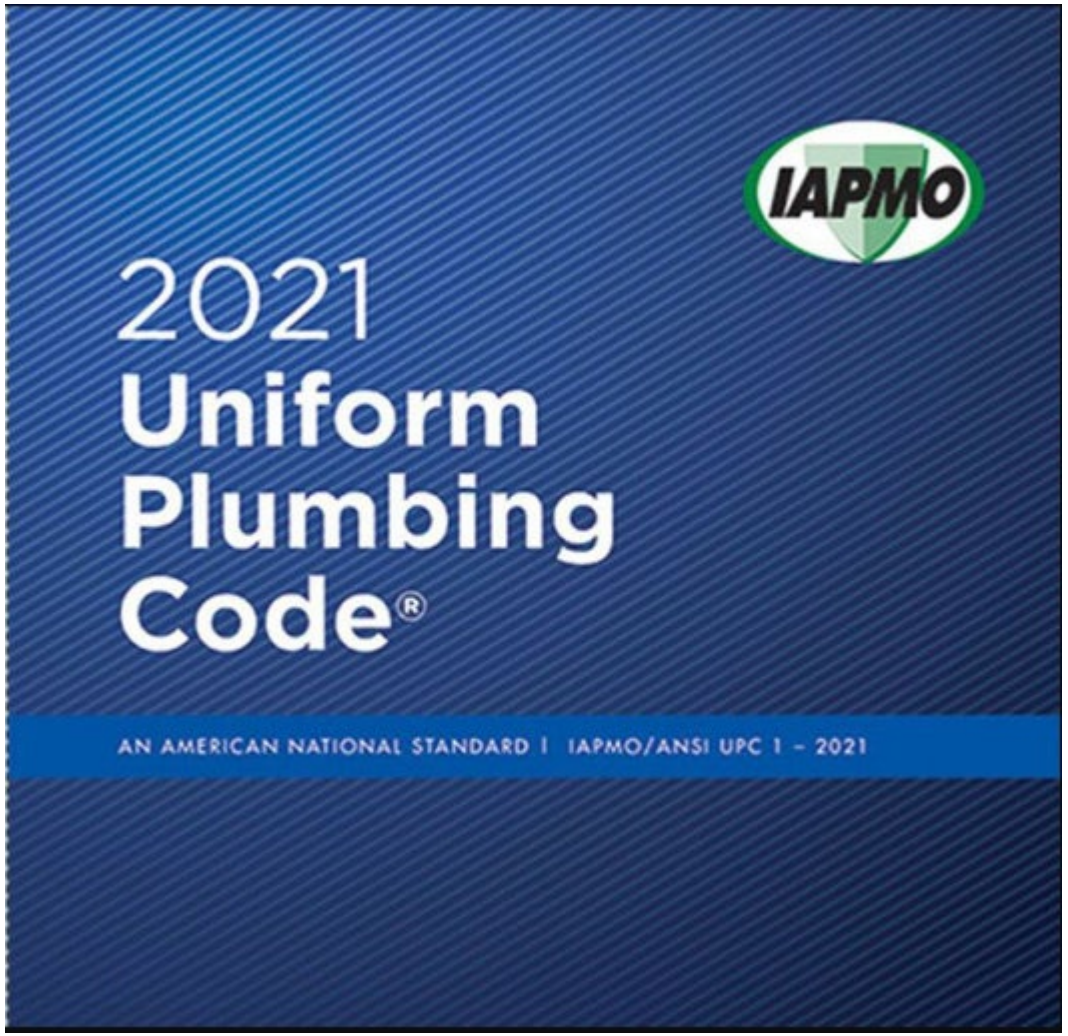
HOUSTON
PUBLIC WORKS

HOUSTON CONSTRUCTION CODE MODERNIZATION

SIGNIFICANT CODE CHANGES & HIGHLIGHTS OF THE 2015 TO 2018 AND 2018 TO 2021 UNIFORM PLUMBING CODE (UPC)



2021 UNIFORM PLUMBING CODE

Significant changes from 2015 to 2018 and 2018 to 2021 base code Uniform Plumbing Code

SUMMARY OF 2021 CHANGES

Additions

- Section 205.0
- Section 206.0
- Section 207.0
- Section 218.0
- Section 309.0
- Section 417.6
- Section 606.8
- Section 1312.0
- Section 1315.0
- Section 1321.6
- Section 1322.1.4

Modifications/Removals

- Section 209.0
- Section 210.0
- Section 214.0
- Section 215.0
- Section 407.3
- Section 408.3
- Section 416.2
- Section 501.1
- Section 508.2
- Section 603.0
- Section 608.2
- Section 611.0
- Section 703.2
- Section 715.3
- Section 814.0
- Section 911.0
- Section 1101.4
- Section 1208.6
- Section 1208.8
- Section 1213.5
- Section 1213.6
- Section 1303.0
- Section 1307.0
- Section 1309.0
- Section 1310.0
- Section 1314.0

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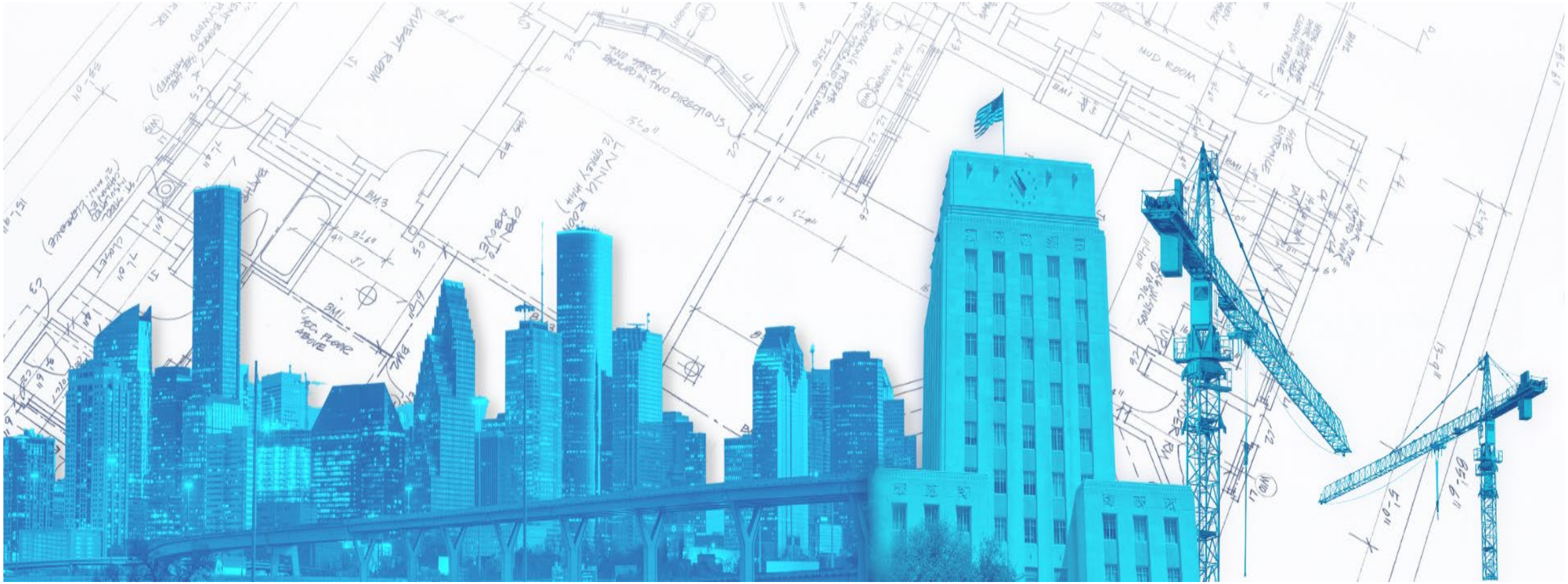
UPC CHAPTER 2 DEFINITIONS



BOTTLE FILLING STATION (WATER DISPENSER): 204.0 – B – [2021 HOUSTON AMENDMENT]

- Revised Definition:

Bottle Filling Station (Water Dispenser): 204.0 – B –

- A plumbing fixture that is connected to the potable water distribution system and the drainage system of the premises and that is manually controlled by the user for the purpose of dispensing potable drinking water into a personal drinking receptacle. ~~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.~~

CIRCUIT VENT: 205.0 – C – (2021 EDITION)

- New Definition:

  Circuit Vent: 205.0 – C –
  - The vent that connects to a horizontal drainage branch and vents two traps to a maximum of eight traps connected into a battery of fixtures.

CRITICAL CARE AREA TO COMMERCIAL MODULAR SYSTEM: 205.0 – C – (2021 EDITION)

- Replacement of Critical Care Area definition with Commercial Modular System definition

- 2018 Section 205.0 – C – :
  - ~~Critical Care Area. A room or space in which failure of equipment or a system is likely to cause major injury or death to patients or caregivers (Category 1). [NFPA 99:3.3.28]~~

- 2021 Section 205.0 – C – :
  - <u>Commercial Modular System. A drinking water treatment unit system consisting of multiple components attached to a manifold, produced specifically for food service applications, and not intended for use in residential applications.</u>

DRINKING FOUNTAIN: 206.0 – D – [2021 HOUSTON AMENDMENT]

- Revised Definition:

Drinking Fountain: 206.0 – D –

- A plumbing fixture that is connected to the potable water distribution system and the drainage system of the premises and that allows the user to obtain a drink directly from a stream of flowing water without the use of any accessories. ~~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 for chilling the drinking water.~~

DEAD LEGS, EXPANSION TANK: 206.0 – D –, 207.0 – E – (2021 EDITION)

- New Definitions:

  Dead Legs: 206.0 – D –
  - A section of potable water pipe which contains water that has no flow or does not circulate.

  Expansion Tank: 207.0 – E –
  - A vessel used to protect potable water systems from excessive pressure.

GENERAL ANESTHESIA AND LEVELS OF SEDATION/ANALGESIA: 209.0 – G – (2021 EDITION)

- Revision of text:

~~214.0~~ 209.0 - ~~L~~ G-

General Anesthesia and Levels of Sedation/Analgesia.

Deep Sedation/Analgesia. A drug-induced depression of consciousness during which patients cannot be easily aroused but respond purposefully following repeated or painful stimulation. The ability to independently maintain ventilatory function may be impaired. Patients may require assistance in maintaining a patent airway, and spontaneous ventilation may be inadequate. Cardiovascular function is usually maintained. [NFPA 99: ~~3.3.61.2~~ 3.3.66.2]

HEALTH CARE FACILITY'S GOVERNING BODY: 210.0 – H – (2021 EDITION)

- Revision of text:

~~209.0~~ 210.0 - ~~G~~ H-
Health Care Facility's Governing Body.

The person or persons who have the overall legal responsibility for the operation of a health care facility. [NFPA 99: ~~3.3.62~~ 3.3.72]

LOW-PRESSURE WATER DISPENSER: 214.0 – L – (2021 EDITION)

- Revision of text:

214.0 – L –

Low-Pressure Water Dispenser. A terminal fitting located downstream of a pressure reducing valve that dispenses drinking hot water above 71°C (160°F) or cold water or both at a pressure of 105 kPa (15 psi) or less.

MEDICAL GAS: 215.0 – M – (2021 EDITION)

- Revision of text:

215.0 – M –

Medical Gas. A patient medical gas or medical support gas. (See also Patient Medical Gas and Medical Support Gas.) [NFPA 99: ~~3.3.93~~ 3.3.99]

PATIENT CARE SPACE: 218.0 – P – (2018 EDITION)

218.0 Patient Care Space. Revised.

Patient Care Space. Any space of a health care facility wherein patients are intended to be examined or treated. [NFPA 99:3.3.127]

Category 1 Space. Space in which failure of equipment or a system is likely to cause major injury or death of patients, staff, or visitors. [NFPA 99:3.3.127.1]

Category 2 Space. Space in which failure of equipment or a system is likely to cause minor injury to patients, staff, or visitors. [NFPA 99:3.3.127.2]

Category 3 Space. Space in which the failure of equipment or a system is not likely to cause injury to patients, staff, or visitors but can cause discomfort. [NFPA 99:3.3.127.3]

Category 4 Space. Space in which failure of equipment or a system is not likely to have a physical impact on patient care. [NFPA 99:3.3.127.4]

POINT-OF-ENTRY, POINT-OF-USE: 218.0 – P – (2021 EDITION)

- New Definitions:

- Point-of-Entry, Water Treatment Unit. A device serving the water distribution system of a building for the purposes of altering, modifying, adding, or removing minerals, chemicals, contaminants, and suspended solids in the water.

- Point-of-Use, Water Treatment Unit. A device serving a single atmospheric outlet such as a faucet for the purposes of altering, modifying, adding, or removing any minerals, chemicals, contaminants, and suspended solids in water.

WATER COOLER: 225.0 – W – [2021 HOUSTON AMENDMENT]

- New Definition:

  Water Cooler: 225.0 – W –

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

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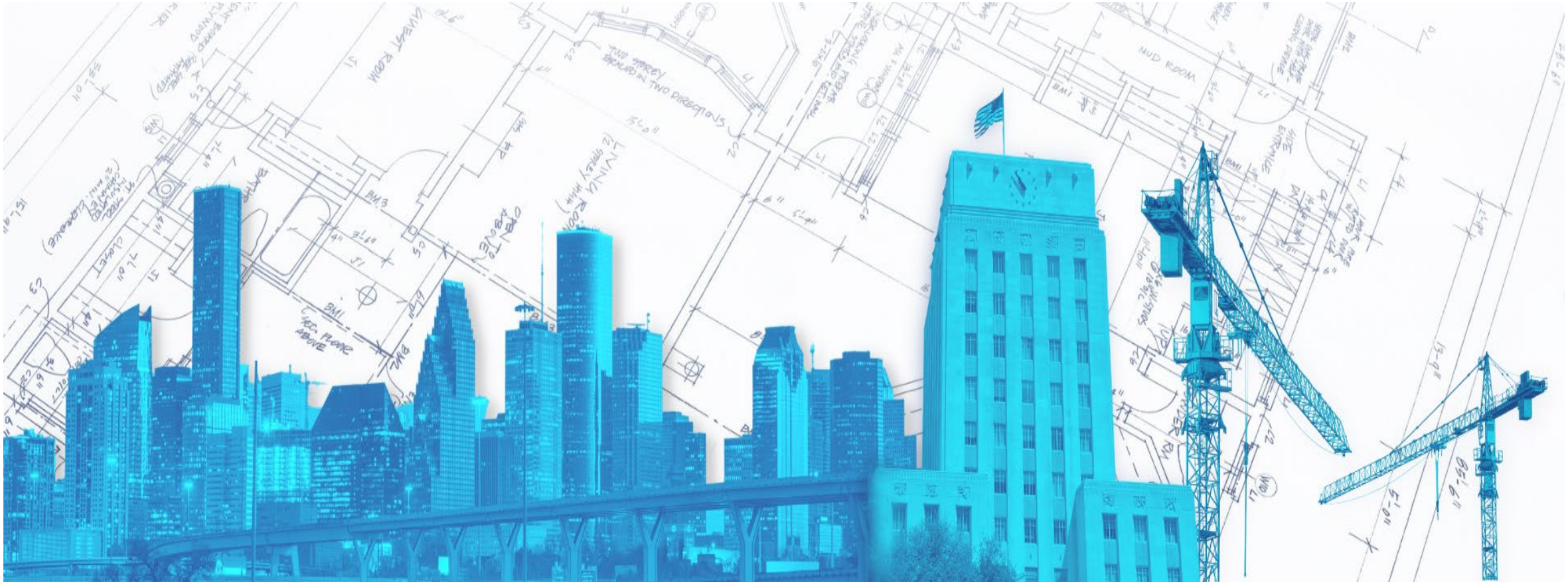
UPC CHAPTER 3
GENERAL REGULATIONS



MARKING: 301.2.1 (2018 EDITION)

301.2.1 Marking. Each length of pipe and each pipe fitting, trap, fixture, material, and device used in a plumbing system shall have cast, stamped, or indelibly marked on it any markings required by the applicable referenced standards and listing agency, and the manufacturer's mark or name, which shall readily identify the manufacturer to the end user of the product. Where required by the approved standard that applies, the product shall be marked with the weight and quality of the product. Materials and devices used or entering into the construction of plumbing and drainage systems, or parts thereof, shall be marked and identified in a manner satisfactory to the Authority Having Jurisdiction. Such markings shall be done by the manufacturer. Field markings shall not be acceptable.

Exception: Marking shall not be required on nipples created from cutting and threading of approved pipe.

WORKMANSHIP: 309.0 (2021 EDITION)

- Newly addressed in Section 309.0
- 309.6 Dead Legs. Dead legs shall have a method of flushing.

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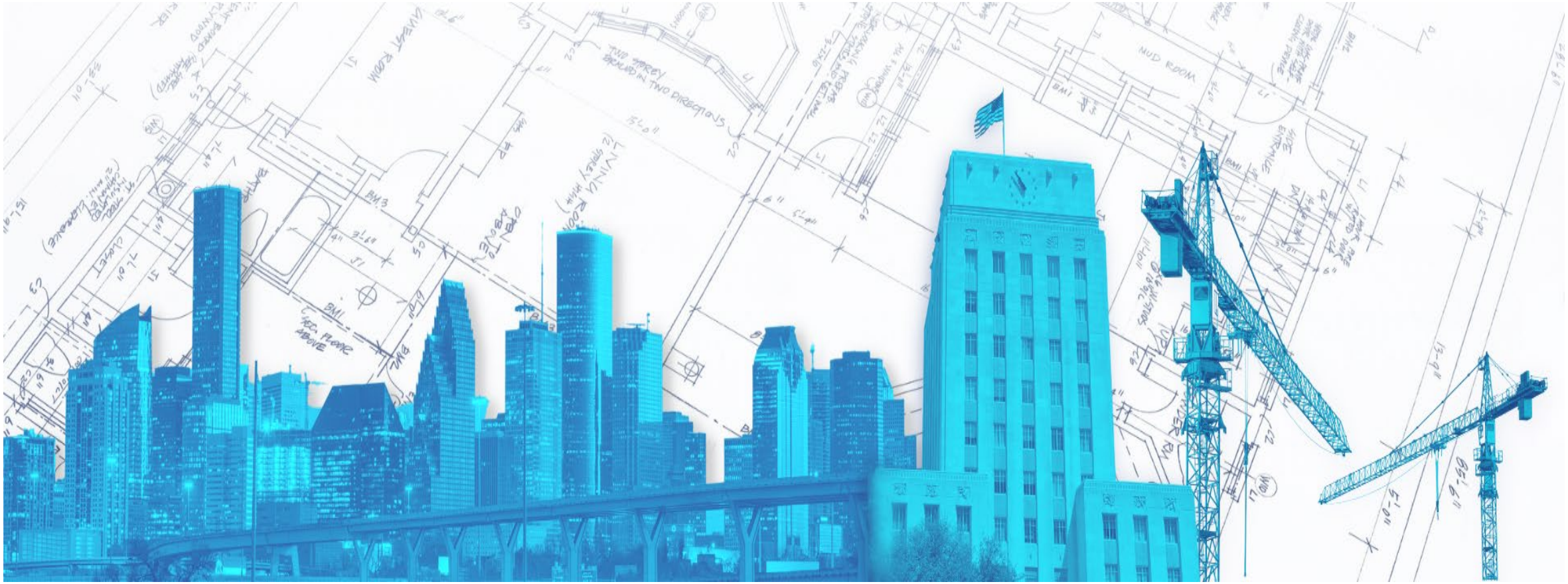
UPC CHAPTER 4 PLUMBING FIXTURES AND FIXTURE FITTINGS



WALL-HUNG FIXTURES: 402.4 (2018 EDITION)

402.4 Wall-Hung Fixtures. Wall-hung fixtures shall be rigidly supported by metal supporting members so that no strain is transmitted to the connections. Floor-affixed supports for off the-floor plumbing fixtures for public use shall comply with ASME A112.6.1M. Framing-affixed supports for off-the-floor water closets with concealed tanks shall comply with ASME A112.6.2. Flush tanks and similar appurtenances shall be secured by approved non-corrosive screws or bolts.

EXPOSED PIPES AND SURFACES: 403.3 (2018 EDITION)

403.3 Exposed Pipes and Surfaces. Add-
ASTM C1822.

403.3 Exposed Pipes and Surfaces. Water supply and drain pipes under accessible lavatories and sinks shall be insulated or otherwise be configured to protect against contact. Protectors, insulators, or both shall comply with ASME A112.18.9 or ASTM C1822.

WASTE FITTINGS AND OVERFLOWS: 404.0 (2018 EDITION)

404.0 Waste Fittings and Overflows

404.1 Waste Fittings. New section.

~~**404.1**~~ **404.2 General Overflows.** Renumbered.

404.0 Waste Fittings and Overflows.

404.1 Waste Fittings. Waste fittings shall comply with ASME A112.18.2/CSA B125.2, ASTM F409 or Table 701.2 for aboveground drainage piping and fittings.

404.2 Overflows. Where a fixture is provided with an overflow, the waste shall be so arranged that the standing water in the fixture shall not rise in the overflow where the stopper is closed or remain in the overflow where the fixture is empty. The overflow pipe from a fixture shall be connected to the house or inlet side of the fixture trap, except that overflow on flush tanks shall be permitted to discharge into the water closets or urinals served by them, but it shall be unlawful to connect such overflows with any other part of the drainage system.

LIMITATION OF HOT WATER TEMPERATURE FOR PUBLIC LAVATORIES: 407.3 (2021 EDITION)

- Revision of text for further clarification:

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 complies with ASSE 1070/ASME A112.1070/CSA B125.70. The water heater thermostat shall not be considered a control for meeting this provision.~~ The maximum temperature shall be regulated by one of following means:

(1) A limiting device conforming to either ASSE 1070/ASME A112.1070/CSA B125.70.

(2) A Water Heater conforming to ASSE 1084.

OVERFLOW: 407.6 (2018 EDITION)

407.6 Overflow. Where overflows are provided, they shall be installed in accordance with Section ~~404.1~~ 404.2.

INDIVIDUAL SHOWER AND TUB-SHOWER COMBINATION CONTROL VALVES: 408.3 (2021 EDITION)

- Revision of text for further clarification:

408.3 Individual Shower and Tub-Shower Combination Control Valves. Showers and tub-shower combinations shall be provided with individual control valves of the pressure balance, thermostatic, or combination pressure balance/thermostatic mixing valve type that provide scald and thermal shock protection for the rated flow rate of the installed showerhead. These valves shall be installed at the point of use and comply with ASSE 1016/ASME A112.1016/CSA B125.16 or ASME A112.18.1/CSA B125.1.

~~Handle position, stop or temperature limiting control shall be provided on shower and tub-shower combination valves and shall be adjusted per the manufacturer's instructions to deliver maximum mixed water setting of 120°F (49°C). Water heater thermostats shall not be considered a suitable control for meeting this provision.~~

GANG SHOWERS: 408.3.1 (2021 EDITION)

- Revision of text for further clarification:

408.3.1 Gang Showers. Where gang showers are sup-plied with a single temperature-controlled water supply pipe, it shall be controlled by a mixing valve that com-plies with ASSE 1069.

TEMPERATURE LIMITING: 408.3.2 (2021 EDITION)

- Revision of text for further clarification:

408.3.2 Temperature Limiting. The maximum water temperature discharging from an individual showerhead shall be limited to 120°F (49°C) by one of the following methods:

A shower or tub/shower combination valve conforming to ASSE 1016/ASME A112.1016/CSA B125.16 where either:

The valve is field-adjusted to the required maximum temperature, or

The handle position, stop, or temperature limiting control is set in accordance with the manufacturer's instructions to the required maximum temperature;

For gang showers supplied by a single water supply pipe, a mixing valve that conforms to ASSE 1069 that is field-adjusted to the required maximum temperature;

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

(4) A water heater conforming to ASSE 1084;

A temperature actuated flow reduction device conforming to ASSE 1062.

OVERFLOW: 409.3 (2018 EDITION)

409.3 Overflow. Where overflows are provided, they shall be installed in accordance with Section ~~404.1~~ 404.2.

DRINKING FOUNTAINS: 415.0 [2021 HOUSTON AMENDMENT]

- Addition of text:

415.0 Drinking Fountains. Drinking fountains shall be in accordance with Section 2904 of the Houston Building Code.

[EDITORIAL NOTE: THE REMAINDER OF SECTION 415 IS RESERVED AND NOT ADOPTED BY THIS JURISDICTION.]

WATER SUPPLY: 416.2 AND TABLE 1701.1 (2021 EDITION)

- Revision of text for further clarification:

- 416.2 Water Supply. Emergency eyewash and shower equipment shall not be limited in the water supply flow rates. Where hot and cold water is supplied to an emergency shower or eyewash station, the temperature of the water supply shall be controlled by a temperature actuated mixing valve complying with ASSE 1071. Where water is supplied directly to an emergency shower or eyewash station from a water heater, the water heater shall comply with ASSE 1085. The flow rate, discharge pattern, and temperature of flushing fluids shall be provided in accordance with ISEA Z358.1.

WATER SUPPLY: 416.2 AND TABLE 1701.1, CONTINUED (2021 EDITION)

- Addition of referenced standard:

TABLE 1701.1: REFERENCED STANDARDS

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTIONS
ASSE 1085-2018	Water Heaters for Emergency Equipment	Appliances	416.2

LOW-PRESSURE WATER DISPENSER: 417.6 (2021 EDITION)

- Addition to Section 417

- 417.6 Low-Pressure Water Dispenser. Beverage faucets shall comply with ASME A112.18.1/CSA B125.1. Low-pressure water dispensers that dispense electrically heated or chilled water and have a reservoir vented to the atmosphere shall comply with ASSE 1023 and UL 399.

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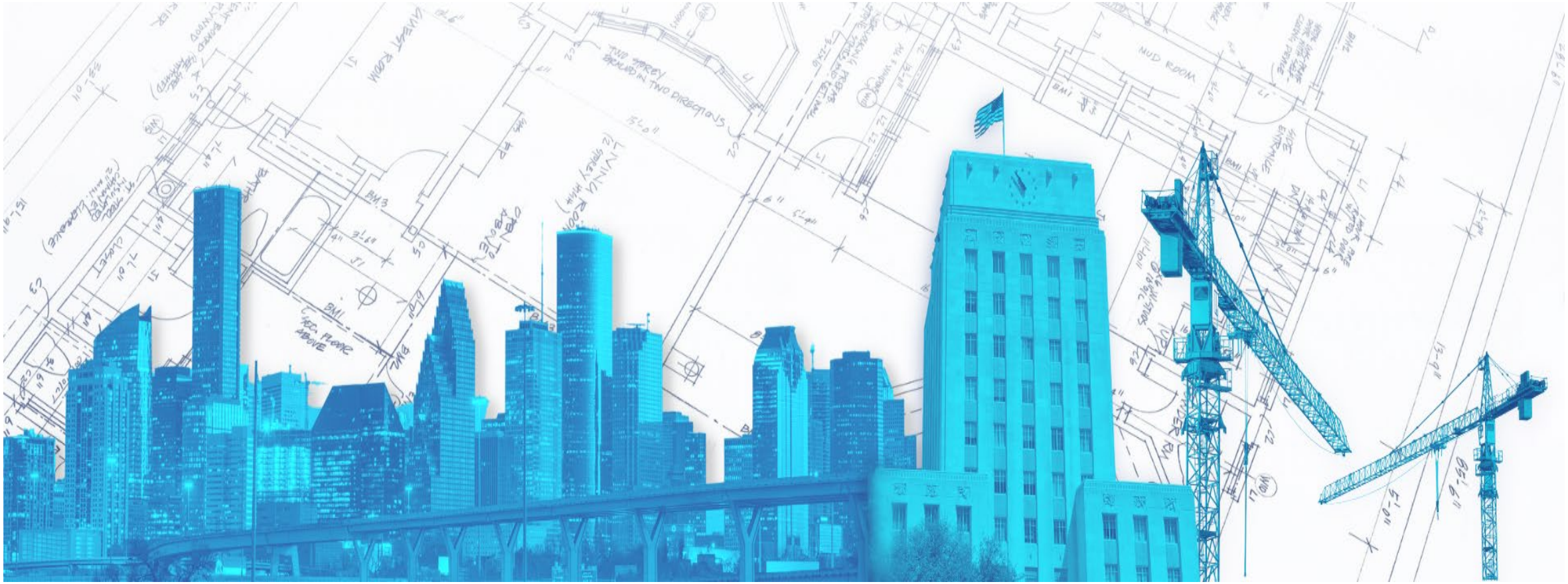
UPC CHAPTER 5 WATER HEATERS



WATER HEATERS: 501, TABLE 501.1(1), AND TABLE 1701 (2021 EDITION)

- Revision of text for clarification:

Table 501.1(1) Water Heaters

Type	Standard
Electric, Household Storage	UL 174
Oil-Fired Storage Tank	UL 732
Gas Fired 75,000 Btu/h or less, Storage	CSA Z21.10.1
Gas-Fired, Above 75,000 Btu/h, Storage and Instantaneous	CSA Z21.10.3
Electric, Commercial Storage	UL 1453
Solid Fuel-Fired	UL 2523
Electric Instantaneous	UL 499

WATER HEATERS: 501, TABLE 501.1(1), AND TABLE 1701 CONTINUED (2021 EDITION)

- Addition of referenced standard:

Table 1701.1 Referenced Standards

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTIONS
UL 499-2014	Electric Heater Appliances (with Revisions thru Feb 23, 2017)	Appliances	Table 501.1(1)

WATER HEATERS: TABLE 501.1(2) (2021 EDITION)

- Revision of text for clarification:

Table 501.1(2) First Hour Rating

Number of Bathrooms	**1 to 1.5**			**2 to 2.5**				**3 to 3.5**			
Number of Bedrooms	**1**	**2**	**3**	**2**	**3**	**4**	**5**	**3**	**4**	**5**	**6**
First Hour Rating[2] Gallons	~~42~~ 38	~~54~~ 49	~~54~~ 49	~~54~~ 49	~~67~~ 62	~~80~~ 74	~~80~~ 74	~~67~~ 62	~~80~~ 74	~~80~~ 74	~~80~~ 74

INSTALLATION OF APPLIANCES ON ROOFS: TABLE 508.2 (2021 EDITION)

- Revision of text for clarification:

- 508.2 Installation of Appliances on Roofs. (remaining text unchanged)

- 508.2.1 Edge of Roof Clearance. Appliances shall be installed on a well-drained surface of the roof. At least 6 feet (1829 mm) of clearance shall be available between any part of the appliance, and the edge of a roof or similar hazard, or rigidly fixed rails, guards, parapets, or other building structures at least 42 inches (1067 mm) in height shall be provided on the exposed side. [NFPA 54:9.4.2.2]

INSTALLATION OF APPLIANCES ON ROOFS: TABLE 508.2 CONTINUED (2021 EDITION)

508.2.1.1 Guards and Rails. Guards or rails shall be required where the following exist:

- (1) The clearance between the appliance and a roof edge or open end of an equipment platform is less than 6 feet (3048 mm).

- (2) The open end of the equipment platform is located more than 30 inches (762 mm) above the roof, floor, or grade below.

- Where guards or rails are installed, they shall be constructed so as to prevent the passage of a 21-inch (533 mm) diameter ball, resist the imposed loading conditions, and shall extend not less than 30 inches (7625 mm) beyond each side of the equipment or appliance. Exception: Guards shall not be required where a permanent fall arrest anchorage connector system in accordance with ASSE Z359.1 is installed.

INSTALLATION OF APPLIANCES ON ROOFS: TABLE 508.2, TABLE 1701.1 CONTINUED (2021 EDITION)

- Addition of referenced standard:

TABLE 1701.1: REFERENCED STANDARDS

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTIONS
ASSE Z359.1-2016	The Fall Protection Code	Miscellaneous	508.2.1.1

ABOVE-CEILING OR NONDUCTED AIR HANDLING SYSTEM: 509.3.6 (2018 EDITION)

509.3.6 Above-ceiling or Nonducted Air Handling System. New section.

509.3.6 Above-ceiling or Nonducted Air Handling System. Where a venting system passes through an above-ceiling air space or other nonducted portion of an air-handling system, it shall conform to one of the following requirements:

(1) The venting system shall be a listed special gas vent, other system serving a Category III or Category IV appliance, or other positive pressure vent, with joints sealed in accordance with the appliance or vent manufacturer's instructions.

(2) The vent system shall be installed such that no fittings or joints between sections are installed in the above-ceiling space.

(3) The venting system shall be installed in a conduit or enclosure with joints between the interior of the enclosure and the ceiling space sealed. [NFPA 54:12.4.5.2]

PLASTIC PIPING: 509.4.1 (2018 EDITION)

509.4.1 Plastic Piping. ~~Plastic piping used for venting appliances listed for use with such venting materials shall be approved.~~ Where plastic piping is used to vent an appliance, the appliance shall be listed for use with such venting materials and the appliance manufacturer's installation instruction shall identify the specific plastic piping material. [NFPA 54:12.5.2]

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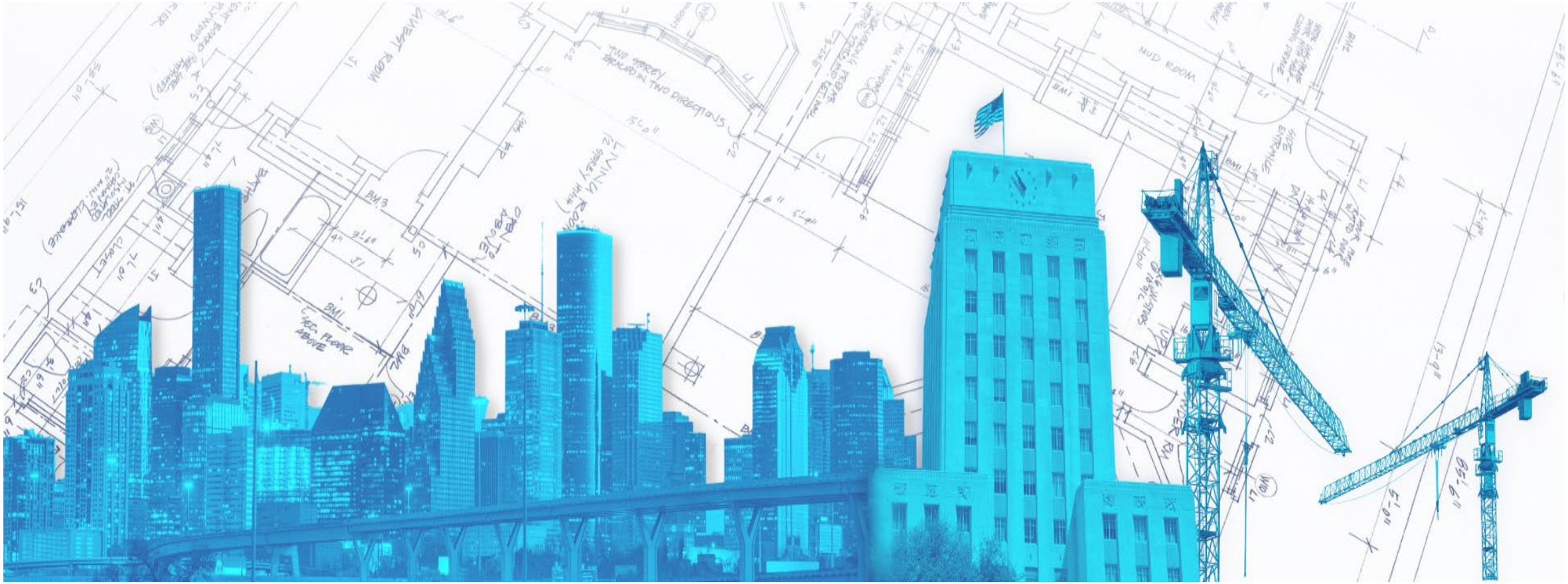
UPC CHAPTER 6 WATER SUPPLY AND DISTRIBUTION



CROSS-CONNECTION CONTROL: 603.0 AND TABLE 1701.1, 1701.2 (2021 EDITION)

- Revision of Sections 603.3, 603.3.10, and 603.3.11:

603.3 Backflow Prevention Devices, Assemblies, and Methods. Backflow prevention devices, assemblies, and methods shall comply with Section 603.3.1 through Section ~~603.3.9~~ 603.3.12.

603.3.10 Dual Check Backflow Preventer. A dual check backflow preventer consists of two independently acting check valves, force loaded to a normally closed position.

~~603.5.15.1~~ 603.3.11 Laboratory Faucet Backflow Preventers. Laboratory faucets ~~shall be protected by a~~ backflow preventer~~s~~ ~~that~~ shall ~~complies~~ comply with ASSE 1035.

CROSS-CONNECTION CONTROL: 603.0 AND TABLE 1701.1, 1701.2 CONTINUED (2021 EDITION)

- Revision of Sections 603.3.12 and 603.5.10:

603.3.12 Backflow Preventer with Intermediate Atmospheric Vent. A backflow preventer with intermediate atmospheric vent consists of two independently acting check valves, force loaded to a normally closed position, and an intermediate chamber with a means for automatically venting to atmosphere, force loaded to a normally open position.

603.5.10 Steam or Hot Water Boilers. Potable water connections to steam or hot water boilers shall be protected from backflow by a double check valve backflow prevention assembly, backflow preventer with intermediate atmospheric vent and pressure reducing valve, or reduced pressure principle backflow prevention assembly in accordance with Table 603.2. Where chemicals are introduced into the system a reduced pressure principle backflow prevention assembly shall be provided in accordance with Table 603.2.

CROSS-CONNECTION CONTROL: 603.0 AND TABLE 1701.1, 1701.2 CONTINUED (2021 EDITION)

- Revision of Table 603.2:

TABLE 603.2

BACKFLOW PREVENTION DEVICES, ASSEMBLIES, AND METHODS

DEVICE, ASSEMBLY OR METHOD	APPLICABLE STANDARDS	POLLUTION (LOW HAZARD)		CONTAMINATION (HIGH HAZARD)		INSTALLATION [2,3]
		BACK-SIPHONAGE	BACK-PRESSURE	BACK-SIPHONAGE	BACK-PRESSURE	
Backflow preventer with intermediate atmospheric vent	ASSE 1012	X	X	-	-	Installation of potable water connections to water boilers. No high-hazard chemicals shall be introduced into the system using such devices. Designed to operate under continuous pressure conditions. May discharge water.

CROSS-CONNECTION CONTROL: 603.0 AND TABLE 1701.1, 1701.2 CONTINUED (2021 EDITION)

- Revision of Table 603.2:

Dual Check Backflow Preventer	ASSE 1024	X	X	-	-	Installation does not include carbonated drink dispensers.
Laboratory faucet backflow preventer	ASSE 1035	-	-	X	X	Installation includes laboratory faucets, such devices are not for use under continuous pressure conditions. No valve downstream.[4]

CROSS-CONNECTION CONTROL: 603.0 AND TABLE 1701.1, 1701.2 CONTINUED (2021 EDITION)

- Revision of Table 603.2:

Backflow preventer with intermediate atmospheric vent and pressure reducing valve.	ASSE 1081	X	X	-	-	Installation of potable water connections to water boilers. No high-hazard chemicals shall be introduced into the system using such devices. Designed to operate under continuous pressure conditions. May discharge water.

CROSS-CONNECTION CONTROL: 603.0 AND TABLE 1701.1, 1701.2 CONTINUED (2021 EDITION)

- Revision of Table 1701.1:

TABLE 1701.1

REFERENCED STANDARDS

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTIONS
ASSE 1012-2009	Backflow Preventers with Intermediate Atmospheric Vent	Backflow Protection	Table 603.2
ASSE 1024-2017	Dual Check Backflow Preventers	Backflow Protection	Table 603.2
ASSE 1035-2008	Laboratory Faucet Backflow Preventers	Backflow Protection	Table 603.5.15.1, Table 603.2
ASSE 1081-2014	Backflow Preventers with integral Pressure Reducing Boiler Feed Valve and Intermediate Atmospheric Vent Style for Domestic and Light Commercial Water Distribution Systems.	Backflow Protection	Table 603.2

CROSS-CONNECTION CONTROL: 603.0 AND TABLE 1701.1, 1701.2 CONTINUED (2021 EDITION)

- Revision of Table 1701.2:

TABLE 1701.2

STANDARDS, PUBLICATIONS, PRACTICES, AND GUIDES

DOCUMENT NUMBER	DOCUMENT TITLE	APPLICATION
~~ASSE 1012-2009~~	~~Backflow Preventers with an Intermediate Atmospheric Vent.~~	~~Backflow Protection~~
~~ASSE 1024-2004~~	~~Dual Check Backflow Preventers~~	~~Backflow Protection~~
~~ASSE 1035-2008~~	~~Dual Check Backflow Preventers~~	~~Backflow Protection~~

ACCESS AND CLEARANCE: 603.4.3 (2018 EDITION)

603.4.3 Access and Clearance. Access and clearance shall be provided for the required testing, maintenance, and repair. Access and clearance shall be in accordance with the manufacturer's instructions, and not less than 12 inches (305 mm) between the lowest portion of the assembly and grade, floor, or platform. Installations elevated that exceed 5 feet (1524 mm) above the floor or grade shall be provided with a platform capable of supporting a tester or maintenance person.

PIPE, TUBE, AND FITTINGS: 604.1 AND TABLE 1701.1 (2021 EDITION)

- Revision of Table 604.1:

TABLE 604.1

MATERIALS FOR BUILDING SUPPLY AND WATER DISTRIBUTION PIPING AND FITTINGS

MATERIAL	BUILDING SUPPLY PIPE AND FITTINGS	WATER DISTRIBUTION PIPE AND FITTINGS	REFERENCED STANDARD(S) PIPE	REFERENCED STANDARD(S) FITTINGS
PEX	X	X	ASTM F876, ~~ASTM F877,~~ CSA B137.5, AWWA C904[1]	ASSE 1061, ASTM F877, ASTM F1807, ASTM F1960, ASTM F1961, ASTM F2080, ASTM F2159, ASTM F2735, CSA B137.5

PIPE, TUBE, AND FITTINGS: 604.1 AND TABLE 1701.1 CONTINUED (2021 EDITION)

- Revision of Table 604.1:

TABLE 604.1

MATERIALS FOR BUILDING SUPPLY AND WATER DISTRIBUTION PIPING AND FITTINGS

MATERIAL	BUILDING SUPPLY PIPE AND FITTINGS	WATER DISTRIBUTION PIPE AND FITTINGS	REFERENCED STANDARD(S) PIPE	REFERENCED STANDARD(S) FITTINGS
PEX	X	X	ASTM F876, CSA B137.5, AWWA C904[1]	ASSE 1061, ASTM F877, ASTM F1807, ASTM F1960, ~~ASTM F1961,~~ ASTM F2080, ASTM F2159, ASTM F2735, CSA B137.5
PEX-AL-PEX	X	X	ASTM F1281, CSA B137.10, ~~ASTM F2262~~	ASTM F1281, ASTM F1974, ASTM F2434, CSA B137.10

PIPE, TUBE, AND FITTINGS: 604.1 AND TABLE 1701.1 CONTINUED (2021 EDITION)

- Revision of Table 1701.1:

TABLE 1701.1

REFERENCED STANDARDS

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTIONS
~~ASTM F1961-2009~~	~~Metal Mechanical Cold Flare Compression Fittings with Disc Spring for Crosslinked Polyethylene (PEX) Tubing~~ (WITHDRAWN)	~~Fittings~~	~~Table 604.1~~
~~ASTM F2262-2009~~	~~Crosslinked Polyethylene/Aluminum/ Crosslinked Polyethylene Tubing OD Controlled SDR9~~ (WITHDRAWN)	~~Piping, Plastic~~	~~Table 604.1~~

TRACER WIRE: 604.10.1 (2018 EDITION)

604.10.1 Tracer Wire. Plastic materials for building supply piping outside underground shall have a blue insulated copper trace wire an electrically continuous corrosion-resistant blue insulated copper tracer wire, or other approved conductor installed adjacent to the piping. Access shall be provided to the tracer wire, or the tracer wire shall terminate aboveground at each end of the nonmetallic piping. The tracer wire size shall be not less than 18 AWG, and the insulation type shall be suitable for direct burial.

CHECK VALVE REQUIRED: 606.8 (2021 EDITION)

- Addition of Section 606.8:

606.8 Check Valve Required. All systems that circulate water by means of a pump or other mechanical device or method shall have a check valve(s) or equal device(s) installed so as to insure the direction of flow.

EXCESSIVE WATER PRESSURE: 608.2 AND TABLE 1701.1 (2021 EDITION)

- Revision of text:

608.2 Excessive Water Pressure. Where static water pressure in the water supply piping is exceeding 80 psi (552 kPa), an approved-type pressure regulator preceded by an adequate strainer shall be installed and the static pressure reduced to 80 psi (552 kPa) or less. Pressure regulators for potable water distribution systems shall comply with ASSE 1003. Pressure regulator(s) equal to or exceeding 1½ inches (40 mm) shall not require a strainer.

EXCESSIVE WATER PRESSURE: 608.2 AND TABLE 1701.1 CONTINUED (2021 EDITION)

- Addition of referenced standard:

Table 1701.1 Referenced Standards

TABLE 1701.1
REFERENCED STANDARDS

STANDARD NUMBER	STANDARD TITLE	APPLICATION	REFERENCED SECTIONS
ASSE 1003-2009	Water Pressure Reducing Valves for Domestic Water Distribution Systems	Valves	Table 608.2

(Portions of table not shown don't change.)

TESTING: 609.4 (2018 EDITION)

609.4 Testing.
Exception: PEX, PP or PE-RT tube shall be permitted to be tested with air where permitted by the manufacturer's instructions.

DRINKING WATER TREATMENT UNITS: 611.0 (2021 EDITION)

- Revision of text for further clarification:

611.1 Application. Drinking water treatment units shall comply with the applicable referenced standards in Table 611.1. ~~NSF 42. or NSF 53. Water softeners shall comply with NSF 44. Ultraviolet water treatment systems shall comply with NSF 55. Reverse osmosis drinking water treatment systems shall comply with NSF 58. Drinking water distillation systems shall comply with NSF 62.~~

611.1.1 Alkaline Water treatment. Alkaline water treatment devices shall comply with IAPMO IGC 322.

611.1.2 Scale Reduction Devices. Scale reduction devices shall comply with IAPMO Z601.

DRINKING WATER TREATMENT UNITS: 611.0 (2021 EDITION)

Table 611.1 Drinking Water Treatment Units

APPLICATION	RESIDENTIAL		COMMERCIAL
	POINT-OF-USE	POINT OF ENTRY	
	Commercial and Food Service Water Treatment Equipment Utilizing Drinking Water	Water Conditioning, Water Treatment	
Aesthetic Contaminant Reduction (Filters)	NSF 42	NSF 42	ASSE 1087 And NSF 42*
Health Related Contaminant Reduction (Filters)	NSF 53	NSF 53	ASSE 1087 and NSF 53*
Water Softener		NSF 44	ASSE 1087
Ultraviolet Water Treatment	NSF 55	NSF 55	ASSE 1087
Reverse Osmosis	NSF 58	NSF 61	ASSE 1087
Distillation	NSF 62	NSF 62	ASSE 1087

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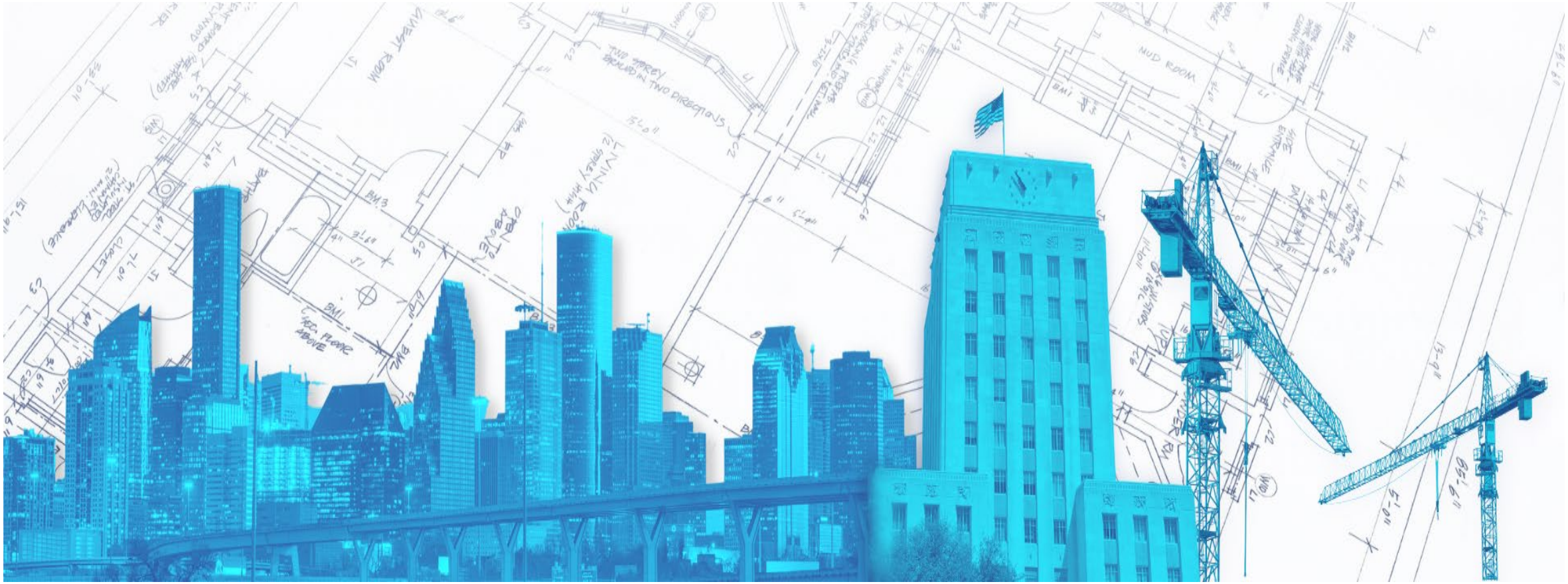
UPC CHAPTER 7 SANITARY DRAINAGE



DRAINAGE PIPING: 701.2 (2018 EDITION)

701.2 Drainage Piping. Revise- (2) ABS and PVC DWV piping installations shall be installed in accordance with applicable standards referenced in Table 701.2 and Chapter 14 “Firestop Protection.” Except for individual single-family dwelling units, materials exposed within ducts or plenums shall have a flame-spread index of not more than 25 and a smoke-developed index of not more than 50, where tested in accordance with ASTM E84 or UL 723. These tests shall comply with all requirements of the standards to include the sample size, both for width and length. Plastic pipe shall not be tested filled with water.

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MAXIMUM UNIT LOADING AND MAXIMUM LENGTH OF DRAINAGE AND VENT PIPING: TABLE 703.2 (2021 EDITION)

- Revision of table information:

TABLE 703.2
MAXIMUM UNIT LOADING AND MAXIMUM LENGTH OF DRAINAGE AND VENT PIPING

Size of Pipe (Inches)	**1-1/4**	**1-1/2**	**2**	**3**	**4**	**5**	**6**	**8**	**10**	**12**
Maximum Units Drainage Piping[1]										
Vertical	1	2[2,7]	16[3]	48[4]	256	600	1380	3600	5600	8400
Horizontal	1	1[7]	8[3]	35[4]	216[5]	428[5]	720[5]	2640[5]	4680[5]	8200[5]
Maximum Length Drainage Piping										
Vertical, (feet)	45	65	85	212	300	390	510	750	-	-
Horizontal (unlimited)										
Vent Piping Horizontal and Vertical[6]										
Maximum Units	1	8[3]	24	84	256	600	1380	3600	-	-
Maximum Lengths, (feet)	45	60	120	212	300	390	510	750		

(Portions of table and text not shown don't change.)

- 7. Up to 8 public lavatories are permitted to be installed on a 1-1/2 inch (40 mm) vertical branch or horizontal sanitary branch sloped at ¼ inch per foot (20.8 mm/m).

EXISTING SEWERS: 715.3 (2021 EDITION)

- Revision of the text:

715.3 Existing Sewers. Replacement of existing building sewer and building storm sewers using trenchless methodology and materials shall be installed in accordance with ASTM F1216, ASTM F2561, ASTM F2599, or ASTM F3240. Cast-iron soil pipes and fittings shall not be repaired or replaced by using this method aboveground or belowground. Replacement using cured-in-place pipe liners shall not be used on collapsed piping or when the existing piping is compromised.

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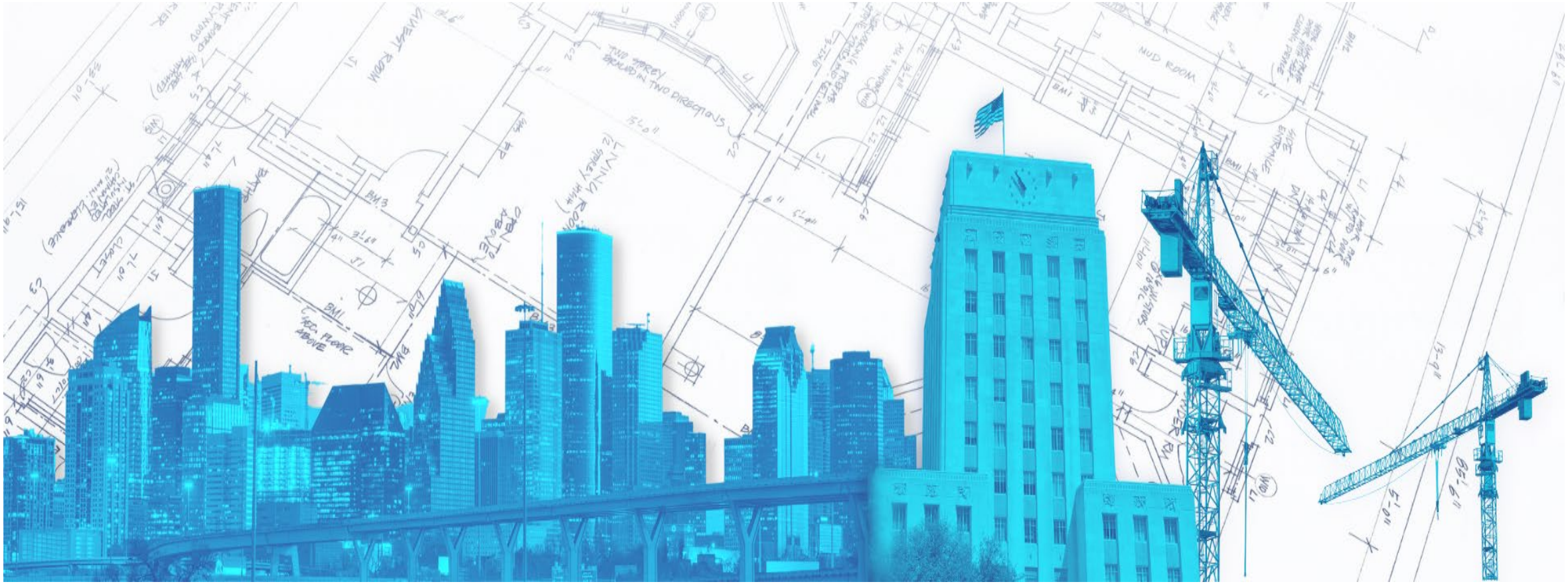
UPC CHAPTER 8 INDIRECT WASTES



CONDENSATE WASTE AND CONTROL: 814.0 (2021 EDITION)

- Revision of the text and inclusion of the exception:

814.5 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 trapped and vented receptors, roof drains, dry wells, leach pits, or the tailpiece of plumbing fixtures. A condensate drain shall be trapped in accordance with the appliance manufacturer's instructions or as approved.

- Exception: Where permitted in Section 814.6.

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

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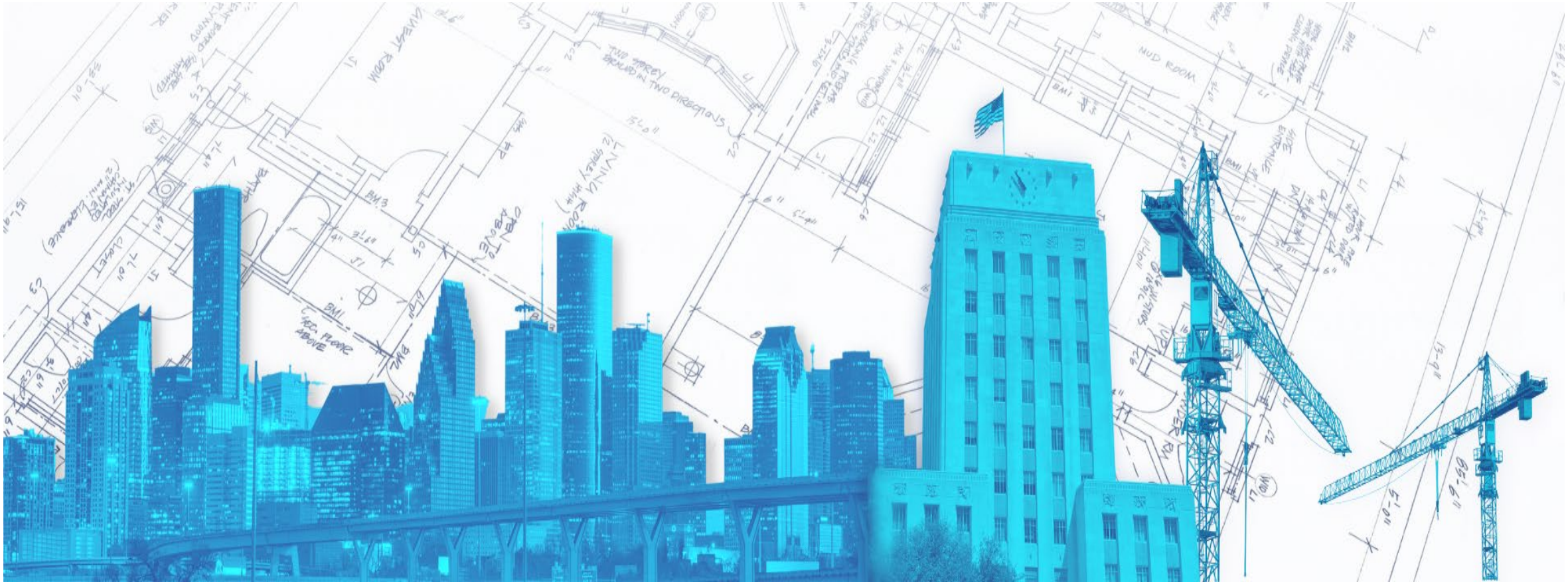
UPC CHAPTER 9 VENTS



APPLICABLE STANDARDS: 903.1 (2018 EDITION)

903.1 Applicable Standards. Revise- (2) ABS and PVC DWV piping installations shall be in accordance with Chapter 14 “Firestop Protection.” Except for individual single-family dwelling units, materials exposed within ducts or plenums shall have a flame-spread index of not more than 25 and a smoke-developed index of not more than 50 where tested in accordance with ASTM E84 or UL 723. These tests shall comply with all requirements of the standards to include the sample size, both for width and length. Plastic pipe shall not be tested filled with water.

CIRCUIT VENTING: 911.0 (2021 EDITION)

- Revision of the text:

911.1 Circuit Vent Permitted. A maximum of eight ~~fixtures~~ floor-outlet water closets, showers, bathtubs, or floor drains connected to a horizontal branch ~~drain~~ shall be permitted to be circuit vented. Each ~~fixture drain~~ trap arm shall connect horizontally to the horizontal branch being circuit vented in accordance with Table 1002.2. The horizontal branch drain shall be classified as a drain and a vent from the most downstream ~~fixture drain~~ trap arm connection to the most upstream fixture drain trap arm connection to the horizontal branch.

Exception: Back-outlet and wall-hung water closets shall be permitted to be circuit vented provided that no floor-outlet fixtures are connected to the same horizontal branch.

CIRCUIT VENTING: 911.0 (2021 EDITION)

- Revision of the text:

~~911.1.1 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 of this section~~

911.2 Circuit Vent Size and Connection. The circuit vent size shall be in accordance with Table 703.2 according to the number of circuit vented fixtures connected to the horizontal branch but 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 between the two most upstream trap arms. The circuit vent pipe shall not receive the discharge of a soil or waste.

CIRCUIT VENTING: 911.0 (2021 EDITION)

- Revision of the text:

911.2.1 Multiple Circuit Vents. When multiple circuit vents are interconnected according to Section 911.4.1, each individual circuit vent shall be sized according to Section 911.2. The vent pipe connecting each circuit vent shall be sized according to Table 703.2.

~~911.3 Slope and Size of Horizontal Branch. The 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.~~

CIRCUIT VENTING: 911.0 (2021 EDITION)

- Revision of the text:

~~911.3.1 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 911.3. 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.~~

~~911.4~~ 911.3 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~~ when connecting to a drainage stack that receives the discharge of soil or waste from upper horizontal branches.

CIRCUIT VENTING: 911.0 (2021 EDITION)

- Revision of the text:

~~911.4.1~~ 911.3.1 Connection and Installation. The relief vent shall connect to the horizontal branch ~~drain~~ between the stack and the most downstream ~~fixture drain~~ trap arm of the circuit vent. The relief vent shall be installed on the vertical to the horizontal branch.

~~911.4.2~~ 911.3.2 Fixture Drain ~~or Branch~~. The relief vent is permitted to ~~be~~ serve as a fixture drain ~~or fixture branch for a fixture located within the same branch interval as the circuit-vented horizontal branch~~. Fixtures ~~The discharge~~ discharging to a relief vent shall be one or two fixture unit fixtures but shall not exceed a total of 4 fixture units.

CIRCUIT VENTING: 911.0 (2021 EDITION)

- Revision of the text:

911.4 Slope and Size of Horizontal Branch. The vented section of the horizontal branch shall be uniformly sloped and not more than 1 inch per foot (83.3 mm/m). The entire length of the vented section of the horizontal branch shall be sized for the total drainage discharge to the branch according to Table 703.2.

911.4.1 Multiple Circuit-Vented Branches. Circuit-vented horizontal branches 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 Section 911.4.1.1 and Section 911.4.1.2.

CIRCUIT VENTING: 911.0 (2021 EDITION)

- Revision of the text:

911.4.1.1 Size of Parallel Horizontal Branches. Parallel horizontal 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 911.4.

911.4.1.2 Size of Continuous Horizontal Branches. Two or more circuit vented systems continuous on the same horizontal branch shall be uniformly sized for the total discharge into the branch.

911.5 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.

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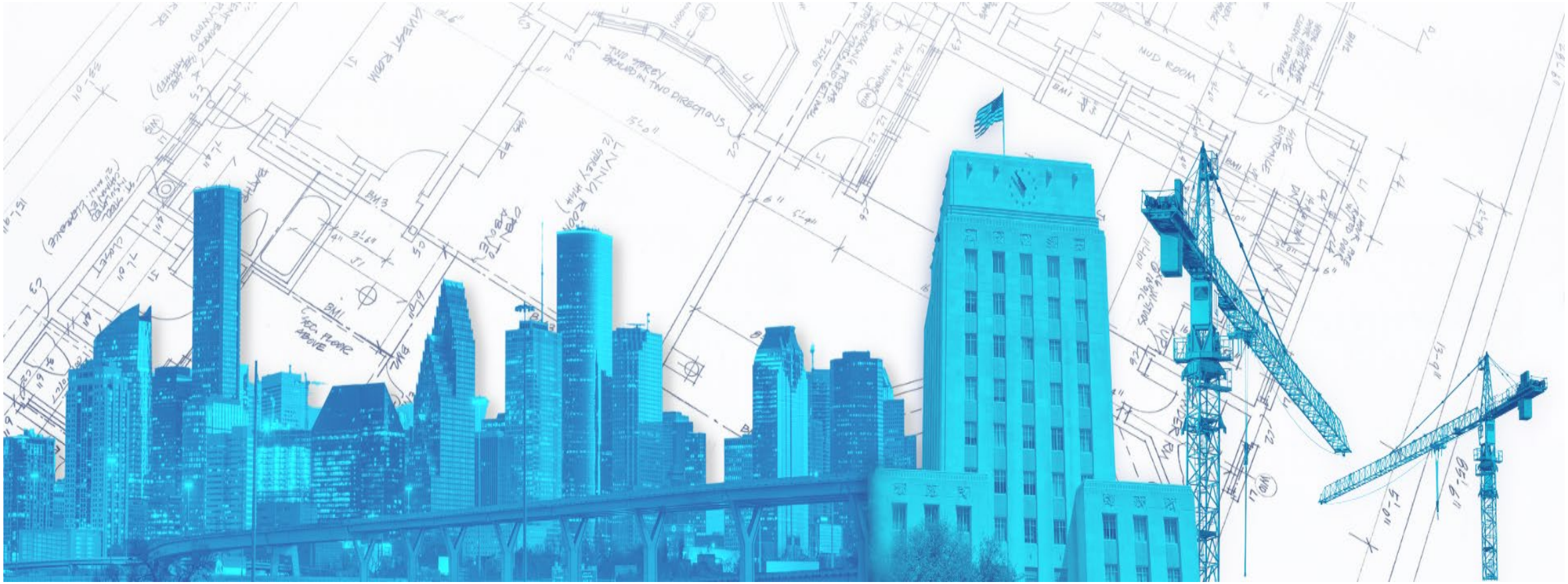
UPC CHAPTER 11 STORM DRAINAGE



MATERIAL USES: 1101.4 (2018 EDITION)

1101.4 Material Uses. Add- These tests shall comply with all requirements of the standards to include the sample size, both for width and length. Plastic pipe shall not be tested filled with water.

MATERIAL USES: 1101.4 (2021 EDITION)

- Revision of the text:

1101.4 Material Uses. Pipe, tube, and fittings conveying rainwater shall be of such materials and design as to perform their intended function to the satisfaction of the Authority Having Jurisdiction. Conductors within a vent or shaft shall be of cast-iron, galvanized steel, wrought iron, copper, copper alloy, lead, Schedule 40 ABS DWV, Schedule 40 PVC DWV, stainless steel 304 or 316L [stainless steel 304 pipe and fittings shall not be installed underground and shall be kept not less than 6 inches (152 mm) aboveground], or other approved materials, and changes in direction shall be in accordance with the requirements of Section 706.0. ABS and PVC DWV piping installations shall be installed in accordance with applicable standards referenced in Table 1701.1 and Chapter 14 “Firestop Protection.” Except for individual single-family dwelling units, materials exposed within ducts or plenums shall have a flame-spread index of not more than 25 and a smoke-developed index of not more than 50, where tested in accordance with ASTM E84 or UL 723. ~~These tests shall comply with all requirements of the standards to include the sample size, both for width and length. Plastic pipe shall not be tested filled with water.~~ Plastic piping installed in plenums shall be tested in accordance with all requirements of ASTM E84 or UL723. Mounting methods, supports and sample sizes of materials for testing that are not specified in ASTM E84 or UL 723 shall be prohibited.

ENGINEERED STORM DRAINAGE SYSTEM: 1106.0 (2018 EDITION)

1106.0 Engineered Storm Drainage System.

New section and subsections.

1106.0 Engineered Storm Drainage System.

1106.1 General. The design and sizing of a storm drainage system shall be permitted to be determined by accepted engineering practices. The system shall be designed by a registered design professional and approved in accordance with Section 301.5.

1106.2 Siphonic Roof Drainage Systems. The design of a siphonic roof drainage system shall comply with ASPE 45.

1106.3 Siphonic Roof Drains. Siphonic roof drains shall comply with ASME A112.6.9.

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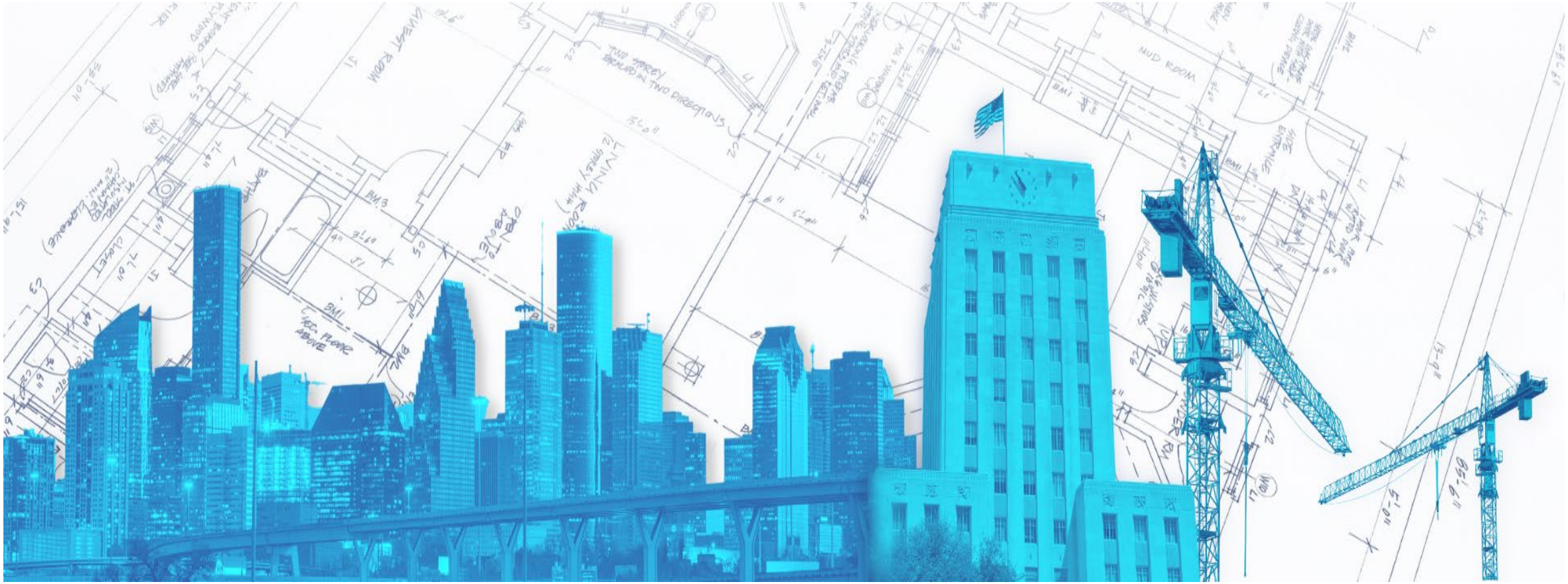
UPC CHAPTER 12 FUEL GAS PIPING



MAXIMUM GAS DEMAND: 1208.4.1 (2018 EDITION)

1208.4.1 Maximum Gas Demand. The volumetric flow rate of gas to be provided (in cubic feet per hour) shall be the sum of the maximum inputs of the appliances served. The volumetric flow rate of gas to be provided shall be adjusted for altitude where the installation is above 2000 feet (610 m). [NFPA 54: 5.4.2.1-5.4.2.2] ~~calculated using the manufacturer's input ratings of the appliance served, adjusted for altitude~~. Where the input rating is not indicated, the gas supplier, appliance manufacturer, or a qualified agency shall be contacted, or the rating from Table 1208.4.1 shall be used for estimating the volumetric flow rate of gas to be supplied. The total connected hourly load shall be used as the basis for piping sizing, assuming all the appliances are operating at full capacity simultaneously.
Exception: Sizing shall be permitted to be based upon
established load diversity factors. [NFPA 54:5.4.2.3]

METALLIC PIPING JOINTS AND FITTINGS: 1208.6.10 (2021 EDITION)

- Removal of Section 1208.6.10 and revision of Section 1208.6.10.5:

~~1208.6.10.1 Listing. Pipe joints shall be threaded, flanged, brazed, welded, or press-connect fittings that comply with CSA LC 4. Where nonferrous pipe is brazed, the brazing materials shall have a melting point in excess of 1000°F (538°C). Brazing alloys shall not contain more than 0.05 percent phosphorus.~~

~~1208.6.10.6~~ 1208.6.10.5 Metallic Pipe Fittings. Metallic pipe fittings shall comply with the following:

- (1) Threaded fittings in sizes larger than 4 inches (100 mm) shall not be used ~~unless approved by the Authority Having Jurisdiction.~~
- (2) Fittings used with steel, stainless steel, or wrought-iron pipe shall be steel, stainless steel, copper alloy, malleable iron, or cast iron.
- …

METALLIC PIPING JOINTS AND FITTINGS: 1208.6.10 CONTINUED (2021 EDITION)

- Revision of Section 1208.6.10.5:

~~1208.6.10.6~~ 1208.6.10.5 Metallic Pipe Fittings. Metallic pipe fittings shall comply with the following:

- …
- (8) Special fittings such as couplings, proprietary-type joints, saddle tees, gland-type compression fittings, and flared, flareless, or compression-type tubing fittings shall be as follows:
  - (a) Used within the fitting manufacturer's pressure-temperature recommendations.
  - (b) Used within the service conditions anticipated with respect to vibration, fatigue, thermal expansion, or contraction.
  - ~~(c) Installed or braced to prevent separation of the joint by gas pressure or external physical damage.~~
  - ~~(d)~~ (c) ~~Approved by~~ Acceptable to the Authority Having Jurisdiction.

METALLIC PIPING JOINTS AND FITTINGS: 1208.6.10 CONTINUED (2021 EDITION)

- Revision of Section 1208.6.10.5:

~~1208.6.10.6~~ 1208.6.10.5 Metallic Pipe Fittings. Metallic pipe fittings shall comply with the following:

- …
- (9) When pipe fittings are drilled and tapped in the field, the operation shall be in accordance with the following:
  - (a) The operation shall be performed on systems having operating pressures of 5 psi (34 kPa) or less.
  - (b) The operation shall be performed by the gas supplier or their designated representative.
  - (c) The drilling and tapping operation shall be performed in accordance with written procedures prepared by the gas supplier.
  - (d) The fittings shall be located outdoors.
  - (e) The tapped fitting assembly shall be inspected and proven to be free of leaks. [NFPA 54:5.6.7.5 ~~(1-8)~~]

PLASTIC PIPING, JOINTS, AND FITTINGS: 1208.6.11 (2021 EDITION)

- Revision of Section 1208.6.11 and 1208.6.11.2:

1208.6.11 Plastic Piping, Joints, and Fittings. Plastic pipe, tubing, and fittings shall be ~~installed~~ joined in accordance with the manufacturer's ~~installation~~ instructions. Section 1208.6.11.1 through Section 1208.6.11.4 shall be observed ~~where~~ when making such joints. [NFPA 54:5.6.8]

1208.6.11.2 Heat-Fusion Joint. Heat-fusion joints shall be made in accordance with qualified procedures that have been established and proven by test to produce gastight joints at least 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 D2513." [NFPA 54:5.6.8(2)]

PLASTIC PIPING, JOINTS, AND FITTINGS: 1208.6.11 CONTINUED (2021 EDITION)

- Revision of Section 1208.6.11.3:

1208.6.11.3 Compression-Type Mechanical Joints. Where compression-type mechanical joints are used, the gasket material in the fitting shall be compatible with the plastic piping and with the gas distributed by the system. An internal tubular rigid stiffener shall be used in conjunction with the fitting. The stiffener shall be flush with the end of the pipe or tubing and shall extend ~~not less than~~ at least to the outside end of the compression fitting ~~where~~ when installed. The stiffener shall be free of rough or sharp edges and shall not be a forced fit in the plastic. Split tubular stiffeners shall not be used. [NFPA 54:5.6.8(3)]

FLANGE GASKETS: 1208.6.13 (2021 EDITION)

- Revision of Section 1208.6.13.1:

1208.6.13.1 Flange Gasket Materials. Acceptable materials shall include the following:

- (1) Metal (plain or corrugated)
- (2) Composition
- (3) Aluminum ~~o~~ "O" rings
- (4) Spiral-wound metal gaskets
- (5) Rubber-faced phenolic
- (6) Elastomeric [NFPA 54:5.6.10.1]

VENTING OF LINE PRESSURE REGULATORS: 1208.8.4 (2021 EDITION)

- Revision of Section 1208.8.4:

1208.8.4 Venting of Line Pressure Regulators. Line pressure regulators shall comply with all of the following:

- (1) An independent vent to the exterior of the building, sized in accordance with the regulator manufacturer's instructions, shall be provided where the location of a regulator is such that a ruptured diaphragm will cause a hazard.
  - (a) Where more than one regulator is at a location, each regulator shall have a separate vent to the outdoors or, if approved by the Authority Having Jurisdiction, the vent lines shall be permitted to be manifolded in accordance with accepted engineering practices to minimize back pressure in the event of diaphragm failure.
  - (b) Materials for vent piping shall be in accordance with Section 1208.6 through Section 1208.6.11.3.

Exception: A regulator and vent limiting means combination listed as complying with CSA Z21.80 shall be permitted to be used without a vent to the outdoors.

BACKPRESSURE PROTECTION: 1208.12 (2021 EDITION)

- Revision of Section 1208.12:

1208.12 Backpressure Protection. Protective devices shall be installed as close to the equipment as practical where the design of the equipment connected is such that air, oxygen, or standby gases ~~are capable of being~~ could be forced into the gas supply system.

Gas and air combustion mixers incorporating double diaphragm “zero” or “atmosphere” governors or regulators shall require no further protection unless connected directly to compressed air or oxygen at pressures of 5 psi (34 kPa) or more. [NFPA 54:5.10.1.1 – 5.10.1.2] with CSA Z21.80 shall be permitted to be used without a vent to the outdoors.

CONCEALED PIPING IN BUILDINGS: 1210.4 (2021 EDITION)

- Revision of Section 1210.4 and 1210.4.1:

1210.4 Concealed Piping in Buildings. Gas piping in concealed locations shall be installed in accordance with this section. [NFPA 54:7.3.1]

1210.4.1 Connections. Where gas piping is to be concealed, connections shall be of the following type:

- (1) Pipe fittings such as elbows, tees, couplings, and right/left nipple/couplings.
- (2) Joining tubing by brazing (see Section ~~1208.6.10.2~~ 1208.6.10.1).
- (3) Press-connect fittings listed to CSA LC 4 ~~for use in concealed spaces or that have been demonstrated to sustain, without leakage, forces due to temperature expansion or contraction, vibration, or fatigue based on their geographic location, application, or operation.~~
- (4) CSST Fittings listed to CSA LC 1.
- ~~(4)~~ (5) Where necessary to insert fittings in the gas pipe that has been installed in a concealed location, the pipe shall be reconnected by welding, flanges, or the use of a right/left nipple/coupling.

CAP OUTLETS: 1210.8.1 (2021 EDITION)

- Revision of Section 1210.8.1:

1210.8.1 Cap Outlets. Each outlet, including a valve, shall be closed gastight with a threaded plug or cap immediately after installation and shall be left closed until the appliance or equipment is connected thereto.

~~Where~~ When an appliance or equipment is disconnected from an outlet, and the outlet is not to be used again immediately, it shall be capped or plugged gastight.

Exceptions:

- (1) Laboratory appliances installed in accordance with Section 1212.3.1 shall be permitted.
- (2) The use of a listed quick-disconnect device with integral shutoff or listed gas convenience outlet shall be permitted. [NFPA 54:7.7.2.1]

PIPING SYSTEM LEAK TEST: 1213.5 (2021 EDITION)

- Revision of Sections 1213.5 and 1213.5.1:

1213.5 Piping System Leak Test. Leak checks using fuel gas shall be permitted in piping systems that have been pressure-tested in accordance with Section 1213.0. [NFPA 54:8.2.1]

1213.5.1 Turning Gas On. During the process of turning gas on into a system of new gas piping, the entire system shall be inspected to determine that there are no open fittings or ends and that all valves at unused outlets are closed and plugged or capped. [NFPA 54:8.2.2]

PIPING SYSTEM LEAK TEST: 1213.5 (2021 EDITION)

- Revision of Sections 1213.5.2 and 1213.5.3:

1213.5.2 Leak Check. Immediately after the gas is turned on into a new system or into a system that has been initially restored after an interruption of service, the piping system shall be checked for leakage. Where leakage is indicated, the gas supply shall be shut off until the necessary repairs have been made. [NFPA 54:8.2.3]

1213.5.3 Placing Appliances and Equipment in Operation. Appliances and equipment shall not be placed in operation until after the piping system has been checked for leakage in accordance with Section 1213.5.2, the piping system is purged in accordance with Section 1213.6, and connections to the appliance are checked for leakage. [NFPA 54:8.2.4]

PURGING REQUIREMENTS: 1213.6 (2021 EDITION)

- Revision of Sections 1213.6 and 1213.6.1:

1213.6 Purging Requirements. The purging of piping shall be in accordance with Section 1213.6.1 through Section 1213.6.3. [NFPA 54:8.3]

1213.6.1 Piping Systems Required to be Purged Outdoors. The purging of piping systems shall be in accordance with ~~the provisions of~~ Section 1213.6.1.1 through Section 1213.6.1.5 where the piping system meets either of the following:

- (1) The design operating gas pressure is greater than 2 psig (14 kPa).
- (2) The piping being purged contains one or more sections of pipe or tubing meeting the size and length criteria of Table 1213.6.1. [NFPA 54:8.3.1]

VARIABLE GAS PRESSURE: 1215.6 (2018 EDITION)

1215.6 Variable Gas Pressure. Where the supply gas
pressure exceeds ~~139 inches~~ 5 psi (34.6 kPa) ~~of water column~~
for natural gas and ~~277 inches~~ 10 psi (69 kPa) ~~of water column~~
for undiluted propane or is less than 6 inches (1.5 kPa) of water
column, or where diversity demand factors are used, the design,
pipe, sizing, materials, location, and use of such systems first
shall be approved by the Authority Having Jurisdiction. Piping
systems designed for pressures exceeding the serving gas
supplier's standard delivery pressure shall have prior verification
from the gas supplier of the availability of the design pressure.

HOUSTON PUBLIC WORKS

UPC CHAPTER 13 HEALTH CARE FACILITIES AND MEDICAL GAS AND MEDICAL VACUUM SYSTEMS

BUILDING SYSTEM RISK CATEGORIES: 1302.1 (2018 EDITION)

1302.1 Building System Risk Categories.

1302.1.1 Risk Assessment. New section.

1302.1.2 Document Risk Assessment. New section.

1302.1 Building System Risk Categories. Activities, systems, or equipment shall be designed to meet Category 1 through Category 4 requirements as detailed in this code. [NFPA 99:4.1]

1302.1.1 Risk Assessment. Categories shall be determined by following and documenting a defined risk assessment procedure. [NFPA 99:4.2.1]

1302.1.2 Documented Risk Assessment. A documented risk assessment shall not be required for Category 1. [NFPA 99:4.2.2]

HEALTH CARE FACILITIES: 1303.0 (2021 EDITION)

- Revision of Sections 1303.8 and 1303.9:

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.

1303.9 Work Performed in Occupied Healthcare Facilities. In existing, occupied, inpatient healthcare facilities, all plumbing systems installation and remodel work shall be performed by personnel certified in accordance with ASSE/IAPMO 12010, ASSE/IAPMO 12030 and ASSE/IAPMO 12040.

CENTRAL SUPPLY SYSTEMS: 1307.0 (2021 EDITION)

- Revision of Section 1307.3:

1307.3 Permitted Locations for Medical Gases. Central supply systems for oxygen, medical air, nitrous oxide, carbon dioxide, and all other patient medical gases shall be piped only to medical gas outlets complying with Section ~~1316.0~~ 1315.0, into areas where the gases will be used under the direction of licensed medical professionals for purposes congruent with the following:

- (1) Direct respiration by patients.
- (2) Clinical application of the gas to a patient, such as the use of an insufflator to inject carbon dioxide into patient body cavities during laparoscopic surgery and carbon dioxide used to purge heart-lung machine blood flow ways.
- (3) Medical device applications directly related to respiration.
- (4) Power for medical devices used directly on patients.
- (5) Calibration of medical devices intended for Section 1307.3(1) through Section 1307.3(4).
- (6) Simulation centers for the education, training, and assessment of health care professionals. [NFPA 99:5.1.3.5.2]

OXYGEN CONCENTRATOR SUPPLY UNITS: 1309.0 (2021 EDITION)

- Revision of Sections 1309.1 and 1309.2:

1309.1 Oxygen Requirements. Oxygen concentrator supply units for use with medical gas pipelines shall produce oxygen meeting the requirements of Oxygen 93 USP or Oxygen USP. [NFPA 99:5.1.3.5.11.1]

1309.2 Particulate Size. Output shall have less than or equal to ~~6.85 × 10-7~~ 1.686 x 10-6 pounds per cubic yard (1 mg/m3) of permanent particulates sized 1 micron or larger at normal atmospheric pressure. [NFPA 99:5.1.3.5.11.2]

OXYGEN CONCENTRATOR SUPPLY UNITS: 1309.0 CONTINUED (2021 EDITION)

- Revision of Sections 1309.4 and 1309.8.1:

1309.4 Compatible Materials. Materials of construction on the oxygen side of the oxygen concentrator unit shall comply with Section ~~1307.3(4)~~ 1307.4(4) [NFPA 99:5.1.3.5.11.4]

1309.8.1 Venting of Relief Valves. Indoor supply systems shall have all relief valves vented per Section ~~1308.2(1)~~ 1308.2(4) through Section 1308.2(9). [NFPA 99:5.1.3.3.3.2]

CATEGORY 1 MEDICAL AIR CENTRAL SUPPLY SYSTEMS: 1310.0 (2021 EDITION)

- Revision of Section 1310.2:

1310.2 Uses of Medical Air. Medical air sources shall be connected to the medical air distribution system only and shall be used only for air in the application of human respiration and calibration of medical devices for respiratory application. [NFPA 99:5.1.3.6.2]

GENERAL: 1312.1 (2018 EDITION)

1312.1 General. New or replacement valves shall be permitted
to be of any type as long as they meet the following conditions:
Revise- (3) They are constructed of materials ~~approved~~ suitable for the service.
Add- (6) They permit in-line serviceability.
(7) They are cleaned for oxygen service by the manufacturer if
used for any positive pressure service. [NFPA 99:5.1.4.1.6]

MEDICAL SURGICAL VACUUM CENTRAL SUPPLY SYSTEMS: 1312.0 (2021 EDITION)

- Addition of Section 1312.5:

1312.5 Piping Arrangement and Redundancies.

Piping arrangement shall be as follows:

- (1) Piping shall be arranged to allow service and a continuous supply of medical–surgical vacuum in the event of a single fault failure.
- (2) Piping arrangement shall be permitted to vary based on the technology(ies) employed, provided that an equal level of operating redundancy is maintained.
- (3) Where only one set of vacuum pumps is available for a combined medical–surgical vacuum system and an analysis, a research, or a teaching laboratory vacuum system, such laboratories shall be connected separately from the medical–surgical system directly to the receiver tank through its own isolation valve and fluid trap located at the receiver, and between the isolation valve and fluid trap, a scrubber shall be permitted to be installed. [NFPA 99:5.1.3.7.5, 5.1.3.7.5.1]

MEDICAL SURGICAL VACUUM CENTRAL SUPPLY SYSTEMS: 1312.0 CONTINUED (2021 EDITION)

- Addition of Sections 1312.6 and 1312.7:

1312.6 Piping Serviceability. The medical-surgical vacuum receiver(s) shall be serviceable without shutting down the medical-surgical vacuum system by any method to ensure continuation of service to the facility's medical-surgical pipeline distribution system. [NFPA 99:5.1.3.7.5.2]

1312.7 Shutoff Valve. Medical-surgical vacuum central supply systems shall be provided with a source shutoff valve per Section 1314.6. [NFPA 99:5.1.3.7.5.3]

MAIN LINE VALVES: 1312.9.3 (2018 EDITION)

1312.9.3 Main Line Valves. Main line valves shall be
labeled in substance as follows:
MAIN LINE VALVE FOR THE
(GAS/VACUUM NAME)
SERVING (NAME OF BUILDING)
[NFPA 99:5.1.11.2.4]

ELECTRICAL POWER AND CONTROL: 1314.0 (2021 EDITION)

- Removal of Sections 1314.0, 1314.1, and 1314.2:

~~1314.1 Vacuum Pumps. Medical vacuum source systems shall be controlled to ensure continuous supply of suction at pressures consistent with Table 1305.1 under all conditions of system use as follows:~~

- ~~(1) Automatic activation of pump(s) as necessary to supply the demand.~~
- ~~(2) Managing the operation to equalize wear on all pumps. Where this equalization is achieved manually, the facility staff shall arrange a schedule for manual alternation. [NFPA 99:5.1.3.7.6(A)]~~

~~1314.2 Electrical Installation and Wiring. Electrical installation and wiring shall conform to the requirements of NFPA 70. [NFPA 99: 5.1.3.7.6(E)]~~

CATEGORY 2 MEDICAL-SURGICAL VACUUM: 1315.2.1 (2018 EDITION)

1315.2.1 Category 2 Medical-Surgical Vacuum. Category 2 systems shall comply with Section 1315.0, except as follows:

(1) Medical-surgical vacuum systems shall be permitted to be simplex.

(2) The facility shall develop their emergency plan to deal with the loss of medical-surgical vacuum. [NFPA 99:5.2.3.6]

CATEGORY 3 MEDICAL-SURGICAL VACUUM: 1315.2.2 (2018 EDITION)

1315.2.2 Category 3 Medical-Surgical Vacuum. Category 3 medical-surgical vacuum systems if used, shall comply with Section 1315.2. [NFPA 99:5.3.3.9]

STATION OUTLETS AND INLETS: 1315.0 (2021 EDITION)

- Addition of Sections 1315.4, 1315.5, and 1315.6:

1315.4 Identification. Each outlet/inlet shall be legibly identified in accordance with 1323.15. [NFPA 99:5.1.5.5]

1315.5 Threaded Outlets/Fittings. Threaded outlets/inlets shall be noninterchangeable connections complying with the mandatory requirements of CGA V-5. [NFPA 99:5.1.5.6]

1315.6 Gas-Specific Station Outlet/Inlet. Each station outlet/inlet, including those mounted in columns, hose reels, ceiling tracks, or other special installations, shall be designed so that parts or components that are required to be gas-specific for compliance with Section 1315.1 and Section 1315.8 cannot be interchanged between the station outlet/inlet for different gases. [NFPA 99:5.1.5.7]

STATION OUTLETS AND INLETS: 1315.0 CONTINUED (2021 EDITION)

- Addition of Sections 1315.7, 1315.8, and 1315.9:

1315.7 Common Parts. The use of common parts in outlets/inlets, such as springs, O-rings, fasteners, seals, and shut-off poppets, shall be permitted. [NFPA 99:5.1.5.8]

1315.8 Marking of Components. Components of a vacuum station inlet necessary for the maintenance of vacuum specificity shall be legibly marked to identify them as components or parts of a vacuum or suction system. [NFPA 99:5.1.5.9]

1315.9 Components Not Specific to a Vacuum. Components of inlets not specific to a vacuum shall not be required to be marked. [NFPA 99:5.1.5.10]

STATION OUTLETS AND INLETS: 1315.0 CONTINUED (2021 EDITION)

- Addition of Sections 1315.10, 1315.11, and 1315.12:

1315.10 Factory-Installed Copper Inlet Tubes. Factory-installed copper inlet tubes on station outlets extending no further than 8 inches (203 mm) from the body of the terminal shall be not less than DN8 (NPS 1/4) (3/8-inch O.D.) size, with 0.3-inch (7.6 mm) minimum inside diameter. [NFPA 99:5.1.5.11]

1315.11 Factory-Installed Copper Outlet Tubes. Factory-installed copper outlet tubes on station inlets extending no further than 8 inches (203 mm) from the body of the terminal shall be not less than DN10 (NPS 3/8) (1/2 in. O.D.) size, with 0.4-inch (10.2 mm) minimum inside diameter. [NFPA 99:5.1.5.12]

1315.12 Protection from Damage. Station outlets/inlets shall be permitted to be recessed or otherwise protected from damage. [NFPA 99:5.1.5.13]

STATION OUTLETS AND INLETS: 1315.0 CONTINUED (2021 EDITION)

- Addition of Sections 1315.13 and 1315.14:

1315.13 Multiple Wall Outlets/Inlets. When multiple wall outlets/inlets are installed, they shall be spaced to allow the simultaneous use of adjacent outlets/inlets with any of the various types of therapy equipment. [NFPA 99:5.1.5.14]

1315.14 Nonstandard Operation Pressures. Station outlets in systems having nonstandard operating pressures shall meet the following additional requirements:

- (1) They shall be gas-specific.
- (2) They shall be pressure-specific where a single gas is piped at more than one operating pressure [e.g., a station outlet for oxygen at 80 psi (552 kPa) shall not accept an adapter for oxygen at 50 psi (345 kPa)].
- (3) If operated at a pressure in excess of 80 psi (552 kPa they shall be either D.I.S.S. connectors or comply with 1316.14(4).
- (4) If operated at a gauge pressure between 200 psi and 300 psi (1379 kPa and 2068 kPa), the station outlet shall be designed so as to prevent the removal of the adapter until the pressure has been relieved to prevent the adapter injuring the user or others when removed from the out-let. [NFPA 99:5.1.5.15]

CATEGORY 3 GAS POWERED DEVICE DISTRIBUTION PIPING: 1319.7.2.1 (2018 EDITION)

1319.7.2.1 Category 3 Gas Powered Device Distribution Piping. The source valve shall be closed unless the source gas is being used for the test. [NFPA 99:5.3.12.2.9(2)]

CATEGORY 3 GAS POWERED DEVICE DISTRIBUTION PIPING: 1319.7.3.1 (2018 EDITION)

1319.7.3.1 Category 3 Gas Powered Device Distribution Piping. The piping systems shall be subjected to a 24hour standing pressure testing using oil-free, dry nitrogen NF or the system gas. [NFPA 99:5.3.12.2.9(3)]

CATEGORY 3 GAS POWERED DEVICE DISTRIBUTION PIPING: 1319.7.5.1 (2018 EDITION)

1319.7.5.1 Category 3 Gas Powered Device Distribution Piping. At the conclusion of the tests, there shall be no change in the test pressure greater than a gauge pressure of 5 psi (35 kPa). [NFPA 99:5.1.12.2.6.4, 5.3.12.2.9(5)]

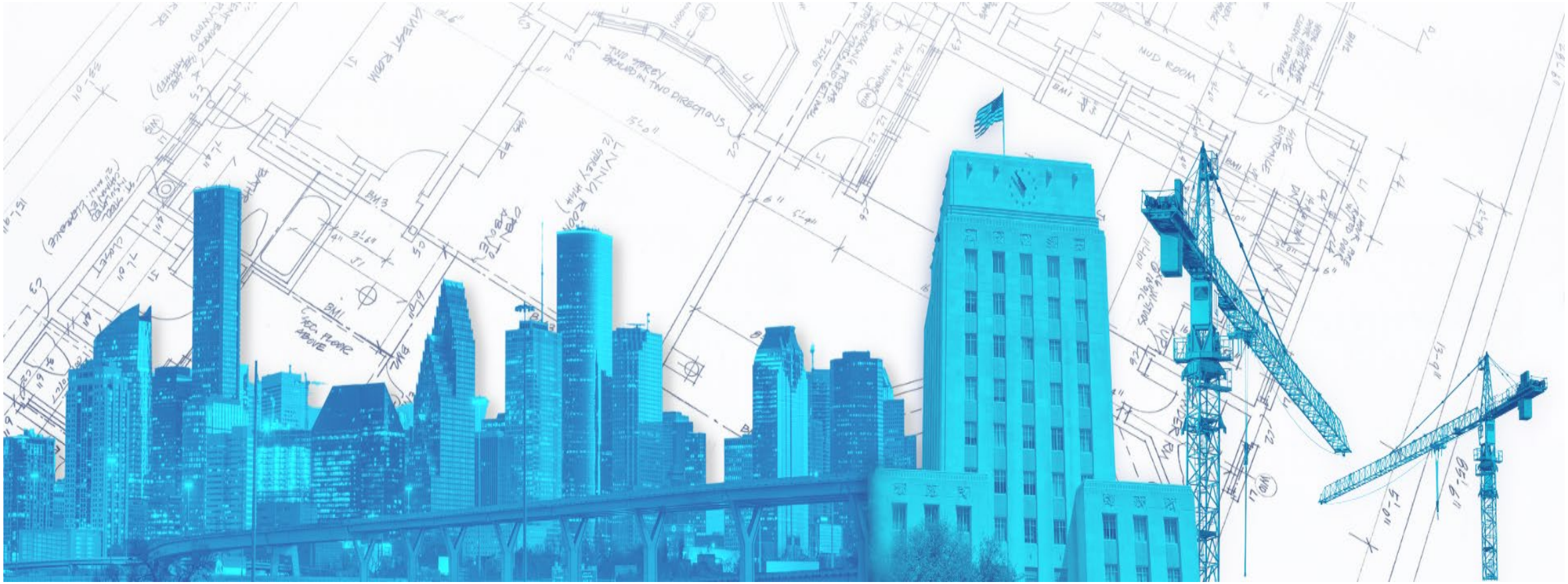
PURGING AND SHIELD GAS: 1321.6 AND 1322.1.4 (2021 EDITION)

- Addition of Sections 1321.6 and 1322.1.4:

1321.6 Purging. Braze joints shall be continuously purged with nitrogen NF. [NFPA 99:5.1.10.4.1.10]

1322.1.4 Shield Gas. The shield gas shall be as required in Section 1322.1.3. [NFPA 99:5.1.10.5.1.6]

UPC APPENDIX L SUSTAINABLE PRACTICES



APPROVAL: L 407.2 (2018 EDITION)

L 407.2 Approval. New section.

L 407.2 Approval. Dedicated meters, other than water utility meters shall be approved by the Authority Having Jurisdiction for the intended use.

CONDENSATE DRAINAGE RECOVERY: L 408.1.1 (2018 EDITION)

L 408.1.1 Condensate Drainage Recovery.
New section.

L 408.1.1 Condensate Drainage Recovery. Condensate from air-conditioning, boiler and steam systems used to supply water for non-potable water systems shall be in accordance with Section 1506.0.

SELF-SERVICE: L 413.2 (2018 EDITION)

L 413.2 Self-Service. New section.

L 413.2 Self-Service. Spray wands and foamy brushes shall use not more than 3.0 gpm (0.19 L/s).

REVERSE OSMOSIS: L 413.3 (2018 EDITION)

L 413.3 Reverse Osmosis. New section.

L 413.3 Reverse Osmosis. Spot-free reverse osmosis discharge (reject) water shall be recycled.

TOWEL RINGERS: L 413.4 (2018 EDITION)

L 413.4 Towel Ringers. New section.

L 413.4 Towel Ringers. Towel ringers shall have a positive shutoff valve. Spray nozzles shall be replaced annually.

Exception: Bus and large commercial vehicle washes are exempt from the requirements of this section.

PERFORMANCE REQUIREMENTS FOR WATER-HEATING EQUIPMENT MINIMUM EFFICIENCY REQUIREMENTS: TABLE L 503.3.2 (2018 EDITION)

TABLE L 503.3.2 PERFORMANCE REQUIREMENTS FOR WATER-HEATING EQUIPMENT MINIMUM EFFICIENCY REQUIREMENTS. Table revised.

INSULATION: L 503.3.3 (2018 EDITION)

L ~~603.3.3~~ 503.3.3 Insulation. Add- (3) The first 8 feet (2438 mm) of branch piping connecting to recirculated, heat-traced, or impedance heated piping.

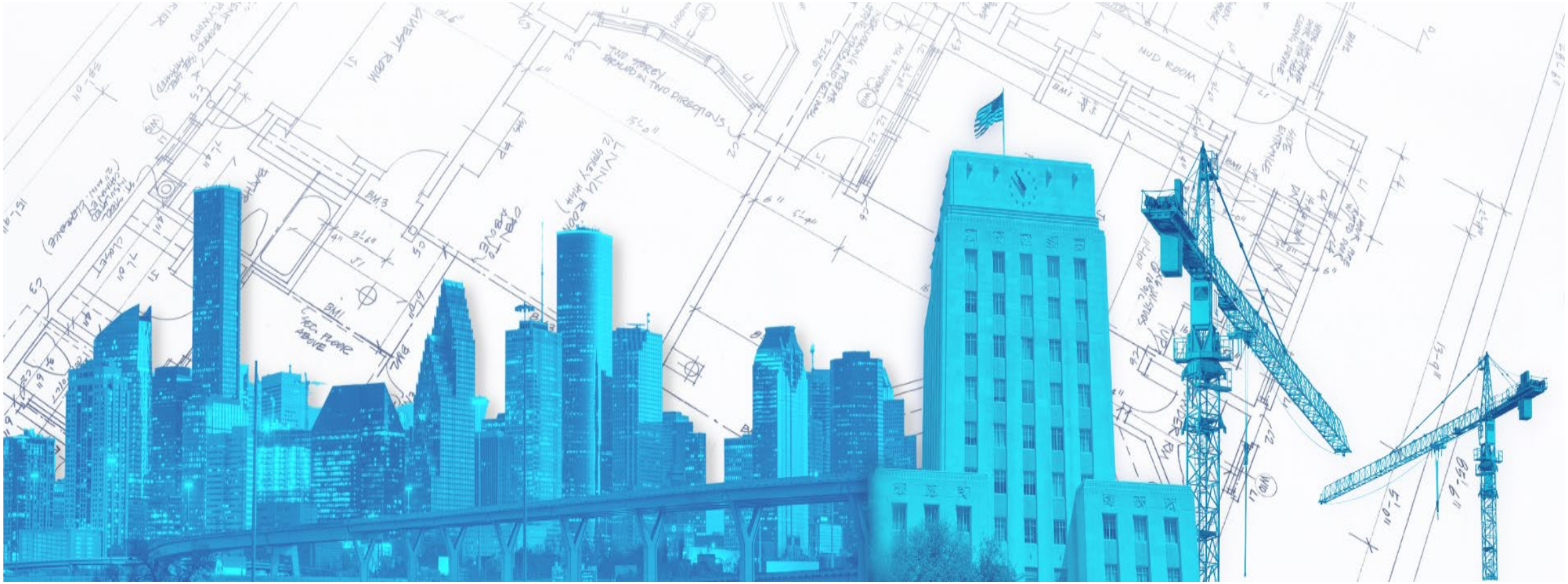
(4) The inlet piping between the storage tank and a heat trap in a nonrecirculating storage system.

(5) Piping that is externally heated (such as heat trace or impedance heating). [ASHRAE 90.1:7.4.3]

BUILDINGS WITH HIGH-CAPACITY SERVICE WATER HEATING SYSTEMS: L 503.4.2.1 (2018 EDITION)

L 503.4.2.1 Buildings with High-Capacity Service Water Heating Systems. Revise- (3) Individual gas water heaters with input capacity, not more than ~~1 000 000~~ 100 000 Btu/h (29.3 kW). [ASHRAE 90.1:7.5.3]

UPC APPENDIX M PEAK WATER DEMAND CALCULATOR



APPENDIX M PEAK WATER DEMAND CALCULATOR (2018 EDITION)

- See 2018 UPC for full Appendix M:

M 101.0 General.

M 101.1 Applicability. This appendix provides a method for estimating the demand load for the building water supply and principal branches for single- and multi-family dwellings with water-conserving plumbing fixtures, fixture fittings, and appliances.

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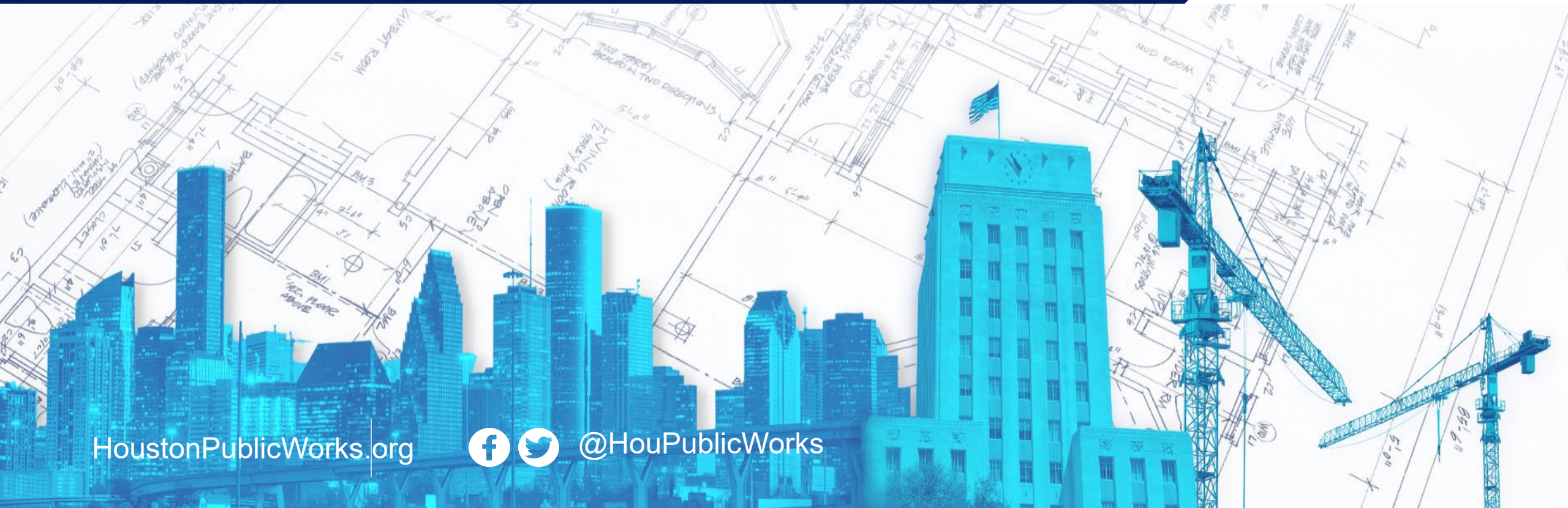
THANK YOU!



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