered or licensed to perform plumbing design work <u>or who demonstrates competency to design the alternate water source system as required by the Authority Having Jurisdiction.</u> Components, piping, and fittings used in any alternate water source system shall be listed.</p> <p>Revised language for B 101.2 to correspond with changes in 501.2</p> <p>B 101.2 System Design. Potable rainwater catchment systems complying with this appendix shall be designed by a person registered, <u>or licensed,</u> or deemed competent to perform plumbing design work or who demonstrates competency to design the potable rainwater catchment system as required by the Authority Having Jurisdiction to perform potable rainwater catchment system design work.</p>	Editorial revision to correspond with current language of competency in the Supplement while complying with the IAPMO Manual of Style.	AS
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24	Alternate Water Sources TG	<p>Revise section as follows:</p> <p>501.7 Minimum Water Quality Requirements. The minimum water quality for alternate water source systems shall meet the applicable water quality requirements for the intended application as determined by the public health Authority Having Jurisdiction. <u>Water quality for non-potable rainwater catchment systems shall comply with Section 505.9.4.</u> In the absence of water quality requirements for on-site treated non-potable water and reclaimed (recycled) water systems, the EPA/625/R-04/108 contains recommended water reuse guidelines to assist regulatory agencies develop, revise, or expand alternate water source water quality standards.</p> <p>Revise as follows:</p> <p>505.9.4 Minimum Water Quality. The minimum water quality for harvested rainwater shall meet the applicable water quality requirements for the intended applications as determined by the public Health Authority Having Jurisdiction. <u>In the absence of water quality requirements determined by the Authority Having Jurisdiction, the minimum treatment and water quality shall also comply with Table 505.9.4.</u> No treatment is required for rainwater used for subsurface or non-sprinkled surface irrigation where the maximum storage volume is less than 360 gallons (1363 L).</p> <p style="text-align: center;"><u>TABLE 505.9.4</u></p> <table border="1" data-bbox="346 1307 1344 1523"> <thead> <tr> <th data-bbox="346 1307 682 1364"><u>Application</u></th> <th data-bbox="682 1307 1102 1364"><u>Minimum Treatment</u></th> <th data-bbox="1102 1307 1344 1364"><u>Minimum Water Quality</u></th> </tr> </thead> <tbody> <tr> <td data-bbox="346 1364 682 1523">Car washing</td> <td data-bbox="682 1364 1102 1523"> <ul style="list-style-type: none"> • <u>Debris excluder or other approved means in compliance with Section 505.9.10.</u> • <u>100 Micron (100 µm) in compliance with Section</u> </td> <td data-bbox="1102 1364 1344 1523">N/A</td> </tr> </tbody> </table>	<u>Application</u>	<u>Minimum Treatment</u>	<u>Minimum Water Quality</u>	Car washing	<ul style="list-style-type: none"> • <u>Debris excluder or other approved means in compliance with Section 505.9.10.</u> • <u>100 Micron (100 µm) in compliance with Section</u> 	N/A	Water quality, testing and maintenance requirements for nonpotable rainwater systems were added.	AS
<u>Application</u>	<u>Minimum Treatment</u>	<u>Minimum Water Quality</u>								
Car washing	<ul style="list-style-type: none"> • <u>Debris excluder or other approved means in compliance with Section 505.9.10.</u> • <u>100 Micron (100 µm) in compliance with Section</u> 	N/A								

	<u>505.9.11 for drip irrigation.</u>	
<u>Subsurface and drip irrigation</u>	<ul style="list-style-type: none"> • <u>Debris excluder or other approved means in compliance with Section 505.9.10.</u> • <u>100 Micron (100 µm) in compliance with Section 505.9.11 for drip irrigation.</u> 	<u>N/A</u>
<u>Spray irrigation where the maximum storage volume is less than 360 gallons (1363 L)</u>	<ul style="list-style-type: none"> • <u>Debris excluder or other approved means in compliance with Section 505.9.10.</u> • <u>Disinfection in accordance with Section 505.9.8.</u> 	<u>N/A</u>
<u>Spray irrigation where the maximum storage volume is equal to or greater than 360 gallons (1363 L)</u>	<ul style="list-style-type: none"> • <u>Debris excluder or other approved means in compliance with Section 505.9.10.</u> 	<ul style="list-style-type: none"> • <u>Escherichia coli: < 100 CFU/100 mL</u> • <u>Turbidity: < 10 NTU</u>
<u>Urinal and water closet flushing, clothes washing, and trap priming</u>	<ul style="list-style-type: none"> • <u>Debris excluder or other approved means in compliance with Section 505.9.10.</u> • <u>100 Micron (100 µm) in compliance with Section 505.9.11.</u> 	<ul style="list-style-type: none"> • <u>Escherichia coli: < 100 CFU/100 mL</u> • <u>Turbidity: < 10 NTU</u>
<u>Ornamental fountains and other water features</u>	<ul style="list-style-type: none"> • <u>Debris excluder or other approved means in compliance with Section 505.9.10.</u> 	<ul style="list-style-type: none"> • <u>Escherichia coli: < 100 CFU/100 mL</u> • <u>Turbidity: < 10 NTU</u>
<u>Cooling tower make up water</u>	<ul style="list-style-type: none"> • <u>Debris excluder or other approved means in compliance with Section 505.9.10.</u> • <u>100 Micron (100 µm) in compliance with Section 505.9.11.</u> 	<ul style="list-style-type: none"> • <u>Escherichia coli: < 100 CFU/100 mL</u> • <u>Turbidity: < 10 NTU</u>

**Table 501.5
Minimum Alternate Water Source Testing, Inspection and Maintenance Frequency**

Description	Minimum Frequency
Test water quality of rainwater catchment systems required by Section 505.9.4 to maintain a	<ul style="list-style-type: none"> • <u>Every 3 12 months.</u> • <u>After system renovation or repair</u>

		minimum water quality.		
25	GTC	<p>Add new section as follows:</p> <p>501.12 Separation Requirements. All underground alternate water source service piping other than gray water shall be separated from the building sewer in accordance with the plumbing code. Treated non-potable 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 when both pipe materials are approved for use within a building. Where horizontal piping materials do not meet this requirement the minimum separation shall be increased to 60 inches (1524 mm). The potable water piping shall be installed at an elevation above the treated non-potable water piping.</p>	Separation requirements for underground alternate water source service piping added to the General section.	AS
26	GTC	<p>Add new section as follows:</p> <p>501.13 Abandonment. All alternate water source system that is no longer in use or fails to be maintained in accordance with Section 501.5 shall be abandoned. Abandonment shall comply with Section 305.0.</p>	Provisions for abandonment of system are added to the General section.	AS
27	GTC	<p>Revise section as follows:</p> <p>502.2.3 Diversion. The point of diversion of gray water to system shall connect to the sanitary drainage system shall occur downstream of fixture traps and vent connections through an approved gray water diverter valve. The gray water diverter shall be installed in an accessible location and clearly indicate the direction of flow.</p>	Editorial revision to clarify the point of connection.	AS
28	GTC	<p>Revise sections as follows:</p> <p>503.10 Signs. Rooms and water closet tanks in buildings using reclaimed (recycled) water shall be in accordance with Section 503.10.1 through Section 503.10.2. 501.10. 503.10.1 Commercial, Industrial, and Institutional Restroom Signs. 503.10.2 Equipment Room Signs.</p> <p>504.11 Signs. Signs in buildings using on-site treated nonpotable water shall be in accordance with Section 504.11.1 and Section 504.11.2. 501.10. 504.11.1 Commercial, Industrial, and Institutional Restroom Signs. 504.11.2 Equipment Room Signs.</p> <p>505.10 Signs. Signs in buildings using rainwater water shall be in accordance with Section 505.10.1 and Section 505.10.2. 501.10. 505.10.1 Commercial, Industrial, and Institutional Restroom Signs. 505.10.2 Equipment Room Signs.</p> <p>Add new sections as follows:</p>	Signage sections repeated three times with slight variations. Move to General and add pictographs.	AS

501.10 Commercial, Industrial, and Institutional Restroom Signs. A sign shall be installed in all restrooms in commercial, industrial, and institutional occupancies using reclaimed (recycled) water, on-site treated water, and non-potable rainwater for water closets, urinals, or both. Each sign shall contain 1/2 of an inch (12.7 mm) letters of a highly visible color on a contrasting background. The location of the sign(s) shall be such that the sign(s) shall be visible to all users. The location of the sign(s) shall be approved by the Authority Having Jurisdiction and shall contain the following text:

TO CONSERVE WATER, THIS BUILDING USES *-----* TO FLUSH TOILETS AND URINALS.

501.10.1 Equipment Room Signs. Each room containing reclaimed (recycled) water, on-site treated water, and non-potable rainwater equipment shall have a sign posted in a location that is visible to anyone working on or near non-potable water equipment with the following wording in 1 inch (25.4 mm) letters:

CAUTION: NON-POTABLE *-----*, DO NOT DRINK. DO NOT CONNECT TO DRINKING WATER SYSTEM. NOTICE: CONTACT BUILDING MANAGEMENT BEFORE PERFORMING ANY WORK ON THIS WATER SYSTEM.

** Shall indicate RECLAIMED (RECYCLED) WATER, ONSITE TREATED WATER, or RAINWATER accordingly.

29

GTC

Revise sections as follows:

503.11 Inspection and Testing. Reclaimed (recycled) water systems shall be inspected and tested in accordance with Section 503.11.1 through Section 503.11.2 501.11.

~~**503.11.1 Supply System Inspection and Test.**~~

~~**503.11.2 Annual Cross-Connection Inspection and Testing.**~~

~~**503.11.2.1 Visual System Inspection.**~~

~~**503.11.2.2 Cross-Connection Test.**~~

~~**503.11.2.3 Discovery of Cross-Connection.**~~

~~**503.11.2.4 Annual Inspection.**~~

504.12 Inspection and Testing. On-site treated nonpotable water systems shall be inspected and tested in accordance with Section 504.12.1 through Section 504.12.2 501.11.

~~**504.12.1 Supply System Inspection and Test.**~~

~~**504.12.2 Annual Cross-Connection Inspection and Testing.**~~

~~**504.12.2.1 Visual System Inspection.**~~

~~**504.12.2.2 Cross-Connection Test.**~~

~~**504.12.2.3 Discovery of Cross-Connection.**~~

~~**504.12.2.4 Annual Inspection.**~~

Inspection and Testing sections repeated 3 times with slight variations. Move to General section. The phrase "alternate water source" has been substituted for reclaimed water, on-site treated water and rainwater.

AS

505.11 Inspection and Testing. Rainwater catchment systems shall be inspected and tested in accordance with Section ~~505.11.1~~ through Section ~~505.11.2~~ 501.11.

~~505.11.1 Supply System Inspection and Test.~~

~~505.11.2 Annual Cross-Connection Inspection and Testing.~~

~~505.11.2.1 Visual System Inspection.~~

~~505.11.2.2 Cross-Connection Test.~~

~~505.11.2.3 Discovery of Cross-Connection.~~

~~505.11.2.4 Annual Inspection.~~

Add new sections as follows:

501.11 Inspection and Testing. Alternate water source systems shall be inspected and tested in accordance with Section 501.12.1 through Section 501.12.2.

501.11.1 Supply System Inspection and Test. Alternate water source systems shall be inspected and tested in accordance with the plumbing code for testing of potable water piping.

501.11.2 Annual Cross-Connection Inspection and Testing. An initial and subsequent annual inspection and test shall be performed on both the potable and alternate water source systems. The potable and alternate water source system shall be isolated from each other and independently inspected and tested to ensure there is no cross-connection in accordance with Section 501.12.2.1 through Section 501.12.2.4.

501.11.2.1 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 alternate water source and potable water lines shall be checked to verify that no modifications were made, and that no cross-connections are visible.

(2) Pumps and equipment, equipment room signs, and exposed piping in equipment room shall be checked.

(3) Valves shall be checked to ensure that valve lock seals are still in place and intact. Valve control door signs shall be checked to verify that no signs have been removed.

501.11.2.2 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 alternate water source system shall be shut down, depressurized, and drained.

(2) The potable water system shall remain pressurized for a minimum period of time specified by the Authority Having Jurisdiction while the alternate water source system is empty. The minimum period the alternate water source system is to remain depressurized shall be determined on a case-by-case basis, taking into account the size and complexity of the potable and the alternate water source distribution systems, but in no case shall that period be less than 1 hour.

(3) The drain on the alternate water source system shall be checked for flow during the test and all fixtures, potable and alternate water source, shall be tested and inspected for flow. Flow from any alternate water source system outlet indicates a cross-connection. No flow from a potable water outlet shall indicate that it is connected to the alternate water source

		<p>system.</p> <p><u>(4) The potable water system shall then be depressurized and drained.</u></p> <p><u>(5) The alternate water source system shall then be activated and pressurized.</u></p> <p><u>(6) The alternate water source system shall remain pressurized for a minimum period of time specified by the Authority Having Jurisdiction while the potable water system is empty. The minimum period the potable water system is to remain depressurized shall be determined on a case-by-case basis, but in no case shall that period be less than 1 hour.</u></p> <p><u>(7) All fixtures, potable and alternate water source, shall be tested and inspected for flow. Flow from any potable water system outlet indicates a cross-connection. No flow from an alternate water source outlet will indicate that it is connected to the potable water system.</u></p> <p><u>(8) The drain on the potable water system shall be checked for flow during the test and at the end of the test.</u></p> <p><u>(9) If there is no flow detected in any of the fixtures which would indicate a cross-connection, the potable water system shall be repressurized.</u></p> <p><u>501.11.2.3 Discovery of Cross-Connection.</u> In the event that a cross-connection is discovered, the following procedure, in the presence of the Authority Having Jurisdiction, shall be activated immediately:</p> <p><u>(1) The alternate water source piping to the building shall be shut down at the meter, and the alternate water source riser shall be drained.</u></p> <p><u>(2) Potable water piping to the building shall be shut down at the meter.</u></p> <p><u>(3) The cross-connection shall be uncovered and disconnected.</u></p> <p><u>(4) The building shall be retested following procedures listed in Section 501.12.2.1 and Section 501.12.2.2.</u></p> <p><u>(5) The potable water system shall be chlorinated with 50 parts-per-million (ppm) chlorine for 24 hours.</u></p> <p><u>(6) The potable water system shall be flushed after 24 hours, and a standard bacteriological test shall be performed. If test results are acceptable, the potable water system shall be permitted to be recharged.</u></p> <p><u>501.11.2.4 Annual Inspection.</u> An annual inspection of the alternate water source system, following the procedures listed in Section 501.12.2.1 shall be required. Annual cross-connection testing, following the procedures listed in Section 501.12.2.2 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.</p>		
30	GTC	<p>Revise section as follows:</p> <p>504.7 On-Site Treated Non-Potable Water Devices and Systems. Devices or equipment used to treat on-site treated non-potable 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 approved for the intended application. <u>Devices or equipment used to treat on-site treated non-potable water for use in water closet and urinal flushing, surface irrigation and similar applications shall be listed and labeled to IAPMO IGC 207-2009a or NSF 350-2011.</u></p> <p>Table 1101.1 Referenced Standards</p>	<p>Include standard references for On-Site treated non-potable water devices or equipment.</p>	AM

		Standard Number-Year	Standard Title	Referenced Section		
		<u>NSF 350-2011</u>	<u>On-Site Residential and Commercial Reuse Treatment Systems</u>	<u>Section 504.7</u>		
31	GTC	<p>Revise section as follows:</p> <p>505.6 Sizing. Rainwater catchment system distribution piping for indoor applications shall be sized as outlined in this supplement for sizing potable water piping. The design and size of rainwater drains, gutters, conductors, and leaders shall be in accordance with the plumbing code.</p> <p>Add new section as follows:</p> <p><u>501.14 Sizing. Unless otherwise provided for in this supplement, alternate water source piping shall be sized in accordance with the plumbing code for sizing potable water piping.</u></p> <p>Delete sections as follows:</p> <p>503.12 Sizing.</p> <p>504.13 Sizing.</p>			<p>Sizing sections repeated three times for each alternate water source with slight variations. Moved sizing requirements to General section.</p>	AS
32	GTC	<p>Revise section as follows:</p> <p>505.9.3 Collection Surfaces. Rainwater shall be collected from roof surfaces <u>or other manmade, aboveground collection surfaces.</u> Rainwater catchment system shall not collect rainwater from:</p> <ol style="list-style-type: none"> (1) Vehicular parking surfaces. (2) Surface water runoff. (3) Bodies of standing water. 			<p>Included surfaces other than roof surfaces to correspond with the Rainwater Catchment System definition.</p>	AS
33	Alternate Water Sources TG	<p>Revise sections as follows:</p> <p>505.9.5.4 Below Grade. Rainwater storage tanks installed below grade shall be structurally designed to withstand all anticipated earth or other loads. Holding tank covers shall be capable of supporting an earth load of not less than 300 pounds per square foot (lb/ft²) (1465 kg/m²) when the tank is designed for underground installation. Below grade rainwater tanks installed underground shall be provided with manholes. The manhole opening shall be <u>a minimum diameter of 20 inches and located not less than 4 inches (102 mm) above the surrounding grade.</u> The surrounding grade shall be sloped away from the manhole. Underground tanks shall be ballasted, anchored, or otherwise secured, to prevent the tank from floating out of the ground when empty. The combined weight of the tank and hold down system should meet or exceed the buoyancy force of the tank.</p>			<p>Minimum manhole dimension of sufficient size to allow safe access was added.</p>	AM

		<p>B104.4.1.2 Below Grade. Rainwater storage tanks installed below grade shall be structurally designed to withstand all anticipated earth or other loads. Holding tank covers shall be capable of supporting an earth load of not less than 300 pounds per square foot (lb/ft²) (1465 kg/m²) when the tank is designed for underground installation. Below grade rainwater tanks installed underground shall be provided with manholes. The manhole opening shall be <u>a minimum diameter of 20 inches and</u> located not less than 4 inches (102 mm) above the surrounding grade. The surrounding grade shall be sloped away from the manhole. Underground tanks shall be ballasted, anchored, or otherwise secured, to prevent the tank from floating out of the ground when empty. The combined weight of the tank and hold down system should meet or exceed the buoyancy force of the tank.</p>		
34	GTC	<p>Add new sections as follows:</p> <p><u>505.9.5.8 Storage Tank Venting.</u> Where venting by means of drainage or overflow piping is not provided or is considered insufficient, a vent shall be installed on each tank. The vent shall extend from the top of the tank and terminate a minimum of six inches (6") above grade and shall be a minimum of 1 ½" in diameter. The vent terminal shall be directed downward and covered with a 3/32 inch (2.4 mm) mesh screen to prevent the entry of vermin and insects.</p> <p><u>B104.4.6 Storage Tank Venting.</u> Where venting by means of drainage or overflow piping is not provided or is considered insufficient, a vent shall be installed on each tank. The vent shall extend from the top of the tank and terminate a minimum of six inches (6") above grade and shall be a minimum of 1 ½" in diameter. The vent terminal shall be directed downward and covered with a 3/32 inch (2.4 mm) mesh screen to prevent the entry of vermin and insects.</p>	Venting requirements were added for storage tanks.	AS
35	Hot Water TG	<p>Delete sections as follows:</p> <p>602.3 Recirculation Systems. 602.3.1 Pump Operation. 602.3.2 Demand Controlled. 602.3.3 System Balancing. 602.3.4 Flow Balancing Valves. 602.3.5 Air Elimination. 602.3.6 Gravity or Thermosyphon Systems. 603.4.4.1 Recirculation System Balancing. 603.4.4.2 Flow Balancing Valves. 603.4.4.3 Air Elimination 603.4.5.2 Temperature Maintenance Controls. 603.4.5.4 Circulating Pump Controls.</p> <p>Add sections as follows:</p> <p><u>601.3 Recirculation Systems.</u> <u>601.3.1 Pump Operation.</u></p>	<p>Recirculation system provisions for both residential and non-residential have been combined under General provisions.</p> <p>The sub-section on Demand Controlled has been replaced with a new sub-section entitled Recirculation Pump Controls</p>	AS

		<p>601.3.1.1 For Low-Rise Residential Buildings. Circulating hot water systems shall be arranged so that the circulating pump(s) can be turned off (automatically or manually) when the hot water system is not in operation. [ASHRAE 90.2:7.2]</p> <p>601.3.1.2 For Other than Low-Rise Residential Buildings. When used to maintain storage tank water temperature, recirculating pumps shall be equipped with controls limiting operation to a period from the start of the heating cycle to a maximum of 5 minutes after the end of the heating cycle. [ASHRAE 90.1:7.4.4.4]</p> <p>601.3.2 Recirculation Pump Controls. Pump controls shall include on-demand activation or time clocks combined with temperature sensing. Time clock controls for pumps shall not let the pump operate more than 15 minutes every hour. Temperature sensors shall stop circulation when the temperature set point is reached and shall be located on the circulation loop at or near the last fixture. The pump, pump controls and temperature sensors shall be accessible. Pump operation shall be limited to hours of operation only.</p> <p>601.3.3 Temperature Maintenance Controls. For other than low-rise residential buildings, systems designed to maintain usage temperatures in hot-water pipes, such as recirculating hot-water systems or heat trace, shall be equipped with automatic time switches or other controls that can be set to switch off the usage temperature maintenance system during extended periods when hot water is not required. [ASHRAE 90.1:7.4.4.2]</p> <p>601.3.4 System Balancing. Systems with multiple recirculation zones shall be balanced to uniformly distribute hot water, or they shall be operated with a pump for each zone.</p> <p>601.3.5 Flow Balancing Valves. Flow balancing valves shall be a factory preset automatic flow control valve, a flow regulating valve, or a balancing valve with memory stop.</p> <p>601.6.6 Air Elimination. Provision shall be made for the elimination of air from the return system.</p> <p>601.3.7 Gravity or Thermosyphon Systems. Gravity or thermosyphon systems are prohibited.</p> <p>602.3 Recirculation Systems. Recirculation systems shall meet the provisions in Section 601.3</p> <p>603.4.4.1 Recirculation Systems. Recirculation systems shall meet the provisions in Section 601.3</p>		
36	Hot Water TG	<p>Delete sections as follows:</p> <p>602.5 Insulation.</p> <p>603.4.3 Insulation.</p> <p>Add sections as follows:</p> <p>601.2 Insulation. Hot water supply and return piping shall be thermally insulated. The wall thickness of the insulation shall be equal to the nominal diameter of the pipe up to 2 inches (50 mm). The wall thickness shall be not less than 2 inches (51 mm) for nominal pipe diameters exceeding 2 inches (51 mm). The conductivity of the insulation [k-factor (Btu•in/(h•ft²•oF))], measured radially, shall be less than or equal to 0.28 [Btu•in/(h•ft²•oF)] [0.04 W/(m•k)]. Hot water piping to be insulated shall be installed such that insulation is continuous. Pipe insulation shall be installed to within ¼ of an inch (6.4 mm) of all</p>	Both Sections on insulation are identical and apply to both Residential and Non-residential and therefore are placed under General provision.	AS

		<p>appliances, appurtenances, fixtures, structural members, or a wall where the pipe passes through to connect to a fixture within 24 inches (610 mm). Building cavities shall be large enough to accommodate the combined diameter of the pipe plus the insulation, plus any other objects in the cavity that the piping must cross. Pipe supports shall be installed on the outside of the pipe insulation.</p> <p>Exceptions:</p> <p>(1) Where the hot water pipe is installed in a wall that is not of sufficient width to accommodate the pipe and insulation, the insulation thickness shall be permitted to have the maximum thickness that the wall can accommodate and not less than 1/2 of an inch (12.7 mm) thick.</p> <p>(2) Hot water supply piping exposed under sinks, lavatories, and similar fixtures.</p> <p>(3) Where hot water distribution piping is installed within attic, crawlspace, or wall insulation.</p> <p>(a) In attics and crawlspaces the insulation shall cover the pipe not less than 5 inches (140 mm) further away from the conditioned space.</p> <p>(b) In walls, the insulation must completely surround the pipe with not less than 1 inch (25.4 mm) of insulation.</p> <p>(c) If burial within the insulation will not completely or continuously surround the pipe, then these exceptions do not apply.</p> <p>602.5 Insulation. Insulation of hot water and return piping shall meet the provisions in Section 601.2.</p> <p>603.4.3 Insulation. Insulation of hot water and return piping shall meet the provisions in Section 601.2.</p>		
37	Hot Water TG	<p>Add section as follows:</p> <p>602.7.1 Hot Water System Submeters. Where a hot water supply from a circulation loop or electric heat trace line is equipped with a submeter, the hot water distribution system downstream of the submeter shall have either an end-of-line hot water circulation pump or shall be electrically heat traced. The maximum volume of water in the runoffs of the circulation loop or electric heat trace line downstream of the submeter shall not exceed 16 ounces (oz) (473 mL).</p> <p>If there is no circulation loop or electric heat traced line downstream of the submeter, the submeter shall be located within two (2) feet of the central hot water system; or the branch line to the submeter shall be circulated or heat traced to within two (2) feet of the submeter. The maximum volume from the submeter to each fixture shall not exceed 32 ounces (oz) (946 mL).</p>	Provisions for hot water submetering were added with the applicable maximum volume requirements.	AS
38	GTC	<p>Update Table 603.4.2 of GPMCS to 2010 Edition of ASHRAE 90.1.</p> <p>SEE ATTACHMENT 1</p>	The proposed changes to Chapter 6 of the GPMCS are based on ASHRAE 90.1-2010.	AS
39	Hot Water TG	<p>Add section as follows:</p> <p>606.0 Drain Water Heat Exchangers. Drain water heat exchangers shall comply with IAPMO PS-92. The heat exchanger shall be accessible.</p>	A new section added for drainage heat recovery devices with the appropriate compliance standard.	AS

40	GTC	Update Chapter 7 of GPMCS to 2010 Edition of ASHRAE 90.1. SEE ATTACHMENT 1	The proposed changes to Chapter 7 of the GPMCS are based on ASHRAE 90.1-2010.	AS																										
41	Pat McLaughlin, McLaughlin & Associates	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="4" style="text-align: center;">TABLE 702.9 MINIMUM REQUIREMENTS FOR NON-FEDERALLY COVERED HVAC EQUIPMENT [ASHRAE 90.2: TABLE 6.9]</th> </tr> <tr> <th style="text-align: center;">EQUIPMENT TYPE</th> <th style="text-align: center;">SUBCATEGORY OR RATING CONDITION</th> <th style="text-align: center;">MINIMUM EFFICIENCY</th> <th style="text-align: center;">TEST PROCEDURE</th> </tr> </thead> <tbody> <tr> <td rowspan="4" style="text-align: center; vertical-align: middle;">Groundwater source* heat pump</td> <td rowspan="2" style="text-align: center; vertical-align: middle;">Cooling Mode</td> <td>11.0 EER @ 70°F Ent. Water</td> <td rowspan="2" style="text-align: center; vertical-align: middle;">ARI 325 <u>ISO 13256-1</u></td> </tr> <tr> <td>11.5 EER @ 50°F Ent. Water</td> </tr> <tr> <td rowspan="2" style="text-align: center; vertical-align: middle;">Heating Mode</td> <td>3.4 COP @ 70°F Ent. Water</td> <td rowspan="2" style="text-align: center; vertical-align: middle;">ARI 325 <u>ISO 13256-1</u></td> </tr> <tr> <td>3.0 COP @ 50°F Ent. Water</td> </tr> <tr> <td rowspan="4" style="text-align: center; vertical-align: middle;">Unitary A/C</td> <td rowspan="2" style="text-align: center; vertical-align: middle;">Water cooled split system</td> <td>9.3 EER @ 85°F Ent. Water</td> <td rowspan="2" style="text-align: center; vertical-align: middle;">ARI 210/240</td> </tr> <tr> <td>8.3 IPLV @ 75°F Ent. Water</td> </tr> <tr> <td rowspan="2" style="text-align: center; vertical-align: middle;">Evaporatively cooled split system</td> <td>9.3 EER @ 95°F Out. Amb.</td> <td rowspan="2" style="text-align: center; vertical-align: middle;">ARI 210/240</td> </tr> <tr> <td>8.5 IPLV @ 80°F Out. Amb.</td> </tr> </tbody> </table>	TABLE 702.9 MINIMUM REQUIREMENTS FOR NON-FEDERALLY COVERED HVAC EQUIPMENT [ASHRAE 90.2: TABLE 6.9]				EQUIPMENT TYPE	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE	Groundwater source* heat pump	Cooling Mode	11.0 EER @ 70°F Ent. Water	ARI 325 <u>ISO 13256-1</u>	11.5 EER @ 50°F Ent. Water	Heating Mode	3.4 COP @ 70°F Ent. Water	ARI 325 <u>ISO 13256-1</u>	3.0 COP @ 50°F Ent. Water	Unitary A/C	Water cooled split system	9.3 EER @ 85°F Ent. Water	ARI 210/240	8.3 IPLV @ 75°F Ent. Water	Evaporatively cooled split system	9.3 EER @ 95°F Out. Amb.	ARI 210/240	8.5 IPLV @ 80°F Out. Amb.	Water cooled and evaporatively cooled air conditioners are federally regulated. The test procedure for ground water source heat pumps is ISO 13256-1 and not ARI 325, which has been discontinued.	AS
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42	Erik Emblem, Joint Committee on Energy and Environmental Policy	Revise sections as follows: 703.4.4.2.2.1 Duct Leakage Tests for Systems with Less than 3 inches Water Column. Reserved. <u>Ductwork that is designed to operate at static pressures less than 3 inches Water Column (0.75 kPa) located outdoors and within unconditioned space shall be leak-tested according to the testing procedures contained in SMACNA HVAC Air Duct Leakage Test Manual or Associated Air Balance Council Procedural Standards Chapter 5 Leakage Testing. Positive pressure leakage testing is acceptable for negative pressure ductwork.</u>	Reserved section for duct leakage testing less than 3 inches water column was developed indicating the appropriate procedures.	AM																										
43	HVACR TG	Add new section as follows: <u>703.5.8.3 Grease Removal Devices. Reserved.</u>	A new section reserved for grease removal devices for kitchen exhaust hoods.	AS																										

44	HVACR TG	<p>Revise section as follows:</p> <p>805.2 Bathroom Exhaust Fans. Except when a whole house ventilation <u>energy recovery</u> system is used, a mechanical exhaust fan vented to the outdoors shall be provided in each room containing a bathtub, shower, or tub/shower combination. The ventilation rate shall be not less than 50 ft³/min (23.6 L/s) for intermittent operation and 20 ft³/min (9.4 L/s) for continuous operation. <u>Fans shall be in accordance with the ENERGY STAR program</u></p>	Energy Star compliance was added to the provisions for fans.	AM																																							
45	HVACR TG	<p>Add new section as follows:</p> <p>807.2 Heating and Air-Conditioning System Design. Heating and air-conditioning systems shall be sized, designed and have their equipment selected using the following methods:</p> <ol style="list-style-type: none"> 1. <u>The heat loss and heat gain is established according to ANSI/ACCA 2 Manual J – 2004 (Residential Load Calculation), ASHRAE handbooks or other equivalent methods.</u> 2. <u>Duct systems are sized according to ANSI/ACCA 1 Manual D – 2009 (Residential Duct Systems), ASHRAE handbooks or other equivalent methods.</u> 3. <u>Select heating and cooling equipment according to ANSI/ACCA 3 Manual S – 2004 (Residential Equipment Selection) or other equivalent methods.</u> 	A new section to include provisions of design methods for heating and air-conditioning.	AS																																							
46	GTC	<p>Revise section as follows:</p> <p>TABLE 1101.1</p> <table border="1" data-bbox="296 768 1360 1513"> <thead> <tr> <th data-bbox="296 768 573 816">STANDARD NUMBER-YEAR</th> <th data-bbox="583 768 1087 816">STANDARD TITLE</th> <th data-bbox="1098 768 1360 816">REFERENCED SECTION</th> </tr> </thead> <tbody> <tr> <td data-bbox="296 824 573 873">ACCA Manual D, 7th Edition-2009</td> <td data-bbox="583 824 1087 873">Residential Duct Systems</td> <td data-bbox="1098 824 1360 873">702.4.4</td> </tr> <tr> <td data-bbox="296 881 573 930">ACCA Manual J, 7 8th Edition</td> <td data-bbox="583 881 1087 930">Residential Load Calculation</td> <td data-bbox="1098 881 1360 930">Table 702.6.1</td> </tr> <tr> <td data-bbox="296 938 573 987">ANSI/AHAM RAC-1-87-2003</td> <td data-bbox="583 938 1087 987">Room Air Conditioners</td> <td data-bbox="1098 938 1360 987">Table 703.8.1(4)</td> </tr> <tr> <td data-bbox="296 995 573 1044">ARCSEA/ASPE</td> <td data-bbox="583 995 1087 1044">Rainwater Catchment Design and Installation Standard</td> <td data-bbox="1098 995 1360 1044">505.1</td> </tr> <tr> <td data-bbox="296 1052 573 1101">ARI ANSI/AHRI 210/240-2006</td> <td data-bbox="583 1052 1087 1101">Performance Rating of Unitary Air Conditioning and Air-Source Heat Pump Equipment</td> <td data-bbox="1098 1052 1360 1101">Table 703.8.1(1), Table 703.8.1(2), Table 702.9</td> </tr> <tr> <td data-bbox="296 1109 573 1157">ARI ANSI/AHRI 310/380-2004 (CSA-C744- 04)</td> <td data-bbox="583 1109 1087 1157">Standard for Packaged Terminal Air Conditioners and Heat Pumps</td> <td data-bbox="1098 1109 1360 1157">Table 703.8.1(4)</td> </tr> <tr> <td data-bbox="296 1166 573 1214">ARI (AHRI) 325-1998</td> <td data-bbox="583 1166 1087 1214">Grand Ground Water-Source Heat Pumps</td> <td data-bbox="1098 1166 1360 1214">Table 702.9</td> </tr> <tr> <td data-bbox="296 1222 573 1271">ARI (ANSI/AHRI) 340/360-2007 with Addendum 1</td> <td data-bbox="583 1222 1087 1271">Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment</td> <td data-bbox="1098 1222 1360 1271">Table 703.8.1(1), Table 703.8.1(2)</td> </tr> <tr> <td data-bbox="296 1279 573 1328">ARI (ANSI/AHRI) 365 (L-P)-2009</td> <td data-bbox="583 1279 1087 1328">Commercial and Industrial Unitary Air-Conditioning Condensing Units</td> <td data-bbox="1098 1279 1360 1328">Table 703.8.1(1)</td> </tr> <tr> <td data-bbox="296 1336 573 1385">ARI (ANSI/AHRI) 390-2003</td> <td data-bbox="583 1336 1087 1385">Performance Rating of Single Package Vertical Air-Conditioners and Heat Pumps</td> <td data-bbox="1098 1336 1360 1385">Table 703.8.1(4)</td> </tr> <tr> <td data-bbox="296 1393 573 1442">ARI (ANSI/AHRI) 400-2001 with Addendum 2</td> <td data-bbox="583 1393 1087 1442">Liquid to Liquid Heat Exchangers with addendum 2</td> <td data-bbox="1098 1393 1360 1442">Table 703.8.1(8)</td> </tr> <tr> <td data-bbox="296 1450 573 1498">ARI (ANSI/AHRI) 460-2000 2005</td> <td data-bbox="583 1450 1087 1498">Remote Mechanical Draft Air Cooled Refrigerant Condensers</td> <td data-bbox="1098 1450 1360 1498">Table 703.8.1(7)</td> </tr> </tbody> </table>	STANDARD NUMBER-YEAR	STANDARD TITLE	REFERENCED SECTION	ACCA Manual D, 7th Edition-2009	Residential Duct Systems	702.4.4	ACCA Manual J, 7 8th Edition	Residential Load Calculation	Table 702.6.1	ANSI/AHAM RAC-1- 87-2003	Room Air Conditioners	Table 703.8.1(4)	ARCSEA/ASPE	Rainwater Catchment Design and Installation Standard	505.1	ARI ANSI/AHRI 210/240-2006	Performance Rating of Unitary Air Conditioning and Air-Source Heat Pump Equipment	Table 703.8.1(1), Table 703.8.1(2), Table 702.9	ARI ANSI/AHRI 310/380-2004 (CSA-C744- 04)	Standard for Packaged Terminal Air Conditioners and Heat Pumps	Table 703.8.1(4)	ARI (AHRI) 325-1998	Grand Ground Water-Source Heat Pumps	Table 702.9	ARI (ANSI/AHRI) 340/360-2007 with Addendum 1	Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment	Table 703.8.1(1), Table 703.8.1(2)	ARI (ANSI/AHRI) 365 (L-P)-2009	Commercial and Industrial Unitary Air-Conditioning Condensing Units	Table 703.8.1(1)	ARI (ANSI/AHRI) 390-2003	Performance Rating of Single Package Vertical Air-Conditioners and Heat Pumps	Table 703.8.1(4)	ARI (ANSI/AHRI) 400-2001 with Addendum 2	Liquid to Liquid Heat Exchangers with addendum 2	Table 703.8.1(8)	ARI (ANSI/AHRI) 460-2000 2005	Remote Mechanical Draft Air Cooled Refrigerant Condensers	Table 703.8.1(7)	Maintenance to update the standards listed in Chapter 11.	AS
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ARI (AHRI) 550/590-2003	Performance Rating of Water Chilling Packages Using the Vapor Compression Cycle	704.3.1.2, Table 703.8.1(3)
ARI (ANSI/AHRI) 560-2000	Absorption Water Chilling and Water Heating Packages	Table 703.8.1(3)
ARI (AHRI) 1160 (I-P) - 2008	Performance Rating of Heat Pump Pool Heaters	Table 603.4.2
ASHRAE 52.1-1992 WITHDRAWN	Gravimetric and Dust Spot Procedures for Testing Air Cleaning Devices Used in General Ventilation for Removing Particulate Matter	803.1.1
ANSI/ASHRAE 52.2-2007	Method of Testing General Ventilation Air Cleaning Devices for Removal Efficiency by Particle Size	Chapter 2, 803.1.1
ANSI/ASHRAE 55-2004 2010	Thermal Environmental Conditions for Human Occupancy	807.1
ANSI/ASHRAE 62.1-2007 2010	Ventilation for Acceptable Indoor Air Quality	703.5.1, 703.5.2.1, 703.5.2.3
ANSI/ASHRAE 62.2-2007 2010	Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings	805.1.3
ANSI/ASHRAE 90.1-2007 (2008 Supplement) 2010 (I-P)	Energy Standard for Buildings Except Low-Rise Residential Buildings (Includes Addenda a, b, c, g, h, i, j, k, l, m, n, p, q, s, t, u, w, y, ad, and aw)	Chapter 6, Chapter 7
ANSI/ASHRAE 90.2-2007	Energy Efficient Design of Low-Rise Residential Buildings	Chapter 6, Chapter 7
ASHRAE 136-1993 (R2006)	A Method of Determining Air Change Rates in Detached Dwellings	805.1.3.1.3
ANSI/ASHRAE 146-2006 2011	Method of Testing and Rating Pool Heaters	Table 603.4.2
ASHRAE GRP-158-1979	Cooling and Heating Load Calculation Manual	Table 702.6.1
ASHRAE/ACCA 183-2007 (R2011)	Peak Cooling and Heating Load Calculations in Buildings Except Low Rise Residential Buildings	703.4.2
ASME A112.18.1/CSA B125.1-2005	Plumbing Supply Fittings	402.4.1, 402.4.2.1, 402.5
ASME A112.19.2/CSA B45.1-2008	Ceramic Plumbing Fixtures	402.2.1, 402.2.2, 402.3
ASME A112.19.3/CSA B45.4-2007	Stainless Steel Plumbing Fixtures	402.3.1
ASME A112.19.14-2006	Six-Liter Water Closets Equipped With a Dual Flushing Device	402.2.1
ASME A112.19.19-2006	Vitreous China Nonwater Urinals	402.3.1
ASSE 1016-2005	Automatic Compensating Valves for Individual Showers and Tub/Shower Combinations	402.5.4
ASTM C518-2004 2010	Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus	Table 703.8.2(1), Table 703.8.2(2)
ASTM D2683-2004 2010	Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing	705.1.2
ASTM D3035-2008 2010	Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter	705.1.2

<u>ASTM D3261-2003</u> <u>2010a</u>	Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing	705.1.2
<u>ASTM D3350-2008</u> <u>2010a</u>	Standard Specification for Polyethylene Plastics Pipe and Fittings Materials	705.1.2
<u>ASTM E96/E96M-2005</u> <u>2010</u>	Standard Test Methods for Water Vapor Transmission of Materials	702.4.1
<u>ASTM F1055-2006-2011</u>	Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene and Crosslinked Polyethylene (PEX) Pipe and Tubing	705.1.2
<u>CAN/CSA C448-2002</u> <u>(R2007)</u>	Design and Installation of Earth Energy Systems	705.1.1
CFR 10, 430, App N	DOE Uniform Test Method for Measuring the Energy Consumption of Furnaces	Table 603.4.2, Table 703.8.1(5), Table 703.8.1(6)
CFR 10, 431	DOE Energy Efficiency Program for Certain Commercial and Industrial Equipment	Table 703.8.1(6)
<u>CAN/CSA B137.4-2005</u> <u>9</u>	Thermoplastic Pressure Piping Compendium; Polyethylene (PE) pipe	705.1.2
<u>CSA ANSI Z21.10.3/CSA</u> <u>4.3-2004-2011</u>	Gas Water Heaters, Volume III, Storage Water Heaters With Input Ratings Above 75 000 BTU per Hour, circulating and Instantaneous	Table 603.4.2
<u>CSA ANSI Z21.47b/CSA</u> <u>2.3b -2007</u> <u>8 /CSA-2.3A-</u> <u>2007</u>	Gas-Fired Central Furnaces	Table 703.8.1(5)
<u>CSA/AM CSA ANSI</u> <u>Z83.8/CSA 2.6 2006</u> <u>9</u>	Gas Unit Heaters, Gas Packaged Heaters, Gas Utility Heaters and Gas-Fired Duct Furnaces	Table 703.8.1(5)
CTI ATC-105-2000	Acceptance Test Code for Water Cooling Towers	Table 703.8.1(7)
CTI ATC-105S-2004	Acceptance Test Code for Closed Circuit Cooling Towers	Table 703.8.1(7)
CTI STD-201- 2004 <u>2011</u>	Standard for Certification of Water Cooling Tower Thermal Performance	Table 703.8.1(7)
EPA/625/R-04/108, <u>2004</u>	Guidelines for Water Reuse	501.7
EPA WaterSense	High-Efficiency Lavatory Faucet Specification, Version 1.0, October 1, 2007	402.4.1
EPA WaterSense	Tank-Type High-Efficiency Toilet Specification, Version 1.01, January 24, 2007 May 20, 2011	402.2.1
<u>IAPMO IGC 207-2006</u> <u>b</u> <u>2009a/CSA B128 - 2006</u>	Reclaimed Water Conservation System for Flushing Toilets	504.0, Appendix B
<u>IAPMO IGC 250-2007</u>	Diverter Valve for Rainwater Tank	505.0, Appendix B
<u>IAPMO PS 76</u>	<u>Ballcock or Flushometer Valve Tailpiece Trap Primers and Trap Primer Receptors / Adaptors</u>	<u>413.0</u>
IAPMO UMC 2009*	Uniform Mechanical Code	101.6.3
IAPMO UPC 2009*	Uniform Plumbing Code	103.6.4
IAPMO USEC 2009*	Uniform Solar Energy Code	604.1
<u>IAPMO Z124.9-2004</u>	Plastic Urinal Fixtures	402.3, 402.3.1
ISO 13256-1-1998	Water-source Heat Pumps - Testing and Rating for Performance – Part 1: Water-to-Air and Brine-to-Air Heat Pumps	Table 703.8.1(2)
<u>NFPA 31-2006</u> <u>2011</u>	Standard for the Installation of Oil Burning Equipment	702.6.2

NFPA 54-2009*(2012)	National Fuel Gas Code	702.6.2
NFPA 211-2006/2010	Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances	702.6.2
NSF/ANSI 44-2007	Residential Cation Exchange Water Softeners	405.1
NSF/ANSI 53-2007a 2010	Drinking Water Treatment Units – Health Effects	B104.2.1
NSF P151, 1995	Protocol for Health Effects from Rainwater Catchment System Components	B103.1
SCAQMD METHOD 316A-1992 (revised 1996)	Determination of Volatile Organic Compounds (VOC) in materials Used for Pipes and Fittings	808.1
SMACNA-1985	HVAC Air Duct Leakage Test Manual	702.4.3.1, 703.4.4.2.2
SMACNA-1994	HVAC Systems Commissioning Manual	703.7.3.4.1
SMACNA-2005	HVAC Duct Construction Standards, Metal and Flexible	703.4.4, 703.4.4.2.1
SMACNA-2007	IAQ Guidelines for Occupied Buildings under Construction	803.1.1
UL 181A-1994 2005(R2005)	Closure Systems for Use with Rigid Air Ducts and Air Connectors	Table 703.4.4.2(2)
UL 181B-1995 2005(R2006)	Closure Systems for Use with Flexible Air Ducts and Air Connectors	Table 703.4.4.2(2)
UL 727-2006	Oil Fired Central Furnaces	Table 703.8.1(5)
UL 731-1995	Standard for Safety Oil-Fired Unit Heaters	Table 703.8.1(5)

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GTC

Revise table as follows:

Table B 101.5.1

Description	Minimum Frequency
Perform applicable water quality tests to verify compliance with Section B104.2.	3-months

Revise sections as follows:

B 104.2 Minimum Water Quality. ~~The minimum water quality for harvested rainwater shall meet the applicable water quality requirements for the intended applications~~ Upon initial system startup, the quality of the water for the intended applications shall be verified at the point(s) of use, as determined by the public health Authority Having Jurisdiction, Health Department or other department having jurisdiction. In the absence of water quality requirements determined by the Authority Having Jurisdiction, the minimum water quality shall comply with the following limits:

- 1) Escherichia coli (fecal coliform): 99.9% reduction
- 2) Protozoan Cysts: 99.99% reduction
- 3) Viruses: 99.99% reduction
- 4) Turbidity: <0.3 NTU

Minimum water quality standards for potable water and frequency of testing is added. Disinfection devices expanded to include a requirement to be listed or certified to perform the required microbiological reduction.

AM

		<p><u>Normal system maintenance will require system testing every 3 months. System shall comply with the following standards</u></p> <ol style="list-style-type: none"> 1) <u>Escherichia coli (fecal coliform):</u> 99.9% reduction 2) <u>Turbidity:</u> <0.3 NTU <ol style="list-style-type: none"> a. <u>Upon failure of the fecal coliform test, system shall be re-commissioned involving cleaning, and retesting in accordance with section B104.2</u> b. <u>One sample shall be analyzed for applications serving up to 1,000 persons. When the treated water shall serve 1,000-2,500 persons two (2) samples shall be analyzed and for 2,501-3,300 persons three (3) samples shall be analyzed.</u> <p>B 104.2.2 Disinfection Devices. Chlorination, ozone, and ultraviolet or other disinfection methods <u>approved by an Authority Having Jurisdiction, or the product is listed and certified according to a microbiological reduction performance standard for drinking water shall be used to treat harvested rainwater to meet the required water quality permitted.</u> The disinfection devices and systems shall be installed in accordance with the manufacturer's installation instructions and the conditions of listing. Disinfection devices and systems shall be located downstream of the water storage tank.</p>		
48	GTC	<p>Revise section as follows:</p> <p>B 103.3 Storage Tanks. Rainwater storage shall be constructed of solid, durable materials not subject to excessive corrosion or decay and shall be watertight. Storage tanks shall be approved by the Authority Having Jurisdiction for potable water applications, provided such tanks comply with approved applicable standards. Rainwater storage tanks shall be in accordance with Section B104.4.1.</p>	Editorial revision to move storage tank construction under the section on Rainwater Storage Tanks.	AS
49	GTC	<p>Add new section as follows:</p> <p><u>B 104.4.1 Construction. Rainwater storage tanks shall be constructed of solid, durable materials not subject to excessive corrosion or decay and shall be watertight. Storage tanks shall be approved by the Authority Having Jurisdiction for potable water applications, provided such tanks comply with approved applicable standards.</u></p>	New section as a result of the editorial revision to move storage tank construction under the section on Rainwater Storage Tanks.	AS