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2015 Houston UPC – Chapter 1 Administration	2021 UPC – Chapter 1 – Administration	2021 Houston UPC Amendments	Code Change Summary
101.1 Title. ~~This document~~ These regulations shall be known as the ~~Uniform~~ *City of Houston Plumbing Code*, ~~may be cited as such and will be referred to~~ herein after referred to as "this code~~.~~" and also known as the *Plumbing Code*. The City of Houston *Construction Code* collectively includes this volume and certain other codes, pamphlets, specifications and documents that are adopted in or by reference through the adopting ordinance, City of Houston Ordinance No. 2021-1037[4].		**101.1 Title.** ~~This document~~ These regulations shall be known as the "~~Uniform~~ *City of Houston Plumbing Code*," ~~may be cited as such, and will be referred to~~ herein after referred to as "this code~~.~~" and also known as the *Plumbing Code*. The City of Houston *Construction Code* collectively includes this volume and certain other codes, pamphlets, specifications and documents that are adopted in or by reference through the adopting ordinance, City of Houston Ordinance No. 2023-907.	**No change to Houston amendment.**
102.1 Conflicts Between Codes. ~~Where the requirements within the jurisdiction of this plumbing code conflict with the requirements of the mechanical code, this code shall prevail~~. In instances where this code, applicable standards, or the manufacturer's installation instructions conflict, the more stringent provisions shall prevail. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall prevail. Where, in any specific instance, provisions of this code, including adopted appendices, specify different materials, different methods of construction, or other requirements that differ from those provided in the *City Code* or other volumes of the *Construction Code*, including adopted appendices, other than the *Fire Code* and its adopted appendices and standards, the most restrictive shall prevail. Where, in any specific instance, provisions of this code, including adopted appendices, specify different materials, different methods of construction, or other requirements that differ from those provided in the *Fire Code*, including its adopted appendices and standards, and the *building official* and the fire marshal are unable to mutually reconcile the requirements by issuing a written interpretation, then either of them may refer the matter to the General Appeals Board created under the *Building Code*, which shall conduct a review of the matter and issue a written code interpretation based upon the apparent intent of the codes involved. Notwithstanding any other provision, interpretations that are issued by the General Appeals Board shall not be subject to further appeal.		**102.1 Conflicting Provisions ~~Between Codes~~.** ~~Where the requirements within the jurisdiction of this plumbing code conflict with the requirements of the mechanical code, this code shall prevail.~~ In instances where this code, applicable standards, or the manufacturer's installation instructions conflict, the more stringent provisions shall prevail. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall prevail. Where, in any specific instance, provisions of this code, including adopted appendices, specify different materials, different methods of construction, or other requirements that differ from those provided in the *City Code* or other volumes of the *Construction Code*, including adopted appendices, other than the *Fire Code* and its adopted appendices and standards, the most restrictive shall prevail. Where, in any specific instance, provisions of this code, including adopted appendices, specify different materials, different methods of construction, or other requirements that differ from those provided in the *Fire Code*, including its adopted appendices and standards, and the *building official* and the fire marshal are unable to mutually reconcile the requirements by issuing a written interpretation, then either of them may refer the matter to the General Appeals Board created under the *Building Code*, which shall conduct a review of the matter and issue a written code interpretation based upon the apparent intent of the codes involved. Notwithstanding any other provision, interpretations that are issued by the General Appeals Board shall not be subject to further appeal.	**No change to Houston amendment.**
102.1.1 Residential Code. Plumbing for detached one- and two-family dwellings and townhouses not more than three stories high with separate means of egress and their accessory structures shall comply with the *Residential Code*. Plumbing for residential occupancies to which the *Residential Code* does not apply shall be governed by this code. **102.1.2 Energy Efficiency.** The *Energy Conservation Code* and Chapter 11 of the *Residential Code*, and any amendments adopted as authorized by state law,		**102.1.1 Residential Code.** Plumbing for detached one- and two-family dwellings and townhouses not more than three stories above grade plane in height, each with separate means of egress, and their accessory structures not more than three stories above grade plane in height shall comply with the *Residential Code*. Plumbing for residential occupancies to which the *Residential Code* does not apply shall be governed by this code. **102.1.2 Energy Efficiency.** The *Energy Conservation Code* and Chapter 11 of the *Residential Code*, and any amendments adopted as authorized by state law,	**No change to Houston amendment.**

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constitute the energy efficiency/conservation codes of the jurisdiction. **102.1.3 Irrigation Systems.** Irrigation systems shall comply with standards and specifications regarding the design, installation, and operation of such systems in accordance with Chapter 344 of the Texas Administrative Code, Chapter 1903 of the Texas Occupations Code and any rules adopted by the Texas Commission on Environmental Quality pursuant to Section 1903.053 of the Texas Occupations Code.		constitute the energy efficiency/conservation codes of the jurisdiction. **102.1.3 Irrigation Systems.** Irrigation systems shall comply with standards and specifications regarding the design, installation, and operation of such systems in accordance with Title 30, Chapter 344 of the Texas Administrative Code, Chapter 1903 of the Texas Occupations Code and any rules adopted by the Texas Commission on Environmental Quality pursuant to Section 1903.053 of the Texas Occupations Code.	
102.8 Appendices. The provisions on the appendices are intended to supplement the requirements of this code and shall not be considered part of this code unless formally adopted as such. Appendices A, B, C, I, K, and L, as amended by this jurisdiction, are hereby adopted and shall be incorporated into and made part of this code.		**102.8 Appendices.** The provisions in the appendices are intended to supplement the requirements of this code and shall not be considered part of this code unless formally adopted as such. Appendices A, B, C, I, K, L, and N as amended by this jurisdiction are hereby adopted and shall be incorporated into and made part of this code.	**Amendment includes new Appendix N adoption.**
102.9 Exempt Installations. The provisions of this code shall not apply to: **(1)** Gas service mains from the street main to the meter. **(2)** The installation of gas meters by the utility organization supplying gas. **(3)** Gas piping installations of the utility organization made on its own or public premises and part of the general gas supply and distribution for this jurisdiction and surrounding communities. **(4)** The installation of public sewers and public water distribution systems by this jurisdiction, its contractors, agents and employees.		**102.9 Exempt Installations.** The provisions of this code shall not apply to: (1) Gas service mains from the street main to the meter. (2) The installation of gas meters by the utility organization supplying gas. (3) Gas piping installations of the utility organization made on its own or public premises and part of the general gas supply and distribution for this jurisdiction and surrounding communities. (4) The installation of public sewers and public water distribution systems by this jurisdiction, its contractors, agents and employees.	**No change to Houston amendment.**
102.10 Homeowners. In accordance with the Plumbing License Law, nothing in this code shall prevent any homeowner from installing and maintaining plumbing in a building owned and occupied by him as his homestead and done in compliance with the requirements of all applicable state adopted codes and ordinances of this jurisdiction. Such privilege does not grant the right to violate any of the provisions of this code or state adopted codes, nor it is to be construed as exempting any such property owner from obtaining a permit and paying the required fees therefor, except for work that is exempt from permitting under this code.		**102.10 Homeowners.** In accordance with the Plumbing License Law, this code shall not prevent any homeowner from installing and maintaining plumbing in a building owned and occupied by the owner as his homestead if done in compliance with the requirements of all applicable state-adopted codes and ordinances of this jurisdiction. Such privilege does not grant the right to violate any of the provisions of this code or state-adopted codes, nor shall it be construed as exempting any such property owner from obtaining a permit and paying the required fees therefor, except for work that is exempt from permitting under this code.	**No change to Houston amendment.**
102.11 Basic Principles. The general requirements of this code are enunciated as necessary principles for proper, basic environmental sanitation through properly designed, acceptably installed, and adequately maintained plumbing systems. The following principles shall serve to define the intent of this code: **Principle No. 1.** All premises intended for human habitation, occupancy, or use shall be provided with a supply of potable water that is neither connected with unsafe water supplies nor subject to the hazards of backflow,		**102.11 Basic Principles.** The general requirements of this code are enunciated as necessary principles for basic environmental sanitation through designed, acceptably installed, and adequately maintained plumbing systems. The following principles shall serve to define the intent of this code: **Principle No. 1.** All premises intended for human habitation, occupancy, or use shall be provided with a supply of potable water that is neither connected with unsafe water supplies nor subject to the hazards of backflow, backsiphonage, or back pressure due to dormant or inert periods.	**No change to Houston amendment.**

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backsiphonage, or back pressure do to dormant or inert periods. **Principle No. 2.** Every building having plumbing fixtures installed and intended for human habitation, occupancy, or use and located on premises abutting on a street, alley, or easement in which there is a public sewer shall have a separate connection with such sewer. Where two or more buildings are located on one lot fronting 75 feet (22.9 m) or less on such street, alley, or easement and the lot is under one ownership, one sewer connection to the public main may be used for all buildings located thereon. On industrial tracts, apartment projects, or similar installations under one ownership where the sanitary sewers within the tract are maintained and operated by one owner, separate connections shall be made to the privately owned and maintained sewer, but only one connection need be made to the public sewer. **Principle No. 3.** Each dwelling unit shall have not less than one water closet, one bathtub or shower, one lavatory, and one kitchen-type sink. Adequate 120ºF (48ºC) hot water shall be provided to the tub or shower, lavatory, and kitchen sink. All other structures human occupancy or use on premises located within 300 feet (91.4 m) of a public sewer or having a private sewage-disposal system shall have adequate sanitary sewer facilities but in no case less than one water closet and one fixture for cleansing purposes. **Principle No. 4.** Plumbing fixtures shall be made of smooth, nonabsorbent material, shall be free from concealed fouling surface, and shall be located in ventilated enclosures. **Principle No. 5.** Each fixture directly connected to the drainage system shall be equipped with a water-seal trap. **Principle No. 6.** No substance that will clog the pipes, produce explosive mixtures, destroy the pipes or their joints or will interfere unduly with the sewage disposal process shall be allowed to enter the building drainage system. **Principle No. 7.** Proper protection shall be provided to prevent contamination of food, water, sterile goods, and similar materials by backflow of sewage. When necessary, the fixture, device, or appliance shall be connected indirectly with the building drainage system. **Principle No. 8.** No water closet shall be located in a room or compartment that is not properly lighted and ventilated. **Principle No. 9.** If water closets or other plumbing fixtures are installed in buildings located on premises where there is no public sewer available as determined by the provisions of all applicable ordinances, suitable provisions shall be made for disposing of the building sewage by a method of sewage treatment and disposal approved by the Authority Having Jurisdiction. On-site sewage disposal systems shall additionally comply with Chapter 366 of the Texas Health and Safety Code. **Principle No. 10.** Where a plumbing drainage system may be subject to backflow of sewage, suitable provisions shall be made to prevent its overflow in the building. **Principle No. 11.** Plumbing shall be installed with due regard to preservation of the strength of structural members		**Principle No. 2.** Every building having plumbing fixtures installed and intended for human habitation, occupancy, or use and located on premises abutting a street, alley, or easement in which there is a public sewer shall have a separate connection with such sewer. Where two or more buildings are located on one lot fronting 75 feet (22.9 m) or less on such street, alley, or easement and the lot is under one ownership, one sewer connection to the public main may be used for all buildings located thereon. On any industrial tract, apartment project, or similar installation under one ownership where the sanitary sewers within the tract, project or installation are maintained and operated by one owner, separate connections shall be made to the privately owned and maintained sewer, but only one connection need be made to the public sewer. **Principle No. 3.** Each dwelling unit shall have not less than one water closet, one bathtub or shower, one lavatory, and one kitchen-type sink. Adequate 120ºF (48ºC) hot water shall be provided to the tub or shower, lavatory, and kitchen sink. All other structures for human occupancy or use on premises located within 300 feet (91.4 m) of a public sewer or having a private sewage disposal system shall have adequate sanitary sewer facilities but in no case less than one water closet and one fixture for cleansing purposes. **Principle No. 4.** Plumbing fixtures shall be made of smooth, nonabsorbent material, shall be free from concealed fouling surface, and shall be located in ventilated enclosures. **Principle No. 5.** Each fixture directly connected to the drainage system shall be equipped with a water-seal trap. **Principle No. 6.** No substance that will clog the pipes, produce explosive mixtures, destroy the pipes or their joints or interfere unduly with the sewage disposal process shall be allowed to enter the building drainage system. **Principle No. 7.** Proper sewage backflow protection shall be provided to prevent overflow into the building as well as to prevent contamination of food, water, sterile goods, and similar materials. In any instance where the possibility of contamination may occur due to backflow or overflow the fixture, device, or appliance shall be connected indirectly to the building drainage system. **Principle No. 8.** No water closet shall be located in a room or compartment that is not properly lighted and ventilated. **Principle No. 9.** If water closets or other plumbing fixtures are installed in buildings located on premises where there is no public sewer available as determined by the provisions of all applicable ordinances, provisions shall be made for disposing of the building sewage by a method of sewage treatment and disposal approved by the Authority Having Jurisdiction. On-site sewage disposal systems shall additionally comply with Chapter 366 of the Texas Health and Safety Code.	

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and prevention of damage to walls and other surfaces through fixture usage. **Principle No. 12.** Sewage or other waste from a plumbing system that may be deleterious to surface or subsurface waters shall not be discharge into the ground or into any waterway unless it has first been rendered innocuous through subjection to a form of treatment that is approved by the Authority Having Jurisdiction and that meets the standards established by law.		**Principle No. 10.** Where a plumbing drainage system may be subject to backflow of sewage, provisions shall be made to prevent its overflow in the building. **Principle No. 11.** Plumbing shall be installed without compromise to the strength of structural members and to prevent damage to walls and other surfaces through fixture usage. **Principle No. 12.** Sewage or other waste from a plumbing system that may be deleterious to surface or subsurface waters shall not be discharged into the ground or into any waterway unless it has first been rendered innocuous through subjection to a form of treatment that is approved by the Authority Having Jurisdiction and that meets the standards established by applicable law.	
103.2 Liability. ~~The Authority Having Jurisdiction charged with the enforcement of this code, acting in good faith and without malice in the discharge of the Authority Having Jurisdiction's duties, shall not thereby be rendered personally liable for damage that accrues to persons or property as a result of an act or by reason of an act or omission in the discharge of duties. A suit brought against the Authority Having Jurisdiction or employee because of such act or omission performed in the enforcement of provisions of this code shall be defended by legal counsel provided by this jurisdiction until final termination of such proceedings.~~ Except as otherwise provided by law, the Authority Having Jurisdiction shall not personally be liable for any act or omission arising out of any official action taken to implement and enforce the provisions of this code. Additionally, except as otherwise provided by law, the Authority Having Jurisdiction shall not be personally liable for damages arising out of any act or omission committed in the course and scope of employment. Where and to the extent consistent with the provisions of Chapter 2, Article X, of the *City Code*, this jurisdiction shall provide legal representation and indemnification for any suit brought against the Authority Having Jurisdiction because of acts or omissions performed in the implementation or enforcement of this code. This code shall not be construed to relieve from or lessen the responsibility of any person owning, operating or controlling any building, structure, system or other construction for any damages to persons or property caused by defects, nor shall the code enforcement agency of the *jurisdiction* be held as assuming any such liability by reason of the inspections authorized by this code or any *permits* or certificates issued under this code.		**103.2 Liability.** ~~The Authority Having Jurisdiction charged with the enforcement of this code, acting in good faith and without malice in the discharge of the Authority Having Jurisdiction's duties, shall not thereby be rendered personally liable for damage that accrues to persons or property as a result of an act or by reason of an act or omission in the discharge of duties. A suit brought against the Authority Having Jurisdiction or employee because of such act or omission performed in the enforcement of provisions of this code shall be defended by legal counsel provided by this jurisdiction until final termination of such proceedings.~~ Except as otherwise provided by law, the Authority Having Jurisdiction shall not be personally liable for damages arising out of any act or omission arising out of any official action taken to implement or enforce the provisions of this code. Additionally, except as otherwise provided by law, the Authority Having Jurisdiction shall not be personally liable for damages arising out of any act or omission committed in the course and scope of employment. Where and to the extent consistent with the provisions of Chapter 2, Article X, of the *City Code*, this jurisdiction shall provide legal representation and indemnification for any suit or claim brought against the Authority Having Jurisdiction because of acts or omissions performed in the implementation or enforcement of this code. This code shall not be construed to relieve from or lessen the responsibility of any person owning, operating or controlling any building, structure, system or other construction for any damages to persons or property caused by defects, nor shall the code enforcement agency or the *jurisdiction* be held as assuming any such liability by reason of the inspections authorized by this code or any *permits* or certificates issued under this code.	**Minor wordsmithing change, no major change to Houston amendment.**
103.3.1 ~~Licensing.~~ ~~Provision for licensing shall be determined by the Authority Having Jurisdiction.~~ **Irrigation Permit.** An installer of an irrigation system shall obtain a separate permit for each property before installing such a system.		**103.3.1 ~~Licensing.~~** ~~Provision for licensing shall be determined by the Authority Having Jurisdiction.~~ **Irrigation Permit.** An installer of an irrigation system shall obtain a separate permit for each property before installing such a system.	**No change to Houston amendment.**

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104.2 Exempt Work. A permit shall not be required for the following: **(1)** The stopping of leaks in drains~~,~~ or soil, waste, or vent pipe, provided, however, that if a trap, drain pipe~~,~~ or soil, waste, or vent pipe become defective and it becomes necessary to remove and replace ~~the same~~ it with new material, ~~the same~~ it shall be considered as new work ~~and~~ for which a permit shall be procured and inspection made as provided in this code. **(2)** The clearing of stoppages, including the removal and reinstallation of bathroom or kitchen faucets or water closets, or the repairing of leaks in pipes, valves, or fixtures, provided such repairs do not involve or require the replacement or rearrangement of valves, pipes, or fixtures. Exemption from the permit requirements of this code shall not be deemed to grant authorization for work to be done in violation of the provisions of ~~the~~ this code or other laws or ordinances of this jurisdiction. This section shall be construed in a manner that is consistent with the Plumbing License Law, and no provision herein shall be construed to exempt work for which a permit is required to be obtained from this jurisdiction.		**104.2 Exempt Work.** A permit shall not be required for the following: **(1)** The stopping of leaks in drains~~,~~ or in soil, waste, or vent pipes, provided, however, that if a trap, drainpipe~~,~~ or soil, waste, or vent pipe becomes defective, and it becomes necessary to remove and replace ~~the same~~ it with new material, ~~the same~~ it shall be considered as new work ~~and~~ for which a permit shall be procured and inspection made as provided in this code. **(2)** The clearing of stoppages, including the removal and reinstallation of bathroom or kitchen faucets or water closets, or the repairing of leaks in pipes, valves, or fixtures, provided such repairs do not involve or require the replacement or rearrangement of valves, pipes, or fixtures. Exemption from the permit requirements of this code shall not be deemed to grant authorization for work to be done in violation of the provisions of ~~the~~ this code or other laws or ordinances of this jurisdiction. This section shall be construed in a manner that is consistent with the Plumbing License Law, and no provision herein shall be construed to exempt work for which a permit is required to be obtained from this jurisdiction.	**Minor wordsmithing change, intent of enforcement remains unchanged.**
104.3 Application for Permit. Upon application by a state-licensed master plumber or by a property owner of a building owned and occupied by him as his homestead to install storm and sanitary sewers, plumbing fixtures, appurtenances and appliances for drainage, gas, water and/or sewer lines, or medical gas, water treatment and/or irrigation lines and appurtenances, or by drain layer's license holders to install storm sewers, or by an installer of an irrigation system to install irrigation lines or systems, if the conditions and requirements of this code have been complied with and if there are adequate facilities or arrangements have been made to provide service to such plumbing installations, the Authority Having Jurisdiction shall issue a permit. No plumbing permit shall be issued until a building permit shall have first been issued where a building permit is required. To obtain a permit, the applicant shall first file an application therefore in writing on a form furnished by the Authority Having Jurisdiction for that purpose. Such application shall: **(1)** Identify and describe the work to be covered by the permit for which application is made. **(2)** Describe the land upon which the proposed work is to be done by legal description, street address, or similar description that will readily identify and definitely locate the proposed building or work. **(3)** Indicate the use or occupancy for which the proposed work is intended. **(4)** Be accompanied by construction documents in accordance with Section 104.3.1.		**104.3 Application for Permit.** Upon application by a state-licensed master plumber or by a property owner of a building owned and occupied by him as his homestead to install storm and sanitary sewers, plumbing fixtures, appurtenances and appliances for drainage, gas, water and/or sewer lines, or medical gas, water treatment and/or irrigation lines and appurtenances, or by drain layer's license holders to install storm sewers, or by an installer of an irrigation system to install irrigation lines or systems, if the conditions and requirements of this code have been complied with and if there are adequate facilities or arrangements have been made to provide service to such plumbing installations, the Authority Having Jurisdiction shall issue a permit. No plumbing permit shall be issued until a building permit has first been issued where a building permit is required. To obtain a permit, the applicant shall first file an application therefore in writing on a form furnished by the Authority Having Jurisdiction for that purpose. Such application shall: **(1)** Identify and describe the work to be covered by the permit for which application is made. **(2)** Describe the land upon which the proposed work is to be done by legal description, street address, or similar description that will readily identify and locate the proposed building or work. **(3)** Indicate the use or occupancy for which the proposed work is intended. **(4)** Be accompanied by construction documents in accordance with Section 104.3.1. **(5)** Be signed by the permittee or the permittee's authorized agent. The Authority Having Jurisdiction	**No change to Houston amendment.**

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(5) Be signed by the permittee or the permittee's authorized agent. The Authority Having Jurisdiction shall be permitted to require evidence to indicate such authority. **(6)** Give such other data and information ~~in accordance with~~ as may reasonably be required by the Authority Having Jurisdiction. **(7)** Be accompanied by the applicable fees as provided in the city fee schedule.		shall be permitted to require evidence to indicate such authority. **(6)** Give such other data and information ~~in accordance with~~ as may reasonably be required by the Authority Having Jurisdiction. **(7)** Be accompanied by the applicable fees as provided in the *city fee schedule*.	
104.3.2 Plan Review Fees. Where a plan or other data is required to be submitted in accordance with Section 104.3.1, a plan review fee shall be paid at the time of submitting construction documents for review. The plan review fees for plumbing systems work shall be charged as described in Section 118.1.11 of the *Building Code* and the city fee schedule ~~determined and adopted by this jurisdiction~~. The plan review fees specified in this subsection are separate fees from the permit fees ~~specified in Section 104.5~~. ~~Where plans are incomplete or changed so as to require additional review, a fee shall be charged at the rate shown in Table 104.5.~~ When approved plans are lost or changed so as to require an additional plan review or when a plan review is required and there is no building permit required, a plan review fee shall be charged as described in Section 118.2.8 of the *Building Code* and the city fee schedule.		**104.3.2 Plan Review Fees.** Where a plan or other data is required to be submitted in accordance with Section 104.3.1, a plan review fee shall be paid at the time of submitting construction documents for review. The plan review fees for plumbing systems work shall be charged as described in Section 118.1.11 of the Building Code and the *city fee schedule* ~~determined and adopted by this jurisdiction~~. The plan review fees specified in this subsection are separate fees from the permit fees ~~specified in Section 104.5~~. ~~Where plans are incomplete or changed so as to require additional review, a fee shall be charged at the rate shown in Table 104.5.~~ When approved plans are lost or changed so as to require an additional plan review or when a plan review is required and there is no building permit required, a plan review fee shall be charged as described in Section 118.2.8 of the Building Code and the *city fee schedule*.	**No change to Houston amendment.**
104.3.2.1 Deferred Submittal Plan Review Fees. A plan review fee shall be paid at the time of submitting construction documents for review of deferred submittal plans. The fee for any deferred submittal review shall be charged at the rate shown in the city fee schedule for a minimum permit fee plus applicable administration fee. The plan review fees specified in this subsection are separate fees from the permit fees.		**104.3.2.1 Deferred Submittal Plan Review Fees.** A plan review fee shall be paid at the time of submitting construction documents for review of deferred submittal plans. The fee for any deferred submittal review shall be charged at the rate shown in the *city fee schedule* for a minimum permit fee plus applicable administration fee. The plan review fees specified in this subsection are separate fees from the permit fees.	**No change to Houston amendment.**
104.3.3 Time Limitation of Application. An application for which no permit is issued within 180 days following the date of application shall become inactive, and plans and other data submitted for review thereafter shall be returned to the applicant or destroyed by the *Authority Having Jurisdiction*. The *building official* is authorized to grant one or more extensions of time for additional periods not to exceed 180 days each, for a maximum of two years from the date of the original application, upon written request and justifiable cause demonstrated by the applicant. If an application for permit does not result in a permit within two years after the date of original application, the permit application shall expire. In order to renew action on an application after expiration, the applicant shall submit a new permit application and plans and shall pay a new plan review fee. ~~Applications for which no permit is issued within 180 days~~		**104.3.3 Time Limitation of Application.** An application for which no permit is issued within 180 days following the date of application shall become inactive, and plans and other data submitted for review thereafter shall be returned to the applicant or destroyed by the *Authority Having Jurisdiction*. The *building official* is authorized to grant one or more extensions of time for additional periods not to exceed 180 days each, for a maximum of two years from the date of the original application, upon written request and justifiable cause demonstrated by the applicant. If an application for permit does not result in a permit within two years after the date of original application, the permit application shall expire. In order to renew action on an application after expiration, the applicant shall submit a new permit application and plans and shall pay a new plan review fee. ~~Applications for which no permit is issued within 180 days following the date of application shall expire by limitation.~~	**No change to Houston amendment.**

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~~following the date of application shall expire by limitation, plans and other data submitted for review thereafter, shall be returned to the applicant or destroyed by the Authority Having Jurisdiction. The Authority Having Jurisdiction shall be permitted to exceed the time for action by the applicant for a period not to exceed 180 days upon request by the applicant showing that circumstances beyond the control of the applicant have prevented action from being taken. No application shall be extended more than once. In order to renew action on an application after expiration, the applicant shall resubmit plans and pay a new plan review fee.~~		~~plans and other data submitted for review thereafter, shall be returned to the applicant or destroyed by the Authority Having Jurisdiction. The Authority Having Jurisdiction shall be permitted to exceed the time for action by the applicant for a period not to exceed 180 days upon request by the applicant showing that circumstances beyond the control of the applicant have prevented action from being taken. No application shall be extended more than once. In order to renew action on an application after expiration, the applicant shall resubmit plans and pay a new plan review fee.~~	
104.4.2 Validity of Permit. The issuance of a permit or approval of construction documents shall not be construed to be a permit for, or an approval of, a violation of the provisions of this code or other ordinance of the jurisdiction. No permit presuming to give authority to violate or cancel the provisions of this code shall be valid. The issuance of a permit based upon plans, specifications, or other data shall not prevent the Authority Having Jurisdiction from thereafter requiring the correction of errors in said plans, specifications, and other data or from preventing building operations being carried on thereunder where in violation of this code or of other ordinances of this jurisdiction. A permit and all its privileges are issued to the property owner, regardless of who submits the application or pays the fees. Where a Texas license is required to perform specific work, a permit shall be valid only for work performed under the licensed master plumber named on the application. A name change on an application or an existing permit must be obtained if the licensed master plumber listed on the application or existing permit is no longer responsible for the work performed. Provided that a refund has not been issued, the property owner has not changed, and written authority to amend the permit to designate a different master plumber has been provided by the property owner to the building official, the building official shall issue an amended permit. A name change fee and an administrative fee shall be charged as provided in Section 118.1 of the *Building Code* and the city fee schedule. In the case of the death or dissolution of the original property owner or master plumber, pursuant to a timely name change request submitted within 45 calendar days after such death or dissolution, the permit will be transferred to the new property owner or master plumber or amended to designate the new property owner or master plumber at no fee except for the administrative fee established in Section 118.1.1 of the *Building* Code and the city fee schedule. Applicants requiring a re-permit who fail to re-permit any applicable work within the time frames established by this code shall be subject to permit fees established in Section 118 of the *Building Code* and the city fee schedule based on the scope of work for all remaining construction and uninspected work. Approved plans are issued to the		**104.4.2 Validity of Permit.** The issuance of a permit or approval of construction documents shall not be construed to be a permit for, or an approval of, a violation of the provisions of this code or other ordinance of the jurisdiction. No permit presuming to give authority to violate or cancel the provisions of this code shall be valid. The issuance of a permit based upon plans, specifications, or other data shall not prevent the Authority Having Jurisdiction from thereafter requiring the correction of errors in said plans, specifications, and other data or from preventing building operations being carried on thereunder where in violation of this code or of other ordinances of this jurisdiction. A permit and all its privileges are issued to the property owner, regardless of who submits the application or pays the fees. Where a Texas license is required to perform specific work, a permit shall be valid only for work performed under the licensed master plumber named on the application. A name change on an application or an existing permit must be obtained if the licensed master plumber listed on the application or existing permit is no longer responsible for the work performed. Provided that a refund has not been issued, the property owner has not changed, and written authority to amend the permit to designate a different master plumber has been provided by the property owner to the building official, the building official shall issue an amended permit. A name change fee and an administrative fee shall be charged as provided in Section 118.1.13 of the *Building Code* and the *city fee schedule*. In the case of the death or dissolution of the original property owner or master plumber, pursuant to a timely name change request submitted within 45 calendar days after such death or dissolution, the permit will be transferred to the new property owner or master plumber or amended to designate the new property owner or master plumber at no fee except for the administrative fee established in Section 118.1.1 of the *Building* Code and the *city fee schedule*. Applicants requiring a re-permit who fail to re-permit any applicable work within the time frames established by this code shall be subject to permit fees established in Section 118 of the *Building Code* and the *city fee schedule* based on the scope of work for all remaining	**No change to Houston amendment.**

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property owner and the property owner's authorized agent listed on the permit associated with the plans.		construction and uninspected work. Approved plans are issued to the property owner and the property owner's authorized agent listed on the permit associated with the plans.	
104.4.3 Expiration. A permit issued by the Authority Having Jurisdiction under the provisions of this code shall ~~expire by limitation and become null and void where the work authorized by such permit is not commenced within 180 days from the date of such permit, or where~~ become inactive unless the work authorized by such permit is commenced within 180 days after its issuance, or if the work authorized by such permit is suspended or abandoned ~~at a time after the work is commenced~~ for a period of 180 days after the time the work was commenced. ~~Before such work is recommenced, a new permit shall first be obtained to do so, and the fee therefore shall be one-half the amount required for a new permit for such work, provided no changes have been made or will be made in the original construction documents for such work, and provided further that such suspensions or abandonment has not exceeded 1 year.~~ If work is not commenced under a permit within two years after the date of issuance or is suspended or abandoned at any time for a period of two years, the permit shall expire and become null and void. In order to recommence work under an expired permit, the permit holder shall pay the full applicable permit fee and submit plans that comply with this code for all uninspected work. **Exception:** For the purpose of issuing a certificate of occupancy or a certificate of compliance, the Authority Having Jurisdiction may, upon request, reactivate a permit and perform a final inspection of work.		**104.4.3 Expiration.** A permit issued by the Authority Having Jurisdiction under the provisions of this code shall ~~expire by limitation and become null and void where the work authorized by such permit is not commenced within 180 days from the date of such permit, or where~~ become inactive unless the work authorized by such permit has commenced and been inspected by a city inspector within 180 days after its issuance, or if the work authorized by such permit is suspended or abandoned ~~at a time after the work is commenced~~ for a period of 180 days after the time the work was commenced. ~~Before such work is recommenced, a new permit shall first be obtained to do so, and the fee therefore shall be one-half the amount required for a new permit for such work, provided no changes have been made or will be made in the original construction documents for such work, and provided further that such suspensions or abandonment has not exceeded 1 year.~~ If work has not commenced under a permit within two years after the date of issuance or is suspended or abandoned at any time for a period of two years, the permit shall expire and become null and void. In order to recommence work under an expired permit, the permit holder shall pay the full applicable permit fee and submit plans that comply with this code for all uninspected work. **Exception:** For the purpose of issuing a certificate of occupancy or a certificate of compliance, the Authority Having Jurisdiction may, upon request, reactivate a permit and perform a final inspection of work.	**No change to Houston amendment.**
104.4.4 Extensions. The Authority Having Jurisdiction is authorized to grant, in writing, one or more extensions of time, for periods not more than 180 days each. The extension shall be requested in writing and justifiable cause demonstrated. ~~A permittee holding an unexpired permit shall be permitted to apply for an extension of the time within which work shall be permitted to commence under that permit where the permittee is unable to commence work within the time required by this section. The Authority Having Jurisdiction shall be permitted to extend the time for action by the permittee for a period not exceeding 180 days upon written request by the permittee showing that circumstances beyond the control of the permittee have prevented action from being taken. No permit shall be extended more than once. In order to renew action on a permit after expiration, the permittee shall pay a new full permit fee.~~		**104.4.4 Extensions.** The Authority Having Jurisdiction is authorized to grant, in writing, one or more extensions of time, for periods not more than 180 days each. The extension shall be requested in writing and justifiable cause demonstrated. ~~A permittee holding an unexpired permit shall be permitted to apply for an extension of the time within which work shall be permitted to commence under that permit where the permittee is unable to commence work within the time required by this section. The Authority Having Jurisdiction shall be permitted to extend the time for action by the permittee for a period not exceeding 180 days upon written request by the permittee showing that circumstances beyond the control of the permittee have prevented action from being taken. No permit shall be extended more than once. In order to renew action on a permit after expiration, the permittee shall pay a new full permit fee.~~	**No change to Houston amendment.**
104.4.5 Suspension or Revocation. The Authority Having Jurisdiction is authorized to ~~shall be permitted to, in writing,~~ suspend or revoke a permit issued under the provisions of		**104.4.5 Suspension or Revocation.** The Authority Having Jurisdiction is authorized to ~~shall be permitted to, in writing,~~ suspend or revoke a permit issued under the provisions of this code wherever the permit is issued in error or on the	**No change to Houston amendment.**

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this code wherever the permit is issued in error or on the basis of incorrect, inaccurate, or incomplete information, ~~supplied~~ or in violation of ~~other~~ any ordinance, ~~or~~ regulation, or provision of this code ~~of the jurisdiction~~. Prior to taking such action, the Authority Having Jurisdiction shall provide notice of a right to a hearing on the matter pursuant to Section 106.7.1		basis of incorrect, inaccurate, or incomplete information, ~~supplied~~ or in violation of ~~other~~ any ordinance, ~~or~~ regulation of the jurisdiction, or provision of this code. Prior to taking such action, the Authority Having Jurisdiction shall provide notice of a right to a hearing on the matter pursuant to Section 106.7.1.	
104.5 Fees. The fee for each permit shall be as set forth in the city fee schedule. ~~Fees shall be assessed in accordance with the provisions of this section and as set forth in the fee schedule, Table 104.5. The fees are to be determined and adopted by this jurisdiction.~~		**104.5 Fees.** The fee for each permit shall be as set forth in the *city fee schedule*. ~~Fees shall be assessed in accordance with the provisions of this section and as set forth in the fee schedule, Table 104.5. The fees are to be determined and adopted by this jurisdiction.~~	**No changes to Houston amendment.**
104.5.1.1 Special Investigation Fee. If the investigation in Section 104.5.1 reveals that work without a permit has commenced, a special investigation fee shall be collected in an amount equal to the amount of the permit fee that is required by this code if a permit were to be issued. The payment of such special investigation fee shall not exempt a person from compliance with other provisions of this code, nor from a penalty prescribed by law.		**104.5.1.1 Special Investigation Fee.** If the investigation in Section 104.5.1 reveals that work without a permit has commenced, a special investigation fee shall be collected in an amount equal to the amount of the permit fee that is required by this code if a permit were to be issued. The payment of such special investigation fee shall not exempt a person from compliance with other provisions of this code, nor from a penalty prescribed by law.	**No changes to Houston amendment.**
104.5.2 Minimum Investigation Fees. ~~An~~ minimum investigation fee, as established in Section 118.1.15 and the city fee schedule, shall be charged for all investigations other than those conducted pursuant to Section 104.5.1. The payment of such minimum investigation fee shall not exempt a person from compliance with other provisions of this code, nor from the penalty prescribed by law.		**104.5.2 Minimum Investigation Fees.** ~~An~~ minimum investigation fee, in addition to the permit fee, shall be collected whether a permit is then or subsequently issued. The minimum investigation fee shall be ~~equal to the amount of the permit fee that is required by this code if a permit were to be issued~~ as established in Section 118.1.15 and the *city fee schedule*. The minimum investigation fee shall be charged for all investigations other than those conducted pursuant to Section 104.5.1. The payment of such minimum investigation fee shall not exempt a person from compliance with other provisions of this code, nor from a penalty prescribed by law.	**Minor wordsmithing change, intent of enforcement remains unchanged.**
104.5.3 Fee Refunds. ~~The Authority Having Jurisdiction shall be permitted to authorize the refunding of a fee as follows:~~ ~~**(1)** The amount paid hereunder that was erroneously paid or collected.~~ ~~**(2)** Refunding of not more than a percentage, as determined by this jurisdiction where no work has been done under a permit issued in accordance with this code.~~ The building official may authorize the refund of any fee paid hereunder that was erroneously paid or collected due to an error by a city employee. This provision shall not be applicable if the error occurred because of incorrect information provided by the applicant. The building official may authorize a refund of not more than 90 percent of the amount in excess of the minimum permit fee paid when no work has been done under a permit issued in accordance with this code. If work has been done under the permit, no refund shall be authorized. The		**104.5.3 Fee Refunds.** ~~The Authority Having Jurisdiction shall be permitted to authorize the refunding of a fee as follows:~~ ~~(1) The amount paid hereunder that was erroneously paid or collected.~~ ~~(2) Refunding of not more than a percentage, as determined by this jurisdiction where no work has been done under a permit issued in accordance with this code.~~ The building official may authorize the refund of any fee paid hereunder that was erroneously paid or collected due to an error by a city employee. This provision shall not be applicable if the error occurred because of incorrect information provided by the applicant. The building official may authorize a refund of not more than 90 percent of the amount in excess of the minimum permit fee paid when no work has been done under a permit issued in accordance with this code. If work has been done under the permit, no refund shall be authorized.	**No changes to Houston amendment.**

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originally paid administrative fee and the plan review portion of the permit fee shall be nonrefundable. The building official ~~Authority Having Jurisdiction~~ shall not authorize a ~~the~~ refund~~ing~~ of any fee paid except upon written application filed by the original permit~~tee~~ holder not ~~to exceed~~ later than 180 calendar days after the date of fee payment.		The originally paid administrative fee and the plan review portion of the permit fee shall be nonrefundable. The building official ~~Authority Having Jurisdiction~~ shall not authorize a ~~the~~ refund~~ing~~ of any fee paid except upon written application filed by the original permit~~tee~~ holder not ~~to exceed~~ later than 180 calendar days after the date of fee payment.	
104.5.4 Annual Fee Increase. Notwithstanding any maximum fee established pursuant to the City of Houston *Construction Code*, the fees in this or in any volume of the *Construction Code*, as adjusted according to this section, shall be automatically increased on the first day of each subsequent calendar year as provided in Section 1-13 of the *City Code*.		**104.5.4 Annual Fee Increase.** Notwithstanding any maximum fee established pursuant to the *Construction Code*, the fees in this or in any volume of the *Construction Code*, as adjusted according to this section, shall be automatically increased on the first day of each subsequent calendar year as provided in Section 1-13 of the *City Code*.	**"City of Houston" was removed from the paragraph.** **No changes to intent of Houston amendment.**
105.2.6 Reinspections. The building official may assess a ~~A~~ reinspection fee ~~shall be permitted to be assessed~~ for each inspection or reinspection when an inspector arrives to perform the inspection and finds the ~~where such~~ portion of work for which inspection is called is not complete ~~or where required~~ when corrections called for in a previous inspection report have not been made. This ~~provision~~ section shall not to be interpreted as requiring reinspection fees the first time a job is rejected for failure to comply ~~be in accordance~~ with the requirements of this code, but as controlling the practice of calling for inspections before the job is ready for inspection or reinspection. The building official may assess a reinspection fee ~~Reinspection fees shall be permitted to be assessed where~~ when the inspection record card is not posted or otherwise available on the work site, when the approved plans are not readily available to the inspector, for failure to provide access on the date for which the inspection is requested, or for deviating from plans requiring the approval of the Authority Having Jurisdiction. To obtain reinspection, the applicant shall ~~file an application therefore in writing upon a form furnished for that purpose~~ make a request and pay the reinspection fee in accordance with ~~Table 104.5~~ Section 118 of the *Building Code* and the city fee schedule. In instances where reinspection fees have been assessed, no additional inspection of the work will be performed until the required fees have been paid.		**105.2.6 Reinspections.** The building official may assess a ~~A~~ reinspection fee ~~shall be permitted to be assessed~~ for each inspection or reinspection when an inspector arrives to perform the inspection and finds the ~~where such~~ portion of work for which inspection is called is not complete or ~~where required~~ when corrections called for in a previous inspection report have not been made. This ~~provision~~ section shall not to be interpreted as requiring reinspection fees the first time a job is rejected for failure to comply ~~be in accordance~~ with the requirements of this code, but as controlling the practice of calling for inspections before the job is ready for inspection or reinspection. The building official may assess a reinspection fee ~~Reinspection fees shall be permitted to be assessed where~~ when the inspection record card is not posted or otherwise available on the work site, when the approved plans are not readily available to the inspector, for failure to provide access on the date for which the inspection is requested, or for deviating from plans requiring the approval of the Authority Having Jurisdiction. To obtain reinspection, the applicant shall ~~file an application therefore in writing upon a form furnished for that purpose~~ make a request and pay the reinspection fee in accordance with ~~Table 104.5~~ Section 118 of the *Building Code* and the *city fee schedule*. In instances where reinspection fees have been assessed, no additional inspection of the work will be performed until the required fees have been paid.	**No changes to Houston amendment.**
106.1 General. It shall be unlawful for a person, firm, or corporation to erect, construct, enlarge, alter, repair, move, improve, remove, convert, demolish, equip, use, or maintain plumbing or permit the same to be done in violation of this code. It shall be a violation to falsify any test required by this code.		**106.1 General.** It shall be unlawful for a person, firm, or corporation to erect, construct, enlarge, alter, repair, move, improve, remove, convert, demolish, equip, use, or maintain plumbing or permit the same to be done in violation of this code. It shall be a violation to falsify any test required by this code.	**No changes to Houston amendment.**
106.3 Penalties. A person, firm, or corporation violating a provision of this code shall be deemed guilty of a misdemeanor,		**106.3 Penalties.** A person, firm, or corporation violating a provision of this code shall be deemed guilty of a misdemeanor,	**No changes to Houston amendment.**

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and upon conviction thereof, shall be punishable by a fine, imprisonment, or both set forth by the governing laws of the jurisdiction. Each separate day or portion thereof, during which a violation of this code occurs or continues, shall be deemed to constitute a separate offense. Where no specific penalty is otherwise provided in this code, the violation of any provision of this code shall constitute a misdemeanor punishable upon conviction by a fine of not less than $500.00 nor more than $2,000.00. Each day that any violation continues shall constitute and be punishable as a separate offense. Where any conduct in violation of this code also constitutes a violation of state penal law, then the offense shall be punishable as provided in the applicable state law. In prosecutions under this code, the various provisions hereof that are designated as an "exception" or "exceptions" shall not be treated as exceptions within the meaning of Section 2.02 of the Texas Penal Code, and instead, they shall constitute defenses to prosecution within the meaning of Section 2.03 of the Texas Penal Code.		and upon conviction thereof, shall be punishable by a fine, imprisonment, or both set forth by the governing laws of the jurisdiction. Each separate day or portion thereof, during which a violation of this code occurs or continues, shall be deemed to constitute a separate offense. Where no specific penalty is otherwise provided in this code, the violation of any provision of this code shall constitute a misdemeanor punishable upon conviction by a fine of not less than $500.00 nor more than $2,000.00. Each day that any violation continues shall constitute and be punishable as a separate offense. Where any such conduct in violation of this code also constitutes a violation of state penal law, then the offense shall be punishable as provided in the applicable state law. In prosecutions under this code, the various provisions hereof that are designated as an "exception" or "exceptions" shall not be treated as exceptions within the meaning of Section 2.02 of the Texas Penal Code, and instead, they shall constitute defenses to prosecution within the meaning of Section 2.03 of the Texas Penal Code.	
106.4 Stop Work Orders. Where work is being done contrary to the provisions of this code, the Authority Having Jurisdiction shall be permitted to order the work stopped by notice in writing served on persons engaged in the doing or causing such work to be done, and such persons shall forthwith stop work until authorized by the Authority Having Jurisdiction to proceed with the work. At the time such top order is issued, the person doing the work and the permit holder shall be given notice of a right to a hearing on the matter pursuant to Section 106.7 of this code. On written request from the person doing the work or the permit holder, such a hearing shall be held within three business days unless the permit holder or the person doing the work requests an extension of time. Any stop order that has been issued shall remain in effect pending any hearing requested on the matter, unless the stop order is withdrawn by the Authority Having Jurisdiction.		**106.4 Stop Work Orders.** Where work is being done contrary to the provisions of this code, the Authority Having Jurisdiction shall be permitted to order the work stopped by notice in writing served on persons engaged in the doing or causing such work to be done, and such persons shall forthwith stop work until authorized by the Authority Having Jurisdiction to proceed with the work. At the time such stop work order is issued, the person doing the work and the permit holder shall be given notice of a right to a hearing on the matter pursuant to Section 106.7 of this code. On written request from the person doing the work or the permit holder, such a hearing shall be held within three business days unless the permit holder or the person doing the work requests an extension of time. Any stop work order that has been issued shall remain in effect pending any hearing requested on the matter, unless the stop work order is withdrawn by the Authority Having Jurisdiction.	**No changes to Houston amendment.**
106.7 Hearing Procedures. **106.7.1 Hearing Notices.** Whenever notice is to be given to any person concerning the right to a hearing, the notice may be given by personal delivery, certified mail, or personal delivery service, return receipt requested. If notice is being given to a building owner or to a tenant therein, and the Authority Having Jurisdiction is unable to determine the name or address of such person after checking the building and the applicable records of the jurisdiction's Department of Public Works, the County Appraisal District, the electrical utility company and the gas utility company, the Authority Having Jurisdiction shall mail notice to the billing addresses of the building as shown on the records of the Water Division of the jurisdiction's Department of Public Works and shall be posted on or in view of each entrance to the building. Additionally, if any notice is mailed to a building owner or a building tenant and is returned without delivery,		**106.7 Hearing Procedures.** **106.7.1 Hearing Notices.** Whenever notice is to be given to any person concerning the right to a hearing, the notice may be given by personal hand delivery, certified mail, or personal delivery service, return receipt requested. If notice is being given to a building owner or to a tenant therein, and the Authority Having Jurisdiction is unable to determine the name or address of such person after checking the building and the applicable records of the jurisdiction's Department of Public Works, the County Appraisal District, the electrical utility company and the gas utility company, the Authority Having Jurisdiction shall mail notice to the billing addresses of the building as shown on the records of the Water Division of the jurisdiction's Department of Public Works and shall post the notice on or in view of each entrance to the building. Additionally, if any notice is mailed to a building owner or a building tenant and is returned without	**Amendment updated with word smithing changes, intent of enforcement remains unchanged.**

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notice shall be effective if posted on or in view of each entrance of the building.		delivery, notice shall be effective if posted on or in view of each entrance of the building.	
106.7.2 Hearings. Except where otherwise specifically provided, all hearings held pursuant to this code shall be conducted by the director of Houston Public Works or a representative, who shall hereinafter be referred to as the "hearing official." The director shall not designate any person to be a hearing official under this code who has taken any part in the investigation of the matter that is the subject of the hearing or any person who directly supervised the investigation. The hearing official shall consider only the evidence presented at the hearing in rendering a decision. The hearing official shall set forth the decision in writing and shall be served on each party in the same manner as a notice of a right to a hearing.		**106.7.2 Hearings.** Except where otherwise specifically provided, all hearings held pursuant to this code shall be conducted by the director of Houston Public Works or a representative, who shall hereinafter be referred to as the "hearing official." The director shall not designate any person to be a hearing official under this code who has taken any part in the investigation of the matter that is the subject of the hearing or any person who directly supervised the investigation. The hearing official shall consider only the evidence presented at the hearing in rendering a decision. The hearing official shall set forth the decision in writing and shall provide the decision to each party in the same manner as a notice of a right to a hearing.	**No changes to Houston amendment.**
107.1 General. In order to hear and decide appeals of orders, decisions, or determinations made by the Authority Having Jurisdiction relative to the application and interpretations of this code, there shall be and ~~here~~ is hereby created a Plumbing Code Review Board ~~of Appeals~~ consisting of seven members who are qualified by experience and training to pass upon matters pertaining to plumbing design, construction, and maintenance and the public health aspects of plumbing systems and who are not employees of the jurisdiction. The Authority Having Jurisdiction shall be an ex-officio member and shall act as secretary to said board but shall have no vote upon a matter before the board. ~~The Board of Appeals shall be appointed by the governing body and shall hold office at its pleasure.~~ The board shall adopt rules of procedure for conducting its business and shall render decisions and findings in writing to the appellant with a duplicate copy to the Authority Having Jurisdiction.		**107.1 General.** In order to hear and decide appeals of orders, decisions, or determinations made by the Authority Having Jurisdiction relative to the application and interpretations of this code, there shall be and is hereby created a Plumbing Code Review Board ~~of Appeals~~ consisting of seven members who are qualified by experience and training to pass upon matters pertaining to plumbing design, construction, and maintenance and the public health aspects of plumbing systems and who are not employees of the jurisdiction. The Authority Having Jurisdiction shall be an ex-officio member and shall act as secretary to said board but shall have no vote upon a matter before the board. ~~The Board of Appeals shall be appointed by the governing body and shall hold office at its pleasure.~~ The board shall adopt rules of procedure for conducting its business and shall render decisions and findings in writing to the appellant with a duplicate copy to the Authority Having Jurisdiction.	**No changes to Houston amendment.**
107.3 Composition. Each board member, except the member in position 7, shall be appointed by the Mayor and confirmed by the City Council. The Mayor shall designate a member to be chairperson. Each of the seven positions shall be numbered: **(1) Positions 1 and 2** shall be filled by professional engineers registered by the State of Texas who are actively engaged in the design of plumbing systems. **(2) Positions 3 and 4** shall be filled by duly licensed master plumbers. **(3) Position 5** shall be filled by a degreed engineer who is in the employ of a local gas utility company. **(4) Position 6** shall be filled by a member at large. **(5) Position 7** shall be filled by the chief plumbing inspector of this jurisdiction.		**107.3 Composition.** Each board member, except the member in position 7, shall be appointed by the Mayor and confirmed by the City Council. The Mayor shall designate a member to be the chairperson. Each of the seven positions shall be numbered: (1) Positions 1 and 2 shall be filled by professional engineers registered by the State of Texas who are actively engaged in the design of plumbing systems. (2) Positions 3 and 4 shall be filled by licensed master plumbers. (3) Position 5 shall be filled by a degreed engineer who is employed by a local gas utility company. (4) Position 6 shall be filled by a member of the public at large. (5) Position 7 shall be filled by the chief plumbing inspector of this jurisdiction.	**No changes to Houston amendment.**
107.4 Terms of Office; Qualifications; Removal; Vacancy; Meetings. The terms of office for the appointees to Position Nos. 1, 3, and 5 shall expire on the second day of January of odd-numbered years, and the terms of office for the appointees to Position Nos. 2, 4, and 6 shall expire on the second day of January of even-numbered years; however, each member shall		**107.4 Terms of Office; Qualifications; Removal; Vacancy; Meetings.** The terms of office for the appointees to Position Nos. 1, 3, and 5 shall expire on the second day of January of odd-numbered years, and the terms of office for the appointees to Position Nos. 2, 4, and 6 shall expire on the second day of January of even-numbered years; however, each member shall	**No changes to Houston amendment.**

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continue in office until his respective successor shall have been appointed and qualified. The adoption of this code shall not terminate the term of office of any person currently serving in any position on the board. In addition to other qualifications herein above required, each member of the board shall be a citizen of the United States. All members of the board other than the appointee to Position 6 shall be selected on the basis of their technical and professional qualifications. Each member of the board shall be subject to removal by the Mayor. Whenever any position on the board becomes vacant by reason of death, resignation, or removal, the vacancy shall be filled for the unexpired term of the member being replaced. The Mayor shall appoint, subject to confirmation by City Council, another qualified person to serve the unexpired term of the vacancy. The board shall hold meetings in this jurisdiction at times and places to be designated by the chairperson, who is also authorized to call special meetings when deemed necessary. Each member of the board shall receive $50.00 for each meeting he attends at which a quorum is present; provided, however, those members who are employees of this jurisdiction will be paid only for those meetings they attend that are neither held during nor continue beyond their regular working hours. Members shall not be compensated for more than three meetings in any one calendar month.		continue in office until his respective successor shall have been appointed and qualified. The adoption of this code shall not terminate the term of office of any person currently serving in any position on the board. In addition to other qualifications herein above required, each member of the board shall be a citizen of the United States. All members of the board other than the appointee to Position 6 shall be selected on the basis of their technical and professional qualifications. Each member of the board shall be subject to removal by the Mayor. Whenever any position on the board becomes vacant by reason of death, resignation, or removal, the vacancy shall be filled for the unexpired term of the member being replaced. The Mayor shall appoint, subject to confirmation by City Council, another qualified person to serve the unexpired term of the vacancy. The board shall hold meetings in this jurisdiction at times and places to be designated by the chairperson, who is also authorized to call special meetings when deemed necessary. Each member of the board shall receive $50.00 for each meeting he attends at which a quorum is present; provided, however, those members who are employees of this jurisdiction will be paid only for those meetings they attend that are neither held during nor continue beyond their regular working hours. Members shall not be compensated for more than three meetings in any one calendar month.	
107.5 Quorum. Four board members present at any meeting shall constitute a quorum for the transaction of all business of said board. A majority vote of the board members present at any meeting constituting a quorum shall prevail.		**107.5 Quorum.** Four board members present at any meeting shall constitute a quorum for the transaction of all business of said board. A majority vote of the board members present at any meeting constituting a quorum shall prevail.	**No changes to Houston amendment.**
107.6 Review of Action of Plumbing Inspectors. Disputes arising between plumbing inspectors and any person concerning the application of the provisions of this code may be submitted to the Authority Having Jurisdiction. Any interested party (other than an inspector of this jurisdiction) who is dissatisfied with the decision of the Authority Having Jurisdiction on the matter may appeal that decision to the board by making application therefor in writing to the Authority Having Jurisdiction. The Authority Having Jurisdiction shall forward the application to the board chairperson who shall inform the applicant and the Authority Having Jurisdiction in writing of the date and time set for a hearing on the matter. If the applicant fails to appear at the hearing, either in person or by attorney, the dispute shall be decided against the applicant. Each party to the dispute shall be entitled to present his side of the matter to the board, and the board shall render its decision on the matter based upon its interpretation of the applicable provisions of this code. Any party to the dispute who is dissatisfied with the board's decision shall have the right to appeal the decision to the City Council, by delivering a written notice of appeal to the office of the City Secretary within 10 days after the date of		**107.6 Review of Action of Plumbing Inspectors.** Disputes arising between plumbing inspectors and any person concerning the application of the provisions of this code may be submitted to the Authority Having Jurisdiction. Any interested party (other than an inspector of this jurisdiction) who is dissatisfied with the decision of the Authority Having Jurisdiction on the matter may appeal that decision to the board by making application therefor in writing to the Authority Having Jurisdiction. The Authority Having Jurisdiction shall forward the application to the board chairperson, who shall inform the applicant and the Authority Having Jurisdiction in writing of the date and time set for a hearing on the matter. If the applicant fails to appear at the hearing, either in person or by an attorney, the dispute shall be decided against the applicant. Each party to the dispute shall be entitled to present his side of the matter to the board, and the board shall render its decision on the matter based upon its interpretation of the applicable provisions of this code. Any party to the dispute who is dissatisfied with the board's decision shall have the right to appeal the decision to the City Council, by delivering a written notice of appeal to the office of the City Secretary within 10 days after the date of the board's decision. The City Council shall affirm, reverse, or	**No changes to Houston amendment.**

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the board's decision. The City Council shall affirm, reverse, or modify the board's decision based upon the City Council's interpretation of the applicable provisions of this code. The City Council's decision on the matter shall be final. All appeals to the City Council are subject to the rules of the City Council, which are codified in Section 2-2 of the *City Code*, copies of which are available from the City Secretary. Parties wishing to preserve their right of appeal must comply with the rules of the City Council, including Rule 12.		modify the board's decision based upon the City Council's interpretation of the applicable provisions of this code. The City Council's decision on the matter shall be final. All appeals to the City Council are subject to the rules of the City Council, which are codified in Section 2-2 of the *City Code*, copies of which are available from the City Secretary. Parties wishing to preserve their right of appeal must comply with the rules of the City Council, including Rule 12.	
107.7 Review of New Materials, Methods and Interpretations of this Code. Any person whose plumbing products are not specifically approved by this code may file a petition in writing for approval thereof with the Authority Having Jurisdiction, who shall determine whether the material or method should be approved pursuant to this code. If the Authority Having Jurisdiction denies approval of the material or method, the decision may be appealed to the board. Such an appeal shall be by a petition delivered to the Authority Having Jurisdiction who in turn shall deliver the petition to the chairperson of the board. The board shall, within 30 days after the date of filing of the petition, hear the petition and determine the merits of the material or method. The board may establish any additional tests to which the product must be subjected if the board finds the tests necessary to determine whether the product should be approved. Any and all tests shall be made at the petitioner's expense, and the petitioner shall deposit the cost with this jurisdiction before the tests are made. If additional tests are required, the board shall render its decision within 30 days after the tests are completed. In the event the board is of the opinion that the plumbing should be approved pursuant to Section 301.2 of this code, they shall so state in the minutes of the board, and such plumbing shall be approved.		**107.7 Review of New Materials, Methods and Interpretations of this Code.** Any person whose plumbing products are not specifically approved by this code may file a petition in writing for approval thereof with the Authority Having Jurisdiction, who shall determine whether the material or method should be approved pursuant to this code. If the Authority Having Jurisdiction denies approval of the material or method, the decision may be appealed to the board. Such an appeal shall be by a petition delivered to the Authority Having Jurisdiction who in turn shall deliver the petition to the chairperson of the board. The board shall, within 30 days after the date of filing of the petition, hear the petition and determine the merits of the material or method. The board may establish any additional tests to which the product must be subjected if the board finds the tests necessary to determine whether the product should be approved. Any and all tests shall be made at the petitioner's expense, and the petitioner shall deposit the cost with this jurisdiction before the tests are made. If additional tests are required, the board shall render its decision within 30 days after the tests are completed. In the event the board is of the opinion that the plumbing should be approved pursuant to Section 301.3 of this code, they shall so state in the minutes of the board, and such plumbing shall be approved.	**No changes to Houston amendment.**
108.0 Licensing. **108.1 General.** Before any person shall engage in the plumbing business within the jurisdiction, the person shall secure a state license as a master plumber as required by the Texas State Board of Plumbing Examiners under the current Plumbing License Law. A master license holder shall annually register his state plumbing license with the Authority Having Jurisdiction during the month of initial registration. The Authority Having Jurisdiction shall not register a master plumber as a contractor until and unless the master plumber is listed on the Texas State Board of Plumbing Examiner's website. Registration shall not be effective if plumbing master fails to maintain current proof of insurance as required by state law.		**108.0 Licensing.** **108.1 General.** Before any person shall engage in any plumbing business within the jurisdiction, the person shall secure a state license as a master plumber as required by the Texas State Board of Plumbing Examiners under the current Plumbing License Law. A master license holder shall annually register his state plumbing license with the Authority Having Jurisdiction during the month of initial registration. The Authority Having Jurisdiction shall not register a master plumber as a contractor until and unless the master plumber is listed on the Texas State Board of Plumbing Examiner's website. Registration shall not be effective if the master plumber fails to maintain current proof of insurance as required by state law.	**No changes to Houston amendment.**
108.2 License to do Plumbing Work. Each person engaged in the actual installation of plumbing shall be licensed either as a master plumber, current journeyman plumber, or an apprentice plumber by the Texas State Board of Plumbing Examiners under the Plumbing License Law. A licensed master		**108.2 License to Do Plumbing Work.** Each person engaged in plumbing installation shall be licensed either as a master plumber, current journeyman plumber, tradesman plumber, or an apprentice plumber by the Texas State Board of Plumbing Examiners under the Plumbing License Law. A licensed	**Amendment updated with word smithing changes, intent of enforcement remains unchanged.**

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plumber must have a medical gas endorsement to engage in the installation of medical gas.		master plumber must have a medical gas endorsement to engage in the installation of medical gas.	
108.2.1 Licensing of Drain Layers. Before any person other than a master plumber engages in the business of laying sanitary or storm sewers, the person shall make an application for and secure a drain layer's license. The application for and issuance of such license shall be in accordance with Chapter 47 of the *City Code*.		**108.2.1 Licensing of Drain Layers.** Before any person other than a master plumber engages in the business of laying storm sewers, the person shall make an application for and secure a drain layer's license. The application for and issuance of such license shall be in accordance with Chapter 47 of the *City Code*.	**No changes to Houston amendment.**
108.2.2 Registered Irrigators. Before any person other than a master plumber engages in the installation of lawn irrigation systems, the person shall obtain a certificate of registration (license) under state law and register with the Authority Having Jurisdiction. This requirement shall not extend to work that is exempt under this code and state law. The annual fee for irrigator registration required under this schedule is stated in the city fee schedule.		**108.2.2 Registered Irrigators.** Before any person other than a master plumber engages in the installation of lawn irrigation systems, the person shall obtain a certificate of registration (license) under state law and register with the Authority Having Jurisdiction. This requirement shall not extend to work that is exempt under this code and state law. The annual fee for irrigator registration required under this section is stated in the *city fee schedule*.	**No changes to Houston amendment.**
108.2.3 Certified Water Treatment Specialists. Before any person other than a master plumber engages in the business of installing water treatment equipment, the person must secure a State of Texas Water Treatment Specialist Certification under Chapter 341 of the Texas Health and Safety Code, and register the certification with the Authority Having Jurisdiction.		**108.2.3 Certified Water Treatment Specialists.** Before any person other than a master plumber engages in the business of installing water treatment equipment, the person must secure a State of Texas Water Treatment Specialist Certification under Chapter 341 of the Texas Health and Safety Code, and register the certification with the Authority Having Jurisdiction.	**No changes to Houston amendment.**
108.3 Illegal Work. Upon notice from the Authority Having Jurisdiction, any person engaged in the plumbing or drain laying business whose work, workmanship or materials do not conform to this code shall immediately make necessary changes or corrections to conform to this code. If work has not been so changed 10 days after delivery of notice, the Authority Having Jurisdiction shall the refuse to issue any further permits to the person until the nonconforming work has been fully corrected in accordance with this code.		**108.3 Illegal Work.** Upon notice from the Authority Having Jurisdiction, any person engaged in plumbing or drain laying business whose work, workmanship or materials do not conform to this code shall immediately make necessary changes or corrections to conform to this code. If work has not been so changed 10 days after delivery of this notice, the Authority Having Jurisdiction shall refuse to issue any further permits to the person until the nonconforming work has been fully corrected in accordance with this code.	**No changes to Houston amendment.**
108.4 Prohibited Use of Name or License to Obtain Permit. No person engaged in the business of plumbing or laying drains shall allow his name to be used by any other person to obtain a permit.		**108.4 Prohibited Use of Name or License to Obtain Permit.** No person engaged in the business of plumbing or laying drains shall allow his name or license to be used by any other person to obtain a permit unless the license holder provides written authorization to the Authority Having Jurisdiction.	**No changes to Houston amendment.**
108.5 Vehicles Identification Required. Each person engaged in plumbing business in the jurisdiction shall identify all vehicles used in the business with signs showing the name of the business and the master plumber's license number. This information shall be accurate, legible and painted on each side of all vehicles at all times. Lettering shall be a minimum of 2 inches (50.8 mm) high.		**108.5 Vehicles Identification Required.** In accordance with Title 22 Chapter 367 of the Texas Administrative Code, each person engaged in plumbing business in the jurisdiction shall identify all vehicles used in the business with signs showing the name of the business and the master plumber's license number. This information shall be accurate, legible and painted on each side of all vehicles at all times. Lettering shall be a minimum of 2 inches (50.8 mm) high.	**No changes to Houston amendment.**
{**EDITORIAL NOTE:** DELETE TABLE 104.5.}		[**EDITORIAL NOTE:** DELETE TABLE 104.5.]	**No changes to Houston amendment.**

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2015 Houston UPC – Chapter 2 Definitions	2021 UPC – Chapter 2 – Definitions	2021 Houston UPC Amendments	Code Change Summary
201.2 Interchangeability. Words used in the present tense include the future; words in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural, the singular.		**201.2 Interchangeability.** Words used in the present tense include the future; words in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural, the singular.	**No changes to Houston amendment.**
201.3 Specific Construction and Terms Defined in Other Codes. Where specific rules of construction or terms are not addressed or defined in this code and are addressed or defined in the *City Code* or another volume of the *Construction Code*, such terms or specific constructions herein shall have the meanings ascribed to them in those other volumes, as applicable to the construction and proposed scope of work hereunder.		**201.3 Specific Construction and Terms Defined in Other Codes.** Where specific rules of construction or terms are not addressed or defined in this code and are addressed or defined in the *City Code* or another volume of the *Construction Code*, such terms or specific constructions herein shall have the meanings ascribed to them in those other volumes, as applicable to the construction and proposed scope of work hereunder.	**No changes to Houston amendment.**
203.0 – A – **Authority Having Jurisdiction.** The director of Houston Public Works. ~~The organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, installations, or procedures. The Authority Having Jurisdiction shall be a federal, state, local, or other regional department or an individual such as a plumbing official, mechanical official, labor department official, health department official, building official, or others having statutory authority. In the absence of a statutory authority, the Authority Having Jurisdiction may be some other responsible party.~~ This definition shall include the Authority Having Jurisdiction's duly authorized representative.		**203.0 – A –** **Authority Having Jurisdiction.** The City of Houston, TX. The definitions shall also mean the Director of Houston Public Works who is appointed to administer and enforce provisions of this code. ~~The organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, installations, or procedures. The Authority Having Jurisdiction shall be a federal, state, local, or other regional department or an individual such as a plumbing official, mechanical official, labor department official, health department official, building official, or others having statutory authority. In the absence of a statutory authority, the Authority Having Jurisdiction may be some other responsible party.~~ This definition shall include the Authority Having Jurisdiction's duly authorized representative.	**Minor wordsmithing changes to definition, no change to intent of definition.**
204.0 – B – **Building Code.** The City of Houston *Building Code*, as adopted by this jurisdiction. **Building Official.** The director of Houston Public Works or the duly authorized representative designated by the director to act as the chief construction code enforcement official of the jurisdiction; also known as *chief building official*. The term also includes the Houston Airport Systems building official who may be designated by the building official to perform *Construction Code* permitting and enforcement activities on Houston Airport Systems premises.		**204.0 – B –** **Bottle Filling Station (Water Dispenser).** 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.~~ **Building Code.** The City of Houston *Building Code*, as adopted and amended by this jurisdiction. **Building Official.** The director of Houston Public Works or the duly authorized representative designated by the director to act as the chief construction code enforcement official of the jurisdiction. The term also includes the Houston Airport	**New definition for "Bottle Filling Station" brought over from IPC definitions. Code change approved during Public Comment Period – Refer to "Technical Memo 08: Drinking Fountain Requirements" for changes related to drinking fountains.** **No changes to other changes to Houston definition amendments.**

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		Systems building official who may be designated by the building official to perform *Construction Code* permitting and enforcement activities on Houston Airport Systems premises.	
205.0 – C – **Certificate of Compliance.** A certificate stating that materials and products meet specified standards or that the scope of work under a specific permit was done in compliance with approved construction documents. Any reference in the *Construction Code* to a "CC", certificate of completion, or a certificate of inspection issued by this jurisdiction, is a reference to a certificate of compliance as defined herein. **City Code.** The *Code of Ordinances, Houston, Texas.* **City Fee Schedule.** The schedule of fees charged by the city for various permits, licenses, registrations, authorizations and services, which is maintained on the city's website. **Construction Code.** Has the meaning ascribed in Section 1-2 of the *City Code*.	**Circuit Vent.** 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. **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.	**205.0 – C –** **Certificate of Compliance.** A certificate stating that materials and products meet specified standards or that the scope of work under a specific permit was done in compliance with approved construction documents. Any reference in the *Construction Code* to a "CC", certificate of completion, or a certificate of inspection issued by this jurisdiction, is a reference to a certificate of compliance as defined herein. **City Code.** The *Code of Ordinances, City of Houston, Texas.* **City Fee Schedule.** The schedule of fees charged by the city for various permits, licenses, registrations, authorizations and services, which is maintained on the city's website. **Construction Code.** Has the meaning ascribed in Section 1-2 of the *City Code*.	**No changes to Houston amendment.**
	Dead Leg. A section of potable water pipe which contains water that has no flow or does not circulate.	**206.0 – D –** **Drinking Fountain.** 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.~~	**New definition for "Drinking Fountain" brought over from IPC definitions. Code change approved during Public Comment Period – Refer to "Technical Memo 08: Drinking Fountain Requirements" for changes related to drinking fountains.**
207.0 – E – **Electrical Code.** The City of Houston *Electrical Code*, as adopted and amended by this jurisdiction. **Energy Conservation Code.** The City of Houston *Residential Energy Conservation Code*, or the City of Houston *Commercial Energy Conservation Code*, as adopted and amended by this jurisdiction.	**Expansion Tank.** A vessel used to protect potable water systems from excessive pressure.	**207.0 – E –** **Electrical Code.** The City of Houston *Electrical Code*, as adopted and amended by this jurisdiction. **Energy Conservation Code.** The City of Houston *Residential Energy Conservation Code*, or the City of Houston *Commercial Energy Conservation Code*, as adopted and amended by this jurisdiction.	**No changes to Houston amendment.**
208.0 – F – **Fire Code.** The City of Houston *Fire Code*, as adopted and amended by this jurisdiction.		**208.0 – F –** **Fire Code.** The City of Houston *Fire Code*, as adopted and amended by this jurisdiction.	**No changes to Houston amendment.**
209.0 – G – **Gravity Grease Interceptor.** A plumbing appurtenance or appliance that is installed in a sanitary drainage system to intercept nonpetroleum fats, oils, and greases (FOG) from a wastewater discharge and is identified by volume, 30-minute retention time, baffle(s), not less than two compartments, a total volume of not less than ~~300~~ 500 gallons (~~1135~~ 1893 L), and gravity separation. ~~[~~These interceptors shall either comply with	**Group Wash Fixture.** A lavatory that allows more than one person to utilize the fixture at the same time. The fixture has one or more drains and one or more faucets.	**209.0 – G –** **Gravity Grease Interceptor.** A plumbing appurtenance or appliance that is installed in a sanitary drainage system to intercept nonpetroleum fats, oils, and greases (FOG) from a wastewater discharge and is identified by volume, 30 minute retention time, baffle(s), not less than two compartments, a total volume of not less than ~~300~~ 500 gallons (~~1135~~ 1893 L), and gravity separation. ~~[~~These interceptors shall either comply with	**No changes to Houston amendment.**

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the requirements of Chapter 10 or ~~are~~ be designed by a registered design professional.~~]~~ Gravity grease interceptors are generally installed outside.		the requirements of Chapter 10 or ~~are~~ be designed by a registered design professional.~~]~~ Gravity grease interceptors are generally installed outside.	
210.0 – H – **Health Department.** The Houston Health Department.		**210.0 – H –** **Health Department.** The Houston Health Department.	**No changes to Houston amendment.**
212.0 – J – **Jurisdiction.** The governmental unit that has adopted this code under due legislative authority.		**212.0 – J –** **Jurisdiction.** The governmental unit that has adopted this code under due legislative authority.	**No changes to Houston amendment.**
	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.		
215.0 – M – **Mechanical Code.** The City of Houston *Mechanical Code*, as adopted and amended by this jurisdiction.		**215.0 – M –** **Mechanical Code.** The City of Houston *Mechanical Code*, as adopted and amended by this jurisdiction.	**No changes to Houston amendment.**
	216.0 **Nonwater Urinal~~, Hybrid~~ with Drain Cleansing Action.** A non-water urinal that conveys waste into the drainage system with-out the use of water for flushing and automatically performs a drain-cleansing action after a predetermined amount of time.		
217.0 – O – **On-Site Treated Nonpotable Water.** Nonpotable 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 shall comply with the rules promulgated by the Texas Commission on Environmental Quality.		**217.0 – O –** **On-Site Treated Nonpotable Water.** Nonpotable 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 shall comply with the rules promulgated by the Texas Commission on Environmental Quality.	**No changes to Houston amendment.**
218.0 – P – **Patient Care Room.** Any space ~~room~~ of a health care facility where patients are intended to be examined or treated. [NFPA 99:3.3.1.127~~38~~] **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 patient, 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 the 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, 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. **Pre-fabricated Shower Enclosure.** A factory-assembled watertight structure with enclosing walls, a drain, and door or open access way.	**218.0 – P –** **Plumbing License Law.** Chapter 1301 of the Texas Occupations Code.	**No changes to Houston amendment definition for "Plumbing License Law".** **Previous definition for "Patient Care Room" has been removed as it's now part of base code.**

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~~**Basic Care Room.** A room in which the failure of equipment or a system is not likely to cause injury to the patients or caregivers but can cause patient discomfort. (Category 3). [NFPA 99.3.3.138.1]~~ ~~**Critical Care Room.** A room in which failure of equipment or a system is likely to cause major injury or death of patients or caregivers (Category 1). [NFPA 99.3.3.138.2]~~ ~~**General Care Room.** A room in which failure of equipment or a system is likely to cause minor injury to patients or caregivers (Category 2). [NFPA 99.3.3.138.3]~~ **Plumbing License Law.** Chapter 1301 of the Texas Occupations Code.			
220.0 – R – **Reclaimed Water.** Nonpotable water provided by a water/wastewater utility that, as a result of tertiary treatment of domestic wastewater, meets public health requirements ~~of the public health Authority Having Jurisdiction~~ for its intended uses. The level of treatment and quality of the onsite recycled water shall comply with the rules promulgated by the Texas Commission on Environmental Quality and the provisions of the *Construction Code*, whichever is more restrictive. **Residential Code.** The City of Houston *Residential Code*, as adopted and amended by this jurisdiction.		**220.0 – R –** **Reclaimed Water.** Nonpotable water provided by a water/wastewater utility that, as a result of tertiary treatment of domestic wastewater, meets public health requirements ~~of the public health Authority Having Jurisdiction~~ for its intended uses. The level of treatment and quality of the onsite recycled water shall comply with the rules promulgated by the Texas Commission on Environmental Quality and the provisions of the *Construction Code*, whichever is more restrictive. **Residential Code.** The City of Houston *Residential Code*, as adopted and amended by this jurisdiction.	**No changes to Houston amendment.**
222.0 – T – **Toilet Facility.** A room or space containing not less than one lavatory and one water closet.		**222.0 – T –** **Toilet Facility.** A room or space containing not less than one lavatory and one water closet.	**No changes to Houston amendment.**
		225.0 – W – **Water Cooler.** A drinking fountain that incorporates a means of reducing the temperature of the water supplied to it from the potable water distribution system.	**New definition for "Water Cooler" brought over from IPC definitions. Code change approved during Public Comment Period – Refer to "Technical Memo 08: Drinking Fountain Requirements" for changes related to drinking fountains.**

2015 Houston UPC – Chapter 3 – General Regulations	2021 UPC – Chapter 3 – General Regulations	2021 Houston UPC Amendments	Code Change Summary
301.3 Alternate Materials and Methods of Construction Equivalency. Nothing in this code is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this code. Technical documentation shall be submitted to the Authority Having Jurisdiction to demonstrate equivalency. The Authority Having Jurisdiction shall have the authority to approve or disapprove the system, method, or device for the intended purpose. ~~However, the exercise of this discretionary approval by the Authority Having Jurisdiction shall have no effect beyond the jurisdictional boundaries of said Authority Having Jurisdiction.~~ An alternate material or method of construction so approved			**Previous Houston amendment removed as it's no longer necessary.**

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shall not be considered as in accordance with the requirements, intent, or both of this code for a purpose other than that granted by the Authority Having Jurisdiction where the submitted data does not prove equivalency.			
301.4 Flood Hazard Areas. All plumbing systems shall be designed and constructed in accordance with Chapter 19 of the *City Code*. ~~Plumbing systems shall be located above the elevation in accordance with the building code for utilities and attendant equipment or the elevation of the lowest floor, whichever is higher.~~ ~~**Exception:** Plumbing systems shall be permitted to be located below the elevation in accordance with the building code for utilities and attendant equipment or the elevation of the lowest floor, whichever is higher, provided that the systems are designed and installed to prevent water from entering or accumulating within their components and the systems are constructed to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to such elevation.~~		**301.4 Flood Hazard Areas.** All plumbing systems shall be designed and constructed in accordance with Chapter 19 of the *City Code*. ~~Plumbing systems shall be located above the elevation in accordance with the building code for utilities and attendant equipment or the elevation of the lowest floor, whichever is higher.~~ ~~**Exception:** Plumbing systems shall be permitted to be located below the elevation in accordance with the building code for utilities and attendant equipment or the elevation of the lowest floor, whichever is higher, provided that the systems are designed and installed to prevent water from entering or accumulating within their components, and the systems are constructed to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to such elevation.~~	**No changes to Houston amendment.**
~~**301.4.1 Coastal High Hazard Areas.** Plumbing systems in buildings located in coastal high hazard areas shall be in accordance with the requirements of Section 301.4, and plumbing systems, pipes, and fixtures shall not be mounted on or penetrate through walls that are intended to breakaway under flood loads in accordance with the building code.~~		~~**301.4.1 Coastal High Hazard Areas.** Plumbing systems in buildings located in coastal high hazard areas shall be in accordance with the requirements of Section 301.4, and plumbing systems, pipes, and fixtures shall not be mounted on or penetrate through walls that are intended to breakaway under flood loads in accordance with the building code.~~	**No changes to Houston amendment.**
	309.6 Dead Legs. Dead legs shall have a method of flushing.		**New base code requirement for dead legs.**
319.2 Medical Gas Systems. The installation of medical gas systems shall be performed by certified installers meeting the requirements of the Texas Board of Plumbing Examiners.		**319.2 Medical Gas Systems.** The installation of medical gas systems shall be performed by licensed installers meeting the requirements of the Texas State Board of Plumbing Examiners.	**No changes to Houston amendment.**

2015 Houston UPC – Chapter 4 Plumbing Fixtures and Fixture Fittings	2021 UPC – Chapter 4 – Plumbing Fixtures and Fixture Fittings	2021 Houston UPC Amendments	Code Change Summary
	407.1 Application. Lavatories shall comply with ASME A112.19.1/CSA B45.2, ASME A112.19.2/CSA B45.1, ASME A112.19.3/CSA B45.4, ASME A112.19.12, CSA B45.5/IAPMO Z124, CSA B45.8/IAPMO Z403, CSA B45.11/IAPMO Z401 or CSA B45.12/IAPMO Z402. Group wash fixtures shall comply with the requirements of Section 401.2. Every 20 inches (508 mm) of rim space of a group wash fixture shall be considered as one lavatory for determining the number of lavatories required in accordance with Table 422.1. Lavatory assemblies with automatic soap dispensers, faucets, or hand dryers shall comply with IAPMO IGC 127.		**New base code requirements for group wash fixtures and lavatory assemblies with automatic dispensers, faucets, etc.**
	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~~	**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), unless limited to a maximum temperature of 110ºF (43ºC) for	**New Houston amendment that correlates hot water temperature requirements of the Houston Health Department.**

2015 Houston Amendments	2021 Base Code Changes	2021 Houston Amendments	Code Change Summary

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	~~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.	public safety as regulated by the Health Department. 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, or (2) A water heater conforming to ASSE 1084.	
407.4 Transient Public Lavatories. Self-closing or metering faucets shall be installed on lavatories intended to serve the transient public, such as those in, but not limited to service stations, train stations, airports, restaurants, and convention halls. **Exception:** Self-closing or metering faucets installed on lavatories intended to serve the transient public are not required when a faucet meets Health Department regulations to dispense water at or above a specific temperature.		**407.4 Transient Public Lavatories.** Self-closing or metering faucets shall be installed on lavatories intended to serve the transient public, such as those in, but not limited to, service stations, train stations, airports, restaurants, and convention halls. **Exception:** Self-closing or metering faucets installed on lavatories intended to serve the transient public are not required when a faucet meets Health Department regulations to dispense water at or above a specific temperature.	**No change to Houston amendment.**
	408.1 Application. Manufactured shower receptors and shower bases shall comply with ASME A112.19.1/CSA B45.2, ASME A112.19.2/CSA B45.1, ASME A112.19.3/CSAB45.4, CSA B45.12/IAPMO Z402, or CSA B45.5/IAPMO Z124. Pre-fabricated shower enclosures shall comply with IAPMO IGC 154.		**New base code provisions for prefabricated shower enclosures.**
	408.3.1 Gang Showers. Where gang showers are supplied with a single temperature-controlled water supply pipe, it shall be controlled by a mixing valve that complies with ASSE 1069. ~~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.~~		**Base code updated to remove certain gang shower requirements and incorporate into Section 408.3.2.**
	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: (1) A shower or tub/shower combination valve conforming to ASSE 1016/ASME A112.1016/CSA B125.16 where either: (a) The valve is field-adjusted to the required maximum temperature, or (b) The handle position, stop, or temperature limiting control is set in accordance with the manufacturer's instructions to the required maximum temperature; (2) 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; (3) 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; (5) A temperature actuated flow reduction device conforming to ASSE 1062.		**New base code provisions for temperature limiting devices, provisions incorporated from previous requirements in Section 408.**

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	408.5 Finished Curb or Threshold. Where a shower receptor has a finished dam, curb, or threshold, it shall be not less than 1 inch (25.4 mm) lower than the sides and back of such receptor. In no case, shall a dam or threshold be less than 2 inches (51 mm) or exceeding 9 inches (229 mm) in depth where measured from the top of the dam or threshold to the top of the drain. Each such receptor shall be provided with an integral nailing flange to be located where the receptor meets the vertical surface of the finished interior of the shower compartment. The flange shall be watertight and extend vertically not less than 1 inch (25.4 mm) above the top of the sides of the receptor. The finished floor of the receptor shall slope uniformly from the sides towards the drain not less than 1/8 inch per foot (10.4 mm/m), nor more than 1/2 inch per foot (41.6 mm/m). Thresholds shall be of sufficient width to accommodate a minimum 22 inch (559 mm) door. Shower doors shall open so as to maintain not less than a 22 inch (559 mm) unobstructed opening for egress. Where there is a shower without a threshold, the ~~entire adjoining~~ floor space within the same room ~~to showers without thresholds~~ shall be considered a wet location and shall comply with the requirements of the building, residential, and electrical codes. **Exceptions:** (1) Showers in accordance with Section 403.2. (2) A cast-iron shower receptor flange shall be not less than 0.3 of an inch (7.62 mm) in height. (3) For flanges not used as a means of securing, the sealing flange shall be not less than 0.3 of an inch (7.62 mm) in height.		**Minor wordsmithing in base code requirements.**
	409.4 Limitation of Hot Water Temperature in Bathtubs and Whirlpool Bathtubs. The maximum hot water temperature discharging from the bathtub and whirlpool bathtub filler shall be limited to 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 or CSA B125.3. (2) A water heater conforming to ASSE 1084.		**Updated temperature limitation requirements for bathtubs and whirlpool bathtubs.**
	410.3 Limitation of Water Temperature in Bidets. The maximum hot water temperature discharging from a bidet shall be limited to 110°F (43°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 or CSA B125.3. (2) A water heater conforming to ASSE 1084.		**Updated temperature limitation requirements for bidets.**
411.2 Water Consumption. Water closets shall have a maximum consumption not to exceed ~~1.6~~ 1.28 gallons (~~6.0~~ 4.85 Lpf) of water per flush, or be a high efficiency fixture, in accordance with ASME A112.19.2/CSA B45.1.		**411.2 Water Consumption.** Water closets shall have a maximum consumption not to exceed ~~1.6~~ 1.28 gallons (~~6.0~~ 4.85 L~~pf~~) of water per flush, or be a high efficiency fixture.	**No change to Houston amendment.**

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411.2.2 Flushometer Valve Activated Water Closets. Flushometer valve activated water closets shall have a maximum flush volume of ~~1.6~~ 1.28 gallons (~~6.0~~ 4.85 Lpf) of water per flush in accordance with ASME A112.19.2/CSA B45.1.		**411.2.2 Flushometer Valve Activated Water Closets.** Flushometer valve activated water closets shall have a maximum flush volume of ~~1.6~~ 1.28 gallons (~~6.0~~ 4.85 L~~pf~~) of water per flush.	**No change to Houston amendment.**
411.4 Personal Hygiene Devices. Water closets with integral personal hygiene devices shall comply with ASME A112.4.2/CSA B45.16.			**Houston amendment removed, no longer needed as it's covered in base code UPC.**
412.1 Application. Urinals shall comply with ASME A112.19.2/CSA B45.1, ASME A112.19.19, or CSA B45.5/IAPMO Z124. Urinals shall have an average water consumption not to exceed ~~1~~ 0.5 gallon (~~3.8~~ 1.9 Lpf) of water per flush.		**412.1 Application.** Urinals shall comply with ASME A112.19.2/CSA B45.1, ASME A112.19.19, or CSA B45.5/IAPMO Z124. Urinals shall have an average water consumption not to exceed ~~1~~ 0.5 gallon (~~3.8~~ 1.9 L~~pf~~) of water per flush.	**No change to Houston amendment.**
412.1.1 Nonwater Urinals. Nonwater urinals shall have a barrier liquid sealant to maintain a trap seal. Nonwater urinals shall permit the uninhibited flow of waste through the urinal to the sanitary drainage system. Nonwater urinals shall be cleaned and maintained in accordance with the manufacturer's instructions after installation. Where nonwater urinals are installed, not less than one water supplied fixture rated at not less than 1 water supply fixture unit (WSFU) shall be installed upstream on the same drain line to facilitate drain line flow and rinsing. Where nonwater urinals are installed they shall have a water distribution line rough-in to ~~the~~ each individual urinal location to allow for the installation of an approved backflow prevention device in the event of a retrofit.			**Houston amendment removed, no longer needed as it's covered in base code UPC.**
	412.1.2 Nonwater Urinals with Drain Cleansing Action. Nonwater urinals with drain cleansing action shall comply with ASME A112.19.19 and shall be cleaned, maintained and installed in accordance with the manufacturer's installation instructions.		**New base code requirements for nonwatery urinals.**
		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.]	**New Houston amendment for drinking fountains. Code change approved during Public Comment Period – Refer to "Technical Memo 08: Drinking Fountain Requirements" for changes related to drinking fountains.**
415.2 Drinking Fountain Alternatives. Where food is consumed indoors, water stations shall be permitted to be substituted for drinking fountains. ~~Bottle filling stations shall be permitted to be substituted for drinking fountains up to 50 percent of the requirements for drinking fountains. Drinking fountains shall not be required for an occupant load for 30 or less.~~			**Houston amendment removed due to changes to drinking fountains requirements. Refer to "Technical Memo 08: Drinking Fountain Requirements" for changes related to drinking fountains.**
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. Flow rate, discharge pattern, and	**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,		**Houston amendment removed, no longer needed as it's covered in base code UPC.**

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temperature of flushing fluids shall be provided in accordance with ISEA Z358.1 based on the hazardous material.	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.		
	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.		**New base code provisions for low-pressure water dispensers.**
418.3 Location of Floor Drains. Floor drains shall be installed in the following areas: **(1)** Toilet rooms containing two or more water closets or a combination of one water closet and one urinal, except in a dwelling unit. **(2)** Commercial kitchens and in accordance with Section 704.3. **(3)** Laundry rooms in commercial buildings and common laundry facilities in multi-family dwelling buildings. **(4)** Boiler rooms. **(5)** Industrial and manufacturing facilities, workshops, auto repair shops, and other facilities as required by the Authority Having Jurisdiction where oils, flammable and/or combustible liquids, or other hazardous materials are present, stored, or used. Floor drains shall be connected to appropriately designed interceptors as required by the Authority Having Jurisdiction and the provisions of Chapters 7 and 10.		**418.3 Location of Floor Drains.** Floor drains shall be installed in the following areas: (1) Toilet rooms containing two or more water closets or a combination of one water closet and one urinal, except in a dwelling unit. (2) Commercial kitchens and in accordance with Section 704.3. (3) Laundry rooms in commercial buildings and common laundry facilities in multi-family dwelling buildings. (4) Boiler rooms. (5) Industrial and manufacturing facilities, workshops, auto repair shops, and other facilities as required by the Authority Having Jurisdiction where oils, flammable and/or combustible liquids, or other hazardous materials are present, stored, or used. Floor drains shall be connected to appropriately designed interceptors as required by the Authority Having Jurisdiction and the provisions of Chapters 7 and 10 of this code.	**Minor wordsmithing change to Houston amendment, no change to intent.**
422.1 Fixture Count. Each building shall be provided with sanitary facilities as prescribed in Chapter 29, Table 2902.1, of the *Building Code*. ~~Plumbing fixtures shall be provided for the type of building occupancy and in the minimum number shown in Table 422.1. The total occupant load and occupancy classification shall be determined in accordance with the building code. Occupancy classification not shown in Table 422.1 shall be considered separately by the Authority Having Jurisdiction.~~ ~~The minimum number of fixtures shall be calculated at 50 percent male and 50 percent female based on the total occupant load. Where information submitted indicates a difference in distribution of the sexes such information shall be used in order to determine the number of fixtures for each sex. Once the occupancy load and occupancy are determined, Table 422.1 shall be applied to determine the minimum number of plumbing fixtures required. Where applying the fixture ratios in Table 422.1 results in fractional numbers, such numbers shall be rounded to the next whole number. For multiple occupancies, fractional numbers shall be first summed and then rounded to the next whole number.~~ {**EDITORIAL NOTE:** DELETE TABLE 422.1.}		**422.1 Fixture Count.** Each building shall have sanitary facilities as prescribed in Chapter 29, Table 2902.1, of the *Building Code*. ~~Plumbing fixtures shall be provided for the type of building occupancy and in the minimum number shown in Table 422.1. The total occupant load and occupancy classification shall be determined in accordance with the building code. Occupancy classification not shown in Table 422.1 shall be considered separately by the Authority Having Jurisdiction.~~ ~~The minimum number of fixtures shall be calculated at 50 percent male and 50 percent female based on the total occupant load. Where information submitted indicates a difference in distribution of the sexes such information shall be used in order to determine the number of fixtures for each sex. Once the occupancy load and occupancy are determined, Table 422.1 shall be applied to determine the minimum number of plumbing fixtures required. Where applying the fixture ratios in Table 422.1 results in fractional numbers, such numbers shall be rounded to the next whole number. For multiple occupancies, fractional numbers shall be first summed and then rounded to the next whole number.~~ [**EDITORIAL NOTE:** DELETE TABLE 422.1.]	**Minor wordsmithing change to Houston amendment, no change to intent.**

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2015 Houston UPC – Chapter 5 Water Heaters	2021 UPC – Chapter 5 – Water Heaters	2021 Houston UPC Amendments	Code Change Summary
Table 501.1(2) **First Hour Rating[1]** **mber of hrooms** | **1 to 1.5** | | | **2 to 2.5** | | | | **3 to 3.5** | | | **mber of drooms** | **1** | **2** | **3** | **2** | **3** | **4** | **5** | **3** | **4** | **5** | st Hour ating, **2** allons | ~~42~~ 38 | ~~54~~ 49 | ~~54~~ 49 | ~~54~~ 49 | ~~67~~ 62 | ~~67~~ 62 | ~~80~~ 74 | ~~67~~ 62 | ~~80~~ 74 | ~~80~~ 74 | **For SI units:** 1 gallon = 3.785 L **Notes:** **1.** The first hour rating is found on the "Energy Guide" label. **2.** Solar water heaters shall be sized to meet the appropriate first hour rating as shown in the table.			**Previous Houston amendment removed, now part of base code UPC.**
	507.2 Seismic Provisions. ~~In seismic design categories C,D,E, and F, w~~Water heaters shall be anchored or strapped to resist horizontal displacement due to earthquake motion. Strapping shall be at points within the upper one-third and lower one-third of its vertical dimensions. At the lower point, a distance of not less than 4 inches (102 mm) shall be maintained from the controls with the strapping.		**Minor changes to base code for seismic provisions.**
507.13 Installation in Garages. Appliances in garages and in adjacent spaces that open to the garage and are not part of the living space of a dwelling unit shall be installed so that burners, ignition sources, and burner-ignition devices are located not less than 18 inches (457 mm) above the floor unless listed as flammable vapor ignition resistant. [NFPA 54:9.1.10.1]	**507.13 Installation in Residential Garages.** Appliances in residential garages and in adjacent spaces that open to the garage and are not part of the living space of a dwelling unit shall be installed so that all burners and burner-ignition devices are located not less than 18 inches (457 mm) above the floor unless listed as flammable vapor ignition resistant. [NFPA 54:9.1.10.1]	**507.13 Installation in Residential Garages.** Appliances in residential garages and in adjacent spaces that open to the garage and are not part of the living space of a dwelling unit shall be installed so that all burners, ignition sources, and burner-ignition devices are located not less than 18 inches (457 mm) above the floor unless listed as flammable vapor ignition resistant. [NFPA 54:9.1.10.1]	**Minor change to base code.** **No change to Houston amendment.**
	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]		**Minor change to base code.**
508.3.2 Access Type. The inside means of access shall be a permanent, ~~or fold-away inside stairway or ladder, terminating in an enclosure, scuttle, or trap door. Such scuttles or trap doors shall be not less than 22 inches by 24 inches (559 mm by 610 mm) in size,~~ disappearing or pull-down attic stairs with a clear opening not less than 22 inches in width and a load capacity of not less than 350 pounds (158.757 kg) or a ladder permanently fastened to the building. Such a ladder or stairway shall		**508.3.2 Access Type.** The inside means of access shall be a permanent ~~or foldaway inside stairway or ladder, terminating in an enclosure, scuttle, or trapdoor. Such scuttles or trapdoors shall be atleast 22 inches by 24 inches (559 mm by 610 mm) in size,~~ disappearing or pull-down attic stairs with a clear opening not less than 22 inches in width and a load capacity of not less than 350 pounds (158.757 kg) or a ladder permanently fastened to the building. Such a ladder or stairway shall not be more than 18 feet (5486 mm) in length between landings and not less	**No change to Houston amendment.**

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not be more than 18 feet (5,486 mm) in length between landings and not less than 14 inches (356 mm) in width and shall open easily and safely under all conditions, especially snow; and shall be constructed so as to permit access from the roof side unless deliberately locked on the inside. The ladder shall have rungs spaced not more than 14 inches (356 mm) center to center and not less than 7 inches (177.8 mm) from the face of the wall to the center of each rung. Each stile is to extend 30 inches (762 mm) above the surface to be reached, or as high as possible, if height is limited. Permanent ladders for water heater access need not be provided at parapets or walls less than 30 inches (762 mm) in height. All ladders shall be rated for a load capacity of not less than 350 pounds (158.757 kg). Not less than 6 feet (1,829 mm) of clearance shall be between the access opening and the edge of the roof or similar hazard, or rigidly fixed rails or guards not less than 42 inches (1,067 mm) in height shall be provided on the exposed side. Where parapets or other building structures are utilized in lieu of guards or rails, they shall not be less than 42 inches (1,067 mm) in height. (NFPA 54:9.4.3.3]		than 14 inches (356 mm) in width and shall open easily and safely under all conditions, especially snow, and shall be constructed so as to permit access from the roof side unless deliberately locked on the inside. The ladder shall have rungs spaced not more than 14 inches (356 mm) center to center and not less than 7 inches (177.8 mm) from the face of the wall to the center of each rung. Each stile shall extend 30 inches (762 mm) above the surface to be reached, or as high as possible, if height is limited. Permanent ladders for water heater access need not be provided at parapets or walls less than 30 inches (762 mm) in height. All ladders shall be rated for a load capacity of not less than 350 pounds (158.757 kg). At least 6 feet (1829 mm) of clearance shall be available between the access opening and the edge of the roof or similar hazard, or rigidly fixed rails or guards a minimum of 42 inches (1067 mm) in height shall be provided on the exposed side. Where parapets or other building structures are utilized in lieu of guards or rails, they shall be a minimum of 42 inches (1067 mm) in height. (NFPA 54:9.4.3.3]	
508.4 Appliances in Attics and Under-Floor Spaces. An attic or under-floor space in which an appliance is installed shall be accessible through an opening and passageway not less than as large as the largest component of the appliance~~, and not less than 22 inches by 30 inches (559 mm by 762 mm)~~ and shall be made accessible by a ladder or disappearing or pull-down attic stairs with a clear opening of not less than 30 inches high and 22 inches in width at its narrowest point and a load capacity of not less than 350 pounds (158.757 kg) or a ladder permanently fastened to the building with a load capacity of not less than 350 pounds (158.757 kg). Such a ladder or stairway shall not be more than 18 feet (5486 mm) in length between landings and not less than 14 inches (356 mm) in width. The ladder shall have rungs spaced not more than 14 inches (356 mm) center to center and not less than 7 inches (177.8 mm) from the face of the wall. Each stile is to extend 30 inches (762 mm) above the surface to be reached, or as high as possible, if height is limited. **Exception:** A portable ladder may be used for access for water heaters in attics in buildings with lift out ceilings.		**508.4 Appliances in Attics and Under-Floor Spaces.** An attic or under-floor space in which an appliance is installed shall be accessible through an opening and passageway, not less than as large as the largest component of the appliance~~, and not less than 22 inches by 30 inches (559 mm by 762 mm)~~ and shall be made accessible by a ladder or disappearing or pull-down attic stairs with a clear opening of not less than 30 inches high and 22 inches in width at its narrowest point and a load capacity of not less than 350 pounds (158.757 kg) or a ladder permanently fastened to the building with a load capacity of not less than 350 pounds (158.757 kg). Such a ladder or stairway shall not be more than 18 feet (5486 mm) in length between landings and not less than 14 inches (356 mm) in width. The ladder shall have rungs spaced not more than 14 inches (356 mm) center to center and not less than 7 inches (177.8 mm) from the face of the wall. Each stile is to extend 30 inches (762 mm) above the surface to be reached, or as high as possible, if height is limited. **Exception:** A portable ladder may be used for access for water heaters in attics in buildings with lift out ceilings.	**No change to Houston amendment.**
	509.3 ~~Design and Construction~~ Minimum Safe Performance. Venting systems shall be designed and constructed to convey all flue~~,~~ and vent~~, or both~~ gases to the outdoors. [NFPA 54:12.1]		**Minor change to base code.**
	509.3.3 Mechanical Draft Systems. Mechanical draft systems shall be listed in accordance with UL 378 and installed in accordance with both the appliance and the mechanical draft system manufacturer's installation instructions. [NFPA 54:12.4.3.1]		**Base code now references UL 378 for mechanical draft systems.**

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	509.4.1 Plastic Piping. 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 instructions shall identify the specific plastic piping material. The plastic pipe venting materials shall be labeled in accordance with the product standards specified by the appliance manufacturer or shall be listed and labeled in accordance with UL 1738. [NFPA 54:12.5.2]		**Base code updated with UL 1738 requirements.**
	509.4.2 Plastic Vent Joints. Plastic pipe and fittings used to vent appliances shall be installed in accordance with the appliance manufacturer's installation instructions. Plastic pipe venting materials listed and labeled in accordance with UL 1738 shall be installed in accordance with the vent manufacturer's installation instructions. Where primer is required, it shall be of a contrasting color. [NFPA 54:12.5.3]		**Base code updated with UL 1738 requirements.**
	509.4.3 Special Gas Vents. Special gas vents shall be listed and labeled in accordance with UL 1738 and installed in accordance with the special gas vent manufacturer's installation instructions. [NFPA 54:12.5.4]		**Base code updated with UL 1738 requirements.**
	509.8.2 Direct-Vent Appliance. The ~~vent terminal of a~~ clearances for through-the-wall direct vent ~~appliances with an input of 10,000 Btu/h (2.93 W) or less~~ terminals shall be ~~located at least 6 inches (152 mm) from any air opening into a building, an appliances with an input over 10,000 Btu/h (2.93 kW) but not over 50,000 Btu/h (14.7kW) shall have at least a 12 inch (305 mm) vent termination clearance~~ in accordance with Table 509.8.2. The bottom of the vent terminal and the air intake shall be located ~~at least~~ not less than 12 inches (305 mm) above finished ground level. [NFPA 54:12.9.3]		**Base code updated with UL 1738 requirements.**
	TABLE 509.8.2 **THROUGH-THE-WALL DIRECT-VENT TERMINATION CLEARANCES** **[NFPA 54: TABLE 12.9.3]** DIRECT-VENT APPLIANCE INPUT RATING / THROUGH-THE-WALL VENT TERMINAL CLEARANCE FROM ANY AIR OPENING INTO A BUILDING (inches) 10 000 Btu/h and less — 6 Greater than 10 000 Btu/h and not exceeding 50 000 Btu/h — 9 Greater than 50 000 Btu/h and not exceeding 150 000 Btu/h — 12 > 150 000 Btu/h — In accordance with the appliance manufacturer's instructions and in no case less than the clearances specified in Section 509.8.1. For SI Units: 1 inch = 25.4 mm, 1000 British thermal units per hour = 0.293 kW		**Base code updated with UL 1738 requirements.**

2015 Houston UPC – Chapter 6 Water Supply and Distribution	2021 UPC – Chapter 6 – Water Supply and Distribution	2021 Houston UPC Amendments	Code Change Summary
	601.2 ~~Hot and Cold Water Required~~ Water Supply and Flushing. ~~Except where not deemed necessary for safety or sanitation by the Authority Having Jurisdiction, e~~Each plumbing fixture shall be provided with an adequate supply of potable		**Minor changes to base code.**

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	running water piped thereto in an approved manner, so arranged as to flush and keep it in a clean and sanitary condition without danger of backflow or cross-connection. Water closets and urinals shall be flushed using an approved flush tank or flushometer valve. **Exceptions:** (1) Listed fixtures that do not require water for their operation and are not connected to the water supply. (2) Where not deemed necessary for safety and sanitation by the Authority Having Jurisdiction.		
	601.2.1 Hot and Cold Water Required. In occupancies where plumbing fixtures are installed for private use, hot water shall be required for bathing, washing, laundry, cooking purposes, dishwashing or maintenance. In occupancies where plumbing fixtures are installed for public use, hot water shall be required for bathing and washing purposes. This requirement shall not supersede the requirements for individual temperature control limitations for public lavatories and public and private bidets, bathtubs, whirlpool bathtubs, and shower control valves.		**Minor changes to base code.**
	603.4.2 Testing. The premise owner or responsible person shall have the backflow prevention assembly tested by a certified backflow assembly tester at the time of installation, repair, or relocation and not less than on an annual schedule thereafter, or more often where required by the Authority Having Jurisdiction. The periodic testing shall be performed in accordance with the procedures referenced in ASSE Series 5000 by a tester qualified in accordance with those standards. The field test kit used shall comply with ASSE 1064.		**Base code now references ASSE 1064 for field test kit usage.**
603.5.8.1 Discharge of Water Used for Cooling. Water used for cooling of equipment or similar purposes shall not be returned to the potable water distributing system. When discharged to the building drainage system, wastewater shall be discharged through an indirect waste pipe or airgap.		**603.5.8.1 Discharge of Water Used for Cooling.** Water used for cooling of equipment or similar purposes shall not be returned to the potable water distributing system. When discharged to the building drainage system, wastewater shall be discharged through an indirect waste pipe or airgap.	**No change to Houston amendment.**
603.5.18.2 Water Treatment Units. Reverse osmosis drinking water treatment units shall meet the requirements of the appropriate standards referenced in Table 1701.1. Waste or discharge from reverse osmosis or other types of water treatment units shall enter the drainage system through an airgap. Water supply for water softeners shall be protected by a double check valve assembly,		**603.5.18.2 Water Treatment Units.** Reverse osmosis drinking water treatment units shall meet the requirements of the appropriate standards referenced in Table 1701.1. Waste or discharge from reverse osmosis or other types of water treatment units shall enter the drainage system through an airgap. Water supply for commercial water softeners must be protected by a double check valve assembly.	**No change to Houston amendment.**
603.5.21 Chemical Dispensers. The water supply to chemical dispensers shall be protected against backflow. The chemical dispenser shall comply with ASSE 1055 or the water supply shall be protected by one of the following methods: **(1)** Air gap **(2)** Atmospheric vacuum breaker (AVB)			**Houston amendment removed, now covered in base code UPC.**

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(3) Pressure vacuum breaker backflow prevention assembly (PVB)
(4) Spill-resistant pressure vacuum breaker (SVB)
(5) Reduced-pressure principle backflow prevention assembly (RP)

Table 604.1
Materials for Building Supply and Water Distribution Piping and Fittings

al	Building Supply Pipe and Fittings	Water Distribution Pipe and Fittings	Referenced Standard(s) Pipe	Referer Standa Fittin
er er s	X	X	ASTM B42, ASTM B43, ASTM B75, ASTM B88, ASTM B135, ASTM B251, ASTM B302, ASTM B447	ASME B ASME B ASME B ASME B ASME B1 ASME B ASSE 1
C	X	X	ASTM D2846, ASTM F441, ASTM F442, CSA B137.6	ASSE 1 ASTM D ASTM F ASTM F ASTM F ASTM F CSA B1
AL-C	X	X	ASTM F2855	ASTM D
e-	X	X	AWWA C151	ASME B AWWA C AWWA
ize el	X	X	ASTM A53	–
ble	X	X	–	ASME B
	X*1	–	ASTM D2239, ASTM D2737, ASTM D3035, AWWA C901, CSA B137.9	ASTM D ASTM D ASTM D ASTM F CSA B1
PE	X	X	ASTM F1282, CSA B137.9	ASTM F ASTM F ASTM F ASTM F ASTM F
--	X	X	ASTM F1986	ASTM F

Houston amendment removed, now covered in base code UPC.

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PE-RT	X	X	ASTM F2769, CSA B137.18	ASTM D3261, ASTM F1055, ASSE 1061, ASTM F1807, ASTM F2098, ASTM F2159, ASTM F2735, ASTM F2769, CSA B137.18
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
PEX-AL-PEX	X	X	ASTM F1281, CSA B137.10, ASTM F2262	ASTM F1281, ASTM F1974, ASTM F2434, CSA B137.10
PP	X	X	ASTM F2389, CSA B137.11	ASTM F2389, CSA B137.11
PVC	X*1	–	ASTM D1785, ASTM D2241, AWWA C900	ASTM D2464, ASTM D2466, ASTM D2467, ASTM F1970, AWWA C907
Stainless Steel	X	X	ASTM A269, ASTM A312	–

Notes:
1. *—For building supply or exterior cold-water applications, not for water distribution piping.
2. For brazed fittings only.

604.10.1 Tracer Wire. Plastic materials for building supply piping outside underground shall have 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 not be less than 18 AWG and the insulation type shall be suitable for direct burial.			**Houston amendment removed, now covered in base code UPC.**
Figure 6.5		**Figure 6.5**	**No change to Houston amendment.**

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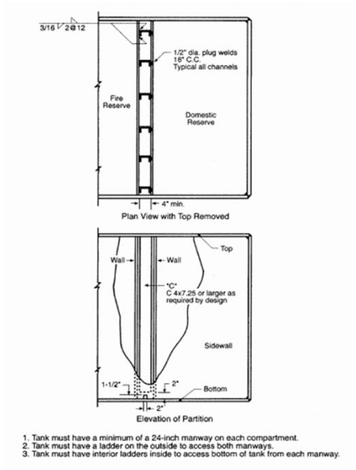
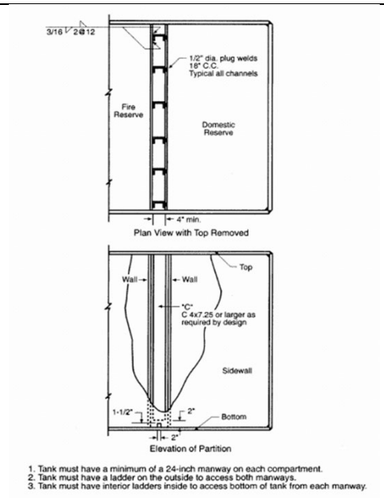
 1. Tank must have a minimum of a 24-inch manway on each compartment. 2. Tank must have a ladder on the outside to access both manways. 3. Tank must have interior ladders inside to access bottom of tank from each manway.		 1. Tank must have a minimum of a 24-inch manway on each compartment. 2. Tank must have a ladder on the outside to access both manways. 3. Tank must have interior ladders inside to access bottom of tank from each manway.	
605.9 PEX Tubing and Joints. PEX plastic tubing and fitting joining methods shall be installed in accordance with the manufacturer's installation instructions and shall comply with Section 605.9.1 ~~and~~ through Section 605.9.~~2~~3.		**605.9 PEX Plastic Tubing and Joints.** PEX plastic tubing and fitting joining methods shall be installed in accordance with the manufacturer's installation instructions and shall comply with Section 605.9.1 through Section 605.9.43.	**Houston amendment updated to give correct reference, no change to intent.**
605.9.3 Tubing. PEX tubing shall have a minimum chlorine designation code of 5 to meet minimum chlorine resistance at end use condition of 100% of the time at 140°F. Acceptable markings on the tubing are: PEX 5106, PEX 5206, and PEX 5306.		**605.9.4 Tubing.** PEX tubing shall have a minimum chlorine designation code of 5 to meet minimum chlorine resistance at end use condition of 100% of the time at 140°F. Acceptable markings on the tubing are: PEX 5106, PEX 5206, and PEX 5306.	**No change to Houston amendment.**
605.12 PVC Plastic Pipe and Joints. PVC plastic pipe and fitting joining methods shall be installed in accordance with the manufacturer's installation instructions and shall comply with Section 605.12.1 through 605.12.3. PVC piping shall not be exposed to direct sunlight unless the piping does not exceed 24 inches (610 mm) and is wrapped with not less than 0.04 of an inch (1.02 mm) thick tape or otherwise protected from UV degradation.			**Houston amendment removed, now covered in base code UPC.**
606.8 Draindown Valve. A means for draining the building piping shall be installed at each building entry. The drain down valve shall not be installed in an underground service pipe, but shall be installed at a location in the pipe above ground before the pipe enters the building.	**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 ensure the direction of flow.		**New base code provisions for check valves.** **Houston amendment moved to Section 606.10.**
	606.9 Leak Detection Devices. Where leak detection devices for water supply and distribution are installed, they shall comply with IAPMO IGC 115 or IAPMO IGC 349.		**New base code provisions for leak detection devices to comply with IAPMO IGC 115 or 349.**
		606.10 Draindown Valve. A means for draining the building piping shall be installed at each building entry. The drain down valve shall not be installed in an underground service pipe, but shall be installed at a location in the pipe above ground before the pipe enters the building.	**No change to Houston amendment, relocated from Section 606.8.**

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607.2 Potable Water Tanks. ~~P~~ All potable water supply tanks, interior tank coatings, or tank liners intended to supply drinking water shall be in accordance with NSF 61. Soil or waste lines shall not pass directly over nonpressure water supply tanks or over manholes in pressure tanks.		**607.2 Potable Water Tanks.** ~~P~~ All potable water supply tanks, interior tank coatings, or tank liners intended to supply drinking water shall be in accordance with NSF 61. Soil or waste lines shall not pass directly over nonpressure water supply tanks or over manholes in pressure tanks.	**No change to Houston amendment.**
607.3 Venting. Tanks used for potable water shall be tightly covered and vented in accordance with the manufacturer's installation instructions. Such vent shall be screened with a corrosion-resistant material of not less than number ~~24~~ 100 mesh.		**607.3 Venting.** Tanks used for potable water shall be tightly covered and vented in accordance with the manufacturer's installation instructions. Such vent shall be screened with a corrosion-resistant material of not less than number ~~24~~ 100 mesh.	**No change to Houston amendment.**
607.4 Overflow. Tanks shall have not less than a 16-square inch (0.01 m^2) overflow that is screened with a corrosion-resistant material of not less than number ~~24~~ 100 mesh. Overflow pipes for gravity tanks shall discharge above and within 6 inches (152.4 mm) of a roof drain, floor drain or catch basin, or they shall discharge into an open hub drain or water supplied sink.		**607.4 Overflow.** Tanks shall have not less than a 16 square inch (0.01 m^2) overflow that is screened with a corrosion-resistant material of not less than number ~~24~~ 100 mesh. Overflow pipes for gravity tanks shall discharge above and within 6 inches (152.4 mm) of a roof drain, floor drain or catch basin, or they shall discharge into an open hub drain or water supplied sink.	**No change to Houston amendment.**
607.6 Cleaning, Painting, Repairing Water Supply Tanks. A potable water supply tank for domestic purposes shall not be lined, painted or repaired with any material that does not meet the current ANSI/AWWA D102 standards and has not been approved by the Authority Having Jurisdiction.		**607.6 Cleaning, Painting, Repairing Water Supply Tanks.** A potable water supply tank for domestic purposes shall not be lined, painted, or repaired with any material that does not meet the current ANSI/AWWA D102 standards and has not been approved by the Authority Having Jurisdiction.	**No change to Houston amendment.**
607.7 When Required. When the water pressure from the public water main during flow is insufficient to supply fixtures that are likely to be in simultaneous operation, the supply shall be from a gravity house tank, pressure tank, or booster system. No pumps are permitted to take suction directly from a public water main in this jurisdiction. **Exception:** Pumps may be allowed to take suction from a public water main in this jurisdiction when approved by the Authority Having Jurisdiction if the main is of sufficient size as determined and approved by the Water Engineering Division of Houston Public Works.		**607.7 When Required.** When the water pressure from the public water main during flow is insufficient to supply fixtures that are likely to be in simultaneous operation, the supply shall be from a gravity house tank, pressure tank, or booster system. No pumps are permitted to take suction directly from a public water main in this jurisdiction. **Exception:** Pumps may be allowed to take suction from a public water main in this jurisdiction when approved by the Authority Having Jurisdiction if the main is of sufficient size as determined and approved by the Water Engineering Division of Houston Public Works.	**No change to Houston amendment.**
607.8 Drains. Water supply tanks shall be provided with valved drain lines located at their lowest point of the tank and discharge water as indirect waste or as required for overflow pipes.		**607.8 Drains.** A potable water supply tank shall have a valved drain line located at the lowest point of the tank and discharge water as indirect waste or as required for overflow pipes.	**Minor wordsmithing changes to Houston amendment to clarify intent.**

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607.9 Tanks—Below-Rim Supply.

(1) Where a potable water outlet terminates below the rim of a tank, the tank shall have an overflow of diameter not less than that given in Table 607.9.

(2) The potable water inlet to the tank or vat shall terminate a distance of not less than one and one-half times the height to which water can rise in the tank above the top of the overflow.

(3) The distance from the inlet to the high water level shall be measured from the critical point of the potable water supply overflow.

TABLE 607.9
SIZES OF OVERFLOW PIPES FOR WATER SUPPLY TANKS

Maximum Capacity of Water Supply Line to Tank	Diameter of Overflow Pipe (Inches ID)
0-50≤ gpm	2
>50-150≤ gpm	2 ½
>100-200≤ gpm	3
>200-400≤ gpm	4
400-700 gpm	5
700-1,000 gpm	6
Over 1,000 gpm	8

607.9 Tanks—Below-Rim Supply.

(1) Where a potable water outlet terminates below the rim of a tank, the tank shall have an overflow with a diameter not less than that provided in Table 607.9.

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(3) The distance from the inlet to the high water level shall be measured from the critical point of the potable water supply overflow.

TABLE 607.9
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>50-150≤ gpm	2 ½
>100-200≤ gpm	3
>200-400≤ gpm	4
400-700 gpm	5
700-1,000 gpm	6
Over 1,000 gpm	8

No change to Houston amendment.

607.10 Construction of Tanks. Tanks used for potable water supply or to supply standpipes for firefighting equipment only shall be equipped with tight vermin-proof covers. Such tanks shall be vented with a return bend vent pipe having an area not less than one half of the area of the overflow riser. The vent opening and overflow riser shall be covered with a metallic screen of not less than 100 mesh. To provide an air gap, the top of the overflow riser shall not be less than 2 inches (50.8 mm) below the fill connection. The potable water supply shall be protected from contamination via the fire standpipe supply by a divided suction tank or a separate tank for potable water supply or by installing an approved backflow preventer on the downstream side of the fire pumps. When a divided tank is used, the tank shall be divided by a double wall partition extending to the top of the tank, and each wall shall be sealed with a continuous weld between the wall and four sides of the tank. There shall be an air space of not less than 4 inches (101.6 mm) between the walls of the partition, with an opening (not threaded) at the bottom of the partition to give visual evidence of loss of integrity of the walls of the partition (see Figure 6.5). The air space between the partition walls shall be given a 1.0 PSI air test with all welds soaped to assure no leaks in the partition chamber. The tank fabricator shall furnish a certificate of compliance with this test that also includes a statement that the coating materials are in compliance with the requirements of ANSI/AWWA D102 and NSF 61 and a metal nameplate on the tank giving the name of the fabricator, the

607.10 Construction of Tanks. Tanks used for potable water supply or to supply standpipes for firefighting equipment only shall be equipped with tight vermin-proof covers. Such tanks shall be vented with a return bend vent pipe having an area not less than one half of the area of the overflow riser. The vent opening and overflow riser shall be covered with a metallic screen of not less than 100 mesh. To provide an air gap, the top of the overflow riser shall not be less than 2 inches (50.8 mm) below the fill connection. The potable water supply shall be protected from contamination via the fire standpipe supply by a divided suction tank or a separate tank for potable water supply or by installing an approved backflow preventer on the downstream side of the fire pumps. When a divided tank is used, the tank shall be divided by a double wall partition extending to the top of the tank, and each wall shall be sealed with a continuous weld between the wall and four sides of the tank. There shall be an air space of not less than 4 inches (101.6 mm) between the walls of the partition, with an opening (not threaded) at the bottom of the partition to give visual evidence of any loss of integrity of the walls of the partition (see Figure 6.5). The air space between the partition walls shall be given a 1.0 PSI air test with all welds soaped to ensure there are no leaks in the partition chamber. The tank fabricator shall furnish a certificate of compliance with this test that also includes a statement that the coating materials are in compliance with the requirements of ANSI/AWWA D102 and NSF 61 and a metal nameplate on the tank giving the name of the fabricator, the date of fabrication, and a serial number. All

No change to Houston amendment.

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date of fabrication, and a serial number. All tanks for potable water service shall be constructed of new material to assure against possibility of contamination from previous usage.		tanks for potable water service shall be constructed of new material to assure against possibility of contamination from previous usage.	
607.11 Piping. Water piping from potable gravity and suction tanks to the suction side of the water pumps and from the discharge end of the pumps to the check valve shall be galvanized.		**607.11 Piping.** Water piping from potable gravity and suction tanks to the suction side of the water pumps and from the discharge end of the pumps to the check valve shall be galvanized.	**No change to Houston amendment.**
607.12 Vacuum Breaker. Pressure tanks used for supplying water to the potable water distribution system, to both the fire standpipes and the potable system or to supply standpipes for fire equipment only, shall be equipped with an acceptable vacuum breaking device located on the top of the tank. The air inlet of this device shall be covered with a metallic screen of not less than 100 mesh.		**607.12 Vacuum Breaker.** Pressure tanks used for supplying water to the potable water distribution system, to both the fire standpipes and the potable system or to supply standpipes for fire equipment only, shall be equipped with an acceptable vacuum breaking device located on the top of the tank. The air inlet of this device shall be covered with a metallic screen of not less than 100 mesh.	**No change to Houston amendment.**
	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. Such regulator(s) shall control the pressure to water outlets in the building unless otherwise approved by the Authority Having Jurisdiction. Each such regulator and strainer shall be accessibly located aboveground or in a vault equipped with a properly sized and sloped bore-sighted drain to daylight, shall be protected from freezing, and shall have the strainer readily accessible for cleaning without removing the regulator or strainer body or disconnecting the supply piping. Pipe size determinations shall be based on 80 percent of the reduced pressure where using Table 610.4. An approved expansion tank shall be installed in the cold water distribution piping downstream of each such regulator to prevent excessive pressure from developing due to thermal expansion and to maintain the pressure setting of the regulator. Expansion tanks used in potable water systems intended to supply drinking water shall comply with NSF 61. The expansion tank shall be properly sized and installed in accordance with the manufacturer's installation instructions and listing. Systems designed by registered design professionals shall be permitted to use approved pressure relief valves in lieu of expansion tanks provided such relief valves have a maximum pressure relief setting of 100 psi (689 kPa) or less.		**Minor change to base code providing regulations on pressure regulations to comply with ASSE 1003.**
608.5 Discharge Piping. The discharge piping that serves~~ing~~ a temperature relief valve, pressure relief valve, or combination of both, shall have no valves, obstructions, or means of isolation and ~~be provided~~ comply with the following: **(1)** ~~Equal~~ Discharge pipe shell be equal to the size of the valve outlet and shall discharge full size to the flood level of the area receiving the discharge and pointing down.	**608.5 Discharge Piping.** The discharge piping serving a temperature relief valve, pressure relief valve, or combination of both shall have no valves, obstructions, or means of isolation and be provided with the following: (1) ~~Equal to~~ Not less than the size of the valve outlet and shall dis-charge full size to the flood level of the area receiving the discharge and pointing down. (2) Materials shall be rated at not less than the operating temperature of the system and approved for such use or shall comply with ASME A112.4.1.		**Houston amendment removed as it's no longer needed, provisions covered in base code.**

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(2) Materials shall be rated at not less than the operating temperature of the system and approved for such use or shall comply with ASME A112.4.1. **(3)** Discharge pipe shall discharge independently by gravity through an air gap into the drainage system or outside of the building with the end of the pipe not exceeding 2 feet (610 mm) and not less than 6 inches (152 mm) above the ground and pointing downwards. **(4)** Discharge pipe shall discharge in such a manner that does not cause personal injury or structural damage. **(5)** No part of such discharge pipe shall be trapped or subject to freezing. **(6)** The terminal end of the pipe shall not be threaded. **(7)** Discharge from a relief valve into a water heater pan shall be prohibited.	(3) Discharge pipe shall discharge independently by gravity through an air gap into the drainage system or outside of the building with the end of the pipe not exceeding 2 feet (610 mm) and not less than 6 inches (152 mm) above the ground and pointing downwards. (4) Discharge in such a manner that does not cause personal injury or structural damage. (5) No part of such discharge pipe shall be trapped or subject to freezing. (6) The terminal end of the pipe shall not be threaded. (7) Discharge from a relief valve into a water heater pan shall be prohibited. (8) The discharge termination point shall be readily observable.		
609.3.1 Sleeves Through Floors. Approved materials shall be installed without joints and must be sleeved where they penetrate the floor. Pipe sleeves shall have a minimum wall thickness of 1/16 inch. No portion of the water pipe shall be in contact with the concrete. In water services that are 3 inches or larger, one fitting may be installed under the slab within 5 feet of the exterior of the building. The fitting shall be installed to allow for replacement without any damage being done to the structure. Galvanized pipe shall not be used in or under slabs.		**609.3.1 Sleeves Through Floors.** Approved materials shall be installed without joints and must be sleeved where they penetrate the floor. Pipe sleeves shall have a minimum wall thickness of 1/16 inch. No portion of the water pipe shall be in contact with the concrete. In water services that are 3 inches or larger, one fitting may be installed under the slab within 5 feet of the exterior of the building. The fitting shall be installed to allow for replacement without any damage being done to the structure. Galvanized pipe shall not be used in or under slabs.	**No change to Houston amendment.**
609.4 Testing. Upon completion of a section or of the entire hot and cold water supply system it shall be tested and proved tight under a water pressure not less than the working pressure under which it is to be used. The water used for tests shall be obtained from a potable source of supply. Except for plastic piping, a 50 psi (345 kPa) air pressure shall be permitted to be substituted for the water test. In either method of test, the piping shall withstand the test without leaking for a period of not less than 15 minutes. **Exception:** PEX, PP or PE-RT tube shall be permitted to be tested with air where permitted by the manufacturer's instructions.			**Houston amendment removed, now covered in base code UPC.**
	609.8 Pumps. Pumps shall be installed in accordance with the manufacturer's installation instructions.		**New base code provisions for pumps.**
	609.8.1 Access. Pumps shall be accessible for repairs.		**New base code provisions for pumps.**
	609.8.2 Potable Water Pumps. Pumps intending intended to supply drinking water shall be in accordance with NSF 61.		**New base code provisions for pumps.**
609.11 Pipe Insulation. Insulation of domestic hot water piping shall be in accordance with the *Energy Conservation Code* ~~Section 609.11.1 and Section 609.11.2~~.			**Houston amendment relocated to Section 609.12**
~~609.11.2 Pipe Insulation Wall Thickness.~~ ~~Hot water pipe insulation shall have a minimum thickness of not less than the diameter of the pipe for a pipe up to 2 inches (50 mm) in diameter. Insulation wall thickness shall be not less than 2~~			**Houston amendment relocated to Section 609.12.2.**

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~~inches (51 mm) for a pipe of 2 inches (50 mm) or more in diameter.~~ ~~**Exceptions:**~~ ~~**(1)** Piping that penetrates framing members shall not be required to have pipe insulation for the distance of the framing penetration.~~ ~~**(2)** Hot water piping between the fixture control valve or supply stop and the fixture or appliance shall not be required to be insulated.~~			
		609.12 Pipe Insulation. Insulation of domestic hot water piping shall be in accordance with the *Energy Conservation Code*. ~~Section 609.12.1 and Section 609.12.2.~~	**No change to Houston amendment, relocated from 609.11.**
		~~**609.12.2 Pipe Insulation Wall Thickness.** Hot water pipe insulation shall have a minimum wall thickness of not less than the diameter of the pipe for a pipe up to 2 inches (50 mm) in diameter. Insulation wall thickness shall be not less than 2 inches (51 mm) for a pipe of 2 inches (50 mm) or more in diameter.~~ ~~**Exceptions:**~~ ~~**(1)** Piping that penetrates framing members shall not be required to have pipe insulation for the distance of the framing penetration.~~ ~~**(2)** Hot water piping between the fixture control valve or supply stop and the fixture or appliance shall not be required to be insulated.~~	**No change to Houston amendment, relocated from 609.11.2.**
	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.		
	TABLE 611.1 DRINKING WATER TREATMENT UNITS APPLICATION | RESIDENTIAL: POINT OF USE | RESIDENTIAL: POINT OF ENTRY | COMMERCIAL 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 * Required for commercial modular systems only.		

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2015 Houston UPC – Chapter 7 Sanitary Drainage	2021 UPC – Chapter 7 – Sanitary Drainage	2021 Houston UPC Amendments	Code Change Summary
701.2 Drainage Piping. Materials for drainage piping shall be in accordance with one of the referenced standards in Table 701.2 except that: **(1)** ~~No g~~Galvanized wrought-iron or galvanized steel pipe shall not be used underground and shall be kept not less than 6 inches (152 mm) aboveground. **(2)** 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. All tests shall comply with these standards including the sample size width and length. Plastic pipe shall not be tested filled with water. **(3)** No vitrified clay pipe or fittings shall be used aboveground or where pressurized by a pump or ejector. ~~They~~ Vitrified clay pipes and/or fittings shall be kept not less than 12 inches (305 mm) belowground. **(4)** Copper or copper alloy tube for drainage and vent piping shall have a weight of not less than that of copper or copper alloy drainage tube type DWV. **(5)** Stainless steel 304 pipe and fittings shall not be installed underground and shall be kept not less than 6 inches (152 mm) aboveground. **(6)** Cast-iron soil pipe and fittings and the stainless steel couplings used to join these products shall be listed and tested in accordance with standards referenced in Table ~~1701.1~~ 701.2. Such pipe and fittings shall be marked with the country of origin, manufacturer's name or registered trademark as defined in the product standards, the third party certifier's mark, and the class of the pipe of fitting ~~and identification of the original manufacturer in addition to markings required by referenced standards~~. **(7)** SDR 35 plastic pipe shall be approved material for drainage piping size 8 inches or larger.	**701.2 Drainage Piping.** Materials for drainage piping shall be in accordance with one of the referenced standards in Table 701.2 except that: (1) No galvanized wrought-iron or galvanized steel pipe shall be used underground and shall be kept not less than 6 inches (152 mm) aboveground. (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~~ Plastic piping installed in plenums shall be tested in accordance with all requirements of ~~the standards to include the~~ ASTM E84 or UL 723. Mounting methods, supports and sample ~~size, both~~ sizes of materials for ~~width and length. Plastic pipe~~ testing that are not specified in ASTM E84 or UL 723 shall ~~not be tested filled with water~~ be prohibited. (3) No vitrified clay pipe or fittings shall be used aboveground or where pressurized by a pump or ejector. They shall be kept not less than 12 inches (305 mm) belowground. (4) Copper or copper alloy tube for drainage and vent piping shall have a weight of not less than that of copper or copper alloy drainage tube type DWV. (5) Stainless steel 304 pipe and fittings shall not be installed underground and shall be kept not less than 6 inches (152 mm) aboveground. (6) Cast-iron soil pipe and fittings and the stainless steel couplings used to join these products shall be listed and tested in accordance with standards referenced in Table 701.2. Such pipe and fittings shall be marked with the country of origin, manufacturer's name or registered trademark as defined in the product standards, the third party certifier's mark, and the class of the pipe or fitting	**701.2 Drainage Piping.** Materials for drainage piping shall be in accordance with one of the referenced standards in Table 701.2 except that: (1) ~~No g~~Galvanized wrought-iron or galvanized steel pipe shall not be used underground and shall be kept not less than 6 inches (152 mm) aboveground. (2) 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. Plastic piping installed in plenums shall be tested in accordance with all requirements of ASTM E84 or UL 723. Mounting methods, supports and sample sizes of materials for testing that are not specified in ASTM E84 or UL 723 shall be prohibited. All tests shall comply with these standards including sample size width and length. Plastic pipe shall not be tested filled with water. (3) No vitrified clay pipe or fittings shall be used aboveground or where pressurized by a pump or ejector. ~~They~~ Vitrified clay pipes and/or fittings shall be kept not less than 12 inches (305 mm) belowground. (4) Copper or copper alloy tube for drainage and vent piping shall have a weight of not less than that of copper or copper alloy drainage tube type DWV. (5) Stainless steel 304 pipe and fittings shall not be installed underground and shall be kept not less than 6 inches (152 mm) aboveground. (6) Cast-iron soil pipe and fittings and the stainless-steel couplings used to join these products shall be listed and tested in accordance with standards referenced in Table 701.2. Such pipe and fittings shall be marked with the country of origin, manufacturer's name or registered trademark as defined in the product standards, the third party certifier's mark, and the class of the pipe or fitting~~.~~ (7) SDR 35 plastic pipe shall be the approved material for drainage piping size 8 inches or larger.	**Base code changes for plastic piping and mounting methods/supports.** **No change to Houston amendment.**
701.8 Below Slab. Piping installed below a slab on grade or mat type foundation shall be not less than 2 inches in diameter.		**701.8 Below Slab.** Piping installed below a slab on grade or mat type foundation shall be not less than 2 inches in diameter.	**No change to Houston amendment.**

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<table>
<tr>
<td></td>
<td>
TABLE 702.1
DRAINAGE FIXTURE UNIT VALUES (DFU)
<table>
<tr><th>PLUMBING APPLIANCES, APPURTENANCES, OR FIXTURES</th><th>MINIMUM SIZE TRAP AND TRAP ARM[7] (inches)</th><th>PRIVATE</th><th>PUBLIC</th><th>ASSEMBLY[8]</th></tr>
<tr><td>Bathtub or Combination Bath/Shower</td><td>1½</td><td>2.0</td><td>2.0</td><td>—</td></tr>
<tr><td>Bidet</td><td>1¼</td><td>1.0</td><td>—</td><td>—</td></tr>
<tr><td>Bidet</td><td>1½</td><td>2.0</td><td>—</td><td>—</td></tr>
<tr><td>Clothes Washer, domestic, standpipe[5]</td><td>2</td><td>3.0</td><td>3.0</td><td>3.0</td></tr>
<tr><td>Dental Unit, cuspidor</td><td>1¼</td><td>—</td><td>1.0</td><td>1.0</td></tr>
<tr><td>Dishwasher, domestic, with independent drain[3]</td><td>1½</td><td>2.0</td><td>2.0</td><td>2.0</td></tr>
<tr><td>Drinking Fountain or Water Cooler</td><td>1¼</td><td>0.5</td><td>0.5</td><td>1.0</td></tr>
<tr><td>Food Waste Disposer, commercial</td><td>2</td><td>—</td><td>3.0</td><td>3.0</td></tr>
<tr><td>Floor Drain, emergency</td><td>2</td><td>—</td><td>0.0</td><td>0.0</td></tr>
<tr><td>Floor Drain (for additional sizes see Section 702.0)</td><td>2</td><td>2.0</td><td>2.0</td><td>2.0</td></tr>
<tr><td>Shower, single-head trap</td><td>2[2]</td><td>2.0</td><td>2.0</td><td>2.0</td></tr>
<tr><td>Multi-head, each additional</td><td>2</td><td>1.0</td><td>1.0</td><td>1.0</td></tr>
<tr><td>Lavatory</td><td>1¼</td><td>1.0</td><td>1.0</td><td>1.0</td></tr>
<tr><td>Lavatories in sets</td><td>1½</td><td>2.0</td><td>2.0</td><td>2.0</td></tr>
<tr><td>Washfountain</td><td>1½</td><td>—</td><td>2.0</td><td>2.0</td></tr>
<tr><td>Washfountain</td><td>2</td><td>—</td><td>3.0</td><td>3.0</td></tr>
<tr><td>Mobile Home, trap</td><td>3</td><td>12.0</td><td>—</td><td>—</td></tr>
<tr><td>Receptor, indirect waste[1,3]</td><td>1½</td><td colspan="3">See footnote[1,3]</td></tr>
<tr><td>Receptor, indirect waste[1,4]</td><td>2</td><td colspan="3">See footnote[1,4]</td></tr>
<tr><td>Receptor, indirect waste[1]</td><td>3</td><td colspan="3">See footnote[1]</td></tr>
<tr><td>Sinks</td><td>—</td><td>—</td><td>—</td><td>—</td></tr>
<tr><td>Bar</td><td>1½</td><td>1.0</td><td></td><td></td></tr>
<tr><td>Bar[2]</td><td>1½</td><td>—</td><td>2.0</td><td>2.0</td></tr>
<tr><td>Clinical</td><td>3</td><td>—</td><td>6.0</td><td>6.0</td></tr>
<tr><td>Commercial with food waste[2]</td><td>1½</td><td>—</td><td>3.0</td><td>3.0</td></tr>
<tr><td>Exam Room</td><td>1½</td><td>—</td><td>1.0</td><td>—</td></tr>
<tr><td>Special Purpose[2]</td><td>1½</td><td>2.0</td><td>3.0</td><td>3.0</td></tr>
<tr><td>Special Purpose</td><td>2</td><td>3.0</td><td>4.0</td><td>4.0</td></tr>
<tr><td>Special Purpose</td><td>3</td><td>—</td><td>6.0</td><td>6.0</td></tr>
<tr><td>Kitchen, domestic[2] (with or without food waste disposer, dishwasher, or both)</td><td>1½</td><td>2.0</td><td>2.0</td><td>—</td></tr>
<tr><td>Laundry[2] (with or without discharge from a clothes washer)</td><td>1½</td><td>2.0</td><td>2.0</td><td>2.0</td></tr>
<tr><td>Service or Mop Basin</td><td>2</td><td>—</td><td>3.0</td><td>3.0</td></tr>
<tr><td>Service or Mop Basin</td><td>3</td><td>—</td><td>3.0</td><td>3.0</td></tr>
<tr><td>Service, flushing rim</td><td>3</td><td>—</td><td>6.0</td><td>6.0</td></tr>
<tr><td>Wash, each set of faucets</td><td>—</td><td>—</td><td>2.0</td><td>2.0</td></tr>
<tr><td>Nonwater Urinal ~~Hybrid~~ with Drain Cleansing Action</td><td>2</td><td>1.0</td><td>1.0</td><td>1.0</td></tr>
<tr><td>Urinal, integral trap 1.0 GPF[2]</td><td>2</td><td>2.0</td><td>2.0</td><td>5.0</td></tr>
<tr><td>Urinal, integral trap greater than 1.0 GPF</td><td>2</td><td>2.0</td><td>2.0</td><td>6.0</td></tr>
<tr><td>Urinal, exposed trap[2]</td><td>1½</td><td>2.0</td><td>2.0</td><td>5.0</td></tr>
<tr><td>Water Closet, 1.6 GPF Gravity Tank[6]</td><td>3</td><td>3.0</td><td>4.0</td><td>6.0</td></tr>
<tr><td>Water Closet, 1.6 GPF Flushometer Tank[6]</td><td>3</td><td>3.0</td><td>4.0</td><td>6.0</td></tr>
<tr><td>Water Closet, 1.6 GPF Flushometer Valve[6]</td><td>3</td><td>3.0</td><td>4.0</td><td>6.0</td></tr>
<tr><td>Water Closet, greater than 1.6 GPF Gravity Tank[6]</td><td>3</td><td>4.0</td><td>6.0</td><td>8.0</td></tr>
<tr><td>Water Closet, greater than 1.6 GPF Flushometer Valve[6]</td><td>3</td><td>4.0</td><td>6.0</td><td>8.0</td></tr>
</table>
For SI units: 1 inch = 25 mm
Notes:
1 Indirect waste receptors shall be sized based on the total drainage capacity of the fixtures that drain thereinto, in accordance with Table 702.2~~3~~.
2 Provide a 2 inch (50 mm) minimum drain.
3 For refrigerators, coffee urns, water stations, and similar low demands.
4 For commercial sinks, dishwashers, and similar moderate or heavy demands.
5 Buildings having a clothes-washing area with clothes washers in a battery of three or more clothes washers shall be rated at 6 fixture units each for purposes of sizing common horizontal and vertical drainage piping.
6 Water closets shall be computed as 6 fixture units where determining septic tank sizes based on Appendix H of this code.
7 Trap sizes shall not be increased to the point where the fixture discharge is capable of being inadequate to maintain their self-scouring properties.
8 Assembly [Public Use (see Table 422.1)].
9 For a bathtub to shower retrofit, a 1½-inch (40 mm) trap and trap arm shall be permitted with a maximum shower size of 36 inches (914 mm) in width and 60 inches (1524 mm) in length. See Section 408.5 and Section 408.6.
</td>
<td></td>
<td>DFU Values Table updated in base code UPC, footnote updated with provisions on bathtub to shower retrofit. Nonwater urinal requirements added to table.</td>
</tr>
<tr>
<td></td>
<td>
TABLE 703.2
MAXIMUM UNIT LOADING AND MAXIMUM LENGTH OF DRAINAGE AND VENT PIPING
<table>
<tr><th>SIZE OF PIPE (inches)</th><th>1¼</th><th>1½</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>8</th><th>10</th><th>12</th></tr>
<tr><td>Maximum Units
Drainage Piping[1]
Vertical
Horizontal</td><td>

1
1</td><td>

2[2, 7]
1[7]</td><td>

16[3]
8[3]</td><td>

48[4]
35[4]</td><td>

256
216[5]</td><td>

600
428[5]</td><td>

1380
720[5]</td><td>

3600
2640[5]</td><td>

5600
4680[5]</td><td>

8400
8200[5]</td></tr>
<tr><td>Maximum Length
Drainage Piping
Vertical, (feet)
Horizontal (unlimited)</td><td>

45</td><td>

65</td><td>

85</td><td>

212</td><td>

300</td><td>

390</td><td>

510</td><td>

750</td><td>

–</td><td>

–</td></tr>
<tr><td>Vent Piping
Horizontal and Vertical[6]
Maximum Units
Maximum Lengths, (feet)</td><td>

1
45</td><td>

8[3]
60</td><td>

24
120</td><td>

84
212</td><td>

256
300</td><td>

600
390</td><td>

1380
510</td><td>

3600
750</td><td>

–</td><td>

–</td></tr>
</table>
For SI units: 1 inch = 25 mm, 1 foot = 304.8 mm
Notes:
1 Excluding trap arm.
2 Except for sinks, urinals, and dishwashers – exceeding 1 fixture unit.
3 Except for six-unit traps or water closets.
4 ~~Only low~~Not to exceed five water closets or five six-unit traps ~~allowed on a vertical pipe or stack, and not to exceed three water closets or six-unit traps on a horizontal branch or drain.~~
5 Based on ¼ inch per foot (20.8 mm/m) slope. For ⅛ of an inch per foot (10.4 mm/m) slope, multiply horizontal fixture units by a factor of 0.8.
6 The diameter of an individual vent shall be not less than 1¼ inches (32 mm) nor less than one-half the diameter of the drain to which it is connected. Fixture unit load values for drainage and vent piping shall be computed from Table 702.1 and Table 702.2~~3~~. Not to exceed one-third of the total permitted length of a vent shall be permitted to be installed in a horizontal position. Where vents are increased one pipe size for their entire length, the maximum length limitations specified in this table do not apply. This table is in accordance with the requirements of Section 901.3.
7 Up to 8 public lavatories are permitted to be installed on a 1½ inch (40 mm) vertical branch or horizontal sanitary branch sloped at ¼ inch per foot (20.8 mm/m).
</td>
<td></td>
<td>Changes to base code Table; footnote 4 updated to limit to five water closets; new footnote 7 provides provisions lavatories installed.</td>
</tr>
<tr>
<td>704.3 Commercial Sinks. Pot sinks, scullery sinks, dishwashing sinks, silverware sinks, and other similar fixtures shall be connected indirectly to the drainage system. ~~A floor drain shall be provided adjacent to the fixture, and the fixture shall be connected on the sewer side of the floor drain trap,~~</td>
<td>704.3 Commercial Sinks. Pot sinks, scullery sinks, dishwashing sinks, silverware sinks, and other similar fixtures shall be connected directly to the drainage system. A floor drain shall be provided adjacent to the fixture~~,~~ and ~~the fixture~~ shall be connected on the sewer side of the ~~floor drain trap, provided~~</td>
<td>704.3 Commercial Sinks. Pot sinks, scullery sinks, dishwashing sinks, silverware sinks, and other similar fixtures shall be connected indirectly to the drainage system. ~~A floor drain shall be provided adjacent to the fixture and shall be connected on the sewer side of the sink. No other drainage line~~</td>
<td>No change to Houston amendment.</td>
</tr>
</table>

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~~provided that no other drainage line is connected between the floor drain waste connection and the fixture drain. The fixture and floor drain shall be trapped and vented in accordance with this code.~~	~~that no~~ sink. No other drainage line ~~is~~ shall be connected between the floor drain waste connection and the fixture drain. The fixture and floor drain shall be trapped and vented in accordance with this code.	~~shall be connected between the floor drain waste connection and the fixture drain. The fixture and floor drain shall be trapped and vented in accordance with this code.~~	
	707.2 Approved. Each cleanout fitting and each cleanout plug or cap shall be of an approved type. A list of approved standards for cleanouts are referenced in Table 707.2.		**Minor update to base code to Table 707.2 for list of approved cleanouts.**
	TABLE 707.2 **CLEANOUT MATERIALS FOR DRAIN, WASTE, AND VENT** MATERIAL / STANDARD ABS — ASTM D2661, CSA B79, IAPMO IGC 78, IAPMO IGC 224 Cast Iron — ASME A112.36.2, ASTM A888, CISPI 301, CSA B79, IAPMO IGC 224 Copper or Copper Alloy — ASME A112.36.2, CSA B79 Ductile Iron — CSA B79 Elastomers — CSA B79, IAPMO PS 90 Polyethylene (PE) — CSA B79 Polypropylene (PP) — CSA B79 PVC — ASTM D2665, CSA B79, IAPMO IGC 78, IAPMO IGC 224 Polyvinylidene Fluoride (PVDF) — CSA B79 Stainless Steel — CSA B79		**New UPC table listing approved cleanouts for drain, waste and vent piping.**
	707.4 Location. Each horizontal drainage pipe shall be provided with a cleanout at its upper terminal, and each run of piping, that is more than 100 feet (30 480 mm) in total developed length, shall be provided with a cleanout for each 100 feet (30 480 mm), or fraction thereof, in length of such piping. An additional cleanout shall be provided in a drainage line for each aggregate horizontal change in direction exceeding 135 degrees (2.36 rad). A cleanout shall be installed above the fixture connection fitting, serving each urinal, regardless of the location of the urinal in the building. **Exceptions:** (1) Cleanouts shall be permitted to be omitted on a horizontal drain line less than 5 feet (1524 mm) in length unless such line is serving sinks or urinals. (2) Cleanouts shall be permitted to be omitted on a horizontal drainage pipe installed on a slope of 72 degrees (1.26 rad) or less from the vertical angle (one-fifth bend). (3) Excepting the building drain, its horizontal branches, kitchen sinks, and urinals, a cleanout shall not be required on a pipe or piping that is above the floor level of the lowest floor of the building. (4) An approved type of two-way cleanout fitting, installed inside the building wall near the connection between the building drain and the building sewer or installed outside of a building at the lower end of a		**Minor change to base code provisions.**

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	building drain and extended to grade, shall be permitted to be substituted for an upper terminal cleanout.		
711.1 General. Drainage connections shall not be made into a drainage piping system within 8 feet (2438 mm) of a vertical to horizontal change of direction of a stack containing suds-producing fixtures. ~~Bathtubs, l~~Laundries, washing machine standpipes, kitchen sinks, and dishwashers shall be considered suds-producing fixtures. Where parallel vent stacks are required, they shall connect to the drainage stack at a point 8 feet (2,438 mm) above the lowest point of the drainage stack. **Exceptions:** **(1)** Single-family residences **(2)** Stacks receiving the discharge from less than three stories of plumbing fixtures.			**Houston amendment removed, returning to base code provisions.**
713.4 Public Sewer Availability. The public sewer shall be permitted to be considered as not being available where such public sewer or a building or an exterior drainage facility connected thereto is located more than ~~200~~ 300 feet (~~60 960~~ 91,440 mm) from ~~a proposed building or exterior drainage facility on~~ a lot or premises that abuts and is served by such public sewer.		**713.4 Public Sewer Availability.** The public sewer shall be permitted to be considered as not being available where such public sewer or a building or an exterior drainage facility connected thereto is located more than ~~200~~ 300 feet (~~60 960~~ 91 440 mm) from ~~a proposed building or exterior drainage facility on~~ a lot or premises that abuts and is served by such public sewer.	**No change to Houston amendment.**
715.1 Materials. The building sewer, beginning 2 feet (610 mm) from a building or structure, shall be of such materials as prescribed in this code. Pipe sizes 6 inches and smaller shall be PVC Schedule 40, and pipe sizes 8 inches or larger shall be permitted to be SDR 35.		**715.1 Materials.** The building sewer, beginning 2 feet (610 mm) from a building or structure, shall be of such materials as prescribed in this code. Pipe sizes 6 inches and smaller shall be PVC Schedule 40, and pipe sizes 8 inches or larger shall be permitted to be SDR 35.	**No change to Houston amendment.**
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. 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.	**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.~~	**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.	**Base code includes additional acceptable standards for use.** **No change to Houston amendment.**
722.1 Building (House) Sewer. An abandoned building (house) sewer, or part thereof, shall be plugged or capped in an approved manner within 5 feet (1,524 mm) of the property line. Before any building may be demolished, a sewer disconnect permit shall be obtained and an inspection made to verify that the sewer has been properly capped within 5 feet of the property line and that the water service has been disconnected and capped at the meter.		**722.1 Building (House) Sewer.** An abandoned building (house) sewer, or part thereof, shall be plugged or capped in an approved manner within 5 feet (1524 mm) of the property line. Before any building may be demolished, a sewer disconnect permit shall be obtained and an inspection made to verify that the sewer has been properly capped within 5 feet of the property line and that the water service has been disconnected and capped at the meter.	**No change to Houston amendment.**
724.0 Private Sewage Disposal Systems. **724.1 General.** Private sewage disposal systems shall conform to all applicable state laws and regulations, including the Construction Standards for Private Sewage Facilities, as published by the Texas Commission on Environmental Quality.		**724.0 Private Sewage Disposal Systems.** **724.1 General.** Private sewage disposal systems shall conform to all applicable state laws and regulations, including the Construction Standards for Private Sewage Facilities, as published by the Texas Commission on Environmental Quality.	**No change to Houston amendment.**

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2015 Houston UPC – Chapter 8 Indirect Wastes	2021 UPC – Chapter 8 – Indirect Wastes	2021 Houston UPC Amendments	Code Change Summary
	804.1 Standpipe Receptors. Plumbing fixtures or other receptors receiving the discharge of indirect waste pipes shall be approved for the use proposed and shall be of such shape and capacity as to prevent splashing or flooding and shall be located where they are readily accessible for inspection and cleaning. No standpipe receptor for a clothes washer shall extend more than 30 inches (762 mm), or not less than 18 inches (457 mm) above its trap weir. No trap for a clothes washer standpipe receptor shall be installed below the floor, but shall be roughed in not less than 6 inches (152 mm) and not more than 18 inches (457 mm) above the floor. No indirect waste receptor shall be installed in a toilet room, closet, cupboard, or storeroom, or in a portion of a building not in general use by the occupants thereof; except standpipes for clothes washers shall be permitted to be installed in toilet and bathroom areas where the clothes washer is installed in the same room.		**Minor change to base code provisions.**
804.2 Accessible Receptors. Accessible indirect waste receptors may be fabricated utilizing a "P" trap, riser stub, and an increaser to form a funnel.		**804.2 Accessible Receptors.** Accessible indirect waste receptors may be fabricated utilizing a "P" trap, riser stub, and an increaser to form a funnel.	**No change to Houston amendment.**
810.1 High Temperature Discharge. No steam pipe shall be directly connected to a plumbing or drainage system, nor shall water having a temperature above 140°F (60°C) be discharged under pressure directly into a drainage system. Pipes from boilers shall discharge by means of indirect waste piping, as determined by the Authority Having Jurisdiction or the boiler manufacturer's recommendations. Such pipes shall be permitted to be indirectly connected by discharging into an open or closed condenser or an intercepting sump of an approved type that will prevent the entrance of steam or such water under pressure into the drainage system. Closed condensers or sumps shall be provided with a vent that shall be taken off the top and extended separately, full size above the roof. Condensers and sumps shall be properly trapped at the outlet with a deep seal trap extending to within 6 inches (152 mm) of the bottom of the tank. The top of the deep seal trap shall have a ¾ of an inch (19.1 mm) opening located at the highest point of the trap to serve as a siphon breaker. Outlets shall be taken off from the side in such a manner as to allow a waterline to be maintained that will permanently occupy not less than one-half the capacity of the condenser or sump. Inlets shall enter above the waterline. Wearing plates or baffles shall be installed in the tank to protect the shell. The sizes of the blowoff line inlet, the water outlets, and the vent shall be as shown in Table 810.1. The contents of condensers receiving steam or hot water under pressure shall pass through an open sump before entering the drainage system. Water above 113°F		**810.1 High Temperature Discharge.** No steam pipe shall be directly connected to a plumbing or drainage system, nor shall water having a temperature above 140°F (60°C) be discharged under pressure directly into a drainage system. Pipes from boilers shall discharge by means of indirect waste piping, as determined by the Authority Having Jurisdiction or the boiler manufacturer's recommendations. Such pipes shall be permitted to be indirectly connected by discharging into an open or closed condenser or an intercepting sump of an approved type that will prevent the entrance of steam or such water under pressure into the drainage system. Closed condensers or sumps shall be provided with a vent that shall be taken off the top and extended separately, full size above the roof. Condensers and sumps shall be properly trapped at the outlet with a deep seal trap extending to within 6 inches (152 mm) of the bottom of the tank. The top of the deep seal trap shall have a ¾ of an inch (19.1 mm) opening located at the highest point of the trap to serve as a siphon breaker. Outlets shall be taken off from the side in such a manner as to allow a waterline to be maintained that will permanently occupy not less than one-half the capacity of the condenser or sump. Inlets shall enter above the waterline. Wearing plates or baffles shall be installed in the tank to protect the shell. The sizes of the blowoff line inlet, the water outlets, and the vent shall be as shown in Table 810.1. The contents of condensers receiving steam or hot water under pressure shall pass through an open sump before entering the drainage system. Water above 113°F	**No change to Houston amendment.**

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<td>(45°C) shall not be discharged to the jurisdiction's drainage system.</td>
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<td>(45°C) shall not be discharged to the jurisdiction's drainage system.</td>
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<tr>
<td>811.9 Sizing. An approved vented neutralizing basin is a basin with a bolted removable cover and dip-pipe outlet that is constructed of acid-resistant material such as molded seamless polyethylene, one-piece acid-proof chemical stoneware, lined carbon steel, or other material approved by the Authority Having Jurisdiction. Neutralizing basins shall be sized according to Table 811.9.

811.10 Material. Neutralization basins shall be provided with neutralizing material such as pieces of marble or limestone, 1 inch to 3 inches in size, so as to render effluent to a pH not less than 5 nor more than 11 before the effluent is discharged into the sewer system.

811.11 Sample Wells. Each chemical neutralization basin shall be provided with a sample well on the discharge side of the neutralization basin.</td>
<td></td>
<td>811.9 Sizing. An approved vented neutralizing basin is a basin with a bolted removable cover and dip-pipe outlet that is constructed of acid-resistant material such as molded seamless polyethylene, one-piece acid-proof chemical stoneware, lined carbon steel, or other material approved by the Authority Having Jurisdiction. Neutralizing basins shall be sized according to Table 811.9.

811.10 Material. Neutralization basins shall contain neutralizing material such as pieces of marble or limestone, 1 inch (25.4 mm) to 3 inches (76.2 mm) in size, so as to render effluent to a pH not less than 5 nor more than 11 before the effluent is discharged into the sewer system.

811.11 Sample Wells. Each chemical neutralization basin shall have a sample well on the discharge side of the neutralization basin.</td>
<td>Minor wordsmithing change to Houston amendment, no change to intent or enforcement.</td>
</tr>
<tr>
<td>Table 811.9
Sizes of Neutralization Basins[1,2]
<table><tr><th>Number of Sinks</th><th>Tank Capacity (Gallons)</th></tr><tr><td>1</td><td>5</td></tr><tr><td>4</td><td>15</td></tr><tr><td>8</td><td>30</td></tr><tr><td>16</td><td>55</td></tr><tr><td>25</td><td>100</td></tr><tr><td>40</td><td>150</td></tr><tr><td>60</td><td>200</td></tr><tr><td>75</td><td>275</td></tr><tr><td>100</td><td>350</td></tr><tr><td>200</td><td>675</td></tr><tr><td>300</td><td>1200</td></tr><tr><td>500</td><td>2000</td></tr></table>1 Tank capacities are measured from invert inlet.
2 Neutralization basins receiving intermittent discharge from equipment shall be sized according to the manufacturer's recommendations. Sizing criteria shall be shown on drawings.</td>
<td></td>
<td>TABLE 811.9
SIZES OF NEUTRALIZATION BASINS[1,2]
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1. Tank capacities are measured from invert inlet.
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<td>No change to Houston amendment.</td>
</tr>
</table>

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	814.2 Condensate Control. Where any equipment or appliance is installed in a space where damage is capable of resulting from condensate overflow,~~ other than damage to replaceable lay in ceiling tiles,~~ a drain line shall be provided and shall be drained in accordance with Section 814.1. An additional protection method for condensate overflow shall be provided in accordance with one of the following: (1) A water level detecting device that will shut off the equipment or appliance in the event the primary drain is blocked. (2) An additional watertight pan of corrosion-resistant material, with a separate drain line, installed beneath the cooling coil, unit, or the appliance to catch the overflow condensate due to a clogged primary condensate drain. (3) An additional drain line at a level that is higher than the primary drain line connection of the drain pan. (4) An additional watertight pan of corrosion-resistant material with a water level detection device installed beneath the cooling coil, unit, or the appliance to catch the over-flow condensate due to a clogged primary condensate drain and to shut off the equipment. The additional pan or the additional drain line connection shall be provided with a drain pipe of not less than 3⁄4 of an inch (20 mm) nominal pipe size, discharging at a point that is readily observed.		**Minor changes to base code regarding replaceable ceiling tiles.**

2015 Houston UPC – Chapter 9 Vents	2021 UPC – Chapter 9 – Vents	2021 Houston UPC Amendments	Code Change Summary
903.1 Applicable Standards. Vent pipe and fittings shall comply with the applicable standards referenced in Table 701.2, except that: **(1)** ~~No g~~Galvanized steel or 304 stainless steel pipe shall not be installed underground and shall be not less than 6 inches (152 mm) aboveground. **(2)** ABS and PVC DWV piping installations shall be in accordance with ~~the 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. All tests shall comply with these standards including the sample size width and length. Plastic pipe shall not be tested filled with water.		**903.1 Applicable Standards.** Vent pipe and fittings shall comply with the applicable standards referenced in Table 701.2, except that: (1) ~~No g~~Galvanized steel or 304 stainless steel pipe shall not be installed underground and shall be not less than 6 inches (152 mm) aboveground. (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. Plastic piping installed in plenums shall be tested in accordance with all requirements of ASTM E84 or UL 723. Mounting methods, supports and sample sizes of materials for testing that are not specified in ASTM E84 or UL 723 shall be prohibited. All tests shall comply with these standards including the sample size width and length. Plastic pipe shall not be tested when filled with water.	**Minor wordsmithing change, no change to intent or enforcement of Houston amendment.**

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	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 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.		**Base code updates to circuit vent requirements.**
	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 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 soil or waste.		**Base code updates to circuit vent requirements.**
	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.		**Base code updates to circuit vent requirements.**
	~~**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.		**Minor changes to base code.**
	~~**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 b and the fixtures within the branch.~~		**Base code removes circuit vent size requirements, provisions are now provided throughout 911.3 and its subsections.**
	~~**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.		**Minor changes to base code.**
	~~**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. The discharge~~ Fixtures discharging to a relief vent shall be one or two fixture unit fixtures but shall not exceed a total of 4 fixture units.		**Minor changes to base code.**
	~~**911.3**~~ **911.4 Slope and Size of Horizontal Branch.** The ~~slope of the vent~~ vented section of the horizontal branch ~~drain~~ 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		**Minor changes to base code.**

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	branch ~~drain~~ shall be sized for the total drainage discharge to the branch according to Table 703.2.		
	~~**911.3.1**~~ **911.4.1 Multiple Circuit-Vented Branches.** Circuit-vented horizontal ~~branch drains~~ 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 ~~the requirements of this section~~ Section 911.4.1.1 and Section 911.4.1.2.		**Minor changes to base code.**
	~~**911.3.1.1**~~ **911.4.1.1 Size of ~~Multiple Circuit Vent~~ Parallel Horizontal Branches.** ~~Multiple~~ 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 ~~911.3~~ 911.4. ~~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.~~		**Minor changes to base code.**
	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.		**New base code provisions on continuous horizontal branches.**

2015 Houston UPC – Chapter 10 Traps and Interceptors	2021 UPC – Chapter 10 – Traps and Interceptors	2021 Houston UPC Amendments	Code Change Summary
1007.2 Trap Seal Primers. Potable water supply trap seal primer valves shall comply with ASSE 1018. Drainage and electronic design type trap seal primer devices shall comply with ASSE 1044.			**Houston amendment removed, now covered in base code UPC.**
1009.8 Sample Wells. Each interceptor shall be provided with a sample well on the discharge side of the interceptor.		**1009.8 Sample Wells.** Each interceptor shall be provided with a sample well on the discharge side of the interceptor.	**No change to Houston amendment.**
1011.1 General. A private or public was rack, or floor or slab used for cleaning machinery or machine parts shall be adequately protected against storm or surface water and shall drain or discharge into an approved interceptor (clarifier). See Figure M.T-1 for minimum size and construction criteria.		**1011.1 General.** A private or public wash rack, or floor or slab used for cleaning machinery or machine parts shall be adequately protected against storm or surface water and shall drain or discharge into an approved interceptor (clarifier). See Figure M.T-1 for minimum size and construction criteria.	**No change to Houston amendment.**
Figure M.T-1 **Minimum Size and Construction**		**Figure M.T-1** **Minimum Size and Construction**	**No change to Houston amendment.**

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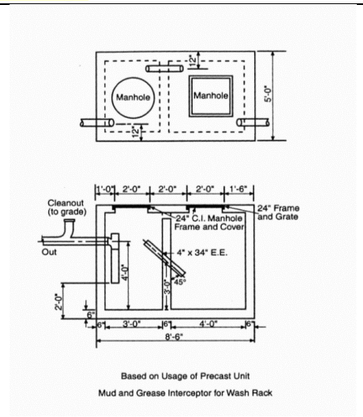		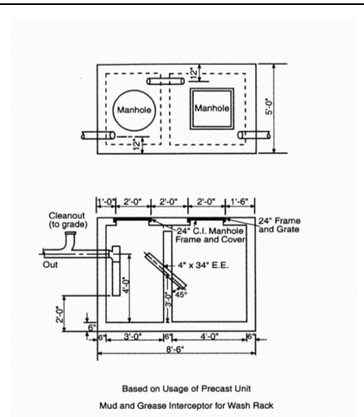	
1012.1 General. Laundry equipment in commercial and industrial buildings that does not have integral strainers shall discharge into an approved lint interceptor having a wire basket or similar device that is removable for cleaning and that will prevent passage into the drainage system of solids ½ of an inch (12.7 mm) or larger in maximum dimension, such as string, rags, buttons, or other solid materials detrimental to the public sewage system. For lint interceptors other than a mechanical lint interceptor properly sized to manufacturer's instructions, see Figures L.T-1, L.T-2, and L.T-3 for minimum size and construction criteria.		**1012.1 General.** Laundry equipment in commercial and industrial buildings that do not have integral strainers shall discharge into an approved lint interceptor having a wire basket or similar device that is removable for cleaning and that will prevent passage into the drainage system of solids ½ of an inch (12.7 mm) or larger in maximum dimension, such as string, rags, buttons, or other solid materials detrimental to the public sewerage system. For lint interceptors other than a mechanical lint interceptor properly sized to manufacturer's instructions, see Figures L.T-1, L.T-2, and L.T-3 for minimum size and construction criteria.	**No change to Houston amendment.**
	1014.1 General. Where it is determined by the Authority Having Jurisdiction that waste pretreatment is required, an approved type of grease interceptor(s) ~~complies~~ shall comply with ASME A112.14.3, ASME A112.14.4, CSA B481, PDI G-101, or PDI G-102, and sized in accordance with Section 1014.2.1 or Section 1014.3.6, shall be installed in accordance with the manufacturer's installation instructions to receive the drainage from fixtures or equipment that produce grease-laden waste~~, located in areas of establishments where food is prepared~~ Grease-laden waste fixtures shall include, but not be limited to, sinks and drains, such as floor drains, floor sinks, and other fixtures or equipment in serving establishments such as restaurants, cafes, lunch counters, cafeterias, bars and clubs, hotels, hospitals, sanitariums, factory or school kitchens, or other establishments where grease is introduced into the drainage or sewage system in quantities that can effect line stoppage or hinder sewage treatment or private sewage disposal systems. A combination of hydromechanical, gravity grease interceptors and engineered systems shall be allowed to meet this code and other applicable requirements of the Authority Having Jurisdiction where space or existing physical constraints of existing buildings necessitate such installations. A grease interceptor shall not be required for individual dwelling units or private living quarters. Water closets, urinals, and other plumbing fixtures conveying human waste shall not drain into or through the grease interceptor.		**New base code provisions for grease-laden fixtures.**

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1014.1.3 Food Waste Disposers ~~and Dishwashers~~. No food waste disposer ~~or dishwasher~~ shall be connected to or discharge into a grease interceptor. Commercial food waste disposers shall be permitted to discharge directly into the building's drainage system.

~~Exception:~~ ~~Food waste disposers shall be permitted to discharge to grease interceptors that are designed to receive the discharge of food waste.~~

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1014.1.3 Food Waste Disposers ~~and Dishwashers.~~ No food waste disposer ~~or dishwasher~~ shall be connected to or discharge into a grease interceptor. Commercial food waste disposers shall be permitted to discharge directly into the building's drainage system.

~~Exception:~~ ~~Food waste disposers shall be permitted to discharge to grease interceptors that are designed to receive the discharge of food waste.~~

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No change to Houston amendment.

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TABLE 1014.2.1
HYDROMECHANICAL GREASE INTERCEPTOR SIZING USING GRAVITY FLOW RATES[1]

ETER OF SE WASTE (inches)	MAXIMUM FULL PIPE FLOW (gpm)[2]	SIZE OF GREASE INTERCEPTOR	
		ONE-MINUTE DRAINAGE PERIOD (gpm)	TWO-MI DRAIN PERIOD
2	20	20	10
3	60	75	35
4	125	150	75
5	230	250	12
6	375	~~500~~400	~~250~~2

For SI units: 1 inch = 25 mm, 1 gallon per minute = 0.06 L/s
Notes:
1. For interceptor sizing by fixture capacity see the example below.
2. ¼ inch slope per foot (20.8 mm/m) based on Manning's formula with friction factor N = .012

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Houston amendment removed, now covered in base code UPC.

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1014.3.5 Construction Requirements. Gravity grease interceptors shall be designed to remove grease from effluent and shall be sized in accordance with this section. Gravity grease interceptors shall also be removed by pumping the interceptor. ~~It is recommended that a~~ A sample ~~box~~ well shall be located at the outlet end of gravity grease interceptors so that the Authority Having Jurisdiction can periodically sample effluent quality.

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1014.3.5 Construction Requirements. Gravity grease interceptors shall be designed to remove grease from effluent and shall be sized in accordance with this section. Gravity grease interceptors shall also be designed to retain grease until accumulations can be removed by pumping the interceptor. ~~It is recommended that a~~ A sample ~~box is~~ well shall be located at the outlet end of gravity grease interceptors so that the Authority Having Jurisdiction can periodically sample effluent quality.

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No change to Houston amendment.

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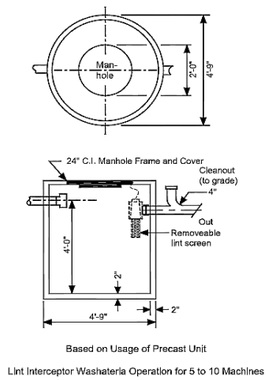
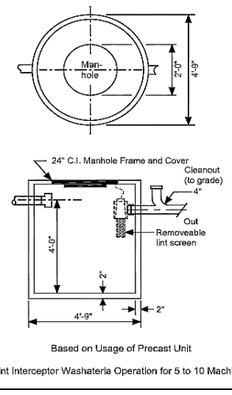
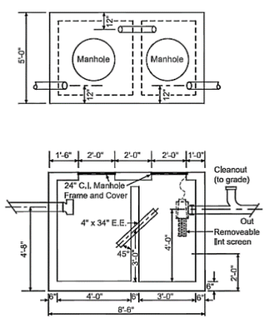
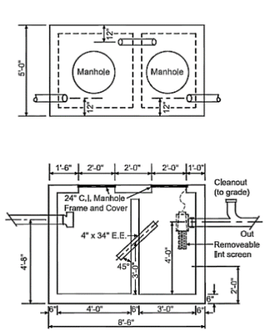
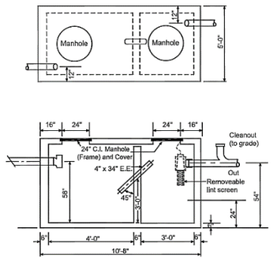
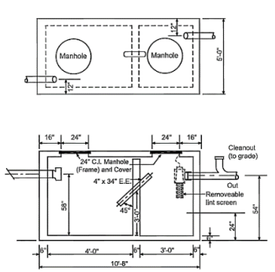
Figure L.T-1  Based on Usage of Precast Unit Lint Interceptor Washateria Operation for 5 to 10 Machines		**Figure L.T-1**  Based on Usage of Precast Unit Lint Interceptor Washateria Operation for 5 to 10 Machines	**No change to Houston amendment.**
Figure L.T-2  Based on Usage of Precast Unit Lint Interceptor Washateria Operation for 11 to 20 Machines		**Figure L.T-2**  Based on Usage of Precast Unit Lint Interceptor Washateria Operation for 11 to 20 Machines	**No change to Houston amendment.**
Figure L.T-3  Based on Usage of Precast Unit Lint Interceptor Washateria Operation for 21 to 30 Machines Larger establishments and commercial-type laundries require an approved design by the project professional engineer.		**Figure L.T-3**  Based on Usage of Precast Unit Lint Interceptor Washateria Operation for 21 to 30 Machines Larger establishments and commercial-type laundries require an approved design by the project professional engineer.	**No change to Houston amendment.**

2015 Houston Amendments	2021 Base Code Changes	2021 Houston Amendments	Code Change Summary

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2015 Houston UPC – Chapter 11 Storm Drainage	2021 UPC – Chapter 11 – Storm Drainage	2021 Houston UPC Amendments	Code Change Summary
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, lea, Schedule 40 ABS DWV, Schedule 40 PVC DWV, SDR 35 for 8 inch or larger PVC, 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 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 UL723. All tests shall comply with all requirements of these standards including the sample size width and length. Plastic pipe shall not be tested filled with water.		**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, SDR 35 for 8 inch or larger PVC, 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 Chapter 17 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. Plastic piping installed in plenums shall be tested in accordance with all requirements of ASTM E84 or UL 723. Mounting methods, supports and sample sizes of materials for testing that are not specified in ASTM E84 or UL 723 shall be prohibited. All tests shall comply with all requirements of these standards including the sample size width and length. Plastic pipe shall not be tested when filled with water.	**No change to Houston amendment.**
1101.4.2 Conductors. Conductors installed aboveground in buildings shall be in accordance with the applicable standards referenced in Table 701.2 for aboveground drain, waste, and vent pipe. Conductors installed aboveground ~~level~~ shall be of: (1) ~~s~~Seamless copper water tube, Type K, L, or M.~~;~~ (2) Schedule 40 copper pipe or Schedule 40 copper alloy pipe.~~;~~ (3) Type DWV copper drainage tube.~~;~~ (4) ~~s~~Service weight cast-iron soil pipe or hubless cast-iron soil pipe.~~;~~ (5) ~~s~~Standard weight galvanized steel pipe.~~;~~ (6) ~~s~~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~~ (7) Schedule 40 ABS or Schedule 40 PVC plastic pipe.~~;~~ (8) SDR 35 plastic pipe 8 inches or longer.		**1101.4.2 Conductors.** Conductors installed aboveground in buildings shall be in accordance with the applicable standards referenced in Table 701.2 for aboveground drain, waste, and vent pipe. Conductors installed aboveground ~~level~~ shall be one of the following: (1) ~~s~~Seamless copper water tube, Type K, L, or M; (2) Schedule 40 copper pipe or Schedule 40 copper alloy pipe; (3) Type DWV copper drainage tube; (4) ~~s~~Service weight cast-iron soil pipe or hubless cast-iron soil pipe; (5) ~~s~~Standard weight galvanized steel pipe; (6) ~~s~~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~~; (7) Schedule 40 ABS or Schedule 40 PVC plastic pipe; or, (8) SDR 35 plastic pipe 8 inches or longer.	**No change to Houston amendment.**
1101.4.3 Leaders. Leaders installed outside shall be in accordance with the applicable standards referenced in Table 701.2 for aboveground drain, waste, and vent pipe; aluminum sheet metal; galvanized steel sheet metal; ~~or~~ copper sheet metal; or SDR 35 plastic pipe 8 inches or longer.		**1101.4.3 Leaders.** Leaders installed outside shall comply with the applicable standards referenced in Table 701.2 for aboveground drain, waste, and vent pipe; aluminum sheet metal; galvanized steel sheet metal; ~~or~~ copper sheet metal; or SDR 35 plastic pipe 8 inches or longer.	**No change to Houston amendment.**

2015 Houston Amendments	2021 Base Code Changes	2021 Houston Amendments	Code Change Summary

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1101.12.1 Primary Roof Drainage. Roof areas of a building shall be drained by roof drains or gutters. The location and sizing of drains and gutters shall be coordinated with the structural design and pitch of the roof. Unless otherwise required by the Authority Having Jurisdiction, roof drains, gutters, vertical conductors or leaders, and horizontal storm drains for primary drainage shall be sized based on a storm rainfall rate of 8 inches per hour ~~of 60 minutes duration and 100 year return period. Refer to Table D 101.1 (in Appendix D) for 100 year, 60 minute storms at various locations~~.		**1101.12.1 Primary Roof Drainage.** Roof areas of a building shall be drained by roof drains or gutters. The location and sizing of drains and gutters shall be coordinated with the structural design and pitch of the roof. Unless otherwise required by the Authority Having Jurisdiction, roof drains, gutters, vertical conductors or leaders, and horizontal storm drains for primary drainage shall be sized based on a storm rainfall rate of 8 inches per hour ~~of 60 minutes duration and 100 year return period. Refer to Table D 101.1 (in Appendix D) for 100 year, 60 minute storms at various locations~~.	**No change to Houston amendment.**
1101.12.2.2.2 Combined System. The secondary roof drains shall connect to the vertical piping of the primary storm drainage conductor downstream of the last horizontal offset located below the roof. The primary storm drainage system shall connect to the building storm water that connects to an underground public storm sewer. The combined secondary and primary roof drain systems shall be sized in accordance with Section 1103.0 ~~based on double the rainfall rate for the local area~~.		**1101.12.2.2.2 Combined System.** The secondary roof drains shall connect to the vertical piping of the primary storm drainage conductor downstream of the last horizontal offset located below the roof. The primary storm drainage system shall connect to the building storm water that connects to an underground public storm sewer. The combined secondary and primary roof drain systems shall be sized in accordance with Section 1103.0 ~~based on double the rainfall rate for the local area~~.	**No change to Houston amendment.**
1101.17 Enclosed Parking Garages. Drains within an enclosed parking garage shall be routed to the sanitary waste drainage system. Drains routed to a sanitary system shall be provided with appropriate traps and a vent system. Vent systems shall comply with Chapter 9. Drains located on the top level of the enclosed parking garage and directly exposed to rainwater shall be drained to the storm drainage system. Traps and vents are not required on these drains. **1101.18 Open Parking Garages.** All drains exposed to rainwater and connected to the storm drainage system within an open parking garage shall not require a trap a vent system.		**1101.17 Enclosed Parking Garages.** Drains within an enclosed parking garage shall be routed to the sanitary waste drainage system. Drains routed to a sanitary waste drainage system shall be provided with appropriate traps and a vent system. Vent systems shall comply with Chapter 9. Drains located on the top level of the enclosed parking garage and directly exposed to rainwater shall be drained to the storm drainage system. Traps and vents are not required on these drains. **1101.18 Open Parking Garages.** All drains exposed to rainwater and connected to the storm drainage system within an open parking garage shall not require a trap or a vent system.	**No change to Houston amendment.**
TABLE 1101.8 **SIZING OF HORIZONTAL RAINWATER PIPING[1, 2]** **FLOW (1/8 in./ft. slope)** / **MAXIMUM ALLOWABLE HORIZONTAL PROJECTED AREAS AT VARIOUS RAINFALL RATES (square f** **gpm** / **1 (in/h)** / **2 (in/h)** / **3 (in/h)** / **4 (in/h)** / **5 (in/h)** / **6 (in/h)** 34 / 3,288 / 1,644 / 1,096 / 822 / 657 / 548 78 / 7,520 / 3,760 / 2,506 / 1,880 / 1,504 / 1,253 139 / 13,360 / 6,680 / 4,453 / 3,340 / 2,672 / 2,227 222 / 21,400 / 10,700 / 7,133 / 5,350 / 4,280 / 3,566 478 / 46,000 / 23,000 / 15,330 / 11,500 / 9,200 / 7,670 860 / 82,800 / 41,400 / 27,600 / 20,700 / 16,580 / 13,800 1,384 / 133,200 / 66,600 / 44,400 / 33,300 / 26,650 / 22,200 2,473 / 238,000 / 119,000 / 79,333 / 59,500 / 47,600 / 39,650			**Houston amendment for Table 1101.8 has been relocated per base code to Section 1103.2.**

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SIZE OF PIPE	FLOW 1/4 in./ft. Slope	MAXIMUM ALLOWABLE HORIZONTAL PROJECTED ROOF AREAS AT VARIOUS RAINFALL RATES (square feet)						
inches	gpm	1 (in/h)	2 (in/h)	3 (in/h)	4 (in/h)	5 (in/h)	6 (in/h)	8 (in/h)
3	48	4,640	2,320	1,546	1,160	928	773	580
4	110	10,600	5,300	3,533	2,650	2,120	1,766	1,325
5	196	18,880	9,440	6,293	4,720	3,776	3,146	2,360
6	314	30,200	15,100	10,066	7,550	6,040	5,033	3,775
8	677	65,200	32,600	21,733	16,300	13,040	10,866	8,150
10	1,214	116,800	58,400	38,950	47,000	23,350	19,450	14,600
12	1,953	188,000	94,000	62,600	47,000	37,600	31,350	23,500
15	3,491	336,000	168,000	112,000	84,000	67,250	56,000	43,000

FLOW (1/2 in./ft. Slope)	MAXIMUM ALLOWABLE HORIZONTAL PROJECT ROOF AREAS AT VARIOUS RAINFALL RATES (sq feet)						
gpm	1 (in/h)	2 (in/h)	3 (in/h)	4 (in/h)	5 (in/h)	6 (in/h)	8 (
68	6576	3288	2192	1644	1310	1096	8
156	15 040	7520	5010	3760	3010	2500	1
278	26 720	13 360	8900	6680	5320	4450	3
445	42 800	21 400	14 267	10 700	8580	7140	5
956	92 000	46 000	30 650	23 000	18 400	15 320	11
1721	165 600	82 800	55 200	41 400	33 150	27 600	20
2768	266 400	133 200	88 800	66 600	53 200	44 400	33
4946	476 000	238 000	158 700	119 000	95 200	79 300	59

For SI units: 1 inch = 25 mm, 1 gallon per minute = 0.06 L/s, ⅛ inch per foot = 10.4 mm/m, 1 inch per hour = 25.4 mm/h, 1 square foot = 0.0929 m^2

Notes:

1. The sizing data for horizontal piping are based on the pipes flowing full.
2. For rainfall rates other than those listed, determine the allowable roof area by dividing the area given in the 1 inch per hour (25.4 mm/h) column by the desired rainfall rate.

TABLE 1103.2
SIZING OF HORIZONTAL RAINWATER PIPING[1, 2]

FLOW (1/8 in./ft. slope)	MAXIMUM ALLOWABLE HORIZONTAL PROJECTED AREAS AT VARIOUS RAINFALL RATES (square f					
gpm	1 (in/h)	2 (in/h)	3 (in/h)	4 (in/h)	5 (in/h)	6 (in/h)

No change to Houston amendments, relocated from Table 1101.8.

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3	34	3,288	1,644	1,096	822	657	548	411
4	78	7,520	3,760	2,506	1,880	1,504	1,253	906
5	139	13,360	6,680	4,453	3,340	2,672	2,227	1,670
6	222	21,400	10,700	7,133	5,350	4,280	3,566	2,675
8	478	46,000	23,000	15,330	11,500	9,200	7,670	5,750
10	860	82,800	41,400	27,600	20,700	16,580	13,800	10,350
12	1,384	133,200	66,600	44,400	33,300	26,650	22,200	16,650
15	2,473	238,000	119,000	79,333	59,500	47,600	39,650	29,750

FLOW 1/4 in./ft. Slope	MAXIMUM ALLOWABLE HORIZONTAL PROJECTI ROOF AREAS AT VARIOUS RAINFALL RATES (squ feet)						
gpm	1 (in/h)	2 (in/h)	3 (in/h)	4 (in/h)	5 (in/h)	6 (in/h)	8 (
48	4,640	2,320	1,546	1,160	928	773	5
110	10,600	5,300	3,533	2,650	2,120	1,766	1
196	18,880	9,440	6,293	4,720	3,776	3,146	2
314	30,200	15,100	10,066	7,550	6,040	5,033	3
677	65,200	32,600	21,733	16,300	13,040	10,866	8
1,214	116,800	58,400	38,950	47,000	23,350	19,450	14
1,953	188,000	94,000	62,600	47,000	37,600	31,350	23
3,491	336,000	168,000	112,000	84,000	67,250	56,000	43

FLOW (1/2 in./ft. Slope)	MAXIMUM ALLOWABLE HORIZONTAL PROJECT ROOF AREAS AT VARIOUS RAINFALL RATES (squ feet)						
gpm	1 (in/h)	2 (in/h)	3 (in/h)	4 (in/h)	5 (in/h)	6 (in/h)	8 (
68	6576	3288	2192	1644	1310	1096	8
156	15 040	7520	5010	3760	3010	2500	1
278	26 720	13 360	8900	6680	5320	4450	3
445	42 800	21 400	14 267	10 700	8580	7140	5
956	92 000	46 000	30 650	23 000	18 400	15 320	11
1721	165 600	82 800	55 200	41 400	33 150	27 600	20
2768	266 400	133 200	88 800	66 600	53 200	44 400	33
4946	476 000	238 000	158 700	119 000	95 200	79 300	59

For SI units: 1 inch = 25 mm, 1 gallon per minute = 0.06 L/s, ⅛ inch per foot = 10.4 mm/m, 1 inch per hour = 25.4 mm/h, 1 square foot = 0.0929 m^2

Notes:
1. The sizing data for horizontal piping are based on the pipes flowing full.

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		2. For rainfall rates other than those listed, determine the allowable roof area by dividing the area given in the 1 inch per hour (25.4 mm/h) column by the desired rainfall rate.	
1107.0 Engineered Storm Drainage System. **1107.1 General.** The design and sizing of a storm drainage system shall be permitted to be determined by accepted engineering practices. A registered design professional shall design the storm drainage system, and Section 301.5 shall govern the approval of such system **1107.2 Siphonic Roof Drainage Systems.** The design of a siphonic roof drainage system shall comply with ASPE 45. **1107.3 Siphonic Roof Drains.** Siphonic roof drains shall comply with ASME A112.6.9.			**Houston amendment removed, now covered in base code UPC.**

2015 Houston UPC – Chapter 12 Fuel Gas Piping	2021 UPC – Chapter 12 – Fuel Gas Piping	2021 Houston UPC Amendments	Code Change Summary
1201.1 Applicability. The regulations of this chapter shall govern the installation fuel gas piping, other than service pipe, in or in connection with a building, structure or within the property lines of premises ~~up to 5 pounds-force per square inch (psi) (34 kPa), other than service pipe~~. Fuel oil piping systems shall be installed in accordance with NFPA 31. **Exception:** Gas piping, meters, gas-pressure regulators, and other appurtenances used by the serving gas supplier in distribution of gas, other than undiluted LP-Gas. [NFPA 54:1.1.1.2(16)]		**1201.1 Applicability.** The regulations of this chapter shall govern the installation fuel gas piping, other than service pipe, in or in connection with a building, structure or within the property lines of premises ~~up to 5 pounds-force per square inch (psi) (34 kPa) for natural gas and 10 psi (69 kPa) for undiluted propane, other than service pipe~~. Fuel oil piping systems shall be installed in accordance with NFPA 31. **Exception:** Gas piping, meters, gas-pressure regulators, and other appurtenances used by the serving gas supplier in distribution of gas, other than undiluted LP-Gas. [NFPA 54:1.1.1.2(16)]	**No change to Houston amendment.**
1202.3 Applications. This code shall not apply to the following (reference standards for some of which appear in Chapter 17): **(1)** Portable LP-Gas appliances and equipment that are not connected to a fixed fuel piping system. **(2)** Installation of appliances such as brooders, dehydrators, dryers, and irrigation equipment used for agricultural purposes. **(3)** Raw material (feedstock) applications, except for piping to special atmosphere generators. **(4)** ~~O~~Portable oxygen-fuel gas cutting and welding systems. **(5)** ~~Industrial gas applications using such gases as acetylene and acetylenic compounds, hydrogen, ammonia, carbon monoxide, oxygen, and nitrogen.~~ **(5)** Petroleum refineries, pipeline compressor or pumping stations, loading terminals, compounding plants, refinery tank farms, and natural gas processing plants. **(6)** Large integrated chemical plants or portions of such plants where flammable or combustible liquids or gases are produced by chemical reactions or used in chemical reactions. **(7)** LP-Gas installations at utility gas plants.		**1202.3 Applications.** This code shall not apply to the following items: (1) Portable LP-Gas appliances and equipment of all types that are not connected to a fixed fuel piping system. (2) Installation of appliances such as brooders, dehydrators, dryers, and irrigation equipment used for agricultural purposes. (3) Raw material (feedstock) applications, except for piping to special atmosphere generators. (4) ~~Oxygen~~ Portable oxygen-fuel gas cutting and welding systems. (5) ~~Industrial gas applications using such gases as acetylene and acetylenic compounds, hydrogen, ammonia, carbon monoxide, oxygen, and nitrogen.~~ (5) Petroleum refineries, pipeline compressor or pumping stations, loading terminals, compounding plants, refinery tank farms, and natural gas processing plants. (6) Large integrated chemical plants or portions of such plants where flammable or combustible liquids or gases are produced by chemical reactions or used in chemical reactions. (7) LP-Gas installations at utility gas plants.	**No change to Houston amendment.**

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(8) Liquefied natural gas (LNG) installations. **(9)** Fuel gas piping in electric utility ~~power~~ plants. **(10)** Proprietary items of equipment, apparatus, or instruments such as gas-generating sets, compressors, and calorimeters. **(11)** LP-Gas equipment for vaporization, gas mixing, and gas manufacturing. **(12)** LP-Gas piping for buildings under construction or renovations that are not to become part of the permanent building piping system—that is, temporary fixed piping for building heat. **(13)** Installation of LP-Gas systems for railroad switch heating. **(14)** Installation of LP-Gas and compressed natural gas (CNG) systems on vehicles. **(15)** Gas piping, meters, gas-pressure regulators, and other appurtenances used by the serving gas supplier in distribution of gas, other than undiluted LP-Gas. [NFPA 54:1.1.1.2] **(16)** Liquid petroleum gas facilities regulated by the Railroad Commission of Texas pursuant to Chapter 113 of the Texas Natural Resources Code.		(8) Liquefied natural gas (LNG) installations. (9) Fuel gas piping in electric utility ~~power~~ plants. (10) Proprietary items of equipment, apparatus, or instruments such as gas-generating sets, compressors, and calorimeters. (11) LP-Gas equipment for vaporization, gas mixing, and gas manufacturing. (12) LP-Gas piping for buildings under construction or renovations that are not to become part of the permanent building piping system—that is, temporary fixed piping for building heat. (13) Installation of LP-Gas systems for railroad switch heating. (14) Installation of LP-Gas and compressed natural gas (CNG) systems on vehicles. (15) Gas piping, meters, gas-pressure regulators, and other appurtenances used by the serving gas supplier in distribution of gas, other than undiluted LP-Gas. (16) Building design and construction except as specified herein. (17) Fuel gas systems on recreational vehicles manufactured in accordance with NFPA 1192. (18) Fuel Gas systems using hydrogen as a fuel. (19) Construction of appliances. [NFPA 54:1.1.1.2] (20) Liquid petroleum gas facilities regulated by the Railroad Commission of Texas pursuant to Chapter 113 of the Texas Natural Resources Code.	
1202.4 Other Requirements. All fuel oil facilities and piping shall conform to the requirements of Chapter 57 of the *Fire Code*.		**1202.4 Other Requirements.** All fuel oil facilities and piping shall conform to the requirements of Chapter 57 of the *Fire Code*.	**No change to Houston amendment.**
1202.5 Gas Tests. A permit shall be required for all gas tests. The licensed master plumber registered with the city as the contractor of record for the permit shall perform a complete gas systems test and inspection with a city plumbing inspector present in the following conditions: **(1)** During rough inspection and before startup of new installations. **(2)** Before resumption of use of a system where service has been interrupted for more than 365 days for any reason. **(3)** Before resumption of use of a system where service has been interrupted for any period of time because of one or more leaks or a fire. **(4)** When the system was found to be unsafe by the serving gas supplier or the Authority Having Jurisdiction. **(5)** Where required by the *Fire Code*. **(6)** Where service is not commenced within 180 days following a gas test.		**1202.5 Gas Tests.** A permit shall be required for all gas tests. The licensed master plumber registered with the city as the contractor of record for the permit shall perform a complete gas systems test and inspection with a city plumbing inspector present in the following circumstances: (1) During rough inspection and before startup of new installations. (2) Before resumption of use of a system where service has been interrupted for more than 365 days. (3) Before resumption of use of a system where service has been interrupted for any period of time due to one or more leaks or a fire. (4) When the system was found to be unsafe by the serving gas supplier or the Authority Having Jurisdiction. (5) Where required by the *Fire Code*. (6) Where service is not commenced within 180 days following a gas test.	**No change to Houston amendment.**
1203.3.1 Rough Piping Inspection. This inspection shall be made after gas piping within the building authorized by		**1203.3.1 Rough Piping Inspection.** This inspection shall be made after gas piping within the building authorized by the permit has been installed and before such piping has	**No change to Houston amendment.**

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the permit has been installed and before such piping has been covered or concealed or fixture or appliance has been attached thereto. This inspection shall include a determination that the gas piping size, material, and installation meet the requirements of this code. This inspection shall also include a pressure test. The gas piping shall pass an air pressure test of 25 psi (172.3689 kPa) for a period of 15 minutes with no perceptible drop. **Exception:** For metal welded piping, and for piping carrying gas at pressure greater than 14 inches (0.4 m) water column pressure (3.4878 kPa), the test pressure shall be not less than 100 psi (689 kPa) for 30 minutes. These tests shall be made using air, CO^2, or nitrogen pressure only and shall be made in the presence of the inspector. The permit holder shall furnish all necessary apparatus for conducting tests.		been covered or concealed or fixture or appliance has been attached thereto. This inspection shall include a determination that the gas piping size, material, and installation meet the requirements of this code. This inspection shall also include a pressure test. The gas piping shall pass an air pressure test of 25 psi (172.3689 kPa) for a period of 15 minutes with no perceptible drop. **Exception:** For metal welded piping, and for piping carrying gas at pressure greater than 14 inches (0.4 m) water column pressure (3.4878 kPa), the test pressure shall be not less than 100 psi (689 kPa) for 30 minutes. These tests shall be made using air, CO^2, or nitrogen pressure only and shall be made in the presence of the inspector. The permit holder shall furnish all necessary apparatus for conducting tests.	
1203.3.2 Final Piping Inspection. This inspection shall be made after piping authorized by the permit has been installed and after portions thereof that are to be covered or concealed are so concealed and before any fixture, appliance, or shutoff valve has been attached thereto and after the completed system is ready to be put into service. This inspection shall comply with Section 1213.~~1~~3. Test gauges used in conducting tests shall be in accordance with Section 318.0.		**1203.3.2 Final Piping Inspection.** This inspection shall be made after piping authorized by the permit has been installed and after portions thereof that are to be covered or concealed are so concealed and before any fixture, appliance, or shutoff valve has been attached thereto, and after the completed system is ready to be put into service. This inspection shall comply with Section 1213.3~~1~~. Test gauges used in conducting tests shall be in accordance with Section 318.0.	**No change to Houston amendment.**
1208.6.1.3 Additional Requirements. Gas meters shall not be located under a show window, under interior stairways, or in engine, boiler, heater, or electric meter rooms. Gas meters shall be located at least 3 feet (914 mm) from known sources of ignition or air intakes.			**Houston amendment relocated to Section 1208.7.1.3.**
		1208.7.1.3 Additional Requirements. Gas meters shall not be located under a show window, under interior stairways, or in engine, boiler, heater, or electric meter rooms. Gas meters shall be located at least 3 feet (914 mm) from known sources of ignition or air intakes.	**No change to Houston amendment, relocated from Section 1208.6.1.3.**
	1208.6.3.1 Steel, Stainless Steel, and Wrought-Iron Pipe. Steel, stainless steel, and wrought-iron pipe shall be at least ~~of standard weight~~ (Schedule 40~~)~~ and shall comply with the dimensional standards of ASME B36.10M and one of the following ~~standards~~: (1) ~~ASME B36.10~~ ASTM A53 (2) ~~ASTM A53~~ ASTM A106 (3) ~~ASTM A106~~ ASTM A312 {~~[~~NFPA 54:5.6.2.2~~]~~}		**New base code requirements for stainless steel.**
	1208.6.4 Metallic Tubing. ~~Seamless copper, aluminum alloy, or steel~~ Tubing shall not be used with gases corrosive to ~~such~~ the tubing material. [NFPA 54:5.6.3.1]		**Minor changes to base code requirements.**

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	1208.6.4.1 Stainless Steel ~~Tubing~~. Stainless steel tubing shall comply with one of the following: (1) ASTM A268 ~~ASTM A254;~~ (2) ASTM A269 [NFPA 54:5.6.3.~~1~~3]		**New base code requirements for stainless steel.**
	1208.6.5 Plastic Pipe, Tubing, and Fittings. Polyethylene plastic pipe, tubing, and fittings used to supply fuel gas shall conform to ASTM D2513. Pipe to be used shall be marked "gas" and "ASTM D2513." Polyamide pipe, tubing, and fittings shall be identified in and conform to ASTM F2945. Pipe to be used shall be marked "gas" and "ASTM F2945." Polyvinyl chloride (PVC) and chlorinated polyvinyl chloride (CPVC) plastic pipe, tubing, and fittings shall not be used to supply fuel gas. [NFPA 54:5.6.4.1.1 – 5.6.4.1.3]		**New base code requirements for polyamide pipe, tubing and fittings, includes new referenced standards.**
	~~**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.~~ ~~**1208.6.10.2**~~ **1208.6.10.1 ~~Tubing~~ Pipe Joints.** ~~Tubing~~ Schedule 40 and heavier pipe joints shall be ~~made with approved gas tubing fittings, be~~ threaded, flanged, brazed with a material having, welded, or assembled with press-connect fit-tings listed to CSA LC 4. [NFPA 54:5.6.7.1] **(1)** Where nonferrous pipe is brazed, the brazing materials shall have a melting point in excess of 1000°F (538°C)~~, or made by press connect fittings that comply with CSA LC 4~~. [NFPA 54:5.6.7.1(B)] **(2)** Brazing alloys shall not contain more than 0.05 percent phosphorus. [NFPA 54:5.6.7.1(C)]		**Base code requirements for pipe joints have been updated.**
	~~**1208.6.10.3**~~ **1208.6.10.2 Copper Tubing Joints.** Copper tubing joints shall be assembled with approved gas tubing fittings, shall be brazed with a material having a melting point in excess of 1000°F (538°C), or shall be assembled with press-connect fittings listed to CSA LC 4, Press-Connect Metallic Fittings for Use in Fuel Gas Distribution Systems. Brazing alloys shall not contain more than 0.05 percent phosphorus. [NFPA 54:5.6.7.2]		**New base code requirements for copper tubing joints.**
	~~**1208.6.10.4**~~ **1208.6.10.3 Stainless Steel Tubing Joints.** Stainless steel joints shall be welded, assembled with approved tubing fittings, brazed with a material having a melting point in excess of 1000°F (538°C), or assembled with press-connect fittings listed to CSA LC 4, Press-Connect Metallic Fittings for Use in Fuel Gas Distribution Systems. Brazing alloys and fluxes shall be recommended by the manufacturer for use on stainless steel alloys. [NFPA 54:5.6.7.3]		**New base code requirements for stainless steel tubing joints.**
	~~**1208.6.10.5**~~ **1208.6.10.4 Flared Joints.** Flared joints shall be used only in systems constructed from nonferrous pipe and tubing where experience or tests have demonstrated that the joint is ~~approved~~ suitable for the conditions and where provisions are made in the		**Minor changes to base code requirements.**

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	design to prevent separation of the joints. [NFPA 54:5.6.7.34]		
	1208.8 Gas Pressure Regulators. A line pressure regulator ~~or gas appliance pressure regulator, as applicable,~~ shall be installed where the gas supply pressure exceeds ~~that at which the branch supply line or appliances are designed to operate or vary beyond design pressure limits~~ the maximum allowable inlet pressure of the appliance served. [NFPA 54:5.8.1]		**Wordsmithing changes to base code gas pressure regulator requirements.**
	1208.8.1 Listing. Line pressure regulators shall be listed in accordance with CSA Z21.80 where the outlet pressure is set to 2 psi (14 kPa) or less. [NFPA 54:5.8.2]		**Base code changes to pressure regulator requirements.**
	1208.10 Overpressure Protection Devices. Overpressure protection devices shall be one of the following: (1) Pressure relief valve. (2) Monitor regulator. (3) Series regulator installed upstream from the line regulator and set to continuously limit the pressure on the inlet of the line regulator to the maximum values specified by Section 1208.9 or less. (4) Automatic shutoff device installed in series with the line pressure regulator and set to shut off when the pressure on the downstream piping system reaches the maximum values specified by Section 1208.9 or less. This device shall be designed so that it will remain closed until manually reset. [NFPA 54:5.9.3.1]		**New base code requirements for overpressure protection devices.**
	1208.10.1 Separate Devices. The devices in Section 1208.10 shall be installed either as an integral part of the service or line pressure regulator or as separate units. Where separate overpressure protection devices are installed, they shall comply with Section 1208.10.2 through Section 1208.10.7. [NFPA 54:5.9.3.2]		**New base code requirements for overpressure protection devices.**
	1208.10.2 Construction and Installation. All over-pressure protection devices shall meet the following requirements: (1) Be constructed of materials so that the operation of the device is not impaired by corrosion of external parts by the atmosphere or of internal parts by the gas. (2) Be designed and installed so they can be operated to determine whether the valve is free. The devices shall also be designed and installed so they can be tested to determine the pressure at which they operate and be examined for leakage when in the closed position. [NFPA 54:5.9.4]		**New base code requirements for overpressure protection devices.**
	1208.10.3 External Control Piping. External control piping shall be designed and installed so that damage to the control piping of one device does not render both the regulator and the overpressure protective device inoperative. [NFPA 54:5.9.5]		**New base code requirements for overpressure protection devices.**

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	1208.10.4 Setting. Each pressure limiting or pressure relieving device shall be set so that the gas pressure supplied to the connected appliance(s) does not exceed the limits specified in Section 1208.11 and Section 1208.11.1. [NFPA 54:5.9.6]		**New base code requirements for overpressure protection devices.**
	1208.10.5 Unauthorized Operation. Where unauthorized operation of any shutoff valve could render a pressure relieving valve or pressure limiting device inoperative, one of the following shall be accomplished: (1) The valve shall be locked in the open position. Instruct authorized personnel in the importance of leaving the shutoff valve open and of being present while the shutoff valve is closed so that it can be locked in the open position before leaving the premises. (2) Duplicate relief valves shall be installed, each having adequate capacity to protect the system, and arrange the isolating valves or three-way valve so that only one relief valve can be rendered inoperative at a time. [NFPA 54:5.9.7]		**New base code requirements for overpressure protection devices.**
	~~**1208.8.6**~~ **1208.10.6 Discharge of Vents.** ~~The discharge of vents shall be in accordance with the following requirements:~~ The discharge stacks, vents, or outlet parts of all pressure- relieving and pressure-limiting devices shall be located so that gas is safely discharged to the outdoors. Discharge stacks or vents shall be designed to prevent the entry of water, insects, or other foreign material that could cause blockage. The discharge stack or vent line shall be at least the same size as the outlet of the pressure- relieving device. [NFPA 54:5.9.8.1 – 5.9.8.2]		**New base code requirements for overpressure protection devices.**
	1208.10.7 Size of Fittings, Pipe, and Openings. The fittings, pipe, and openings located between the system to be protected and the pressure relieving device shall be sized to prevent hammering of the valve and to prevent impairment of relief capacity. [NFPA 54:5.9.9]		**New base code requirements for overpressure protection devices.**
	1210.1 Piping Underground. Underground gas piping shall be installed with sufficient clearance from any other underground structure to avoid contact therewith, to allow maintenance, and to protect against damage from proximity to other structures. In addition, underground plastic piping shall be installed with sufficient clearance or shall be insulated from any source~~s~~ of heat so as to prevent the heat from impairing the serviceability of the pipe. [NFPA 54:7.1.1]		**Minor wordsmithing changes to base code requirements.**
1210.1.6 Piping Underground Beneath Buildings. Where gas piping is installed underground beneath buildings, the piping shall be one of the following: **(1)** Encased in an approved conduit designed to withstand the imposed loads and installed in accordance with Section 1210.1.6.1 or Section 1210.1.6.2. **(2)** A piping or encasement system listed for installation beneath buildings. [NFPA 54:7.1.6] **(3)** Pipe must be removable without causing damage to the structure. Sleeves for corrugated stainless-steel piping may terminate within the building.		**1210.1.6 Piping Underground Beneath Buildings.** Where gas piping is installed underground beneath buildings, the piping shall be ~~either~~ one of the following: (1) Encased in an approved conduit designed to withstand the imposed loads and installed in accordance with Section 1210.1.6.1 or Section 1210.1.6.2. (2) A piping or encasement system listed for installation beneath buildings. [NFPA 54:7.1.6] (3) Pipe must be removable without causing damage to the structure. Sleeves for corrugated stainless-steel piping may terminate within the building.	**Minor change to Houston amendment to incorporate previous UPC language allowing only one option from numbered items below.**

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1210.1.6.1 Conduit with One End Terminating Outdoors. The conduit shall extend into an accessible portion of the building and, at the point where the conduit terminates in the building, the space between the conduit and the gas piping shall be sealed to prevent the possible entrance of a gas leakage. Where the end sealing is of a type that will retain the full pressure of the pipe, the conduit shall be designed for the same pressure as the pipe. The conduit shall extend not less than 4 inches (102 mm) outside the building, be vented outdoors above finished ground level, ~~and~~ be installed so as to prevent the entrance of water and insects<u>, and be graded to the outside</u>. [NFPA 54:7.1.6.2]		**1210.1.6.1 Conduit with One End Terminating Outdoors.** The conduit shall extend into an accessible portion of the building and, at the point where the conduit terminates in the building, the space between the conduit and the gas piping shall be sealed to prevent the possible entrance of any gas leakage. Where the end sealing is of a type that will retain the full pressure of the pipe, the conduit shall be designed for the same pressure as the pipe. The conduit shall extend at least 4 inches (102 mm) outside the building, be vented outdoors above finished ground level, ~~and~~ be installed so as to prevent the entrance of water and insects<u>, and be graded to the outside</u>. [NFPA 54:7.1.6.1]	**No change to Houston amendment.**
1210.1.7.2 Tracer Wire. An electrically continuous corrosion-resistant tracer wire (not less than AWG 14 <u>yellow</u>) or tape shall be buried with the plastic pipe to facilitate locating. ~~One~~ <u>Both ends</u> of the tracer wire or tape shall <u>terminate</u> ~~be brought~~ aboveground at a building wall or riser. [NFPA 54:7.1.7.3]		**1210.1.7.2 Tracer Wire.** An electrically continuous corrosion-resistant tracer shall be buried with the plastic pipe to facilitate locating. The tracer shall be one of the following: (1) A product specifically designed for that purpose. (2) Insulated copper conductor not less than 14 AWG <u>(yellow)</u>. Where tracer wire is used, access shall be provided from aboveground, or ~~one~~ <u>both ends</u> of the tracer wire or tape shall <u>terminate</u> ~~be brought~~ aboveground at a building wall or riser. [NFPA 54:7.1.7.3 – 7.1.7.3.2]	**No change to Houston amendment.**
	1210.2 CSST Piping Systems. CSST piping systems shall be installed in accordance with this code and the manufacturer's installation instructions. [NFPA 54:7.1.8]		**New base code provisions for CSST piping systems.**
<u>**1210.2.4.3 Piping on Roof Tops.** Gas piping installed on a roof surface shall be elevated above the roof surface and shall be supported in accordance with Table 1210.2.4.1. [NFPA 54:7.2.5.4]</u>			**Houston amendment removed, now part of base code UPC.**
	~~**1210.2**~~ **1210.3 Installation of Aboveground Piping.** Piping installed aboveground shall be securely supported and located where it will be protected from physical damage. Where passing through an exterior wall, the piping shall also be protected from corrosion by coating or wrapping with an inert material approved for such applications. The piping shall be sealed around its circumference at the point of the exterior penetration to prevent the entry of water, insects, and rodents. Where piping is encased in a protective pipe sleeve, the annular spaces between the gas piping and the sleeve and between the sleeve and the wall opening shall be sealed. [NFPA 54:7.2.1]		**Minor wordsmithing changes to base code requirements.**
	~~**1208.6.9**~~ **1210.3.1 Protective Coating.** Where piping is in contact with a material or an atmosphere ~~exerting a~~ corrosive ~~action, metallic~~ to the piping system, the piping and fittings shall be coated with a corrosion-resistant material ~~shall be used. External or internal coatings or~~		**Minor wordsmithing changes to base code requirements.**

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	~~linings~~. Any such coating used on piping or components shall not be considered as adding strength to the system. [NFPA 54:~~5.6.6~~7.2.2]		
1210.3.4 Piping in Floors. In industrial occupancies, gas piping in solid floors such as concrete shall be laid in channels in the floor and covered to permit access to the piping with minimum damage to the building. Where piping in floor channels is exposed to excessive moisture or corrosive substances, the piping shall be protected in an approved manner. [NFPA 54:7.3.5.1] ~~**Exception:** In other than industrial occupancies and where approved by the Authority Having Jurisdiction, gas piping embedded in concrete floor slabs constructed with Portland cement shall be surrounded with not less than 1½ inches (38 mm) of concrete and shall not be in physical contact with other metallic structures such as reinforcing rods or electrically neutral conductors. Piping, fittings, and risers shall be protected against corrosion in accordance with Section 1208.5.6. Piping shall not be embedded in concrete slabs containing quick-set additives or cinder aggregate. [NFPA 54:7.3.5.2]~~			**Houston amendment relocated to Section 1210.3.4, no changes.**
	~~1210.3.1~~ **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.~~11.2~~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.		**Minor changes to base code to reference new standard CSA LC 4.**
1210.4.3 Ventilation. A chase shall be ventilated to the outdoors and only at the top. The openings shall have a minimum free area [in square inches (m^2)] equal to the product of one-half of the maximum pressure in the piping [in psi (kPa)] time the largest nominal diameter of that piping [in inches (mm)], or the cross-sectional area of the chase, whichever is smaller. Where more than one fuel gas piping system is present, the free area for each system shall be calculated and the largest area used. [NFPA 54:7.4.3]			**Houston amendment removed, now part of base code UPC.**
		1210.4.4 Piping in Floors. In industrial occupancies, gas piping in solid floors such as concrete shall be laid in channels in the floor and covered to permit access to the piping with a minimum of damage to the building. Where piping in floor channels is exposed to excessive moisture or corrosive substances, the piping shall be protected in a~~n~~	**No changes to Houston amendment, relocated from Section 1210.3.4.**

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		manner approved by the Authority Having Jurisdiction ~~manner.~~ ~~In other than industrial occupancies and where approved by the Authority Having Jurisdiction, gas piping embedded in concrete floor slabs constructed with portland cement shall be surrounded with minimum of 1½ inches (38 mm) of concrete and shall not be in physical contact with other metallic structures such as reinforcing rods or electrically neutral conductors. All piping, fittings, and risers shall be protected against corrosion in accordance with Section 1208.5.6. Piping shall not be embedded in concrete slabs containing quick-set additives or cinder aggregate. [NFPA 54:7.3.5.1 – 7.3.5.2]~~	
1211.2.1 Bonding Jumper Length. The length of the jumper between the connection to the gas piping system and the grounding electrode system shall not exceed 75 feet (22 860 mm). Any additional electrodes shall be bonded to the electrical service grounding electrode system or, where provided, lightning protection grounding electrode system. [NFPA 54:7.13.2.3] **1211.2.2 Bonding Connections.** Bonding connections shall be in accordance with NFPA 70. [NFPA 54:7.13.2.4] **1211.2.3 Devices Used for Bonding.** Devices used for the bonding connection shall be listed for the application in accordance with UL 467. [NFPA 54:7.13.2.5]			**Houston amendment removed, now part of base code UPC.**
	~~**1211.1 Pipe and tubing other than**~~ **1211.3 Arc-Resistant Jacketed CSST.** ~~Each above ground portion of a gas piping system other than~~ CSST ~~that is likely to become energized~~ listed with an arc resistant jacket or coating system in accordance with CSA LC 1 shall be electrically continuous and bonded to an effective ground fault current path. ~~Gas piping, other than~~ Where any CSST component of a piping system does not have an arc-resistant jacket or coating system, the bonding requirements of Section 1211.2 shall apply. Arc-resistant jacketed CSST shall be considered to be bonded ~~where~~ when it is connected to appliances that are connected to the appliance grounding conductor of the circuit supplying that appliance. [NFPA 54:7.~~13~~12.3]		**Base code UPC updated with provisions for arc-resistant jacketed CSST.**
1211.6 Electrical Connections. ~~Electrical~~ All electrical connections between wiring and electrically opened control devices in a piping system shall comply with the requirements of NFPA 70. [NFPA 54:7.15.1]			**Houston amendment removed, now part of base code UPC.**
	1212.6 Appliance Shutoff Valves and Connections. Each appliance connected to a piping system shall have an accessible, approved manual shutoff valve with a nondisplaceable valve member, or a listed gas convenience outlet. Appliance shutoff valves and convenience outlets shall serve a single appliance only. {NFPA 54:9.6.5} The shutoff valve shall be located within 6 feet (1829 mm) of the appliance it serves. {NFPA 54:9.6.5.1} Where a connector is used, the valve shall be installed upstream of the connector. A union or flanged connection shall be provided downstream from the valve to		**Minor changes to base code to reference NFPA standards and correlate requirements.**

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	permit removal of appliance controls. ~~Shutoff valves serving decorative appliances shall be permitted to be installed in fireplaces if listed for such use.~~ [NFPA 54:9.6.5.1(A)] **Exceptions:** (1) Shutoff valves serving decorative appliances in a fire-place shall not be ~~permitted to be accessibly~~ located inside or ~~under an appliance~~ within the fireplace firebox except where ~~such appliances is removed without removal of off~~ the valve is listed for such use. [NFPA 54:9.6.5.1(B)] (2) Shutoff valves shall be permitted to be accessibly located inside wall heaters and wall furnaces listed for recessed installation where necessary maintenance is performed without removal of the shutoff valve.		
1213.1.4 Piping System. A piping system shall be tested as a complete unit or in sections. Under no circumstances shall a valve in a line be used as a bulkhead between gas in one section of the piping system and test medium in an adjacent section, unless ~~two valves are installed in series with a valved "telltale" located between these valves~~ a double block and bleed valve system is installed. A valve shall not be subjected to the test pressure unless it is determined that the valve, including the valve-closing mechanism, is designed to safely withstand the pressure. [NFPA 54:8.1.1.5]			**Houston amendment removed, now part of base code UPC.**
1213.3 Test Pressure. This inspection shall include an air, **CO_2**, or nitrogen pressure test, at a pressure of at least 6 inches (152 mm) of mercury, measured with a manometer or slope gauge ~~which time the gas piping shall stand a pressure of not less than 10 psi (69 kPa) gauge pressure~~. Test pressures shall be held for a length of time satisfactory to the Authority Having Jurisdiction, but in no case less than 15 minutes with no perceptible drop in pressure. ~~For welded piping, and for piping carrying gas at pressures in excess of 14 inches water column pressure (3.5 kPa), the test pressure shall be not less than 60 psi (414 kPa) and shall be continued for a length of time satisfactory to the Authority Having Jurisdiction, but in no case for less than 30 minutes. For CSST carrying gas at pressures in excess of 14 inches water column (3.5 kPa) pressure, the test pressure shall be 30 psi (207 kPa) for 30 minutes. These tests shall be made using air, **CO_2**, or nitrogen pressure and shall be made in the presence of the Authority Having Jurisdiction. Necessary apparatus for conducting tests shall be furnished by the permit holder. Test gauges used in conducting tests shall be in accordance with Section 318.0.~~ The test pressure shall not be less than twice the pressure that the system will be subjected to when in service. These tests shall be made in the presence of an inspector. All necessary apparatus for conducting tests shall be furnished by the permit holder. A final inspection shall be required for all gas systems that require a permit as specified in Section 1202.5. For annual gas tests and GTO's, the tests shall be done at the pressure required for the final gas inspection.		**1213.3 Test Pressure.** This inspection shall include an air, CO_2, or nitrogen pressure test, at a pressure of at least 6 inches (152 mm) of mercury, measured with a manometer or slope gauge ~~which time the gas piping shall stand a pressure of not less than 10 psi (69 kPa) gauge pressure.~~ Test pressures shall be held for a length of time satisfactory to the Authority Having Jurisdiction, but in no case less than 15 minutes with no perceptible drop in pressure. ~~For welded piping, and for piping carrying gas at pressures in excess of 14 inches water column pressure (3.5 kPa), the test pressure shall be not less than 60 psi (414 kPa) and shall be continued for a length of time satisfactory to the Authority Having Jurisdiction, but in no case for less than 30 minutes. For CSST carrying gas at pressures in excess of 14 inches water column (3.5 kPa) pressure, the test pressure shall be 30 psi (207 kPa) for 30 minutes. These tests shall be made using air, CO_2, or nitrogen pressure and shall be made in the presence of the Authority Having Jurisdiction. Necessary apparatus for conducting tests shall be furnished by the permit holder. Test gauges used in conducting tests shall be in accordance with Section 318.0.~~ The test pressure shall not be less than twice the pressure that the system will be subjected to when in service. These tests shall be made in the presence of an inspector. All necessary apparatus for conducting tests shall be furnished by the permit holder. A final inspection shall be required for all gas systems that require a permit as specified in Section 1202.5. For annual gas tests and Gas Turn-On's (GTO's), the tests shall be done at the pressure required for the final gas inspection.	**No change to Houston amendment.**

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Exception: In lieu of the mercury gauge one of the following may be used: **(1)** **Low Pressure Systems** – A low pressure diaphragm gauge with a minimum dial size of 3½ inches with a set hand and a pressure range not to exceed 6 psi with 1/10-pound incrementation. The minimum test pressure shall not be less than 3 psi and the maximum test pressure to be applied shall not exceed 4 psi. **(2)** **Medium Pressure Systems** – A diaphragm type pressure gauge with a minimum dial size of 3½ inches with a set hand and a pressure range not to exceed 20 psi with 2/10-pound incrementation. The minimum test pressure shall not be less than 10 psi and the maximum test pressure shall not exceed 12 psi. **(3)** **High Pressure Systems** – Gauges for high pressure tests shall be as follows: **a.** Required pressure tests exceeding 10 pounds (69 kPa) but less than 100 pounds (689 kPa) shall be performed with gauges that have 1-pound (6.9 kPa) incrementation or less. **b.** Required pressure tests exceeding 100 pounds (689 kPa) shall be performed with gauges incremented for 2 percent or less of the required test pressure. **c.** Test gauges shall have a pressure range not greater than twice the test pressure applied.		**Exception:** In lieu of the mercury gauge one of the following may be used: (1) Low Pressure Systems – A low pressure diaphragm gauge with a minimum dial size of 3½ inches with a set hand and a pressure range not to exceed 6 psi with 1/10-pound incrementation. The minimum test pressure shall not be less than 3 psi, and the maximum test pressure to be applied shall not exceed 4 psi. (2) Medium Pressure Systems – A diaphragm type pressure gauge with a minimum dial size of 3½ inches with a set hand and a pressure range not to exceed 20 psi with 2/10-pound incrementation. The minimum test pressure shall not be less than 10 psi, and the maximum test pressure shall not exceed 12 psi. (3) High Pressure Systems – Gauges for high pressure tests shall be as follows: (a) Required pressure tests exceeding 10 pounds (69 kPa) but less than 100 pounds (689 kPa) shall be performed with gauges that have 1-pound (6.9 kPa) incrementation or less. (b) Required pressure tests exceeding 100 pounds (689 kPa) shall be performed with gauges incremented for 2 percent or less of the required test pressure. (c) Test gauges shall have a pressure range not greater than twice the test pressure applied.	
	1215.2 Sizing of Gas Piping Systems. Sizing of piping systems shall be in accordance with Section 1215.2.1 for natural gas piping system and Section 1215.2.2 for propane piping systems.		**New base code UPC requirements for gas piping systems.**
	1215.2.1 Natural Gas Piping Systems. Table 1215.2(1) through Table 1215.2(23) shall be used in conjunction with one of the methods described in Section 1215.1.1 through Section 1215.1.3 for piping materials other than non-corrugated stainless steel tubing. Section 1215.3 shall be used in conjunction with one of the methods described in Section 1215.1.1 through Section 1215.1.3 for non-corrugated stainless steel tubing. [NFPA 54:6.2.1, 6.2.2]		**New base code UPC requirements for natural gas piping systems.**
	1215.2.1 Natural Gas Piping Systems. Table 1215.2(1) through Table 1215.2(23) shall be used in conjunction with one of the methods described in Section 1215.1.1 through Section 1215.1.3 for piping materials other than non-corrugated stainless steel tubing. Section 1215.3 shall be used in conjunction with one of the methods described in Section 1215.1.1 through Section 1215.1.3 for non-corrugated stainless steel tubing. [NFPA 54:6.2.1, 6.2.2]		**New base code UPC requirements for natural gas piping systems.**
1216.6 Variable Gas Pressure. Where the supply gas pressure exceeds 14 inches (3.5 kPa) or 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			**Houston amendment removed, now part of base code UPC.**

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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.			
{**EDITORIAL NOTE:** DELETE AND REPLACE TABLES 1216.2(2) AND 1216.2(3) WITH THE FOLLOWING:}			**Houston amendment removed, no longer needed.**
Table 1216.2(2) **Schedule 40 Metallic Pipe [NFPA 54:Table 6.2(c)]*** **Gas: Natural** **Inlet Pressure: Less Than 2 psi** **Pressure Drop: 3.0 in. w.c.** **Specific Gravity: .060** **Intended Use: Initial Supply Pressure of 8.0 in. W.C. or Greater**			**Houston amendment removed, now part of base code UPC.**

Pipe Size (inch)								
Nominal:	**½**	**¾**	**1**	**1¼**	**1½**	**2**	**2½**	**3**	**4**
Actual ID:	**0.622**	**0.824**	**1.049**	**1.380**	**1.610**	**2.067**	**2.469**	**3.068**	**4.026**
Length (feet)	**Capacity in Cubic Feet of Gas Per Hour**								
10	454	949	1790	3670	5500	10600	16900	29800	60800
20	312	652	1230	2520	3780	7280	11600	20500	41800
30	250	452	986	2020	3030	5840	9310	16500	33600
40	210	448	846	1730	2600	5000	7970	14100	28700
50	190	397	748	1540	2300	4430	7060	12500	25500
60	172	360	678	1390	2090	4020	6400	11300	23100
70	158	331	624	1280	1920	3690	5890	10400	21200
80	147	308	580	1190	1790	3440	5480	9690	19800
90	137	289	544	1110	1670	3230	5140	9090	18500
100	131	273	514	1060	1580	3050	4860	8580	17500
125	116	242	456	936	1400	2700	4300	7610	15500
150									

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175 200 250	10 5 96 90 80	21 9 20 2 18 8 16 6	41 3 38 0 35 3 31 3	84 8 78 0 72 6 64 3	127 0 117 0 109 0 964	245 0 225 0 209 0 186 0	390 0 359 0 334 0 296 0	689 0 634 0 590 0 523 0	14 100 12 900 12 000 10 700
300 350 400 450 500	72 66 62 58 55	15 1 13 9 12 9 12 1 11 4	28 4 26 1 24 3 22 8 21 5	58 3 53 6 49 9 46 8 44 2	873 803 747 701 662	168 0 155 0 144 0 135 0 128 0	248 0 247 0 229 0 215 0 203 0	474 0 463 0 405 0 380 0 359 0	9660 8890 8270 7760 7330
550 600 650 700 750	52 50 47 46 44	10 9 10 4 99 95 92	20 4 19 5 18 7 17 9 17 3	42 0 40 0 38 4 36 8 35 5	629 600 575 552 532	121 0 116 0 111 0 106 0 102 0	193 0 184 0 176 0 169 0 163 0	341 0 326 0 312 0 300 0 289 0	6960 6640 6360 6110 5890
800 850 900 950 1000	42 41 40 39 38	89 86 83 81 79	16 7 16 2 15 7 15 2 14 8	34 3 33 2 32 2 31 2 30 4	514 497 482 468 455	989 957 928 901 877	158 0 153 0 148 0 144 0 140 0	279 0 270 0 261 0 254 0 247 0	5680 5500 5330 5180 5040
1100 1200 1300 1400 1500	36 34 33 31 30	75 71 68 65 63	14 1 13 4 12 8 12 3 11 9	28 9 27 5 26 4 25 3 24 4	432 412 395 379 366	833 794 761 731 704	133 0 127 0 121 0 116 0 112 0	235 0 224 0 214 0 206 0 198 0	4780 4560 4370 4200 4050
1600 1700 1800 1900 2000	29 28 27 27 26	61 59 57 56 54	11 5 11 1 10 8 10 5	23 6 22 8 22 1 21 5	353 342 331 322 313	680 658 638 619 602	108 0 105 0 102 0 987 960	192 0 185 0 180 0 175 0	3910 3780 3670 3560 3460

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			102	209				1700	

For SI units: 1 inch = 25 mm, 1 foot = 304.8 mm, 1 cubic foot per hour = 0.0283 m^3/h, 1 pound-force per square inch – 6.8947 kPa, 1 inch water column = 0.249 kPa
* Table entries are rounded to 3 significant digits.

Table 1216.2(3)
Schedule 40 Metallic Pipe [NFPA 54: Table 6.2(d)]*

	Gas:	**Natural**
	Inlet Pressure:	**Less Than 2 psi**
	Pressure Drop:	**6.0 in. w.c.**
	Specific Gravity:	**.060**

Intended Use: Initial Supply Pressure of 11.0 in. W.C. or Greater									
	Pipe Size (inch)								
Nominal:	½	¾	1	1¼	1½	2	2½	3	4
Actual ID:	**0.622**	**0.824**	**1.049**	**1.380**	**1.610**	**2.067**	**2.469**	**3.068**	**4.026**
Length (feet)	**Capacity in Cubic Feet of Gas Per Hour**								
10	660	1380	2600	5340	8000	15400	24600	43400	88500
20	454	949	1790	3670	5500	10600	16900	29800	60800
30	364	762	1440	2950	4410	8500	13600	24000	48900
40	312	652	1230	2520	3780	7280	11600	20500	41800
50	276	578	1090	2240	3350	6450	10300	18200	37100
60	250	524	986	2030	3030	5840	9310	16500	33600
70	230	482	907	1860	2790	5380	8570	15100	30900
80	214	448	844	1730	2600	5000	7970	14100	28700
90	201	420	792	1630	2440	4690	7480	13200	27000
100	190	397	748	1540	2300	4430	7060	12500	25500
125	168	352	663	1360	2040	3930	6260	11100	22600
150	153	319	601	1230	1850	3560	5670	10000	20500
175	140	293	553	1130	1700	3270			

Houston amendment removed, now part of base code UPC.

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200 250	131 116	273 242	514 456	12 30 11 40 10 56 93 6	185 0 170 0 158 0 140 0	3050 2700	567 0 522 0 486 0 430 0	100 00 923 0 858 0 761 0	2050 0 1880 0 1750 0 1550 0
300 350 400 450 500	105 96 90 84 80	219 202 188 176 166	413 380 353 332 313	84 8 78 0 72 6 68 1 64 3	127 0 117 0 109 0 102 0 964	2450 2250 2090 1960 1860	390 0 359 0 334 0 313 0 296 0	689 0 634 0 590 0 554 0 523 0	1410 0 1290 0 1200 0 1130 0 1070 0
550 600 650 700 750	76 72 69 66 64	158 151 144 139 134	297 284 272 261 252	61 1 58 3 55 8 53 6 51 6	915 873 836 803 774	1760 1680 1610 1550 1490	281 0 268 0 257 0 247 0 238 0	497 0 474 0 454 0 436 0 420 0	1010 0 9660 9250 8890 8560
800 850 900 950 1000	62 60 58 56 55	129 125 121 118 114	243 235 228 221 215	49 9 48 3 46 8 45 4 44 2	747 723 701 681 662	1440 1390 1350 1310 1280	229 0 222 0 215 0 209 0 203 0	405 0 392 0 380 0 369 0 359 0	8270 8000 7760 7540 7330
1100 1200 1300 1400 1500	52 50 47 46 44	109 104 99 95 92	204 195 187 179 173	42 0 40 0 38 4 36 8 35 5	629 600 575 552 532	1210 1160 1110 1060 1020	193 0 184 0 176 0 169 0 163 0	341 0 326 0 312 0 300 0 289 0	6960 6640 6360 6110 5890
1600 1700 1800 1900 2000	42 41 40 39 38	89 86 83 81 79	167 162 157 152 148	34 3 33 2 32 2	514 497 482 468 455	989 957 928 901 877	158 0 153 0 148 0	279 0 270 0 261 0	5680 5500 5330 5180 5040

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				312 230 4			1440 1400	2540 2470	

For SI units: 1 inch = 25 mm, 1 foot = 304.8 mm, 1 cubic foot per hour = 0.0283 m^3/h, 1 pound-force per square inch – 6.8947 kPa, 1 inch water column = 0.249 kPa

* Table entries are rounded to 3 significant digits.

2015 Houston UPC – Chapter 13 Health Care Facilities and Medical Gas and Medical Vacuum Systems	2021 UPC – Chapter 13 – Health Care Facilities and Medical Gas and Medical Vacuum Systems	2021 Houston UPC Amendments	Code Change Summary
	1301.0 General Requirements.		**Minor change to base code.**
1301.4 Terms. Where the terms "medical gas" or "medical support gas" occur~~s~~, the provisions shall apply to piped systems for oxygen, nitrous oxide, medical air, carbon dioxide, helium, nitrogen, instrument air, and mixtures thereof. Where the name of a specific gas service occurs, the provision shall apply to that gas. [NFPA 99:5.1.1.2] Where the term "medical vacuum" occurs, the provisions shall apply to systems for piped medical-surgical vacuum. Where the name of a specific vacuum service occurs, the provision shall apply to the vacuum service. [NFPA 99:5.1.1.3]			**Houston amendment removed as it's part of base code UPC.**
1301.5 Where Required. Construction and equipment requirements shall be applied to new construction and new equipment, except as ~~otherwise addressed in this chapter~~ modified in individual chapters. [NFPA 99:1.3.2]			**Houston amendment removed as it's part of base code UPC.**
1301.6 Existing Systems. ~~The~~ Only the altered, renovated, or modernized portion of an existing system or individual component shall be required to meet the installation and equipment requirements stated in this chapter. Where the alteration, renovation, or modernization adversely impacts existing performance requirements of a system or component, additional upgrading shall be required. An existing system that does not strictly comply with the provisions of this chapter shall be permitted to be continued in use where the Authority Having Jurisdiction has determined that such use does not constitute a distinct hazard to life. [NFPA 99:1.3.2.1 – 1.3.2.3]			**Houston amendment removed as it's part of base code UPC.**
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. ~~Building systems in health care facilities shall be designed in accordance with Category 1 through Category 3 requirements as detailed in this chapter.~~ [NFPA 99:4.1]	**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~~ chapter. [NFPA 99:4.1]		**Minor change to base code.** **Houston amendment removed as it's part of base code.**

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	1302.1.1 Processes and Operations. The health care facility's governing body shall establish the processes and operations that are planned for the health care facility. [NFPA 99:4.2.1]		**New base code provisions for health care processes and operations.**
	1302.1.1.1 Risk Categories. The governing body shall conduct risk assessments and shall determine risk categories based on the character of the processes and operations conducted in the health care facility. [NFPA 99:4.2.1.1]		**New base code provisions for health care risk category requirements.**
1302.1.1 Risk Assessment. Categories shall be determined by following and documenting a defined risk assessment procedure. [NFPA 99:4.2.1]	~~1302.1.1~~ **1302.1.2 Risk Assessment.** Risk categories shall be ~~determined~~ classified by the health care facility's governing body by following and documenting a defined risk assessment procedure. [NFPA 99:4.2.2]		**Minor changes to base code.** **Houston amendment removed as it's part of base code UPC.**
	1302.1.2.1 Documents to AHJ. Where required by the Authority Having Jurisdiction (AHJ), the risk assessment shall be provided to the AHJ for review based on the character of the processes and operations conducted in the health care facility. [NFPA 99:4.2.2.1]		**New base code provisions requiring risk assessment documentation with AHJ.**
	~~1302.1.2~~ **1302.1.3 Documented Risk Assessment.** A documented risk assessment shall not be required ~~for~~ where Category 1 is selected. [NFPA 99:4.2.3]		**New base code requirements for risk category assessment.**
1302.2 Patient Care ~~Rooms~~ Spaces. The governing body of the facility or its designee shall establish the following areas in accordance with the type of patient care anticipated: **(1)** Category 1 spaces **(2)** Category 2 spaces **(3)** Category 3 spaces **(4)** Category 4 spaces [NFPA 99:1.3.4.1] ~~(1) Critical care rooms~~ ~~(2) General care rooms~~ ~~(3) Basic care rooms [NFPA 99:1.3.4.1]~~			**Houston amendment removed as it's part of base code UPC.**
1302.3 Anesthetizing Locations. It shall be the responsibility of the governing body of the health care organization to designate anesthetizing locations. [NFPA 99:1.3.4.2] ~~**Exception:** Deep sedation and general anesthesia shall not be administered where using a Category 3 medical gas system. [NFPA 99:5.3.1.5]~~			**Houston amendment removed as it's part of base code UPC.**
	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.		**New base code provisions for health care facility plumbing installations and remodels.**

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{**EDITORIAL NOTE:** DELETE SECTION 1304.3 AND REPLACE WITH THE FOLLOWING:} **1304.3 Category 2 Piped Medical Gas and Medical Vacuum.** Category 2 piped gas or piped vacuum system requirements shall be permitted when all of the following criteria are met: **(1)** Only moderate sedation; minimal sedation, as defined in Chapter 2; or no sedation is performed. Deep sedation and general anesthesia shall not be permitted. **(2)** The loss of the piped gas or piped vacuum systems is likely to cause minor injury to patients, staff, or visitors. **(3)** The facility piped gas or piped vacuum systems are intended for Category 2 patient care space as defined in Chapter 2. [NFPA 99:5.2.1.2]			**Houston amendment removed as it's part of base code UPC.**
1304.3.1 Category 3 Piped Medical Gas and Medical Vacuum. Category 3 piped gas and vacuum systems shall be permitted when all of the following criteria are met: **(1)** Only moderate sedation; minimal sedation, as defined in Chapter 2; or no sedation is performed. Deep sedation and general anesthesia shall not be permitted. **(2)** The loss of the piped gas or piped vacuum systems is not likely to cause injury to patients, staff, or visitors, but cause discomfort. **(3)** The facility piped gas and vacuum systems are intended for Category 3 or Category 4 patient care rooms per Chapter 2. [NFPA 99:5.3.1.2]			**Houston amendment removed as it's part of base code UPC.**
1306.1 General. The installation of medical gas and ~~medical~~ vacuum systems shall be made by qualified, competent technicians who are experienced in performing such installations, including all personnel who actually install the piping system. Installers of medical gas and ~~medical~~ vacuum piped distribution systems, all appurtenant piping supporting pump and compressor source systems, and appurtenant piping supporting source gas manifold systems not including permanently installed bulk source systems, shall be certified in accordance with ASSE 6010. [NFPA 99:5.1.10.11.10.1, 5.1.10.11.10.2]			**Houston amendment removed as it's part of base code UPC.**
Moved to Section 1323.10.3. **1306.3 ~~Health Care Organization Personnel.~~** ~~Health care organization personnel shall be permitted to install piping systems where the requirements of Section 1306.1 through Section 1306.2.1 are met during the installation. [NFPA 99:5.1.10.11.10.6]~~ **Piping and Installation.** Piping and installation procedures shall comply with NFPA 99.			**Houston amendment relocated to Section 1323.10.3.**
1307.1 General. Brazing procedures and brazer performance for the installation of medical gas and medical vacuum piping shall be qualified in accordance with either Section IX, "Welding and Brazing Qualifications" of the ASME Boiler and Pressure	**1307.0 Central Supply Systems.** **1307.1 Terms.** Where the terms medical gas or medical support gas occur, the provisions shall apply to all piped systems for oxygen, nitrous oxide, medical air, carbon dioxide, helium, nitrogen, instrument air, and mixtures thereof.		**Minor change to base code.** **Houston amendment removed as it's part of base code UPC.**

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Vessel Code or AWS B2.2, both as modified in Section 1307.2 through Section 1307.7. [NFPA 99:5.1.10.11.11.1, 5.3.6.3.1]	Wherever the name of a specific gas service occurs, the provision shall apply only to that gas. [NFPA 99:5.1.1.3]		
	1307.2 Nature of Hazards of Gas and Vacuum Systems. Potential fire and explosion hazards associated with positive pressure gas central piping systems and medical–surgical vacuum systems shall be considered in the design, installation, testing, operation, and maintenance of these systems. [NFPA 99:5.1.2]		**New base code provisions for gas and vacuum system hazards.**
	~~**1312.1**~~ **1307.3 Permitted Locations for Medical Gases.** Central supply systems ~~and medical gas outlets~~ 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 ~~1312.1(1)~~ 1307.3(1) through Section ~~1312.1(4)~~ 1307.3(4). (6) Simulation centers for the education, training, and assessment of health care professionals. [NFPA 99:5.1.3.5.2]		**Minor changes to base code provisions for medical gas.**
Moved to Section 1319.1. **1308.5 Tubes for Medical Vacuum Systems.** Piping for medical vacuum systems shall be constructed of one of the following: (1) Hard-drawn seamless copper tube manufactured in accordance with one of the following: a) ASTM B88 copper tube (Type K, L, or M) b) ASTM B280 copper ACR tube c) ASTM B819 copper medical gas tubing (Type K or L) (2) Stainless steel tube manufactured in accordance with the following: **a)** ASTM A269 TP304L or 316L. **b)** ASTM A312 TP304L or 316L. **c)** ASTM A312 TP 304l/316L, Sch 5S pipe, and ASTM A403 WP304L/316L, Sch 5S fittings [NFPA 99:5.1.10.2.1] ~~**Exceptions:** Piping for Category 3 medical vacuum systems shall be permitted to be as follows:~~ ~~**(1)** Schedule 40 or Schedule 80 PVC plastic piping manufactured in accordance with ASTM D1785. [NFPA 99:5.3.8.2.3(1)]~~ ~~**(2)** Schedule 40 or Schedule 80 CPVC IPS (iron pipe size) plastic piping manufactured in accordance with ASTM F441. [NFPA 99:5.3.8.2.4(1)]~~			**Houston amendment relocated to Section 1319.1.**

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~~**(3)** CPVC CTS (copper tube size) plastic pipe manufactured in accordance with ASTM D2846, ½ of an inch (15 mm) through 2 inches (50 mm) in diameter. [NPFA 99:5.3.8.2.4(3)]~~			
1308.6 Category 3 Systems. Category 3 systems shall comply with Section 1308.0 through 1309.0, except as follows: **(1)** Dental air and dental vacuum shall comply with Section 1308.5, except the tubing shall be permitted to be annealed (soft temper). **(2)** Dental vacuum tubing shall be permitted to be: **a)** PVC plastic pipe shall be Schedule 40 or schedule 80, complying with ASTM D1785. **b)** PVC plastic fittings shall be Schedule 40 or Schedule 80 to match the pipe, complying with ASTM D2466 or ASTM D2467. **c)** Joints in PVC plastic piping shall be solvent-cemented in accordance with ASTM D2672. **d)** CPVC IPS plastic pipe shall be Schedule 40 or Schedule 80, complying with ASTM F441. **e)** CPVC IPS plastic fittings shall be Schedule 40 or Schedule 80 to match the pipe, complying with ASTM F438 or ASTM F439. **f)** CPVC CTS plastic pipe and fittings ½ of an inch (15 mm) through 2 inches (50 mm) in size shall be SDR 11, complying with ASTM D2846. **g)** Solvent cement for joints in CPVC plastic piping shall comply with ASTM F493. **(3)** Dental air and dental vacuum fittings shall be permitted to be: **a)** Soldered complying with ASME B16.22. **b)** Flared fittings complying with ASME B16.26. **c)** Compression fittings (¾ of an inch (20 mm) maximum size). **(4)** Soldered joints in Category 3 dental air supply piping shall be made in accordance with ASTM B828, using a "lead-free" solder filler metal containing not more than 0.2 percent lead by volume that complies with ASTM B32. **(5)** Where required, gas and vacuum equipment and piping shall be seismically restrained against earthquakes in accordance with the applicable building code. **(6)** Gas and vacuum piping systems shall be designed and sized to deliver the required flow rates at the utilized pressures. (NFPA 99:5.3.10]			**Houston amendment removed as it's part of base code UPC.**
	1309.0 Oxygen Concentrator Supply Units. **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]		**New base code provisions for oxygen concentrator requirements.**
{**EDITORIAL NOTE:** DELETE SECTION 1309.2 AND REPLACE WITH THE FOLLOWING:} **1309.2 Changes in Direction.** Positive pressure patient gas systems, medical support gas systems, and vacuum systems	**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]		**New base code provisions for particulate size output.** **Houston amendment removed as it's part of base code UPC.**

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shall have all turns, offsets, and other changes in direction made using fittings or techniques appropriate to any of the following acceptable joining methods: **(1)** Brazed as described in Section 1309.3. **(2)** Welding as described in Section 1309.5. **(3)** Memory metal fittings as described in Section 1309.4.1. **(4)** Axially swaged, elastic preload fittings as described in Section 1309.4.2. **(5)** Threaded as described under Section 1309.4.3. [NFPA 99:5.1.10.3.1]			
	1309.3 Suitability. Materials of construction on the air side of the oxygen concentrator unit shall be suitable for the service as determined by the manufacturer. [NFPA 99:5.1.3.5.11.3]		**New base code requirements for oxygen concentrator unit construction.**
1309.3.6.3 Abrasive Pads. Clean, nonshedding, abrasive pads shall be used to clean the exterior surfaces of the tube ends. [NFPA 99:5.1.10.4.3.5] ~~**Exception:** For Category 3 systems, nonabrasive pads shall be used to clean the exterior surfaces of tube ends. [NFPA 99:5.3.6.6.3]~~ **1309.3.6.4 Prohibited.** The use of steel wool or sand cloth shall be prohibited. [NFPA 99:5.1.10.4.3.6] ~~For Category 3 systems, the use of wire brushes shall also be prohibited.~~ The cleaning process shall not result in grooving of the surfaces to be joined. [NFPA 99:5.1.10.4.3.7, 5.3.6.6.6] **1309.3.6.7 On-Site Recleaning.** The interior surfaces of tube ends, fittings, and other components that were cleaned for oxygen service by the manufacturer, but become contaminated prior to being installed, shall be permitted to be recleaned ~~in accordance with Section 1311.0~~ on-site by the installer by thoroughly scrubbing the interior surfaces with a clean, hot water-alkaline solution, such as sodium carbonate or trisodium phosphate, using a solution of 1 pound (0.5 kg) of sodium carbonate or trisodium phosphate to 3 gallons (11 L) of potable water and thoroughly rinsing them with clean, hot, potable water. Other aqueous cleaning solutions shall be permitted to be used for on-site recleaning provided that they are as recommended in the mandatory requirements of CGA G-4.I. [NFPA 99:5.1.10.4.3.10, 5.1.10.4.3.11] **1309.3.6.8 Contaminated Materials.** Material that has become contaminated ~~shall be cleaned in accordance with Section 1311.0~~ shall be cleaned as required by Section 1309.3.6.7 for oxygen service, or shall not be installed. [NFPA 99:5.1.10.4.3.12]			**Houston amendment removed as it's part of base code UPC.**
1309.3.8.2 Flow Rate Control. The purge gas flow rate shall be controlled by the use of a pressure regulator and a flowmeter, or a combination thereof. [NFPA 99:5.1.10.4.5.3, 5.3.6.8.4]			**Houston amendment removed as it's part of base code UPC.**

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Pressure regulators alone shall not be used to control purge gas flow rates. [NFPA 99:5.1.10.4.5.4, 5.3.6.8.3] ~~For Category 3 systems, the nitrogen purge gas flow rate shall not be high enough to produce a positive pressure in the piping system. [NFPA 99:5.3.6.8.3]~~			
	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]		**New base code requirements for oxygen concentrator unit construction.**
1309.4.5 Other Types of Fittings. Approved or listed metallic gas tube fittings that provide a permanent joint having the mechanical, thermal, and sealing integrity of a brazed joint shall be permitted to be used. [NFPA 99:5.1.10.9.1]			**Houston amendment removed as it's part of base code UPC.**
	1309.5 Oxygen Concentrator Components. The components that make up the oxygen concentrator unit shall be as follows: (1) The manufacturer of the concentrator unit shall be permitted to use such components and arrangement of such components as needed to produce oxygen complying with Section 1309.1 in the quantity as required by the facility, except where otherwise specifically defined in this code. (2) Air receivers and oxygen accumulators, where used, shall comply with Section VIII, "Unfired Pressure Vessels," of the ASME Boiler and Pressure Vessels Code and be provided with overpressure relief valves. [NFPA 99:5.1.3.5.11.5]		**New base code requirements for oxygen concentrator unit construction.**
	1309.6 Supply Air Quality. The supply air to the concentrators shall be of a quality to ensure the oxygen concentrator unit can produce oxygen complying with Section 1309.1 and shall not be subject to normally anticipated contamination (e.g., vehicle or other exhausts, gas leakage, discharge from vents, flooding, and so forth). [NFPA 99:5.1.3.5.11.6]		**New base code requirements for oxygen concentrator unit construction.**
	1309.7 Electrical Components. The oxygen concentrator supply unit and any associated electrical equipment shall be pro-vided, a minimum, with the following electrical components: (1) Either a disconnect switch for each major electrical component or a single disconnect that deactivates all electrical components in the concentrator unit. (2) Motor starting devices with overload protection for any component with an electrical motor over 2 hp (1.5 kW). [NFPA 99:5.1.3.5.11.7]		**New base code requirements for oxygen concentrator unit electrical components.**
	1309.8 Vent Valve. A vent valve shall be provided as fol-lows: (1) Located on the source side of the concentrator outlet isolation valve to permit the operation of the oxygen concentrator unit for validation, calibration, and testing while the unit is isolated from the pipeline system. (2) Sized to allow for at least 25 percent of the oxygen concentrator unit flow. (3) Vented to a location compliant with Section 1309.8.1. [NFPA 99:5.1.3.5.11.8]		**New base code requirements for oxygen concentrator unit vent valves.**
	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]		**New base code requirements for oxygen concentrator unit relief valves.**

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	1309.9 Valved Sample Port. A DN8 (NPS 1/4) valved sample port shall be provided near the oxygen concentration monitor sensor connection for sampling of the gas from the oxygen concentration unit. [NFPA 99:5.1.3.5.11.9]		**New base code requirements for oxygen concentrator unit valve ports.**
	1309.10 Suitable Filter. At least one 0.1 micron filter suitable for oxygen service shall be provided at the outlet of the oxygen concentrator supply unit. [NFPA 99:5.1.3.5.11.10]		**New base code requirements for oxygen concentrator unit filter requirements.**
	1309.11 Check Valve. A check valve shall be provided at the outlet of the oxygen concentrator supply unit to prevent backflow into the oxygen concentrator supply unit and to allow service to the unit. [NFPA 99:5.1.3.5.11.11]		**New base code requirements for oxygen concentrator unit check valve.**
	1309.12 Outlet Valve. An outlet valve shall be provided to isolate all components of the oxygen concentrator from the pipeline with the following characteristics: (1) The valve shall have both manual and automatic actuation with visual indication of open or closed. (2) The valve shall close automatically whenever the oxygen concentrator unit is not producing oxygen of a concentration equal to that in Section 1309.1. (3) Continuing operation of the oxygen concentrator supply unit through the vent mode shall be permitted with the isolating valve closed. (4) The isolating valve, when automatically closed due to low concentration, shall require manual reset to ensure the oxygen concentrator supply unit is examined prior to return to service. (5) Closing the isolating valve, whether automatically or manually, shall activate an alarm signal at the master alarms (see Section ~~1318.1.1~~ 1317.1.1) indicating that the oxygen concentrator supply unit is disconnected. [NFPA 99:5.1.3.5.11.12]		**New base code requirements for oxygen concentrator unit outlet valves.**
	1309.13 Oxygen Concentration Monitor. The oxygen concentrator supply unit shall be provided with an oxygen concentration monitor with the following characteristics: (1) The monitor shall be capable of monitoring 99 percent oxygen concentration with 1 percent accuracy. (2) The monitor shall continuously display the oxygen concentration and shall activate local alarm and master alarms per NFPA 99 when a concentration lower than 91 percent is observed. (3) The monitor shall continuously display the oxygen concentration. (4) It shall be permitted to insert the monitor into the pipeline without a demand check. [NFPA 99:5.1.3.5.11.13]		**New base code requirements for oxygen concentrator unit monitoring.**
1310.8 Prohibited System Interconnections. Two or more medical gas or medical vacuum piping systems shall not be interconnected for installation, testing, or other reason except as permitted by Section 1310.8.2. [NFPA 99:5.1.10.11.7.1]			**Houston amendment removed as it's part of base code UPC.**
1310.8.2 Medical Gas and Medical Vacuum. Medical gas and vacuum systems with the same contents shall be permitted to be interconnected with an inline valve installed between the systems. [NFPA 99:5.1.10.11.7.2]			**Houston amendment removed as it's part of base code UPC.**

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1310.9 Changes in System Use. Where a positive pressure medical gas piping distribution system, originally used or constructed for the use at one pressure and for one gas, is converted for operation at another pressure or for another gas, ~~the~~ then all provisions of Section 1308.0 shall apply as if the system were new. [NFPA 99:5.1.10.11.9.1]			**Houston amendment removed as it's part of base code UPC.**
1310.10 Breaching or Penetrating Medical Gas Piping. Positive pressure patient medical gas piping and medical support gas piping shall not be breached or penetrated by any means or process that will result in residual copper particles or other debris remaining in the piping of affect the oxygen-clean interior of the piping. The breaching or penetrating process shall ensure that debris created by the process remains contained within the work area. [NFPA 99:5.1.10.11.12]			**Houston amendment removed as it's part of base code UPC.**
{**EDITORIAL NOTE:** DELETE SECTION 1312.1 AND ITS SUBSECTIONS AND REPLACE WITH THE FOLLOWING:} **1312.1 General.** New or replacement valves shall be permitted to be of any type as long as they meet the following conditions: **(1)** They have a maximum pressure drop at intended maximum flow of 0.2 psig (1.4 kPa) in pressure service and 0.15 Hg (3.8 mm) in vacuum service. **(2)** They use a quarter turn to off. **(3)** They are constructed of materials suitable for the service. **(4)** They are provided with copper tube extensions by the manufacturer for brazing. **(5)** They indicate to the operator if the valve is open or closed. **(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]			**Houston amendment removed as it's part of base code UPC.**
1312.1.1 Security. All valves, except valves in zone valve box assemblies, shall be secured by any of the following means: **(1)** Located in secured areas. **(2)** Locked or latched in their operating position. **(3)** Located above ceilings, but remaining accessible and not obstructed. [NFPA 99:5.1.4.1.2] **1312.1.2 Accessibility.** Zone valves shall be installed in valve boxes with removable covers large enough to allow manual operation of valves. Zone valves for use in certain areas, such as psychiatric or pediatric areas, shall be permitted to be secured with the approval of the Authority Having Jurisdiction to prevent inappropriate access. [NFPA 99:5.1.4.1.4] **1312.1.3 Labeled.** All valves shall be labeled as to gas supplied and the area(s) controlled, in accordance with Section 1312.9. [NFPA 99:5.1.4.1.3]			**Houston amendment removed as it's part of base code UPC.**

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1312.2 Source Valves. A shutoff valve shall be placed at the immediate connection of each source system to the piped distribution system to ~~permit~~ allow the entire source, including all accessory devices (e.g. air dryers, final line regulators), to be isolated from the facility. [NFPA 99:5.1.4.2.1]			**Houston amendment removed as it's part of base code UPC.**
	1312.4 Vacuum Filtration. Central supply systems for vacuum shall be provided with inlet filtration with the following characteristics: (1) Filtration shall be at least duplex to allow one filter to be exchanged without impairing vacuum system. (2) Filtration shall be located on the patient side of the vacuum producer. (3) Filters shall be efficient to 0.03 µ and 99.97 percent HEPA or better, per DOE-STD-3020. (4) Filtration shall be sized for 100 percent of the peak calculated demand while one filter or filter bundle is isolated. (5) It shall be permitted to group multiple filters into bundles to achieve the required capacities. (6) The system shall be provided with isolation valves on the source side of each filter or filter bundle and isolation valves on the patient side of each filter or filter bundle, permitting the filters to be isolated without shutting off flow to the central supply system. (7) A means shall be available to allow the user to observe any accumulations of liquids. (8) A vacuum relief petcock shall be provided to allow vacuum to be relieved in the filter canister during filter replacement. (9) Filter elements and canisters shall be permitted to be constructed of materials as deemed suitable by the manufacturer. (10) In normal operation, one filter or filter bundle shall be isolated from the system to be available for service should a blockage in the operating filter occur or rotation of the filters be desired after filter element exchange. [NFPA 99:5.1.3.7.4]		**New base code provisions for vacuum filtration for central supply systems.**
1312.9.2 Labeling. Shutoff valves shall be labeled in substance as follows: Source valve(s) shall be labeled in substance as follows: **SOURCE VALVE FOR THE (SOURCE NAME) [NFPA 99:5.1.11.2.3]** Zone valve box assemblies shall be labeled outside of the valve box as to the areas that they control as follows: **ZONE VALVES FOR THE (GAS/VACUUM NAME) SERVING (NAME OF AREA SERVED BY THE PARTICULAR VALVE) [NFPA 99:5.1.11.2.7]** {**EDITORIAL NOTE:** REMAINDER OF SECTION REMAINS AS IS IN THE 2015 UPC.}			**Houston amendment removed as it's part of base code UPC.**

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1312.10 Emergency Shutoff Valves. Category 3 systems shall comply with Section 1312.0, except as follows: **(1)** Where a central Category 3 medical gas supply is remote from a single treatment facility, the main supply line shall be provided with an emergency shutoff valve so located in the single treatment facility to be accessible from all use-point locations in an emergency. **(2)** Where a central Category 3 medical gas supply system supplies two treatment facilities, each facility shall be provided with an emergency shutoff valve so located in the treatment facility to be accessible from all use-point locations in an emergency. **(3)** Emergency shutoff valves shall be labeled to indicate the gas they control and shall shut off only the gas to the treatment facility that they serve. **(4)** A remotely activated shutoff valve at a supply manifold shall not be used for emergency shutoff. For clinical purposes, such a remote valve actuator shall not fail-closed in the event of a loss of electric power. Where remote actuators are the type that fail-open, it shall be mandatory that cylinder shutoff valves be closed whenever the system is not in use. [NFPA 99:5.3.4.1]			**Houston amendment removed as it's part of base code UPC.**
1313.1 General. Central supply systems and medical gas outlets 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 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 ~~used in accordance with~~ Section 1313.1(1) through Section 1313.1(4). [NFPA 99:5.1.3.5.2] **(6)** Simulation centers for the education, training, and assessment of health care professionals. [NFPA 99:5.1.3.5.2]			**Houston amendment removed as it's part of base code UPC.**
1313.1.1 Materials. Materials used in central supply systems shall comply with the following requirements: **(1)** In those portions of systems intended to handle oxygen at gauge pressures that exceed 350 pounds-force per square inch (psi) (2413 kPa), the interconnecting hose shall contain no polymeric materials.			**Houston amendment removed as it's part of base code UPC.**

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(2) In those portions of systems intended to handle oxygen or nitrous oxide material, construction shall be compatible with oxygen under the temperatures and pressures to which the components are capable of being exposed in the containment and use of oxygen, nitrous oxide, mixtures of these gases, or mixtures containing more than 23.5 percent oxygen. [NFPA 99:5.1.3.5.2 – 5.1.3.5.4(2), 5.3.6.21.8 – 5.3.6.21.8(2)] **(3)** If potentially exposed to cryogenic temperatures, materials shall be designed for low temperature service. **(4)** All materials shall be installed per the manufacturer's requirements. [NFPA 99:5.1.3.5.4]			
1313.1.2 Pressure-Relief Valve Requirements. ~~Pressure-relief valves shall be installed in accordance with Section 1316.2. Each central supply system shall have a pressure-relief valve set at 50 percent above normal line pressure, installed downstream of the pressure regulatory and upstream of the shutoff valve. This pressure-relief valve shall be permitted to be set at a higher pressure, provided another pressure-relief valve set at 50 percent above normal line pressure is installed in the main supply line.~~ Central supply systems for positive pressure gases shall include one or more relief valves, all meeting the following requirements: **(1)** Be located between each final line regulator and the source valve. **(2)** Have a relief setting that is 50 percent above the normal system operating pressure, as indicated in Table 1305.1. [NFPA 99:5.1.3.5.6.3]			**Houston amendment removed as it's part of base code UPC.**
	~~**1314.0 Electrical Power and Control.**~~ ~~**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)]~~		**Base code provisions updated.**
	~~**1315.0**~~ **1314.0 Valves.** ~~**1315.1**~~ **1314.1 Gas and Vacuum Shutoff Valves.** Shut-off valves shall be provided to isolate sections or portions of the piped distribution system for maintenance, repair, or planned future expansion need and to facilitate periodic testing. [NFPA 99:5.1.4.1.1]		**New base code provisions for gas and vacuum shutoff valves.**
	~~**1315.10**~~ **1314.10 Zone Valves.** All station outlets/inlets shall be supplied through a zone valve, which shall be placed as follows: (1) ~~The zone valve shall be placed such that~~ It is installed so that a wall intervenes between the valve and the outlets/inlets that it controls.		**New base code provisions for zone valve requirements.**

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	~~(2) The zone valve shall serve only outlets/inlets located on that same story.~~ (2) It is readily operable from a standing position. (3) It is installed where it is visible and accessible at all times. (4) It is not installed where it can be hidden from plain view, such as behind normally open or normally closed doors. (3~~5~~) ~~The zone valve shall not be located~~ It is not installed in a room with the station outlets/inlets that it controls. (6) It is not installed in rooms, areas, or closets that can be closed or locked. [NFPA 99:5.1.4.6.1]		
	~~**1311.6.4**~~ **1314.10.1 Location.** A zone valve in each medical gas or vacuum line shall be ~~located immediately outside each vital life support area, critical care area, and anesthetizing~~ provided for each Category 1 space and anesthetizing location ~~of~~ for moderate sedation, deep sedation, or general anesthesia~~, in each medical gas, or vacuum line, or both, and located so as to be~~ specific for the occupancy. These zone valves shall be located as follows: (1) They are installed immediately outside the area controlled. (2) They are readily accessible in an emergency. [NFPA 99:5.1.4.6.2]		**Minor wordsmithing changes in base code for risk category requirements.**
	~~**1311.6.2**~~ **1314.10.2 Arrangement.** ~~Zone~~ Piping on the patient side of zone valves shall be ~~so~~ arranged ~~that~~ to provide the following: (1) Shutting off the supply of medical gas or vacuum to one zone will not affect the supply of medical gas or vacuum to another zone or the rest of the system. (2) Service will only be to outlets/inlets located on that same story. (3) All gas delivery columns, hose reels, ceiling tracks, control panels, pendants, booms, or other special installations are located on the patient side of the zone valve. [NFPA 99:5.1.4.6.3]		**New base code provisions for zone valves and piping requirements.**
{**EDITORIAL NOTE:** DELETE SECTION 1314 IN ITS ENTIRETY AND REPLACE WITH THE FOLLOWING:} **1314.0 Medical Air Supply Systems.** **1314.1 Quality of Medical Air.** Medical air shall: **(1)** Be supplied from cylinders, bulk containers, or medical air compressor sources, or be reconstituted from oxygen USP and oil-free, dry nitrogen NF. **(2)** Meet the requirements of medical air USP. **(3)** Have no detectable liquid hydrocarbons. **(4)** Have less than 25 gpm gaseous hydrocarbons. **(5)** Have not more than 1mg/m^3 (6.85 x 10^{-07} lb/yd^3) of permanent particulates sized 1 micron or larger in the air at normal atmospheric pressure. [NFPA 99:5.1.3.6.1]			**Houston amendment removed as it's part of base code UPC.**
1314.2 Medical Air Compressors. Medical air compressors shall be installed in a well-lit, ventilated, and clean location and shall be accessible for maintenance. The location shall be			**Houston amendment removed as it's part of base code UPC.**

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provided with drainage facilities in accordance with this code. The medical air compressor area shall be located separately from medical gas cylinder system sources, and shall be readily accessible for maintenance. **1314.2.1 Required Components.** Medical air compressor systems shall consist of the following: **(1)** Components shall be arranged to allow service and a continuous supply of medical air in the event of a single fault failure. Component arrangement shall be permitted to vary as required by the technology(ies) employed, provided that an equal level of operating redundancy and medical air quality is maintained. [NFPA 99:5.1.3.6.3.9(A)] **(2)** Automatic means to prevent backflow from all on-cycle compressors through all off-cycle compressors. **(3)** Manual shutoff valve to isolate each compressor from the centrally piped system and from other compressors for maintenance or repair without loss of pressure in the system. **(4)** Intake filter-muffler(s) of the dry type. **(5)** Pressure relief valve(s) set at 50 percent above line pressure. **(6)** Piping and components between the compressor and the source shutoff valve that do not contribute to contaminant levels. **(7)** Except as described in Section 1314.2.2(1) through 1314.2.2(6), materials and devices used between the medical air intake and the medical air source valve that are of any design or construction appropriate for the service as determined by the manufacturer. [NFPA 99:5.1.3.6.3.2(2-7)]			
1314.2.2 Category 1 Medical Air Compressors. Medical air compressors shall be sufficient to serve the peak calculated demand with the largest single compressor out of service. In no case shall there be fewer than two compressors. [NFPA 99:1.3.6.3.9(B)] **1314.2.3 Category 2 Medical Air Supply Systems.** Category 2 systems shall comply with Section 1314.0, except as follows: **(1)** Medical air compressors, dryers, aftercoolers, filters, and regulators shall be permitted to be simplex. **(2)** The facility staff shall develop their emergency plan to deal with the loss of medical air. [NFPA 99:5.2.3.5]			**Houston amendment removed as it's part of base code UPC.**
1314.2.4 Category 3 Dental Air Compressor Systems. Category 3 dental air compressor supply systems shall include the following: **(1)** Disconnect switch(es). **(2)** Motor starting device(s). **(3)** Motor overload protection device(s). **(4)** One or more compressors.			**Houston amendment removed as it's part of base code UPC.**

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(5) For single, duplex, or multiple compressor systems, means for activation/deactivation of each individual compressor.
(6) When multiple compressors are used, manual or automatic means to alternate individual compressors.
(7) When multiple compressors are used, manual or automatic means to activate the additional unit(s) should the in-service unit(s) be incapable of maintaining adequate pressure.
(8) Intake filter-muffler(s) of the dry type.
(9) Receiver(s) with a manual or automatic drain.
(10) Shutoff valves.
(11) Compressor discharge check valve(s) (for multiple compressors).
(12) Air dryers that maintains a minimum of 40 percent relative humidity at operating pressure and temperature.
(13) In-line final particulate/coalescing filters rated at 0.01 micron (0.01 µm), with filter status indicator to ensure the delivery of dental air with a maximum allowable 0.05 ppm liquid oil.
(14) Pressure regulator(s).
(15) Pressure relief valve.
(16) Pressure indicator.
(17) Moisture indicator. [NFPA 99:5.3.3.6.1.1]

1314.3 Air Sources. Air sources for medical air compressors shall comply with Section 1314.5.1 or Section 1314.5.2.

1314.3.1 Medical Air Compressor Source. The medical air compressors shall draw their air from a source of clean air. [NFPA 99:5.1.3.6.3.11(A)]

If an air source equal to or better than outside air (e.g., air already filtered for use in operating room ventilating systems) is available, it shall be permitted to be used for the medical air compressors with the following provisions:

(1) This alternate source of supply air shall be available on a continuous 24 hours-per-day, 7 days-per-week basis.
(2) Ventilating systems having fans with motors or drive belts located in the airstream shall not be used as a source of medical air intake. [NFPA 99:5.1.3.6.3.11(E)]

1314.3.2 Source of Dental Air Compressor Intake. Dental air sources for a compressor(s) shall meet the following requirements:

(1) If the intake is located inside the building:
- **a)** It shall be located within a space where no chemical-based materials are stored or used.
- **b)** It shall be located in a space that is not used for patient medical treatment.
- **c)** It shall not draw air from a room or space in which there is an open or semi-open discharge from a Category 3 vacuum system.

Houston amendment removed as it's part of base code UPC.

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(2) If the intake is located outside the building, it shall be drawn from locations where no contamination from vacuum exhaust discharges or particulate matter is anticipated. [NFPA 99:5.3.3.6.1.5]			
1314.4 Air Intakes. Compressor intake piping shall be permitted to be made of materials and use a joining technique as permitted under Section 1308.5 and Section 1309.2. [NFPA 99:5.1.3.6.3.11(F)] **1314.4.1 Location.** Medical air intakes shall be located as follows: **(1)** A minimum of 25 feet (7620 mm) from ventilating system exhausts, fuel storage vents, combustion vents, plumbing vents, and vacuum discharges, or areas that can collect vehicular exhausts or other noxious fumes. **(2)** A minimum of 20 feet (6096 mm) above ground level. **(3)** A minimum of 10 feet (3048 mm) from any door, window, or other opening in the building. [NFPA 99:5.1.3.6.3.11(B-D)] **1314.4.2 Separate Compressors.** Air intakes for separate compressors shall be permitted to be joined together to one common intake where the following conditions are met: **(1)** The common intake is sized to minimize backpressure in accordance with the manufacturer's recommendations. **(2)** Each compressor can be isolated by manual or check valve, blind flange, or tube cap to prevent open inlet piping when the compressor(s) is removed for service from the consequent backflow of room air into the other compressor(s). [NFPA 99:5.1.3.6.3.11(G)] **1314.4.3 Screening.** The end of the intake shall be turned down and screened or otherwise be protected against the entry of vermin, debris, or precipitation by screen fabricated or composed of a noncorroding material. [NFPA 99:5.1.3.6.3.11(H)]			**Houston amendment removed as it's part of base code UPC.**
1314.5 Medical Air Receivers. Receivers for medical air shall: **(1)** Be made of corrosion-resistant materials or otherwise be made corrosion resistant. **(2)** Comply with Section VIII, "Unfired Pressure Vessels" of the ASME Boiler and Pressure Vessel Code. **(3)** Be equipped with a pressure relief valve, automatic drain, manual drain, sight glass, and pressure indicator. **(4)** Be of sufficient capacity to prevent the compressor from short-cycling. [NFPA 99:5.1.3.6.3.6] **1314.5.1 Category 3 Dental Air.** Receivers shall: **(1)** Have the capacity to prevent short-cycling of the compressor(s) **(2)** Comply with Section VIII "Unfired Pressure Vessels" of the ASME Boiler and Pressure Vessel Code. [NFPA 99:5.3.3.6.1.2]			**Houston amendment removed as it's part of base code UPC.**

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1314.5.2 Valves. A medical air receiver shall be provided with proper valves to allow the flow of compressed air to enter and exit out of separate receiver ports during normal operation and allow the receiver to be bypassed during service without shutting down the supply of medical air. [NFPA 99:5.1.3.6.3.9(D)]			
1315.2 Medical-Surgical Vacuum Sources. Medical-surgical vacuum sources shall consist of the following: **(1)** Two or more vacuum pumps sufficient to serve the peak calculated demand with the largest single vacuum pump out of service. **(2)** An automatic means to prevent backflow from on-cycle vacuum pumps through off-cycle vacuum pumps. **(3)** A shutoff valve or other isolation means to isolate each vacuum pump from the centrally piped system and other vacuum pumps for maintenance or repair without loss of vacuum in the system. **(4)** A vacuum receiver. **(5)** Piping between the vacuum pump(s), discharge(s), receiver(s), and the vacuum source shutoff valve shall be in accordance with Section 1308.5, except ~~that~~ brass, galvanized, or black steel pipe shall be permitted to be used in accordance with the manufacturer's instructions. **(6)** ~~Materials~~ Except as defined in Section 1315.2(1) through Section 1315.2(5), materials and devices used between the medical vacuum exhaust and the medical vacuum source shall be permitted to be of a design or construction appropriate for the service, as determined by the manufacturer~~'s instructions~~. [NFPA 99:5.1.3.7.1.2]			**Houston amendment removed as it's part of base code UPC.**
1315.2.1 Category 2 Medical-Surgical Vacuum. Category 2 systems shall comply with Section 1315.2, 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] **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]			**Houston amendment removed as it's part of base code UPC.**
1315.5.1 Location. The exhaust shall be located as follows: **(1)** Outdoors. **(2)** ~~Not less than 10 feet (3048 mm)~~ At least 25 feet (7620 mm) from any door, window, air intake, or other openings in a building~~s~~ or places of public assembly. **(3)** At a level different from air intakes. **(4)** Where prevailing winds, adjacent buildings, topography, or other influences ~~that~~ will not divert the			**Houston amendment removed as it's part of base code UPC.**

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exhaust into occupied areas or prevent dispersion of the exhaust. [NFPA 99:5.1.3.7.7.2]			
{**EDITORIAL NOTE:** DELETE SECTION 1316.2 IN ITS ENTIRETY AND REPLACE WITH THE FOLLOWING:} **1316.2 Pressure-Relief Valves.** All pressure relief valves shall: **(1)** Be of brass, bronze, or stainless steel construction. **(2)** Be designed for the specific gas service. **(3)** Have a relief pressure setting not higher than the maximum allowable working pressure (MAWP) of the component with the lowest working pressure rating in the portion of the system being protected. **(4)** Be vented to the outside of the building, except that relief valves for compressed air systems having less than 3000 cubic feet (84 950 L) at STP shall be permitted to be diffused locally be means that will not restrict the flow. **(5)** Have a vent discharge line that is not smaller than the size of the relief valve outlet. **(6)** Where two or more relief valves discharge into a common vent line, its internal cross-sectional area shall be not less than the aggregate cross-sectional area of all relief valve vent discharge lines served. **(7)** Not discharge into locations creating potential hazards. **(8)** Have the discharge terminal turned down and screened to prevent the entry of rain, snow, or vermin. **(9)** Be designed in accordance with ASME B31.3. [NFPA 99:5.1.3.5.6.1] **1316.2.1 Category 3 Dental Air Pressure Relief Valve Discharge.** Pressure relief valves for dental air systems having less than 3000 cubic feet (84 950 L) at STP shall be permitted to discharge locally indoors in a safe manner that will not restrict the flow. [NFPA 99:5.3.3.6.1.4] **1316.2.2 Isolation.** A pressure-relief valve shall not be isolated from its intended use by a valve.			**Houston amendment removed as it's part of base code UPC.**
1318.1 Category 1 ~~and 2~~ Systems. Master, area, and local alarm systems used for medical gas and medical vacuum systems shall include the following: {**EDITORIAL NOTE:** THE REMAINDER OF THIS SECTION REMAINS AS IS IN THE 2015 UPC.}			**Houston amendment removed as it's part of base code UPC.**
1318.1.1 Master Alarm. The master alarm shall include at least one signal from the source equipment to indicate a problem with the source equipment at this location. This master alarm signal shall activate when any of the required local alarm signals for this source equipment activates. [NFPA 99:5.1.9.5.2]			**Houston amendment removed as it's part of base code UPC.**
{**EDITORIAL NOTE:** DELETE AND REPLACE SECTIONS 1318.2 AND 1318.3 WITH THE FOLLOWING:} **1318.2 Category 2 Systems.** Warning systems associated with Category 2 systems shall provide the master, area, and			**Houston amendment removed as it's part of base code UPC.**

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local alarm functions of a Category 1 system as required in Section 1318.1, except as follows: **(1)** Warning systems shall be permitted to be a single alarm panel. **(2)** The alarm panel shall be located in an area of continuous surveillance while the facility is in operation. **(3)** Pressure and vacuum switches/sensors shall be mounted at the source equipment with a pressure indicator at the master alarm panel. [NFPA 99:5.2.9] **1318.3 Category 3 Systems.** Category 3 warning systems shall comply with Section 1318.2 except as follows: **(1)** Warning systems shall be permitted to be a single alarm panel. **(2)** The alarm panel shall be located in an area of continuous surveillance while the facility is in operation. **(3)** Pressure and vacuum switches/sensors shall be mounted at the source equipment with a pressure indicator at the master alarm panel. **(4)** Warning systems for medical gas systems shall provide the following alarms: **a)** Oxygen main line pressure low. **b)** Oxygen main line pressure high. **c)** Oxygen changeover to secondary bank or impending changeover (if automatic). **d)** Nitrous oxide main line pressure low. **e)** Nitrous oxide main line pressure high. **f)** Nitrous oxide changeover to secondary bank or impending changeover (if automatic). **(5)** Cancelable audible and noncancelable visual alarm signals shall indicate if the pressure in the main line increases or decreases 20 percent from the normal operating pressure. **(6)** Noncancelable visual alarm signals shall continue until the situation that caused the alarm is resolved. **(7)** Pressure switches/sensors shall be installed downstream of any emergency shutoff valves and shall cause an alarm for the medical gas if the pressure decreases or increases 20 percent from the normal operating pressure. **(8)** A cancelable audible indication of each alarm condition that produces a sound at the alarm panel shall reinitiate the audible signal if another alarm condition occurs while the audible signal is silenced. [NFPA 99:5.3.9]			
1318.4 Components. Alarm components shall be verified in accordance with the testing and monitoring requirements of the manufacturer and the Authority Having Jurisdiction.			**Houston amendment removed as it's part of base code UPC.**
	~~**1319.6**~~ **1318.6 Documentation.** The installer shall furnish documentation certifying that all installed piping materials comply with the requirements of Section ~~1319.2~~ 1318.2. [NFPA 99:5.1.10.1.8]		**Minor changes to base code provisions.**

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		1319.1 Tubes for Medical Vacuum Systems. Piping for medical vacuum systems shall be constructed of one of the following: (1) Hard-drawn seamless copper tube manufactured in accordance with one of the following: a) ASTM B88, copper tube (Type K, Type L, or Type M); b) ASTM B280, copper ACR tube; or, c) ASTM B819, copper medical gas tubing (Type K or Type L). (2) Stainless steel tube manufactured in accordance with one of the following: a) ASTM A269 TP304L or 316L; b) ASTM A312 TP304L or 316L; or, c) ASTM A312 TP304L/316L, Schedule 5S pipe, and ASTM A403 WP304L/316L, Schedule 5S fittings. [NFPA 99:5.1.10.2.1].	**No changes to Houston amendment. Relocated from Section 1308.5.**
	~~1320.1.1~~ **1319.1.1 Where Not Required.** If medical gas tube in accordance with ASTM B819, Standard Specification for Seamless Copper Tube for Medical Gas Systems, is used for vacuum piping, such special marking shall not be required. [NFPA 99: 5.1.10.2.2.2]		**New base code section for medical gas tube marking requirements.**
1319.2 Breached Systems. ~~Systems~~ All systems that are breached and components that are subject to additions, renovations, or replacement (e.g., new gas sources: bulk, manifolds, compressors, dryers, alarms) shall be inspected and tested. Systems shall be deemed breached at the point of pipeline intrusion by physical separation or by system component removal, replacement, or addition. Breached portions of the systems subject to inspection and testing shall be confined to the specific altered zone and components in the immediate zone or area that is located upstream for medical vacuum systems and downstream for pressure gases at the point or area of intrusion. [NFPA 99:5.1.12.1.3 – 5.1.12.1.5]			**Houston amendment removed as it's part of base code UPC.**
1319.4 Initial Piping Blow Down. Piping in medical gas and medical vacuum distribution systems shall be blown clear by means of oil-free, dry nitrogen NF after installation of the distribution piping, and before installation of station outlet and inlet rough-in assemblies and other system components (e.g., pressure/vacuum alarm devices, pressure/vacuum indicators, pressure relief valves, manifolds, source equipment). [NFPA 99:5.1.12.2.2, 5.3.6.23.2.2]			**Houston amendment removed as it's part of base code UPC.**
1319.4.1 Test Gas. The test gas shall be oil-free, dry nitrogen NF. [NFPA 99:5.1.12.2.1.2]			**Houston amendment removed as it's part of base code UPC.**
1319.5 Initial Pressure Tests – Medical Gas and Medical Vacuum Systems. Each section of piping in medical gas and medical vacuum systems shall be pressure tested ~~by a party qualified in accordance with Section 1306.1, and using oil-free, dry nitrogen NF~~. [NFPA 99:5.1.12.2.3.1, 5.3.6.23.2.3(A)] Initial pressure tests shall be conducted in accordance with the following:			**Houston amendment removed as it's part of base code UPC.**

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(1) After blow down of the distribution piping. **(2)** After installation of station outlet and inlet rough-in assemblies. ~~Test caps shall be permitted to be used.~~ **(3)** Prior to the installation of components of the distribution piping system that would be damaged by the test pressure. [NPFA 99:5.1.12.2.3.3, 5.3.6.23.2.3(B)]			
1319.5.1 Shutoff Valve. The source shutoff valve ~~for the piping system~~ shall remain closed during the tests specified in Section 1319.5. [NFPA 99:5.1.12.2.3.3, 5.3.6.23.2.3(B)]			**Houston amendment removed as it's part of base code UPC.**
1319.5.4 Initial Pressure Test – Category 3 Copper Piping Systems. Initial pressure tests shall be conducted as follows: **(1)** After blowdown of the distribution piping. **(2)** Station outlets and inlets shall be tested after installation of outlet and inlet shutoff valves. **(3)** Prior to the installation of components of the distribution piping system that would be damaged by the test pressure. **(4)** With source shutoff valves for the piping systems closed during the tests, unless being used for the pressure test gas. **(5)** With test pressure 1.5 times the system operating pressure but not less than a gauge pressure of 150 psi (1034 kPa). **(6)** With test pressure maintained until each joint is examined for leakage by means of a detectant that is safe for use with oxygen and that does not contain ammonia. **(7)** If a leak is located in any component, the component shall be repaired or replaced by the installer and retested. [NFPA 99:5.3.12.2.4]			**Houston amendment removed as it's part of base code UPC.**
1319.5.5 Initial Leak Test – Category 3 Plastic Vacuum Piping Systems. Initial leak tests shall be conducted as follows: **(1)** Each section of the piping in Category 3 vacuum systems with plastic piping shall be leak tested using a test vacuum or the vacuum source equipment. **(2)** In installed, the vacuum source shutoff valves for the piping systems shall remain closed during the tests, unless being used for the leak test vacuum source. **(3)** The leak test vacuum shall be a minimum of 12 inch (305 mm) HgV. **(4)** The test vacuum shall be maintained until each joint has been examined for leakage. An ultrasonic leak detector shall be permitted to be used. **(5)** Leaks, if any, shall be located, repaired, or replaced (if required) by the installer and retested. [NFPA 99:5.3.12.2.5]			**Houston amendment removed as it's part of base code UPC.**

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1319.6 Cross-Connection Tests – Medical Gas and Medical Vacuum Systems. A party qualified in accordance with Section 1306.1 shall determine that no cross-connections exist between medical gas and medical vacuum piping systems. [NFPA 99:5.1.12.2.4, 5.3.6.23.2.4]			**Houston amendment removed as it's part of base code UPC.**
1319.6.7 Initial Cross-Connection Test – Category 3 Copper Piping Systems. Initial cross-connection tests for copper piping systems shall be conducted as follows: **(1)** Tests shall be conducted to determine that no cross-connections exist between the Category 3 copper piping systems and Category 3 copper vacuum piping systems. **(2)** The piping systems shall be at atmospheric pressure. **(3)** The test gas shall be oil-free, dry nitrogen NF or dental air. **(4)** The source of test gas shall be connected only to the piping system being tested. **(5)** The piping system being tested shall be pressurized to a gauge pressure of 50 psi (345 kPa). **(6)** The individual system gas outlet and vacuum inlet in each installed gas-powered device and copper vacuum or copper piping system shall be checked to determine that the test gas pressure is present only at the piping system being tested. **(7)** The cross-connection test shall be repeated for each installed Category 3 piping system for gas-powered devices and for vacuum with copper piping. **(8)** Proper labeling and identification of system outlets/inlets shall be confirmed during the tests. [NFPA 99:5.3.12.2.6]			**Houston amendment removed as it's part of base code UPC.**
1319.6.8 Cross-Connection Test – Category 3 Plastic Vacuum Piping Systems. Initial cross-connection tests for plastic vacuum piping systems shall be conducted as follows: **(1)** Tests shall be conducted to determine that no cross connections exist between any Category 3 plastic vacuum piping systems or Category 3 copper piping systems. **(2)** The vacuum source shutoff valves for the vacuum piping systems shall remain closed during the tests, unless they are being used for the cross-connection test vacuum source. **(3)** The cross-connection test vacuum shall be a minimum of 12 inch (305 mm) HgV. **(4)** The source of test vacuum shall be connected only to the vacuum piping system being tested. **(5)** The individual gas-powered device system gas outlets and vacuum system inlets shall be checked to determine that the test vacuum is only present at the vacuum piping system being tested.			**Houston amendment removed as it's part of base code UPC.**

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(6) The cross-connection tests shall be repeated for each installed vacuum system with plastic piping. **(7)** Proper labeling and identification of system outlets/inlets shall be confirmed during the tests. [NFPA 99:5.3.12.2.7]			
1319.7.1 Time Frame for Testing. Tests shall be conducted after the final installation of station outlet valve bodies, face plates, and other distribution system components (e.g., pressure alarm devices, pressure indicators, line pressure relief valves, manufactured assemblies, hose). [NFPA 99:5.1.12.2.6.1, 5.3.6.23.2.6]			**Houston amendment removed as it's part of base code UPC.**
1319.9.2 Location. Purging shall start at the closest outlet or inlet to the zone valve and continue to the furthest outlet or inlet within the zone. [NFPA 99:5.1.12.2.5.2] ~~**Exception:** For Category 3 medical gas piping systems, purging shall start at the furthest outlet in the system and proceed toward the source equipment. [NFPA 99:5.3.6.23.2.5(C)]~~			**Houston amendment removed as it's part of base code UPC.**
1319.13 Standing Pressure Tests – Category 3 Gas Powered Device Distribution Piping. After successful completion of the initial pressure tests under Section 1319.6.7, Category 3 gas-powered device distribution piping shall be subjected to a standing pressure test, which includes the following: **(1)** Tests shall be conducted after the installation of outlet valves and other distribution system components (e.g., pressure indicators and line pressure relief valves). **(2)** The source valve shall be closed unless the source gas is being used for the test. **(3)** The piping systems shall be subjected to a 24 hour standing pressure testing using oil-free, dry nitrogen NF or the system gas. **(4)** Test pressures shall be 20 percent above the normal system operating line pressure. **(5)** At the conclusion of the tests, there shall be no change in the test pressure greater than a gauge pressure of 5 psi (34 kPa). **(6)** If a leak is located in any component, the component shall be repaired or replaced by the installer and retested. [NFPA 99:5.3.12.2.9]			**Houston amendment removed as it's part of base code UPC.**
1319.14 Category 3 Dental Air and Nitrogen Supply Systems Purge Tests. The purge tests for dental air and nitrogen supply systems shall be conducted as follows: **(1)** The outlets in each Category 3 dental air and nitrogen supply piping system shall be purged to remove any particulate matter from the distribution piping. **(2)** The test gas shall be oil-free, dry nitrogen NF or the system gas. **(3)** Each outlet shall be purged with an intermittent high-volume flow of test gas until the purge produces no discoloration in a clean white cloth.			**Houston amendment removed as it's part of base code UPC.**

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(4) The purging shall be started at the furthest outlet in the system and proceed toward the source equipment. [NFPA 99:5.3.12.2.8]			
	~~**1322.9.9**~~ **1321.10.9 Final Tie-In Test.** After a final brazed connection in a positive pressure medical gas pipeline is made without a nitrogen purge, an outlet in the immediate downstream zone of the affected portion(s) of both the new and existing piping shall be tested in accordance with the final tie-in test in Section ~~1325.5.9~~ 1324.5.9 through Section ~~1325.5.9.4~~ 1324.5.9.4. [NFPA 99:5.1.10.4.5.11]		**Minor changes to base code.**
		1323.10.3 ~~Health Care Organization Personnel.~~ ~~Health care organization personnel shall be permitted to install piping systems if all of the requirements of Section 1323.10 are met during the installation. [NFPA 99:5.1.10.11.10.7]~~ **Piping and Installation.** Piping and installation procedures shall comply with NFPA 99.	**No change to Houston amendment. Relocated from Section 1306.3.**
	~~**1325.5.7**~~ **1324.5.7 System Verification.** Verification tests shall be performed only after all tests required in Section ~~1325.3~~ 1324.3 through Section ~~1325.5.5.7~~ 1324.5.5.7, Installer Performed Tests, have been completed. [NFPA 99:5.1.12.4.1.1]		**Minor changes to base code.**
	~~**1325.5.7.1**~~ **1324.5.7.1 Test Gas.** The test gas shall be oil-free, dry nitrogen NF or the system gas where permitted. [NFPA 5.1.12.4.1.2]		**Minor changes to base code.**
	~~**1325.5.7.2**~~ **1324.5.7.2 Approved Tester.** Testing shall be conducted by a party technically competent and experienced in the field of medical gas and vacuum pipeline testing and meeting the requirements of ASSE 6030, except as required by Section ~~1325.5.7.3~~ 1324.5.7.3. [NFPA 99:5.1.12.4.1.3] Testing shall be performed by a party other than the installing contractor. [NFPA 99:5.1.12.4.1.5] Where systems have not been installed by in-house personnel, testing shall be permitted by personnel of that organization who meet the requirements of Section ~~1325.5.7.2~~ 1324.5.7.2. [NFPA 99:5.1.12.4.1.6]		**Minor changes to base code.**
	~~**1325.5.7.3**~~ **1324.5.7.3 Cryogenic Fluid Testing.** Testing of the cryogenic fluid central supply system shall be conducted by a party technically competent and experienced in the field of cryogenic fluid systems and meeting the requirements of ASSE 6035, in accordance with the mandatory requirements in CGA M-1. [NFPA 99:5.1.12.4.1.4]		**Minor changes to base code.**
	~~**1325.5.8**~~ **1324.5.8 Particulate Matter.** In order to remove any traces of particulate matter deposited in the pipelines as a result of construction, a heavy, intermittent purging of the pipeline shall be done. [NFPA 99:5.1.12.4.6]		**Minor changes to base code.**
	~~**1325.5.9**~~ **1324.5.9 Final Tie-In Test.** Each joint in the final connection between the new work and the existing system shall be leak-tested with the gas of system designation at the normal operating pressure by means of a leak detectant that is safe for use with oxygen and does not contain ammonia. [NFPA 99:5.1.12.4.9.2]		**Minor changes to base code.**

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	~~1325.5.9.1~~ **1324.5.9.1 Vacuum Joints.** Vacuum joints shall be tested using an ultrasonic leak detector or other means that will allow detection of leaks in an active vacuum system. [NFPA 99:5.1.12.4.9.3]		**Minor changes to base code.**
	~~1325.5.9.2~~ **1324.5.9.2 Pressure Gases.** For pressure gases, immediately after the final brazed connection is made and leak-tested, an outlet in the new piping and an outlet in the existing piping that are immediately downstream from the point or area of intrusion shall be purged in accordance with the applicable requirements of Section ~~1325.5.8~~ 1324.5.8. [NFPA 99:5.1.12.4.9.4]		**Minor changes to base code.**
	~~1325.5.9.3~~ **1324.5.9.3 Positive Pressure Gases.** Before the new work is used for patient care, positive pressure gases shall be tested for operational pressure and gas concentration in accordance with Section ~~1325.5.10~~ 1324.5.10 and Section ~~1325.5.11~~ 1324.5.11. [NFPA 99:5.1.12.4.9.5]		**Minor changes to base code.**
	~~1325.5.9.4~~ **1324.5.9.4 Permanent Records.** Permanent records of these tests shall be maintained in accordance with NFPA 99. [NFPA 99:5.1.12.4.9.6]		**Minor changes to base code.**
	~~1325.5.10~~ **1324.5.10 Operational Flow Pressure Drop Test.** Operational flow pressure drop tests shall be performed at each station outlet/inlet or terminal where the user makes connections and disconnections. [NFPA 99: 5.1.12.4.10]		**Minor changes to base code.**
	~~1326.0~~ **1325.0 Category 2 Piped Gas and Vacuum Systems.** ~~1326.1~~ **1325.1 ~~Category 2 Piped Medical Gas and Medical Vacuum~~ General.** Category 2 piped gas or piped vacuum system requirements shall be permitted when all of the following criteria are met: (1) Only moderate sedation; minimal sedation, as defined in Chapter 2; or no sedation is performed. Deep sedation and general anesthesia shall not be permitted. (2) The loss of the piped gas or piped vacuum systems is likely to cause minor injury to patients, staff, or visitors. (3) The facility piped gas or piped vacuum systems are intended for Category 2 patient care space as defined in Chapter 2. [NFPA 99:5.2.1.2]		**Minor changes to base code.**
	~~1326.2~~ **1325.2 Nature of Hazards of Gas and Vacuum Systems.** The requirement of Section 1307.2 shall apply to the nature of hazards of gas and vacuum systems. [NFPA 99:5.2.2]		**Minor changes to base code.**
	~~1326.3~~ **1325.3 Central Supply Systems.** Category 2 systems shall comply with Section 1307.3 through Section 1309.13. [NFPA 99:5.2.3.4]		**Minor changes to base code.**
	~~1326.4~~ **1325.4 Category 2 Medical Air Supply Systems.** Category 2 systems shall comply with Section ~~1313.0~~ 1310.0 through Section 1311.6, except as follows: Medical air compressors, dryers, aftercoolers, filters, and regulators shall be permitted to be simplex. The facility staff shall develop their emergency plan to deal with the loss of medical air. [NFPA 99:5.2.3.5]		**Minor changes to base code.**
	~~1326.5~~ **1325.5 Oxygen Concentrators.** Oxygen supply systems using concentrators shall be permitted to consist of two sources, one of which shall be a cylinder header with		**Minor changes to base code.**

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	sufficient cylinder connections for one average day's supply. [NFPA 99:5.2.3.6]		
	~~**1326.6**~~ **1325.6 Category 2 Medical-Surgical Vacuum.** Category 2 systems shall comply with Section ~~1314.2~~ 1312.0 through Section 1313.5, except as follows: (1) Medical-surgical vacuum systems shall be permitted to be simplex. (2) The facility staff shall develop their emergency plan to deal with the loss of medical-surgical vacuum. [NFPA 99:5.2.3.7]		**Minor changes to base code.**
	~~**1326.7**~~ **1325.7 Valves.** Category 2 systems shall comply with Section ~~1315.1~~ 1314.1 through Section ~~1315.12.1~~ 1314.12.1. [NFPA 99:5.2.4]		**Minor changes to base code.**
	~~**1326.8**~~ **1325.8 Station Outlets and Inlets.** Category 2 systems shall comply with Section ~~1316.0~~ 1315.0. [NFPA 99:5.2.5]		**Minor changes to base code.**
	~~**1326.9**~~ **1325.9 Pressure and Vacuum Indicators.** Category 2 systems shall comply with Section ~~1317.2~~ 1316.2. [NFPA 99:5.2.8]		**Minor changes to base code.**
	~~**1326.10**~~ **1325.10 ~~Category 2~~ Warning Systems (Category 2).** Warning systems associated with Category 2 systems shall provide the master, area, and local alarm functions of a Category 1 system as required in Section ~~1318.1~~ 1317.1, except as follows: (1) Warning systems shall be permitted to be a single alarm panel. (2) The alarm panel shall be located in an area of continuous surveillance while the facility is in operation. (3) Pressure and vacuum switches/sensors shall be mounted at the source equipment with a pressure indicator at the master alarm panel. [NFPA 99:5.2.9]		**Minor changes to base code.**
	~~**1326.11**~~ **1325.11 Category 2 Distribution.** Level 2 systems shall comply with Section ~~1319.2~~ 1318.2 through Section ~~1324.12~~ 1323.12. [NFPA 99:5.2.10]		**Minor changes to base code.**
	~~**1326.12**~~ **1325.12 Labeling and Identification.** Category 2 systems shall comply with Section ~~1324.13~~ 1323.13 through Section ~~1324.15~~ 1323.15. [NFPA 99:5.2.11]		**Minor changes to base code.**
	~~**1326.13**~~ **1325.13 Performance Criteria and Testing — Category 2 (Gas, Medical–Surgical and Vacuum).** Category 2 systems shall comply with Section ~~1325.2~~ 1324.2 through Section ~~1325.5.11~~ 1324.5.11. [NFPA 99:5.2.12]		**Minor changes to base code.**
	Part IV – ~~Testing, Inspection, and Certification~~ Category 3 Piped Gas and Vacuum Systems.		**Minor changes to base code.**
	~~**1327.0**~~ **1326.0 Category 3 Piped Gas and Vacuum Systems.** ~~**1327.1 Category 3 Piped Medical Gas and Medical Vacuum**~~ **1326.1 General.** Category 3 piped gas and vacuum systems shall be permitted when all of the following criteria are met: (1) Only moderate sedation; minimal sedation, as defined in Chapter 2; or no sedation is performed. Deep sedation and general anesthesia ~~shall~~ are not ~~be permitted~~ performed. (2) The loss of the piped gas and vacuum systems is not likely to cause injury to patients, staff, or visitors, but can cause discomfort. (3) The facility piped gas and vacuum systems are intended for Category 3 or Category 4 patient care rooms as defined in Chapter 2. [NFPA 99:5.3.1.2]		**Minor changes to base code.**

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	~~**1327.2**~~ **1326.2 Nature of Hazards of Gas and Vacuum Systems.** The requirement of Section 1307.2 shall apply to the nature of hazards of gas and vacuum systems. [NFPA 99:5.3.2]		**Minor changes to base code.**
	~~**1327.3**~~ **1326.3 Medical Air Supply Systems.** Category 3 systems shall comply with Section 1310.1 through Section 1311.6, except as follows: (1) Medical air compressors, dryers, after coolers, filters, and regulators shall be permitted to be simplex. (2) The facility staff shall develop their emergency plan to deal with the loss of medical air. [NFPA 99:5.3.3.5]		**Minor changes to base code.**
	~~**1327.4**~~ **1326.4 Oxygen Central Supply Systems Using Concentrators.** Category 3 oxygen supply systems using concentrators shall be permitted to consist of two sources, one of which shall be a cylinder header with sufficient cylinder connections for one average day's supply. [NFPA 99:5.3.3.6]		**Minor changes to base code.**
	~~**1327.5**~~ **1326.5 Medical–Surgical Vacuum.** Category 3 systems shall comply with Section 1312.0, except as follows: (1) Medical–surgical vacuum systems shall be permitted to be simplex. (2) The facility staff shall develop their emergency plan to deal with the loss of medical–surgical vacuum. [NFPA 99:5.3.3.7]		**Minor changes to base code.**
	~~**1327.6**~~ **1326.6 Valves.** Category 3 systems shall comply with Section ~~1315.0~~ 1314.0. [NFPA 99:5.3.4]		**Minor changes to base code.**
	~~**1327.7**~~ **1326.7 Station Outlets and Inlets.** Category 3 systems shall comply with Section ~~1316.0~~ 1315.0. [NFPA 99:5.3.5]		**Minor changes to base code.**
	~~**1327.8**~~ **1326.8 Pressure and Vacuum Indicators.** Category 3 systems shall comply with Section ~~1317.2~~ 1316.2. [NFPA 99:5.3.8]		**Minor changes to base code.**
	~~**1327.9**~~ **1326.9 Warning Systems.** Warning systems associated with Category 3 systems shall provide the master, area, and local alarm functions of a Category 1 system as required in Section ~~1318.0~~ 1317.0, except as follows: (1) Warning systems shall be permitted to be a single alarm panel. (2) The alarm panel shall be located in an area of continuous surveillance while the facility is in operation. (3) Pressure and vacuum switches/sensors shall be mounted at the source equipment with a pressure indicator at the master alarm panel. [NFPA 99:5.3.9]		**Minor changes to base code.**
	~~**1327.10**~~ **1326.10 Distribution.** Category 3 systems shall comply with Section ~~1319.2~~ 1318.2 through Section ~~1324.12~~ 1323.12. [NFPA 99:5.3.10]		**Minor changes to base code.**
	~~**1327.11**~~ **1326.11 Labeling and Identification.** Category 3 systems shall comply with Section ~~1324.13~~ 1323.13 through Section ~~1324.15~~ 1323.15. [NFPA 99:5.3.11]		**Minor changes to base code.**
	Part V – Dental Gas and Vacuum Systems.		**Minor changes to base code.**
	~~**1328.0**~~ **1327.0 Dental Gas and Vacuum Systems.** ~~**1328.1**~~ **1327.1 General.** Dental gas and vacuum systems shall comply with this Code and NFPA 99.		**Minor changes to base code.**
	~~**1328.4**~~ **1327.4 Initial Pressure Test.** Each section of the piping in positive-pressure gas systems and copper vacuum systems shall be pressure tested. Plastic vacuum and plastic scavenging piping shall not be pressure tested. [NFPA 99:15.4.7.4.4.1]		**Minor changes to base code.**

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	~~1328.4.1~~ ~~1327.4.1~~ ~~Initial~~ **Pressure Test** ~~Category 3 Copper Piping Systems~~**.** Initial pressure tests shall be conducted as follows: (1) After blowdown of the distribution piping (2) After installation of station outlet/inlet rough-in Assemblies ~~and inlet shutoff valves station outlets and inlets~~. (3) Prior to the installation of components of the distribution piping system that would be damaged by the test pressure (e.g., pressure/vacuum alarm devices, pressure/vacuum indicators, and line pressure relief valves) [NFPA 99:15.4.7.4.4.2]		**Minor changes to base code.**
	~~1328.4.2~~ **1327.4.2 Source Shutoff Valve.** The source shutoff valve shall remain closed during the pressure tests. [NFPA 99:15.4.7.4.4.3]		**Minor changes to base code.**
	~~1328.4.3~~ **1327.4.3 Test Pressure.** ~~With~~ The test pressure for oxygen and nitrous oxide piping shall be 1.5 times the system operating pressure but not less than a gauge pressure of 150 psi (1035 kPa). [NFPA 99:15.4.7.4.4.4]		**Minor changes to base code.**
	~~1328.4.4~~ **1327.4.4 Examine for Leaks.** The test pressure shall be maintained until each joint has been examined for leakage by means of a leak detectant that is safe for use with oxygen and does not contain ammonia. [NFPA 99:15.4.7.4.4.5]		**Minor changes to base code.**
	~~1328.4.5~~ **1327.4.5 Leaks Located.** Any leaks shall be located, repaired (if permitted), or replaced (if required) by the installer, and retested. [NFPA 99:15.4.7.4.4.6]		**Minor changes to base code.**
	~~1328.5~~ **1327.5 Maximum Copper Tube Support Spacing.** The maximum support spacing for copper tube shall be in accordance with Table ~~1328.5~~ 1327.5. [NFPA 99:15.4.5.6.5]		**Minor changes to base code.**
	TABLE 1327.5 MAXIMUM COPPER TUBE SUPPORT SPACING [NFPA 99: TABLE 15.4.5.6.5] PIPE SIZE — HANGER SPACING (feet) DN8 (NPS ¼) (⅜ of an inch O.D.) — 5 DN10 (NPS ⅜) (½ of an inch O.D.) — 6 DN15 (NPS ½) (⅝ of an inch O.D.) — 6 DN20 (NPS ¾) (⅞ of an inch O.D.) — 7 DN25 (NPS 1) (1⅛ of an inch O.D.) — 8 DN32 (NPS 1¼) (1⅜ of an inch O.D.) — 9 DN40 and larger (NPS 1½) (1⅝ of an inch O.D.) — 10 Vertical risers, all sizes, every floor, but not to exceed: — 15 For SI units: 1 inch = 25 mm, 1 foot = 304.8 mm		**New base code table for copper tub support spacing.**
	~~1328.6~~ **1327.6 Maximum Plastic Pipe Support Spacing.** The maximum support spacing for plastic pipe shall be in accordance with Table ~~1328.6~~ 1327.6. [NFPA 99:15.4.5.6.6]		**Minor changes to base code.**

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2015 Houston UPC – Chapter 15 Alternate Water Sources for Nonpotable Applications	2021 UPC – Chapter 15 – Alternate Water Sources For Nonpotable Applications	2021 Houston UPC Amendments	Code Change Summary
1501.2 System Design. Alternate water source systems shall be designed in accordance with this chapter by a registered design professional or who demonstrates competency to design the alternate water source system as required by the Authority Having Jurisdiction. Components, piping, and fittings used in an alternate water source system shall be listed. **Exceptions:** **(1)** A registered design professional is not required to design gray water systems having a maximum discharge capacity of 250 gallons per day (gal/d) (0.011 L/s) for single family and multi-family dwellings. **(2)** A registered design professional is not required to design an on-site treated nonpotable water system for single family dwellings having a maximum discharge capacity of 250 gal/d (0.011 L/s). Systems subject to Title 30 of the Texas Administrative Code shall be designed and installed as required by the Texas Commission on Environmental Quality and the Texas State Board of Plumbing Examiners.	**1501.2 System Design.** Alternate water source systems shall be designed in accordance with this chapter by a licensed plumbing contractor or a registered design professional ~~or licensed person who demonstrates competency to design the alternate water source system as required by the Authority Having Jurisdiction~~. Components, piping, and fittings used in any alternate water source system shall be listed. **Exceptions:** (1) A registered design professional is not required to design gray water systems having a maximum discharge capacity of 250 gallons per day (gal/d) (0.011 L/s) for single family and multi-family dwellings. (2) A registered design professional is not required to design an on-site treated nonpotable water system for single-family dwellings having a maximum discharge capacity of 250 gal/d (0.011 L/s).	**1501.2 System Design.** Alternate water source systems shall be designed in accordance with this chapter by a licensed plumbing contractor, ~~or~~ a registered design professional, or a person competent to design the alternate water source system as determined by the Authority Having Jurisdiction. Components, piping, and fittings used in an alternate water source system shall be listed. **Exceptions:** (1) A registered design professional is not required to design gray water systems having a maximum discharge capacity of 250 gallons per day (gal/d) (0.011 L/s) for single-family and multi-family dwellings. (2) A registered design professional is not required to design an on-site treated nonpotable water system for single family dwellings having a maximum discharge capacity of 250 gal/d (0.011 L/s). Systems subject to Title 30 of the Texas Administrative Code shall be designed and installed as required by the Texas Commission on Environmental Quality and the Texas State Board of Plumbing Examiners.	**Minor changes to Houston amendment providing allowance of competent person(s) to design alternate water source systems. No other changes to Houston amendment.**
	1503.2.2 Diversion. The gray water system shall connect to the sanitary drainage system downstream of fixture traps and vent connections through ~~an approved~~ a gray water diverter valve. The gray water diverter valve shall comply with IAPMO PS 59 and be installed in an accessible location and clearly indicate the direction of flow.		**Minor base code update to reference new standard IAPMO PS 59.**
	1503.2.4 Rainwater Diversion Valves. Rainwater diversion valves ranging from 6 inches (150 mm) to 12 inches (300 mm) in diameter shall comply with IAPMO IGC 352. Valves shall be accessible and include a filter located upstream of the valve when required.		**New base code provisions for rainwater diversion valves.**

2015 Houston UPC – Chapter 16 Nonpotable Rainwater Catchment Systems	2021 UPC – Chapter 16 – Nonpotable Rainwater Catchment Systems	2021 Houston UPC Amendments	Code Change Summary
1602.9.3.2 Prohibited Discharges. Overflows and bleed-off pipes from roof-mounted equipment and appliances shall not discharge any material other than air conditioning condensate onto roof surfaces that are intended to collect rainwater.			**Houston amendment removed, return to base code provisions.**

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2015 Houston UPC – Chapter 17 Referenced Standards	2021 UPC – Chapter 17 – Referenced Standards	2021 Houston UPC Amendments	Code Change Summary
1701.1 Standards. The standards listed in Table 1701.1 are referenced in various sections of this code and shall be considered part of the requirements of this document ~~intended for use in the design, testing, and installation of materials, devices, appliances, and equipment regulated by this code. These standards are mandatory where required by sections in this code.~~ The standards are listed herein by the standard number and effective date, the title, application and the section(s) of this code that references the standard. The application of the referenced standard(s) shall be as specified in Section 301.2.2. Organization abbreviations referred to in Table 1701.1 are defined in a list found at the end of the table.			**Houston amendment removed, return to base code provisions.**

Table 1701.1
Referenced Standards

~~S~~tandard Number	Standard Title	Application	Referenced Section
~~A~~SE A112.4.2-~~09~~/CSA B16-2015*	Water closet Personal Hygiene Devices	Fixtures	301.2.2, 301.3, 4
~~A~~SE A112.6.7-~~(~~R2015)*	Sanitary Floor Sinks	Fixtures	421.1
~~A~~SE A112.6.9-~~(~~R2015~~40~~)*	Siphonic Roof Drains	DWV Components	301.2.2, 301.3
~~A~~SE A112.14.3-2000 (~~R2014~~)*	Grease Interceptors	Fixtures	1014.1
~~A~~SE A112.14.6-2010 (~~R2015~~)*	FOG (Fats, Oils, and Greases) Disposal Systems	Fixtures	1015.2, 1015.4
~~A~~SE A112.18.2-~~511~~/CSA B125.2-~~511~~*	Plumbing Waste Fittings	Fittings	301.2.2, 301.3
~~A~~SE A112.18.6-~~/~~CSA B125.6-2009 (~~R2014~~)*	Flexible Water Connectors	Piping	604.5, 60
~~A~~SE A112.19.3-~~/~~CSA B45.4-2008 (~~R2013~~)*	Stainless Steel Plumbing Fixtures	Fixture	407.1, 40 409.1, 4 411.1, 4 411.2.2, 412.1, 4 420.1, L 402.2.1, 402.2.2, 402.3

TABLE 1701.1
REFERENCED STANDARDS

Standard Number	Standard Title	Applicatio
UL 467-2022	Grounding and Bonding Equipment	Miscellaneo

[**EDITORIAL NOTE:** REMAINDER OF SECTION REMAINS AS IS IN THE 2021 UPC.]

Previous Houston amendments for updated referenced standards removed as they're now part of base code.

UL 467 standard has been amended to be most recent edition, 2022.

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ASME A112.19.5-2011/CSA B45.15-2011 (R2016)*	Flush Valves and Spuds for Water Closets, Urinals, and Tanks	Fixtures	413.3	
ASME A112.19.12-2014~~06 (R2011)~~*	Wall Mounted, Pedestal Mounted, Adjustable, Elevating, Tilting, and Pivoting Lavatory, Sink, and Shampoo Bowl Carrier Systems and Drain Waste Systems	Fixtures	407.1, 420.1	
ASME A112.19.19-2016~~2006 (R2011)~~*	Vitreous China Nonwater Urinals	Fixtures	412.1, L 402.3.1	
ASME B16.1-2015~~2010~~*	Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250	Fittings	1208.5.10	
ASME B16.12-2009 (R2014)*	Cast Iron Threaded Drainage Fittings (Note 1)	Fittings	Table 701.2	
ASME B16.42-2011	Ductile Iron Pipe and Flanged Fittings	Fuel Gas Piping		
ASME B31.1-2014~~2012~~*	Process Piping	Piping	F 1201.1	
ASME B36.10M-2015~~2004 (R2010)~~*	Welded and Seamless Wrought Steel Pipe	Piping, Ferrous	1208.5.2.1(1)	
ASME BPVC Section VIII-2015~~2013~~*	Rules for Construction of Pressure Vessels Division 1	Miscellaneous	1314.2(2), 1315.4(2), E 413.6.2	
ASME BPVC Section IX-2015~~2013~~*	Welding, Brazing, and Fusing Qualifications	Certification	225.0, 1307.1, 1309.5.1, 1309.5.2	
ASPE 45-2013	Siphonic Roof Drainage	Storm Drainage	1107.2	
ASSE 1002/ASME A112.1002/CSA B125.12-2015~~-2008~~*	Anti-Siphon Fill Valves for Water Closet Tanks	Backflow Protection	413.3, Table 603.2	
ASSE 1016-2017~~2011~~/ASME A112.1016-2017~~2011~~/CSA B125.16-2017~~2011~~*	Automatic Compensating Valves for Individual Showers and Tub/Shower Combinations	Valves	408.3, L 402.6.3	
ASSE 1019-2011 R(2016)*	Wall Hydrant with Backflow Protection and Freeze Resistance	Backflow Protection	Table 603.2	
ASSE 1037-2015/ASME A112.1037-2015/CSA B125.37-2015~~1990~~	Pressurized Flushing Devices (Flushometers) for Plumbing Fixtures	Backflow Protection	413.2	
ASSE 1044-2015~~2001~~*	Trap Seal Primer Devices – Drainage Types and Electronic Design Types	DWV Components	301.2.2, 301.3	

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ASSE 1052-2016~~2004~~*	Hose Connection Backflow Preventers	Backflow Protection	Table 603.2
ASSE 1055-2016~~2009~~*	Chemical Dispensing Systems	Backflow Protection	301.2.2, 301.3
ASSE 1060-2017~~2006~~*	Outdoor Enclosures for Fluid Conveying Components	Miscellaneous	603.4.7
ASSE 1061-2015~~2011~~*	Push-Fit Fittings	Fittings	605.1.3.3, 605.2.1, Table 604.1
ASSE 1070-2015/ASME A112.1070-2015/CSA B125.70-2015-~~2004~~*	Water Temperature Limiting Devices	Valves	407.3, 409.4, 410.3
ASSE Series 5000-2015~~2009~~*	Cross-Connection Control Professional Qualifications	Certification	603.2
ASSE Series 6000-2015~~2012~~*	Professional Qualifications Standard for Medical Gas Systems Personnel	Certification	1306.1, 1319.12.2
ASTM A74-2016~~2013a~~	Cast Iron Soil Pipe and Fittings (Notes 1 and 7)	Piping, Ferrous	Table 701.2
ASTM A106/A106M-2015~~2013~~	Seamless Carbon Steel Pipe for High-Temperature Service	Piping, Ferrous	1208.5.2.1(3)
ASTM A269/A269M-2015a~~-2013~~	Seamless and Welded Austenitic Stainless Steel Tubing for General Service	Piping, Ferrous	F 801.2, Table 604.1
ASTM A312/A312M-2016a~~2013b~~	Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes	Piping, Ferrous	Table 604.1
ASTM A403/A403M-2011	Wrought Austenitic Stainless Steel Pipe Fittings	Fittings	
ASTM A888-2015~~2013a~~	Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications (Note 7)	Piping, Ferrous	Table 701.2
ASTM B32-2008 (R2014)	Solder Metal (Note 2)	Joints	605.1.4, 705.3.3, 1309.2
ASTM B42-2015a~~2010~~	Seamless Copper Pipe, Standard Sizes	Piping, Copper Alloy	Table 604.1
ASTM B43-2015~~2009~~	Seamless Red Brass Pipe, Standard Sizes	Piping, Copper Alloy	Table 604.1, Table 701.2
ASTM B88-2016~~2009~~	Seamless Copper Water Tube	Piping, Copper Alloy	604.4, 903.2.3, 1208.5.3.2, 1308.5(1)(a), E 409.1, Table 604.1
ASTM B241/B241M-2016~~2012~~[el]	Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube	Piping, Ferrous	1208.5.2.3, 1208.5.3.3
ASTM B280-2016~~2013~~	Seamless Copper Tube for Air Conditioning and Refrigeration Field Service	Piping, Copper Alloy	1208.5.3.2, 1308.5(1)(b), E 409.1

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ASTM B813-2016~~2010~~	Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube	Joints	605.1.4, 705.3.3	
ASTM B828-2016~~2002 (R2010)~~	Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings	Joints	605.1.4, 705.3.3, 1309.2	
ASTM C4-2004 (R201~~409~~)	Clay Drain Tile and Perforated Clay Drain Tile	Piping, Non-Metallic	Table 1101.4.6	
ASTM C564-2014~~2012~~	Rubber Gaskets for Cast Iron Soil Pipe and Fittings	Joints	705.2.2	
ASTM C1053-2000 (R201~~510~~)	Borosilicate Glass Pipe and Fittings for Drain, Waste, and Vent (DWV) Applications (Note 1)	Piping, Non-Metallic	811.2	
ASTM C1173-2010~~e1~~ (R2014)	Flexible Transition Couplings for Underground Piping Systems	Joints	705.9	
ASTM C1277-2015~~2012~~	Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings	DWV Components	301.2.4, 705.2.2	
ASTM C1540-2015~~2011~~	Heavy Duty Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings	Joints	705.2.2	
ASTM C1563-~~2004~~2008 (R2013)	Gaskets for Use in Connection with Hub & Spigot Cast Iron Soil Pipe and Fittings for Sanitary Drain, Waste, Vent, and Storm Piping Applications	Joints	705.2.2	
ASTM C1822-2015	Insulating Covers on Accessible Lavatory Piping	Miscellaneous		
ASTM D1785-2015~~2012~~*	Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120 (Note 7)	Piping, Plastic	1308.5, Table 604.1, Table 701.2	
ASTM D2235-2004 (R201~~61~~)*	Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings	Joints	705.1.2	
ASTM D2241-2015~~2009~~*	Ply (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)	Piping, Plastic	Table 604.1	
ASTM D2464-2015~~2013~~*	Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80 (Note 1)	Fittings	Table 604.1	
ASTM D2466-2015~~2013~~*	Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40 (Note 1)	Fittings	1309.2, Table 604.1	
ASTM D2467-2015~~2013a~~*	Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80 (Note 1)	Fittings	1309.2, Table 604.1	
ASTM D2513-2014~~e1~~~~2013~~*	Polyethylene (PE) Gas Pressure Pipe, Tubing, and Fittings (Note 1)	Piping, Plastic	1208.5.4, 1208.5.4.2.2, 1208.5.9.2, 1210.1.7.1(1), E 409.3	
ASTM D2609-2015~~2002 (R2008)~~*	Plastic Insert Fittings for Polyethylene (PE) Plastic Pipe (Note 1)	Fittings	Table 604.1	

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ASTM D2661-2014~~2011~~*	Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe and Fittings (Notes 1 and 7)	Piping, Plastic	Table 701.2	
ASTM D2665-2014~~2012~~*	Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings (Note 7)	Piping, Plastic	Table 701.2	
ASTM D2672-2014~~1996a (R2009)~~*	Joints for IPS PVC Pipe Using Solvent Cement	Joints	1309.2	
ASTM D2680-2001 (R2014~~09~~)*	Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Composite Sewer Piping (Note 7)	Piping, Plastic	Table 701.2	
ASTM D2683-2014~~2010~~~~el~~*	Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing	Fittings	Table 604.1	
ASTM D2846/D2846M-2014~~2009b~~~~el~~*	Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Hot- and Cold-Water Distribution System	Piping, Plastic	605.2.2, 605.3.1, 1308.5, 1309.2, Table 604.1	
ASTM D3034-2014~~a2008~~*	Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings (Note 7)	Piping, Plastic	301.2.2, 301.3	
ASTM D3035-2015~~2012~~~~e2~~*	Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter	Piping, Plastic	Table 604.1	
ASTM D3138-2004~~-~~(R2016~~1~~)*	Solvent Cements for Transition Between Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Non-Pressure Piping Components	Joints	705.8.4	
ASTM D3261-2016~~2012~~~~el~~*	Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing	Fittings	Table 604.1	
ASTM D4068-2015~~2009~~*	Chlorinated Polyethylene (CPE) Sheeting for Concealed Water-Containment Membrane	Miscellaneous	408.7.2	
ASTM E84-2016~~2013a~~*	Surface Burning Characteristics of Building Materials	Miscellaneous	701.2(2), 903.1(2), 1101.4	
ASTM E119-2016~~a2012a~~*	Fire Tests of Building Construction and Materials	Miscellaneous	1404.3, 1405.3	
ASTM F437-2015~~2009~~*	Threaded Chlorinated Poly (Vinyl Chlorinated) (CPVC) Plastic Pipe Fittings, Schedule 80	Fittings	Table 604.1	
ASTM F438-2015~~2009~~*	Socket-Type Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 40	Fittings	1309.2, Table 604.1	

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ASTM F441/F441M-2015~~2013el~~*	Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80	Piping, Plastic	1308.5, Table 604.1
ASTM F493-2014~~2010~~*	Solvent Cements for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe and Fittings	Joints	605.2.2, 605.3.1, 1309.2
ASTM F656-2015~~2010~~*	Primers for Use in Solvent Cement Joints of Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings	Joints	605.2.2, 605.3.1, 605.12.2, 705.5.2
ASTM F667/F667M-2016~~2012~~*	3 through 24 in. Corrugated Polyethylene Pipe and Fittings	Piping, Plastic	301.2.2, 301.3
ASTM F794-2003 (R201~~409~~)*	Poly (Vinyl Chlorinated) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter (Note 7)	Piping, Plastic	Table 701.2
ASTM F876-2015a~~2013a~~*	Crosslinked Polyethylene (PEX) Tubing	Piping, Plastic	605.9.1, Table 604.1
ASTM F1055-2016a~~2013~~*	Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene and Crosslinked Polyethylene (PEX) Pipe and Tubing	Fittings	Table 604.1
ASTM F1216-2016~~2009~~*	Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube	Piping, Plastic	715.3
ASTM F1336-2015~~2007~~*	Poly (Vinyl Chloride) (PVC) Gasketed Sewer Fittings	Fittings	301.2.2, 301.3
ASTM F1412-2016~~2009~~*	Polyolefin Pipe and Fittings for Corrosive Waste Drainage Systems	Piping, Plastic	811.2
ASTM F1488-2014~~2009el~~*	Coextruded Composite Pipe (Note 7)	Piping, Plastic	Table 701.2
ASTM F1673-2010 (R2016)*	Polyvinylidene Fluoride (PVDF) Corrosive Waste Drainage Systems	Piping, Plastic	811.2
ASTM F1760-2001 (R2011)	Coextruded Poly (Vinyl Chloride) (PVC) Non-Pressure Plastic Pipe Having Reprocessed Recycled Content	Piping	
ASTM F1807-2015~~2013a~~*	Metal Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing	Fittings	Table 604.1
ASTM F1866-2013~~2007~~*	Poly (Vinyl Chloride) (PVC) Plastic Schedule 40 Drainage and DWV Fabricated Fittings	Fittings	Table 701.2
ASTM F1960-2015~~2012~~*	Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-linked Polyethylene (PEX) Tubing	Fittings	Table 604.1

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ASTM F1974-2009 (R2015)*	Metal Insert Fittings for Polyethylene/Aluminum/Polyethylene and Crosslinked Polyethylene/Aluminum/Crosslinked Polyethylene Composite Pressure Pipe	Fittings	605.7.1, 605.10.1, Table 604.1	
ASTM F2080-2016~~2012~~*	Cold-Expansion Fittings with Metal Compression-Sleeves for Cross-linked Polyethylene (PEX) Pipe	Fittings	Table 604.1	
ASTM F2098-2015~~2008~~*	Stainless Steel Clamps for Securing SDR9 Cross-linked Polyethylene (PEX) Tubing to Metal Insert and Plastic Insert Fittings	Joints	Table 604.1	
ASTM F2159-2014~~2011~~*	Plastic Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing	Joints	Table 604.1	
ASTM F2389-2015~~2010~~*	Pressure-Rated Polypropylene (PP) Piping Systems	Piping, Plastic	605.11.1, 606.1, Table 604.1	
ASTM F2434-2014~~2009~~*	Metal Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Cross-linked Polyethylene /Aluminum/Cross-linked Polyethylene (PEX-AL-PEX) Tubing	Fittings	605.10.1, Table 604.1	
ASTM F2509-2015~~2012~~*	Field-Assembled Anodeless Riser Kits for Use on Outside Diameter Controlled Polyethylene Gas Distribution Pipe and Tubing	Fuel Gas	1210.1.7.1(3)	
ASTM F2618-2015	Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Fittings for Chemical Waste Drainage Systems	Piping		
ASTM F2620-2013~~2012~~*	Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings	Joints	605.6.1.1, 605.6.1.3	
ASTM F2735-2009 (R2016)	Plastic Insert Fittings for SDR9 Cross-linked Polyethylene (PEX) and Polyethylene of Raised Temperature (PE-RT) Tubing	Fittings	Table 604.1	
ASTM F2769-2016~~2010~~	Polyethylene of Raised Temperature (PE-RT) Plastic Hot and Cold-Water Tubing and Distribution Systems	Piping and Fittings, Plastic	Table 604.1	
AWWA C210-2015~~2007~~*	Liquid-Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines	Miscellaneous	604.9	

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AWWA C504-2015~~2010~~*	Rubber Seated Butterfly Valves, 3 in. (75 mm) through 72 in. (1800 mm)	Valves	606.1	
AWWA C507-2015~~2011~~*	Ball Valves, 6 in. through 60 in. (150 mm through 1500 mm)	Valves	606.1	
AWWA C900-2016~~2007~~*	Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 in. through 12 in. (100 mm through 300 mm), for Water Transmission and Distribution	Piping, Plastic	Table 604.1	
AWWA C904-2016~~2006~~*	Cross-linked Polyethylene (PEX) Pressure Pipe, 1/2 in. (12 mm) through 3 in. (76 mm), for Water Service	Piping, Plastic	Table 604.1	
CSA B45.5-2011/IAPMO Z124-2011 (R2016)	Plastic Plumbing Fixtures	Fixtures	407.1, 408.1, 409.1, 411.1, 412.1, 420.1, L 402.3, L 402.3.1	
CSA B64.1.1-2011 (R2016)	Atmospheric Vacuum Breakers (AVB)	Backflow Protection	Table 603.2	
CSA B64.1.2-2011 (R2016)	Pressure Vacuum Breakers (PVB)	Backflow Protection	Table 603.2	
CSA B64.2.1.1-2011 (R2016)	Hose Connection Dual Check Vacuum Breakers (HCVB)	Backflow Protection	Table 603.2	
CSA B64.4-2011 (R2016)	Reduced Pressure Principle (RP) Backflow Preventers	Backflow Protection	Table 603.2	
CSA B64.4.1-2011 (R2016)	Reduced Pressure Principle Backflow Preventers for Fire Protection Systems (RPF)	Backflow Protection	Table 603.2	
CSA B64.5-2011 (R2016)	Double Check Valve (DCVA) Backflow Preventers	Backflow Protection	Table 603.2	
CSA B64.5.1-2011 (R2016)	Double Check Valve Backflow Preventers for Fire Protection Systems (DVCAF)	Backflow Protection	Table 603.2	
CSA B125.5/IAPMO Z2600-2011	Flexible Water Connectors with Excess Flow Shutoff Device	Miscellaneous		
CSA B137.18-2013	Polyethylene of Raised Temperature (PE-RT) Tubing Systems for Pressure Applications	Piping, Fittings		
CSA B181.3-2015~~2011~~	Polyolefin and Polyvinylidene Fluoride (PVDF) Laboratory Drainage Systems	Piping, Plastic	811.2	
CSA LC 1-2016~~a~~-2011*	Fuel Gas Piping Systems Using Corrugated Stainless Steel Tubing (CSST) (same as CSA 6.26~~b~~)	Fuel Gas	1208.5.3.4	
CSA Z21.10.1-2014~~2013~~*	Gas Water Heaters – Volume I, Storage Water Heaters with Input Ratings of 75 000 Btu Per Hour or Less (same as CSA 4.1)	Fuel Gas, Appliances	Table 501.1(2)	

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CSA Z21.10.3-2015~~2013~~*	Gas-Fired Water Heaters – Volume III, Storage Water Heaters with Input Ratings Above 75 000 Btu Per Hour, Circulating and Instantaneous (same as CSA 4.3)	Fuel Gas, Appliances	Table 501.1(2), Table L 603.3.2	
CSA Z21.22~~b~~-2015~~2001 (R2008)~~*	Relief Valves for Hot Water Supply Systems (same as CSA 4.4~~b~~)	Valves	607.5, 608.7	
CSA Z21.24~~a~~-2015~~2009 (R2011)~~*	Connectors for Gas Appliances (same as CSA 6.10~~a~~)	Fuel Gas	1212.1(3), 1212.2	
CSA Z21.41-2014~~2011~~*	Quick-Connect Devices for Use with Gas Fuel Appliances (same as CSA 6.9)	Fuel Gas	1212.6	
CSA Z21.54~~b~~-2014~~2009~~*	Gas Hose Connectors for Portable Outdoor Gas-Fired Appliances (same as CSA 8.4b)	Fuel Gas	1212.3.2	
CSA Z21.69~~a~~-2015~~2012~~*	Connectors for Movable Gas Appliances (same as CSA 6.16a)	Fuel Gas	1212.1.1	
CSA Z21.75~~a~~-2016~~2009~~*	Connectors for Outdoor Gas Appliances and Manufactured Homes (same as CSA 6.27a)	Appliances	1212.1(4)	
CSA Z21.90~~b~~-2015~~2006 (R2011)~~*	Gas Convenience Outlets and Optional Enclosures (same as CSA 6.24b)	Fuel Gas	1212.7	
IAPMO Z1001-2016~~2013~~*	Prefabricated Gravity Grease Interceptors	DWV Components	1014.3.4	
IAPMO Z1033-2015~~2013~~~~a~~*	Flexible PVC Hoses and Tubing for Pools, Hot Tubs, Spas, and Jetted Bathtubs	Fixtures, Swimming Pools, Spas, and Hot Tubs	409.6.1	
ISEA Z358.1-2014~~2009~~*	Emergency Eyewash and Shower Equipment	Miscellaneous	416.1, 416.2	
MSS SP-67-2016~~2011~~	Butterfly Valves	Valves	606.1	
NFPA 13D-2016~~2013~~	Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes	Miscellaneous	612.1, 612.5.3.1	
NFPA 30A-2015~~2012~~*	Motor Fuel Dispensing Facilities and Repair Garages	Miscellaneous	507.14.2	
NFPA 31-2016~~2011~~*	Installation of Oil-Burning Equipment	Fuel Gas, Appliances	505.3, 1201.1, E 401.1, E 412.1, E 413.6, E 413.6.1, E 414.1, E 415.2, E 415.3	
NFPA 51-2018~~2013~~*	Design and Installation of Oxygen-Fueled Gas Systems for Welding,	Fuel Gas	507.9	

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	Cutting, and Allied Processes			
NFPA 54/Z223.1-2015~~2012~~*	National Fuel Gas Code	Fuel Gas	1210.14, E 401.1, E 408.1, E 414.1, E 415.1	
NFPA 58-2017~~2014~~*	Liquefied Petroleum Gas Code	Fuel Gas	1208.5.4.2.3, 1208.5.9.4, 1210.5(6), 1212.10, E 401.1, E 401.2, E 406.1, E 411.1, E 414.1, E 415.1	
NFPA 70-2017~~2014~~*	National Electrical Code	Miscellaneous	1211.6, 1310.4.1, 1318.1(11), F 701.1	
NFPA 88A-2015~~2011~~*	Parking Structures	Miscellaneous	507.14.1	
NFPA 99-2015~~2012~~*	Health Care Facilities Code	Piping	1301.3, 1318.1(9)	
NFPA 211-2016~~13~~*	Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances	Fuel Gas, Appliances	509.5.2, 509.5.3, 509.5.6.1, 509.5.6.3	
NFPA 409-2016~~11~~*	Aircraft Hangars	Miscellaneous	507.15	
NFPA 780-2017~~14~~*	Installation of Lightning Protection Systems	Fuel Gas	1211.4	
NFPA 1192-2015	Recreational Vehicles	Fuel Gas		
NSF 3-2012~~10~~*	Commercial Warewashing Equipment	Appliances	414.1	
NSF 14-2016~~12~~*	Plastics Piping System Components and Related Materials	Piping, Plastic	301.2.3, 604.1, 611.3	
NSF 42-2015~~13~~*	Drinking Water Treatment Units – Aesthetic Effects	Appliances	611.1, 611.3	
NSF 44-2015~~13~~*	Residential Cation Exchange Water Softeners	Appliances	611.1, 611.3, L 410.1	
NSF 53-2015~~13~~*	Drinking Water Treatment Units – Health Effects	Appliances	611.1, 611.3, K 104.2.1, L 504.2.1	
NSF 55-2016~~13~~*	Ultraviolet Microbiological Water Treatment Systems	Appliances	611..1, 611.3	
NSF 58-2015~~13~~*	Reverse Osmosis Drinking Water Treatment Systems	Appliances	611.1, 611.2, 611.3, L 410.3	
NSF 61-2016~~12~~*	Drinking Water System Components – Health Effects	Water Supply Components	415.1, 417.1, 604.1, 604.9, 606.1, 607.2, 608.2	
NSF 62-2015~~13~~*	Drinking Water Distillation Systems	Appliances	611.1, 611.3	

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NSF 350-2014~~12~~*	Onsite Residential and Commercial Water Reuse Treatment Systems	Miscellaneous	1504.7	
NSF 359-2016~~11~~*	Valves for Crosslinked Polyethylene (PEX) Water Distribution Tubing Systems	Valves	606.1	
PDI G-101-2015~~12~~	Testing and Rating Procedure for Hydro Mechanical Grease Interceptors with Appendix of Installation and Maintenance	DWV Components	1014.1	
UL 430-2015~~09~~*	Waste Disposers ~~(with revisions through October 3, 2013)~~	Appliances	419.1	
UL 441-2016~~10~~*	Gas Vents ~~(with revisions through May 18, 2010)~~	Fuel Gas	509.1	
UL 467-2013	Grounding and Bonding Equipment	Miscellaneous	1211.2.3	
UL 778-2016~~10~~*	Motor-Operated Water Pumps ~~(with revisions through May 25, 2012)~~	Appliances	1101.14	
UL 921-2016~~06~~*	Commercial Dishwashers ~~(with revisions through July 6, 2012)~~	Appliances	414.1	
UL 1453-2016~~04~~*	Electric Booster and Commercial Storage Tank Water Heaters ~~(with revisions through July 15, 2011)~~	Appliances	Table 501.1(2)	
UL 1479-2015~~03~~*	Fire Tests of Through-Penetration Firestops ~~(with revisions through October 19, 2012)~~	Miscellaneous	208.0, 222.0, 1404.3, 1405.3	

2015 Houston UPC – Appendix K Potable Rainwater Catchment Systems	2021 UPC – Appendix K – Potable Rainwater Catchment Systems	2021 Houston UPC Amendments	Code Change Summary
K 101.2 System Design. Potable rainwater catchment systems in accordance with this appendix shall be designed by a registered design professional or person deemed competent by the Authority Having Jurisdiction to perform potable rainwater catchment system design work. Systems subject to Title 30 of the Texas Administrative Code shall be designed and installed as required by the Texas Commission on Environmental Quality and the Texas State Board of Plumbing Examiners.		**K 101.2 System Design.** Potable rainwater catchment systems in accordance with this appendix shall be designed by a registered design professional or person deemed competent by the Authority Having Jurisdiction to perform potable rainwater catchment system design work. Systems subject to Title 30 of the Texas Administrative Code shall be designed and installed as required by the Texas Commission on Environmental Quality and the Texas State Board of Plumbing Examiners.	**No change to Houston amendment.**
K 104.4.4.3 Exposure to Sunlight. Rainwater tank openings that are subject to degradation when exposed to sunlight shall not be exposed to direct sunlight.			**Houston amendment relocated to Section K 105.7.**
		K 105.7 Exposure to Sunlight. Rainwater tank openings that are subject to degradation when exposed to sunlight shall not be exposed to direct sunlight.	**No change to Houston amendment, relocated from Section K 104.4.4.3.**