

COLOR CODE INDEX: **Turquoise** = NEW or Modified Text by ICC in 2015
Yellow Strikethrough = Text Deleted from the Code by COH

Text Underlined = COH Amendment added (NEW)
Green Text = NEW or Modified Text by COH in 2015

Grey Text = Previous COH Amendment Brought Forward to 2015

2012 Houston UPC – Chapter 1 Administration	2015 Houston UPC – Chapter 1 Administration	Code Analysis
<p>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 as "this code."</p> <p>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. 2015-1108, which appears in the preamble of the building code.</p>	<p>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.</p> <p><u>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. 2021-1037⁴.</u></p>	<p>City of Houston Amendment</p> <p>Analysis: No change to COH amendment other than date of ordinance. Wordsmithing changes made by City Legal Department.</p> <p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>
<p>101.4 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 any specific case, different provisions of the City Code, the building code, the electrical code, the mechanical code, the energy conservation code, the residential code, the fire code, and this code specify different materials, methods of construction, or other requirements, the most restrictive shall prevail. In instances where the 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.</p>	<p>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.</p> <p>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.</p>	<p>City of Houston Amendment</p> <p>Analysis: UPC 2012 Section 101.4 is relocated to UPC 2015 Section 102.1. Editorial changes made to the COH amendment by city legal department to correlate with other volumes of the Houston Construction Code.</p> <p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>
<p>101.4.1 Residential Code. Plumbing for detached one- and two-family dwellings and multiple single-family dwellings (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.</p> <p>101.4.2 Energy Efficiency. The Energy Conservation Code and Chapter 11 of the residential code, and any amendments adopted as authorized by state law, constitute the energy efficiency/conservation codes of the jurisdiction.</p> <p>101.4.3 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.</p>	<p>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.</p> <p>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, constitute the energy efficiency/conservation codes of the jurisdiction.</p> <p>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.</p>	<p>City of Houston Amendment</p> <p>Analysis: UPC 2012 Sections 101.1.1, 101.4.2, and 101.4.3 COH amendments are relocated to 2015 UPC Sections 102.1.1, 102.1.2, and 101.1.3. The retained COH amendments include No new changes.</p> <p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>
<p>101.10 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</p>	<p>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</p>	<p>City of Houston Amendment</p>

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<p>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 a part of this code.</p>	<p>adopted as such. <u>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.</u></p>	<p>Analysis: UPC 2012 Section 101.10 is relocated to UPC 2015 Section 102.8. The previous 2012 COH amendment for this section was added to the 2015 code with no new changes made. Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>
<p>101.12 Exempt Installations. The provisions of this code shall not apply to:</p> <ul style="list-style-type: none"> a) gas service mains from the street main to the meter, b) the installation of gas meters by the utility organization supplying gas, c) 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, or d) the installation of public sewers and public water distribution systems by this jurisdiction, its contractors, agents and employees. 	<p>102.9 Exempt Installations. <u>The provisions of this code shall not apply to:</u></p> <ul style="list-style-type: none"> <u>(1) Gas service mains from the street main to the meter.</u> <u>(2) The installation of gas meters by the utility organization supplying gas.</u> <u>(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.</u> <u>(4) The installation of public sewers and public water distribution systems by this jurisdiction, its contractors, agents and employees.</u> 	<p>City of Houston Amendment</p> <p>Analysis: 2012 Houston amendment moved from 101.12, no changes made. City Legal modified template of section to numbered sections. Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>
<p>101.13 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 is it 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.</p>	<p>102.10 Homeowners. <u>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.</u></p>	<p>City of Houston Amendment</p> <p>Analysis: UPC 2012 Section 101.13 COH amendment is relocated to UPC 2015 Section 102.10. No changes to these code provisions or the code intent. These code provisions are added to the Houston Plumbing Code to coordinate the code with specific provisions of Texas law which allows a home owner to do plumbing on their own home without carrying a plumbing license. Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>
<p>101.14 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:</p> <p>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.</p> <p>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.</p> <p>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 120°F (48°C) 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</p>	<p>102.11 Basic Principles. <u>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:</u></p> <p>Principle No. 1. <u>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 do to dormant or inert periods.</u></p> <p>Principle No. 2. <u>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.</u></p> <p>Principle No. 3. <u>Each dwelling unit shall have not less than one water closet, one bathtub or shower, one lavatory, and one kitchen-type sink. Adequate 120°F (48°C) 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</u></p>	<p>City of Houston Amendment</p> <p>Analysis: The previous COH amendment UPC 2012 Section 101.14 is moved to UPC 2015 Section 102.11. There are NO changes to the code or code intent. Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>

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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 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 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 law.

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102.2.5 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 any action or omission taken in the course and scope of employment. Where and to the extent consistent with the provisions of Article X of Chapter 2 of the City Code, this jurisdiction shall provide legal representation and

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

City of Houston Amendment

Analysis: 2012 Houston amendment moved from 102.2.5, no changes made. Houston amendment 103.2 moved to Section 104.3. Updated by City Legal department to include section in green.

Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.

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<p>indemnification for any suit brought against the Authority Having Jurisdiction because of acts or omissions performed in the enforcement of this code.</p>	<p>Jurisdiction because of acts or omissions performed in the implementation or enforcement of this code.</p> <p>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.</p>	
<p>103.1.2 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.</p>	<p>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.</p>	<p>City of Houston Amendment</p> <p>Analysis: UPC 2012 Section 103.1.2 model code and COH amendment is relocated to UPC 2015 Section 103.3.1. No changes made to the code or code intent.</p> <p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>
<p>103.1.1 Exempt Work. A permit shall not be required for the following:</p> <ol style="list-style-type: none"> (1) The stopping of leaks in drains, or soil, waste, or vent pipe, 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 with new material, the same shall be considered as new work and a permit shall be procured and inspection made as provided in this code. (2) The clearing of stoppages, including the removal and reinstallation of 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. <p>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 code or other laws or ordinances of this jurisdiction.</p> <p>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 under state law.</p>	<p>104.2 Exempt Work. A permit shall not be required for the following:</p> <ol style="list-style-type: none"> (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. <p>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.</p> <p>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.</p>	<p>City of Houston Amendment</p> <p>Analysis: UPC 2012 Section 103.1.1 model code and COH amendment is relocated to UPC 2015 Section 104.2 (Exempt Work). Minor editorial code changes to correlate with other code sections. No change to the code requirements or code intent. Minor editorial code changes also added by City Legal department.</p> <p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>
<p>103.2 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:</p>	<p>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:</p>	<p>City of Houston Amendment</p> <p>Analysis: UPC 2012 Section 103.2 model code and COH amendment relocated to UPC 2015 Section 104.3. Minor editorial changes that make no changes to the code requirements or code intent.</p> <p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>

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<p>(1) Identify and describe the work to be covered by the permit for which application is made.</p> <p>(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.</p> <p>(3) Indicate the use or occupancy for which the proposed work is intended.</p> <p>(4) Be accompanied by plans, diagrams, computations, and other data in accordance with Section 103.2.1 and by the applicable fees as provided in the city fee schedule.</p> <p>(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.</p> <p>(6) Give such other data and information in accordance with as may reasonably be required by the Authority Having Jurisdiction.</p> <p>(7) Be accompanied by the applicable fees as provided in the city fee schedule.</p>	<p>(1) Identify and describe the work to be covered by the permit for which application is made.</p> <p>(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.</p> <p>(3) Indicate the use or occupancy for which the proposed work is intended.</p> <p>(4) Be accompanied by construction documents in accordance with Section 104.3.1.</p> <p>(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.</p> <p>(6) Give such other data and information in accordance with as may reasonably be required by the Authority Having Jurisdiction.</p> <p>(7) Be accompanied by the applicable fees as provided in the city fee schedule.</p>	
<p>103.4.1 Plan Review Fees. Where a plan or other data is required to be submitted by Section 103.2.1, a plan review fee shall be paid at the time of submitting plans and specifications for review.</p> <p>The plan review fees for plumbing work shall be determined and adopted by this jurisdiction.</p> <p>The plan review fees specified in this subsection are separate fees from the permit fees specified in this section and are in addition to the permit fees.</p> <p>Where plans are incomplete or changed so as to require additional review, a fee shall be charged at the rate shown in Table 103.4.</p>	<p>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.</p> <p>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.</p> <p>The plan review fees specified in this subsection are separate fees from the permit fees specified in Section 104.5.</p> <p>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.</p> <p>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.</p>	<p>City of Houston Amendment</p> <p>Analysis: UPC 2012 Section 103.4.1 model code and COH amendment is relocated to UPC 2015 Section 104.3.2. Model code includes minor editorial changes for clarity and additional COH amendments added to address specific fee requirements and to identify the location where fees are addressed. This section includes editorial changes from City Legal department.</p> <p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>
<p>N/A</p>	<p>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.</p>	<p>City of Houston Amendment</p> <p>Analysis: New COH amendment added by the City Legal department to correlate with other volumes of the Houston Construction Code.</p> <p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>
<p>103.4.2 Expiration of Plan Review. Applications for which no permit is issued within 180 days 2 years following the date of application shall expire by limitation, and 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 extend 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.</p>	<p>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</p>	<p>City of Houston Amendment</p> <p>Analysis: UPC 2012 Section 103.4.2 model code and COH amendment relocated to UPC 2015 Section 104.3.3. COH amendment extensively reworked by City Legal to be consistent throughout all volumes of the Houston Construction Code.</p> <p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>

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	<p>which no permit is issued within 180 days 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.</p>	
<p>103.3.2 Validity of Permit. The issuance of a permit or approval of plans and specifications 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.</p> <p>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.</p> <p>A permit shall be valid only for work performed under the licensed master plumber who signed the application. A new permit must be obtained if the licensed master plumber who signed the application ceases to perform the work. The cost of the new permit shall be charged at the rate listed for the minimum fee stated in the city fee schedule. In the case of the death of the original licensed master plumber, the permit will be transferred to the new licensed master plumber at no fee except for the administrative fee established in the city fee schedule. Applicants who fail to re-permit any applicable work within the timeframes established by this code shall be subject to permit fees in the amount stated in the city fee schedule.</p>	<p>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.</p> <p>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.</p> <p>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 <i>Building Code</i> and the city fee schedule.</p> <p>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 <i>Building Code</i> 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 <i>Building Code</i> and the city fee schedule based on the scope of work for all remaining 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.</p>	<p>City of Houston Amendment</p> <p>Analysis: UPC 2012 Section 103.3.2 model code and COH amendment is relocated to UPC 2015 Section 104.4.2. Previous COH amendment expanded to provide additional clarity and now identifies the property owner owns the permit regardless of who submits the application or pays the permit fee. New provisions now identify policy regarding the death of a property owner or plumbing master or contractor and a requirement and time limitation for completing a name change.</p> <p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>
<p>103.3.3 Expiration. A Every permit issued shall become inactive 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 unless the work authorized by such permit is commenced within 180 days after its issuance, or if the work authorized on the site by such permit is suspended or abandoned at a time after</p>	<p>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</p>	<p>City of Houston Amendment</p> <p>Analysis: UPC 2012 Section 103.3.3 model code and COH amendment relocated to 104.4.3 and 104.4.4. COH amendment</p>

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~~the work is commenced for a period of 180 days after the time work is commenced. The building official 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. 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 plans and specifications for such work, and provided further that such suspensions or abandonment has not exceeded 1 year.~~

~~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.~~

~~If work is not commenced under a permit within two years after the date of issuance or is abandoned at any time for a period of two years, the permit shall expire. In order to recommence work under an expired permit, the permit holder shall pay the full permit fee applicable and submit plans that comply with this code for the previously uninspected portion of the work.~~

~~**Exception:** For the purpose of issuing a certificate of compliance, the building official may, upon request, reactivate a permit and perform a final inspection of work.~~

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.

104.4.4 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.

updated by City Legal to correlate state law and other volumes of the *Houston Construction Code*.

Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.

City of Houston Amendment

Analysis: UPC 2012 code provisions addressing permit extensions was broken out of previous Section 103.3.3 to create new UPC 2015 Section 104.4.4 in the model code. A COH amendment replaces the new code text to correlate with city policy and other volumes of the *Houston Construction Code*.

Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.

103.3.4 Suspension or Revocation. After notice and a hearing pursuant to Section 102.6, the The Authority Having Jurisdiction shall be permitted to, in writing, suspend or revoke a permit issued under the provisions of this code where the permit is issued in error or on the basis of incorrect information supplied or in violation of other ordinance or regulation of the jurisdiction.

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 where ver 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

City of Houston Amendment

Analysis: UPC 2012 Section 103.3.4 and COH amendment relocated to 104.4.5. COH amendment is updated by City Legal. No change to the code requirements or code intent.

Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.

103.4 Fees. Fees shall be assessed in accordance with the provisions of this section and as set forth in the fee schedule Table 103.4. The fees are to be determined and adopted by this jurisdiction. The fee for each permit shall be as set forth in the city fee schedule.

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.

City of Houston Amendment

Analysis: UPC 2012 Section 103.4 is relocated to UPC 2015 Section 104.5. COH amendment editorially rearranged. No changes to the code requirements or code intent.

103.4.3 Investigation Fees—Work Without a Permit. Where work for which a permit is required by this code has been commenced without first obtaining said permit, a special investigation shall be made before a permit shall be issued for such work.

104.5.1 Work Commencing Before Permit Issuance. Where work for which a permit is required by this code has been commenced without first obtaining said permit, a special investigation shall be made before a permit is issued for such work.

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.

City of Houston Amendment

Analysis: Previous UPC 2012 Section 103.4.3 is relocated to UPC 2015 Section 104.5.1 and 104.5.1.1 which is a new COH amendment created by City Legal department for special investigations and to correlate with other volumes of the *Houston Construction Code*.

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Grey Text = Previous COH Amendment Brought Forward to 2015

		<p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>
<p>103.4.3 Investigation Fees—Work Without a Permit. Where work for which a permit is required by this code has been commenced without first obtaining said permit, a special investigation shall be made before a permit shall be issued for such work.</p> <p>103.4.3.1 Fees. An investigation fee, in addition to the permit fee, shall be collected whether or not a permit is then or subsequently issued. The 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. The payment of such investigation fee shall not exempt a person from compliance with other provisions of this code, nor from a penalty prescribed by law.</p>	<p>104.5.2 Minimum Investigation Fees. A 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.</p>	<p>City of Houston Amendment</p> <p>Analysis: UPC 2012 Section 103.4.3 and 103.4.3.1 is relocated to UPC 2015 Section 104.5.2. New COH amendment is included by City Legal department to correlate with other volumes of the <i>Houston Construction Code</i>.</p> <p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>
<p>103.4.4 Fee Refunds. The Authority Having Jurisdiction shall be permitted to authorize the refunding of a fee paid hereunder that was erroneously paid or collected due to an error by one or more jurisdiction employees. This provision shall not be applicable if the error occurred due to incorrect information provided by the applicant.</p> <p>103.4.4.1 Percentage. The Authority Having Jurisdiction shall be permitted to authorize the refunding of not more than a percentage 90 percent of the fee amount in excess of the minimum fee listed in the city fee schedule, as determined by this jurisdiction where 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 administrative fee and plan review fees shall not be refunded.</p>	<p>104.5.3 Fee Refunds. The Authority Having Jurisdiction shall be permitted to authorize the refunding of a fee as follows:</p> <ol style="list-style-type: none"> (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. <p>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.</p> <p>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 originally paid administrative fee and the plan review portion of the permit fee shall be nonrefundable.</p> <p>The building official Authority Having Jurisdiction shall not authorize a the refunding of any fee paid except upon written application filed by the original permittee holder not to exceed later than 180 calendar days after the date of fee payment.</p>	<p>City of Houston Amendment</p> <p>Analysis: UPC 2012 Section 103.4.4 and 103.4.4.1 is relocated to UPC 2015 Section 104.5.3 with reorganized COH amendment which was edited by City Legal department to correlate with other volumes of the <i>Houston Construction Code for consistence</i>.</p> <p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>
<p>103.4.5 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 City of Houston 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.</p>	<p>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.</p>	<p>City of Houston Amendment</p> <p>Analysis: UPC 2012 Section 103.4.5 COH amendment is relocated to UPC 2015 Section 104.5.4. The COH amendment moved without change to the code requirements or code intent.</p> <p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>
<p>103.5.9 Reinspections. A reinspection fee shall be permitted to be assessed for each inspection or reinspection where such portion of work for which inspection is called is not complete or where required corrections have not been made.</p> <p>This provision is not to be interpreted as requiring reinspection fees the first time a job is rejected for failure to be in accordance with the requirements of this</p>	<p>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.</p>	<p>City of Houston Amendment</p> <p>Analysis: UPC 2012 Section 103.5.9 is relocated to UPC 2015 Section 105.2.6. This section is edited by City Legal to coordinate with other volumes of the <i>Houston Construction Code</i>.</p>

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<p>code, but as controlling the practice of calling for inspections before the job is ready for inspection or reinspection.</p> <p>Reinspection fees shall be permitted to be assessed where 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.</p> <p>To obtain reinspection, the applicant shall file an application therefore in writing upon a form furnished for that purpose and pay the reinspection fee in accordance with Table 103.4 the city fee schedule.</p> <p>In instances where reinspection fees have been assessed, no additional inspection of the work will be performed until the required fees have been paid.</p>	<p>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.</p> <p>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.</p> <p>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.</p> <p>In instances where reinspection fees have been assessed, no additional inspection of the work will be performed until the required fees have been paid.</p>	<p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>
<p>102.4 Violations. 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.</p>	<p>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. <u>It shall be a violation to falsify any test required by this code.</u></p>	<p>City of Houston Amendment</p> <p>Analysis: UPC 2012 Section 102.4 is relocated to UPC 2015 Section 106.1 Houston amendment moved from 102.4. No change to the code requirements of code intent.</p> <p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>
<p>102.5 Penalties. A person, firm, or corporation violating a provision of this code shall be deemed guilty of a misdemeanor, 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.</p>	<p>106.3 Penalties. A person, firm, or corporation violating a provision of this code shall be deemed guilty of a misdemeanor, 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. <u>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.</u></p>	<p>City of Houston Amendment</p> <p>Analysis: UPC 2012 Section 102.5 is relocated to UPC 2015 Section 106.3. No changes to the code or code intent.</p> <p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>
<p>102.2.2 Stop 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.</p> <p>At the time such stop 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 102.6 of this code. On request, such a hearing shall be held within three business</p>	<p>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.</p> <p><u>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</u></p>	<p>City of Houston Amendment</p> <p>Analysis: UPC 2012 Section 102.2.3 is relocated UPC 2015 Section 106.4. The COH amendment includes minor editorial changes made by City Legal department for clarity.</p> <p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>

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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.

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.

102.6 Hearing Procedures.

106.7 Hearing Procedures.

102.6.1 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 or by certified mail, 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, notice shall be mailed 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, notice shall be effective if posted on or in view of each entrance of the building.

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, notice shall be effective if posted on or in view of each entrance of the building.

102.6.2 Hearings. Except where otherwise specifically provided, all hearings held pursuant to this code shall be conducted by the director of the jurisdiction's Department of 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 decision of the hearing official shall be set forth 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 be served on each party in the same manner as a notice of a right to a hearing.

City of Houston Amendment

Analysis: UPC 2012 Section 102.6, 102.6.1 and 102.6.2 COH amendment is relocated to UPC 2015 Section 106.7, 106.7.1 and 106.7.2. The COH amendment is updated by City Legal department with minor editorial changes for clarity. No Change to the code requirements or code intent.

Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.

102.3 Board of Appeals. 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.

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.

City of Houston Amendment

Analysis: UPC 2012 Section 102.3 model code is relocated to UPC 2015 Section 107.1 with previous COH amendment.

Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.

102.3.2 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 chairman. Each of the seven positions shall be numbered:

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:

City of Houston Amendment

Analysis: UPC 2012 Section 102.3.2 COH amendment is relocated to UPC 2015 Section 107.3. The COH amendment includes minor editorial changes completed by City Legal department.

- (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.

- (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.

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<p>(2) Positions 3 and 4 shall be filled by duly licensed master plumbers.</p> <p>(3) Position 5 shall be filled by a degreed engineer who is in the employ of a local gas utility company.</p> <p>(4) Position 6 shall be filled by a member at large.</p> <p>(5) Position 7 shall be filled by the chief plumbing inspector of this jurisdiction.</p>	<p>(3) Position 5 shall be filled by a degreed engineer who is in the employ of a local gas utility company.</p> <p>(4) Position 6 shall be filled by a member at large.</p> <p>(5) Position 7 shall be filled by the chief plumbing inspector of this jurisdiction.</p>	<p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>
	<p>107.4 Terms of Office; Qualifications; Removal; Vacancy; Meetings. <u>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 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.</u></p> <p><u>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.</u></p> <p><u>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.</u></p> <p><u>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.</u></p>	<p>City of Houston Amendment</p> <p>Analysis: 2012 Houston amendment moved from 104.</p> <p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>
	<p>107.5 Quorum. <u>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.</u></p>	<p>City of Houston Amendment</p> <p>Analysis: 2012 Houston amendment moved from 104.</p> <p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>
<p>102.3.5 Review of Action of Plumbing Inspectors. <u>Disputes arising between plumbing inspectors and any person concerning the application of the provisions of this code to the installation of plumbing facilities to serve property of the person 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.</u></p> <p><u>The Authority Having Jurisdiction shall forward the application to the Board chairman. The Board chairman 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</u></p>	<p>107.6 Review of Action of Plumbing Inspectors. <u>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.</u></p> <p><u>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</u></p>	<p>City of Houston Amendment</p> <p>Analysis: 2012 Houston amendment moved from 104.</p> <p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>

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<p>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 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.</p> <p>All appeals to the City Council are subject to the rules of the City Council, which are codified in Section 2-2 of the <i>City Code</i>, 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.</p>	<p>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 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.</p> <p>All appeals to the City Council are subject to the rules of the City Council, which are codified in Section 2-2 of the <i>City Code</i>, 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.</p>	
<p>102.3.6 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 chairman 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.</p> <p>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.</p>	<p>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.</p> <p>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.</p>	<p>City of Houston Amendment</p> <p>Analysis: 2012 Houston amendment moved from 104.</p> <p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>
<p>104.0 Licensing</p> <p>104.1 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/her 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.</p> <p>No registration shall be effective at any time that the plumbing master fails to maintain current proof of insurance as required by state law.</p>	<p>108.0 Licensing.</p> <p>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.</p> <p>Registration shall not be effective if plumbing master fails to maintain current proof of insurance as required by state law.</p>	<p>City of Houston Amendment</p> <p>Analysis: 2012 Houston amendment moved from 102. Amendment updated by City Legal Department.</p> <p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>
<p>104.2 License to do Plumbing Work. Each person engaged in the actual installation of plumbing shall be licensed either as a master or current journeyman plumber or registered as an apprentice by the Texas State Board of Plumbing Examiners under the Plumbing License Law. A licensed master plumber must have a medical gas endorsement to engage in the installation of medical gas.</p>	<p>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 plumber must have a medical gas endorsement to engage in the installation of medical gas.</p>	<p>City of Houston Amendment</p> <p>Analysis: 2012 Houston amendment moved from 102. Amendment modified by City Legal department.</p>

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		<p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>
<p>104.3 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 <i>City Code</i>.</p>	<p>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 <i>City Code</i>.</p>	<p>City of Houston Amendment</p> <p>Analysis: 2012 Houston amendment moved from 102. Amendment renumbered by City Legal department.</p> <p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>
<p>104.3.1 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.</p> <p>The annual fee for irrigator registration required in Section 104.3.1 is stated in the city fee schedule.</p>	<p>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.</p> <p>The annual fee for irrigator registration required under this schedule is stated in the city fee schedule.</p>	<p>City of Houston Amendment</p> <p>Analysis: 2012 Houston amendment moved from 102. Amendments renumbered by City Legal department.</p> <p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>
<p>104.3.2 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.</p>	<p>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.</p>	
<p>104.4 Illegal Work. Any person engaged in the plumbing or drain laying business whose work does not conform to this code, or whose workmanship or materials are of inferior quality, shall, upon notice from the Authority Having Jurisdiction, make necessary changes or corrections at once so as to conform to this code. If work has not been so changed 10 days after delivery of notice, the Authority Having Jurisdiction shall then refuse to issue any further permits to the person until the nonconforming work has been fully corrected in accordance with this code.</p>	<p>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.</p>	<p>City of Houston Amendment</p> <p>Analysis: 2012 Houston amendment moved from 102. Amendment modified by City Legal department.</p> <p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>
<p>104.5 Allowing One's Name or License to Be Used to Obtain Permit Fraudulently. No person engaged in the business of plumbing or laying drains shall allow his name to be used by any other person, directly or indirectly, to obtain a permit.</p>	<p>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.</p>	<p>City of Houston Amendment</p> <p>Analysis: 2012 Houston amendment moved from 102.</p> <p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>
<p>104.6 Identification of Vehicles Required. Each person engaged in the plumbing business in the jurisdiction shall identify all vehicles used in the business with signs showing the name of the business and master plumber's license number. This information shall be correct at all times, shall be painted on each side of each vehicle and shall be in full view and legible at all times. Lettering shall be a minimum of 2 inches (50.8 mm) high.</p>	<p>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.</p>	<p>City of Houston Amendment</p> <p>Analysis: 2012 Houston amendment moved from 102.</p> <p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>
	<p>{EDITORIAL NOTE: DELETE TABLE 104.5.}</p>	<p>City of Houston Amendment</p> <p>Analysis: 2012 Houston amendment moved from 102.</p> <p>Justification: Chapter 1 is the legal administration and enforcement chapter governed by local and state law, and separately reviewed by the City Legal Department.</p>

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2012 Houston UPC – Chapter 2 Definitions	2015 Houston UPC – Chapter 2 Definitions	Code Analysis
	<p>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.</p>	<p>City of Houston Amendment Analysis: New amendment provided by City Legal department for clarification. Justification: Clarifying section on the interchangeability of words and definitions; added by City Legal.</p>
	<p>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 <i>City Code</i> or another volume of the <i>Construction Code</i>, 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.</p>	<p>City of Houston Amendment Analysis: New amendment provided by City Legal department for clarification. Justification: Clarifying section on construction and terms defined in other codes; added by City Legal.</p>
<p>Section 203.0 – A – Authority Having Jurisdiction. The jurisdiction's Director of the Department of Public Works and Engineering. 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.</p>	<p>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.</p>	<p>City of Houston Amendment Analysis: No change made to COH amendment. Justification: To provide clarity on Houston adopted codes and ordinances.</p>
<p>Section 204.0 – B – Bathroom. A room equipped with a shower, bathtub, or combination bath/shower. Bathroom Group. A group of fixtures consisting of a Any combination of fixtures, not to exceed one water closet, one or two lavatories, and either a one bathtub, a or one combination bath/shower, or a and one shower, and may include a urinal or bidet and an emergency floor drain. Building Code. The City of Houston Building Code, as adopted by this jurisdiction.</p>	<p>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.</p>	<p>City of Houston Amendment Analysis: Amendments for bathroom and bathroom group not carried forward. Building Official definition modified by City Legal department. Justification: To provide clarity on Houston adopted codes and ordinances. Bathroom/Bathroom group definition no longer needed, provisions covered in base code.</p>
<p>Section 205.0 – C – Certificate of Compliance – N/A (Previously Located in the Building Code) City Code. The Code of Ordinances, Houston, Texas. City Fee Schedule. The schedule of fees charged by the city for various permits, licenses, authorizations and services, which schedule is maintained on the city's website. Construction Code – N/A (Previously Located in the City Code and Building Code)</p>	<p>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.</p>	<p>City of Houston Amendment Analysis: Certificate of Compliance and Construction Code definitions included by City Legal department. City fee schedule definition updated by City Legal to include "registrations". Justification: To provide clarity on Houston adopted codes and ordinances.</p>

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<p>Section 215.0 - M -</p> <p>Mechanical Code. <u>The City of Houston Mechanical Code, as adopted by this jurisdiction.</u></p>	<p>215.0 - M -</p> <p>Mechanical Code. <u>The City of Houston Mechanical Code, as adopted</u> and amended <u>by this jurisdiction.</u></p>	<p>City of Houston Amendment</p> <p>Analysis: Amendment modified by City Legal department. Justification: To provide clarity on Houston adopted codes and ordinances.</p>
<p>Section 217.0 - O -</p> <p>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. <u>The level of treatment and quality shall be approved by the Texas Commission on Environmental Quality.</u></p>	<p>217.0 - O -</p> <p>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. <u>The level of treatment and quality shall comply with the rules promulgated by the Texas Commission on Environmental Quality.</u></p>	<p>City of Houston Amendment</p> <p>Analysis: Amendment modified by City Legal department. Justification: Amendment needed to ensure conformity with state and local government policy.</p>
<p>Section 218.0 - P -</p> <p>Plumbing License Law. <u>Chapter 1301 of the Texas Occupations Code.</u></p>	<p>218.0 - P -</p> <p>Patient Care Room. <u>Any space</u> room of a health care facility where patients are intended to be examined or treated. [NFPA 99:3.3.127³⁸]</p> <p>Category 1 Space. <u>Space in which failure of equipment or a system is likely to cause major injury or death of patients, staff, or visitors.</u> [NFPA 99:3.3.127.1]</p> <p>Category 2 Space. <u>Space in which failure of equipment or a system is likely to cause minor injury to patient, staff, or visitors.</u> [NFPA 99:3.3.127.2]</p> <p>Category 3 Space. <u>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.</u> [NFPA 99:3.3.127.3]</p> <p>Category 4 Space. <u>Space in which the failure of equipment or a system is not likely to have a physical impact on patient care.</u> [NFPA 99:3.3.127.4]</p> <p>Basic Care Room. <u>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.</u> (Category 3). [NFPA 99:3.3.138.1]</p> <p>Critical Care Room. <u>A room in which failure of equipment or a system is likely to cause major injury or death of patients or caregivers</u> (Category 1). [NFPA 99:3.3.138.2]</p> <p>General Care Room. <u>A room in which failure of equipment or a system is likely to cause minor injury to patients or caregivers</u> (Category 2). [NFPA 99:3.3.138.3]</p> <p>Plumbing License Law. <u>Chapter 1301 of the Texas Occupations Code.</u></p>	<p>City of Houston Amendment</p> <p>Analysis: New amendment for Patient Care Rooms that provide added protection and coincide with changes made in the 2018 UPC. Justification: To provide clarity on Houston adopted codes and ordinances.</p>
<p>Section 220.0 - R -</p> <p>Reclaimed (Recycled) Water. Nonpotable water provided by a water/wastewater utility that, as a result of tertiary treatment of domestic wastewater, meets requirements of the public health <u>Authority Having Jurisdiction</u> for its intended uses. <u>The level of treatment and quality of the on-site recycled water shall be approved by the Texas Commission on Environmental Quality.</u></p> <p>Residential Code. <u>The City of Houston Residential Code, based on the International Residential Code for One- and Two-Family Dwellings, as adopted by the State of Texas in Subchapter G of Chapter 214 of the Texas Local Government Code, with amendments adopted by this jurisdiction.</u></p>	<p>220.0 - R -</p> <p>Reclaimed Water. Nonpotable water provided by a water/wastewater utility that, as a result of tertiary treatment of domestic wastewater, meets <u>public health</u> requirements <u>of the public health Authority Having Jurisdiction</u> for its intended uses. <u>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.</u></p> <p>Residential Code. <u>The City of Houston Residential Code, as adopted and amended by this jurisdiction.</u></p>	<p>City of Houston Amendment</p> <p>Analysis: Modification to amendments by City Legal department. Justification: To provide clarity on Houston adopted codes and ordinances.</p>
	<p>222.0 - T -</p>	<p>City of Houston Amendment</p>

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<p>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.</p> <p>301.3.1 Flood Hazard Areas Subject to High-Velocity Wave Action. Plumbing systems in buildings located in flood hazard areas subject to high-velocity wave action shall be in accordance with the requirements of Section 301.3, and the 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.</p>		
	<p>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.</p> <p>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.</p> <p>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.</p>	<p>City of Houston Amendment</p> <p>Analysis: Amendment moved from 301.3. Modifications to amendment made during City Legal review.</p> <p>Justification: Amendment needed to ensure conformity with state and local government policy.</p>
<p>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.</p>	<p>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.</p>	<p>City of Houston Amendment</p> <p>Analysis: No change made to COH amendment.</p> <p>Justification: Amendment needed to ensure conformity with state and local government policy.</p>
2012 Houston UPC – Chapter 4 Plumbing Fixtures and Fixture Fittings	2015 Houston UPC – Chapter 4 Plumbing Fixtures and Fixture Fittings	Code Analysis
<p>403.2 Water Closets. Water closets, either whether flush tank, flushometer tank, or flushometer valve operated, shall have an average consumption not to exceed 4.6 1.28 gallons (6.4 4.85 L) of water per flush or be a high efficiency fixture.</p>		<p>City of Houston Amendment</p> <p>Analysis: 2012 Houston amendment moved to 411.2.</p>
<p>403.3 Urinals. Urinals shall have an average water consumption not to exceed 4.5 gallon (4.2 L) of water per flush.</p>		<p>City of Houston Amendment</p> <p>Analysis: 2012 Houston amendment moved to 411.2.2.</p>
<p>403.4 Metered Faucets. Self-closing or self-closing metering faucets shall be installed on lavatories intended to serve the transient public, such as those in, but not limited to, service stations, train stations, airports, restaurants, and convention halls. Metered faucets shall deliver a maximum of 0.26 25 gallons (0.98 1.0 L) of water per use metering cycle.</p> <p>Exception: When required by the health department to meet minimum temperature requirements.</p>		<p>City of Houston Amendment</p> <p>Analysis: Amendment not carried forward.</p> <p>Justification: Provisions of amendment now located in base code, no longer needed. Exception will be kept and carried forward to Section 407.4.</p>

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	<p>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.</p> <p>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.</p>	<p>City of Houston Amendment</p> <p>Analysis: New COH amendment.</p> <p>Justification: Amendment pulled from Section 403.4 of the 2012 amendments to coincide with local and state laws.</p>
	<p>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.</p>	<p>City of Houston Amendment</p> <p>Analysis: No change made to COH amendment; moved from 412.1.</p> <p>Justification: Amendment needed to ensure conformity with state and local government policy.</p>
	<p>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.</p>	<p>City of Houston Amendment</p> <p>Analysis: No change made to COH amendment; moved from 403.3.</p> <p>Justification: Amendment needed to ensure conformity with state and local government policy.</p>
	<p>411.4 Personal Hygiene Devices. Water closets with integral personal hygiene devices shall comply with ASME A112.4.2/CSA B45.16.</p>	<p>City of Houston Amendment</p> <p>Analysis: New COH amendment.</p> <p>Justification: Amendment includes 2018 provisions to accommodate personal hygiene devices.</p>
	<p>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 4 0.5 gallon (3.8 1.9 Lpf) of water per flush.</p>	<p>City of Houston Amendment</p> <p>Analysis: New COH amendment.</p> <p>Justification: Amendment pulled from Section 411.2 of the 2012 amendments to coincide with local and state laws.</p>
	<p>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.</p>	<p>City of Houston Amendment</p> <p>Analysis: New COH amendment.</p> <p>Justification: Amendment includes 2018 provisions that update section.</p>
	<p>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.</p>	<p>City of Houston Amendment</p> <p>Analysis: New COH amendment.</p> <p>Justification: Amendment needed to comply with state law and includes 2018 provisions.</p>
	<p>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</p>	<p>City of Houston Amendment</p> <p>Analysis: New COH amendment.</p>

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pattern, and temperature of flushing fluids shall be provided in accordance with ISEA Z358.1 based on the hazardous material.

Justification: Amendment includes updated 2018 provisions for emergency eyewash water supply.

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.**

City of Houston Amendment

Analysis: New COH amendment.

Justification: Amendment includes updated 2018 provisions to provide more safety in Industrial and Manufacturing facilities clarifying that floor drains and interceptors are required in any occupancy where oils, flammable and/or combustible liquids or other haza

422.1 Fixture Count. 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.

Each building shall be provided with sanitary facilities as prescribed in Chapter 29, Table 2902.1 of the *Building Code*.

EDITORIAL NOTE: DELETE TABLE 422.1.

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.

City of Houston Amendment

Analysis: No change made to COH amendment.

Justification: Amendment needed to ensure conformity with state and local government policy and to conform to the IBC.

2012 Houston UPC – Chapter 5 Water Heaters

2015 Houston UPC – Chapter 5 Water Heaters

Code Analysis

Table 501.1
First Hour Rating¹

Number of Bathrooms	1 to 1.5			2 to 2.5				3 to 3.5			
	1	2	3	2	3	4	5	3	4	5	6
Number of Bedrooms											
First Hour Rating, 2 Gallons	42	54	54	54	67	67	80	67	80	80	80

For SI units: 1 gallon = 3.785 L

Notes:

- 1. The first hour rating is found on the "Energy Guide" label.

Table 501.1(2)
First Hour Rating¹

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

City of Houston Amendment

Analysis: New UPC 2015 COH amendment obtained from updates to the 2018 UPC. Table has been brought forward from 2018 UPC provisions to provide up to date water heater hour ratings.

Justification: Approved additions to the 2018 UPC model code added to the Houston Plumbing Code as a COH amendment.

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<p>2. Solar water heaters shall be sized to meet the appropriate first hour rating as shown in the table.</p>	<p>2. Solar water heaters shall be sized to meet the appropriate first hour rating as shown in the table.</p>	
<p>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]</p>	<p>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, <u>ignition sources</u>, 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]</p>	<p>City of Houston Amendment Analysis: No change made to COH amendment. Justification: Amendment needed to ensure conformity with state and local government policy.</p>
<p>508.3.2 Access Type. The inside means of access shall be a permanent, <u>or fold-away inside stairway or ladder, terminating in an enclosure, scuttle, or trap door.</u> Such scuttles or trap doors shall be not less than 22 inches by 24 inches (559 mm by 610 mm) in size, pull-down stairway with a clear opening not less than 22 inches in width and a load capacity of not less than 350 pounds or a ladder permanently fastened to the building. Such a ladder or stairway shall 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.</p> <p>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 be not less than 42 inches (1,067 mm) in height. [NFPA 54:9.4.3.3]</p>	<p>508.3.2 Access Type. The inside means of access shall be a permanent, <u>or fold-away inside stairway or ladder, terminating in an enclosure, scuttle, or trap door.</u> 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 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. <u>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).</u></p> <p>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)</p>	<p>City of Houston Amendment Analysis: Minor edits to the COH amendment in the UPC 2015 Section 508.3.2. Changes added during City Legal review. Justification: Amendment needed to ensure conformity with state and local government policy and protect workers who access these types of ladders.</p>
<p>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, <u>and not less than 22 inches by 30 inches (559 mm by 762 mm).</u> and shall be made accessible by a ladder or pull-down stairway with a clear opening not less than 22 inches in width and a load capacity of not less than 350 pounds or a ladder permanently fastened to the building with a load capacity of not less than 350 pounds.</p> <p>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.</p> <p>Exception: A portable ladder may be used for access for water heaters in attics in buildings with lift out ceilings.</p>	<p>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, <u>and not less than 22 inches by 30 inches (559 mm by 762 mm)</u> 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).</p> <p><u>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.</u></p> <p><u>Exception: A portable ladder may be used for access for water heaters in attics in buildings with lift out ceilings.</u></p>	<p>City of Houston Amendment Analysis: Minor edits included during City Legal review. Justification: Amendment needed to ensure conformity with state and local government policy and protect workers who access these types of ladders.</p>
<p>2012 Houston UPC – Chapter 6 Water Supply and Distribution</p>	<p>2015 Houston UPC – Chapter 6 Water Supply and Distribution</p>	<p>Code Analysis</p>

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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.

City of Houston Amendment

Analysis: No change made to COH amendment.
Justification: Amendment needed to ensure conformity with state and local government policy and protect water discharge.

603.5.19.2 Water Treatment Units. Reverse osmosis drinking water treatment units shall meet the requirements of the appropriate standards referenced in Table 1401.1. 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 water softeners shall be protected by a double check valve assembly.

City of Houston Amendment

Analysis: UPC 2012 Section 603.5.19.2 is relocated to UPC 2015 Section 603.5.18.2. The Table reference is updated from 1401.1 to 1701.1.
Justification: Amendment needed to ensure conformity with state and local government policy and protect water treatment units.

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

City of Houston Amendment

Analysis: New COH amendment.
Justification: Amendment includes updated 2018 provisions to provide more safety for chemical dispensers.

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

Material	Building Supply Pipe and Fittings	Water Distribution Pipe and Fittings	Referenced Standard(s) Pipe	Referenced Standard(s) Fittings
Asbestos-Cement	X*	—	ASTM C 296	—
Brass	X	X	ASTM B 43, ASTM B 135	—
Copper	X	X	ASTM B 42, ASTM B 75, ASTM B 88, ASTM B 251, ASTM B 302, ASTM B 447	ASME B 16.15, ASME B 16.18, ASME B 16.22, ASME B 16.26
CPVC	X	X	ASTM D 2846, ASTM F 441, ASTM F 442	ASSE 1061, ASTM D 2846, ASTM F 437, ASTM F 438, ASTM F 439, ASTM F 1970
Ductile-Iron	X	X	AWWA C 151	ASME B 16.4, AWWA C 110, AWWA C 153
Galvanized Steel	X	X	ASTM A 53	—

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

Material	Building Supply Pipe and Fittings	Water Distribution Pipe and Fittings	Referenced Standard(s) Pipe	Referenced Standard(s) Fittings
Copper and Copper Alloys	X	X	ASTM B42, ASTM B43, ASTM B75, ASTM B88, ASTM B135, ASTM B251, ASTM B302, ASTM B447	ASME B16.15, ASME B16.18, ASME B16.22, ASME B16.26, ASME B16.502, ASME B16.51, ASSE 1061
CPVC	X	X	ASTM D2846, ASTM F441, ASTM F442, CSA B137.6	ASSE 1061, ASTM D2846, ASTM F437, ASTM F438, ASTM F439, ASTM F1970, CSA B137.6
CPVC-AL-CPVC	X	X	ASTM F2855	ASTM D2846
Ductile-Iron	X	X	AWWA C151	ASME B16.4, AWWA C110, AWWA C153

City of Houston Amendment

Analysis: New COH amendment.
Justification: Table brought from 2018 UPC to provide a more updated list of approved fittings for water supply and distribution.

2012 Houston UPC Amendments

2015 Houston UPC Amendments

Code Change Summary

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Malleable Iron	X	X	-	ASME B 16.3
PE	X ⁺	-	ASTM D 2239, ASTM D 2737, ASTM D 3035, AWWA C 901, CSA B 137.9	ASTM D 2609, ASTM D 2683, ASTM D 3261, ASTM F 1055, CSA B 137.1
PE-AL-PE	X	X	ASTM F 1282, CSA B 137.9	ASTM F 1282, ASTM F 1974, CSA B 137.9
PE-RT	X	X	ASTM F 2769	ASTM F 1807, ASTM F 2098, ASTM F 2159, ASTM F 2735, ASTM F 2769
PEX	X	X	ASTM F 876, ASTM F 877, CSA B 137.5, AWWA C 904 *	ASSE 1061, ASTM F 877, ASTM F 1807, ASTM F 1960, ASTM F 1961, ASTM F 2080, ASTM F 2159, ASTM F 2735, CSA B 137.5
PEX-AL-PEX	X	X	ASTM F 1281, CSA B 137.10, ASTM F 2262	ASTM F 1281, ASTM F 1974, ASTM F 2434, CSA B 137.10
PP	X	X	ASTM F 2389, CSA B 137.11	ASTM F 2389, CSA B 137.11
PVC	X*	-	ASTM D 1785, ASTM D 2241, AWWA C 900	ASTM D 2464, ASTM D 2466, ASTM D 2467, ASTM F 1970
Stainless Steel	X	X	ASTM A 269, ASTM A 312	-

* For building supply or cold-water applications.

Galvanized Steel	X	X	ASTM A53	-
Malleable Iron	X	X	-	ASME B16.3
PE	X ⁺	-	ASTM D2239, ASTM D2737, ASTM D3035, AWWA C901, CSA B137.9	ASTM D2609, ASTM D2683, ASTM D3261, ASTM F1055, CSA B137.1
PE-AL-PE	X	X	ASTM F1282, CSA B137.9	ASTM F1282, ASTM F1974, ASTM F2159, ASTM F2735, ASTM F2769
PE-AL-PEX	X	X	ASTM F1986	ASTM F1986
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 ⁺	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 ⁺	-	ASTM D1785, ASTM D2241, AWWA C900	ASTM D2464, ASTM D2466, ASTM D2467, ASTM F1970, AWWA C907
Stainless Steel	X	X	ASTM A269, ASTM A312	-

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	<p>Notes:</p> <ol style="list-style-type: none"> * For building supply or exterior cold-water applications, not for water distribution piping. For brazed fittings only. 	
<p>604.9 Plastic Materials. Approved plastic materials I shall be permitted to be used in building supply piping, provided that where metal building supply piping is used for electrical grounding purposes, replacement piping therefore shall be of like materials.</p> <p>Exception: Where a grounding system acceptable to the Authority Having Jurisdiction is installed, inspected, and approved, metallic pipe shall be permitted to be replaced I with nonmetallic pipe. Plastic materials for building supply piping outside underground shall have a blue insulated copper tracer wire or other approved conductor installed adjacent to the piping. Access shall be provided to the tracer wire or the tracer wire shall terminate aboveground at each end of the nonmetallic piping. The tracer wire size shall be not less than 18 AWG and the insulation type shall be suitable for direct burial.</p>	<p>604.10.1 Tracer Wire. Plastic materials for building supply piping outside underground shall have a 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.</p>	<p>City of Houston Amendment</p> <p>Analysis: New COH amendment.</p> <p>Justification: Amendment includes updated 2018 provisions to provide clarity on tracer wire requirements.</p>
<p>604.11 Lead Content. Water pipe and fittings with a lead content which exceeds 8 0.25 percent shall be prohibited in piping systems used to convey potable water.</p>	<p>604.2 Lead Content. The maximum allowable lead content in pipes, pipe fittings, plumbing fittings, and fixtures intended to convey or dispense water for human consumption shall be not more than a weighted average of 0.25 percent with respect to the wetted surfaces of pipes, pipe fittings, plumbing fittings, and fixtures. For solder and flux, the lead content shall be not more than 0.2 percent where used in piping systems that convey or dispense water for human consumption.</p> <p>Exceptions:</p> <ol style="list-style-type: none"> Pipes, pipe fittings, plumbing fittings, fixtures, or backflow preventers used for nonpotable services such as manufacturing, industrial processing, irrigation, outdoor watering, or any other uses where the water is not used for human consumption. Flush valves, fill valves, flushometer valves, tub fillers, shower valves, service saddles, or water distribution main gate valves that are 2 inches (50 mm) in diameter or larger. <p>604.2.1 Lead Content of Water Supply Pipe and Fittings. Pipes, pipe fittings, valves, and faucets utilized in the water supply system for non-drinking water applications shall have a maximum of 8 percent lead content.</p>	<p>City of Houston Amendment</p> <p>Analysis: The code provisions of the 2015 model code that address lead content have been expanded extensively. The COH amendment is no longer needed and as such is not carried forward from the 2012 Houston Plumbing Code.</p> <p>Justification: Amendment no longer needed; provisions covered in 2015 base code.</p>
<p>605.10 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 605.10.1 and Section 605.10.2.</p>	<p>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 605.9.23.</p>	<p>City of Houston Amendment</p> <p>Analysis: These code provisions were relocated in the UPC 2015 from Section 605.10 to Section 605.9. New COH amendment included in conjunction with new Houston amendment 605.9.3 that was approved and incorporated during the Public Comment Period.</p> <p>Justification: New amendment approved and incorporated during the Public Comment Period.</p>
<p>N/A</p>	<p>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.</p>	<p>City of Houston Amendment</p> <p>Analysis: New COH amendment added to address material degradation and public safety concerns associated with PEX tubing resistant to chlorinated water.</p> <p>Justification: New amendment approved and incorporated during the Public Comment Period.</p>

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<p>N/A</p>	<p>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.</p> <p>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.</p>	<p>City of Houston Amendment</p> <p>Analysis: New COH amendment added to address material degradation concerns associated with PVC plastic pipe resistant to ultraviolet radiation from exposure to direct sunlight.</p> <p>Justification: Amendment includes updated 2018 provisions to provide clarity on the protection of PVC pipe and joints.</p>
<p>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.</p>	<p>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.</p>	<p>City of Houston Amendment</p> <p>Analysis: No change made to COH amendment.</p> <p>Justification: Amendment needed to ensure conformity with state and local government policy and protect buildings from freezing temperatures.</p>
<p>607.0 Gravity Supply Water Tanks.</p>	<p>607.0 Potable Water Supply Tanks.</p>	<p>City of Houston Amendment</p> <p>Analysis: Amendment not carried forward, base code updated.</p>
<p>607.2 Potable Water Supply Tanks. Potable water supply tanks, interior tank coatings, or tank liners intended to supply drinking water shall be in accordance with NSF 61. All potable water-supply tanks shall be properly covered or sealed to prevent entrance of foreign material into the water supply. Soil or waste lines shall not pass directly over nonpressure water-supply tanks or over manholes in pressure tanks.</p>	<p>607.2 Potable Water Tanks. 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.</p>	<p>City of Houston Amendment</p> <p>Analysis: Base code has been reworded, COH amendment remains unchanged.</p> <p>Justification: Amendment needed to ensure conformity with TCEQ requirements.</p>
<p>710.7 Drainage and Venting Systems. The drainage and venting systems, in connection with fixtures, sumps, receiving tanks, and mechanical waste-lifting devices, shall be installed under the same requirements as provided for in this code for gravity systems.</p>	<p>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.</p>	<p>City of Houston Amendment</p> <p>Analysis: 2012 amendment moved to 607.6. New COH amendment changing mesh size req's.</p> <p>Justification: Amendment needed to ensure conformity with state and local government policy and coincide with TCEQ requirements.</p>
<p>607.5 Overflow for Water-Supply Tanks. Overflow pipes for gravity tanks shall discharge above and within 6 inches of a roof drain, floor drain or catch basin, or they shall discharge into an open hub drain or water supplied sink. Adequate overflow pipes properly screened against the entrance of insects and vermin shall be provided.</p>	<p>607.4 Overflow. Tanks shall have not less than a 16-square inch (0.01 m²) 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.</p>	<p>City of Houston Amendment</p> <p>Analysis: The provisions addressing overflow of water tanks were updated and relocated to UPC 2015 Section 607.4. Previous UPC 2012 COH amendment in Section 607.5 is relocated to UPC 2015 Section 607.4 and joined with the additional new text of the model code. The 2015 COH amendment changes mesh size and overflow pipe requirements.</p> <p>Justification: Amendment needed to ensure conformity with state and local government policy and coincide with TCEQ requirements.</p>
<p>607.3 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 is not in compliance with the current ANSI/AWWA D102 Standards and has not been approved by the Authority Having Jurisdiction.</p>	<p>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.</p>	<p>City of Houston Amendment</p> <p>Analysis: UPC 2012 Section 607.3 COH amendment is relocated to UPC 2015 Section 607.6. COH amendment include minor editorial changes made by the City Legal department.</p> <p>Justification: Amendment needed to ensure conformity with state and local government policy and coincide with TCEQ requirements.</p>
<p>607.4 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,</p>	<p>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</p>	<p>City of Houston Amendment</p>

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the supply shall be from a gravity house tank, pressure tank, or booster system. No pumps are permitted to take suction directly from a jurisdiction main.

Exception: Pumps may be allowed to take suction from the jurisdiction main when approved by the Authority Having Jurisdiction if the main is of sufficient size as determined and approved by the Water Engineering Division of the jurisdiction's Public Works and Engineering Department.

607.6 Drains. Water-supply tanks shall be provided with valved drain lines located at their lowest point and discharged as indirect waste or as required for overflow pipes.

607.7 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 the following table.

TABLE 607.7

Sizes of Overflow Pipes for Water-supply Tanks

Maximum Capacity of Water Supply Line to Tank	Diameter of Overflow Pipe (inches ID)	Maximum Capacity of Water-supply Line to Tank	Diameter of Overflow Pipe (inches ID)
0-50 gpm	2	400-700 gpm	5
50-150 gpm	2½	700-1,000 gpm	6
100-200 gpm	3	over 1,000 gpm	8
200-400 gpm	4		

(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.

607.8 Construction of Tanks. Tanks used for potable water supply or to supply standpipes for fire-fighting 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

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.

607.8 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.

607.9 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

607.10 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

Analysis: 2012 amendment moved to 607.10. New amendment from 2012 Section 607.4. Amendment modified by City Legal Department.

Justification: Amendment needed to ensure conformity with state and local government policy and coincide with TCEQ requirements.

City of Houston Amendment

Analysis: 2012 amendment moved to 607.11. New amendment from 2012 Section 607.6. Amendment modified by City Legal department.

Justification: Amendment needed to ensure conformity with state and local government policy and coincide with TCEQ requirements.

City of Houston Amendment

Analysis: UPC 2012 Section 607.7 and Table 607.6 COH amendment id relocated to 607.9.

Justification: Amendment needed to ensure conformity with state and local government policy and coincide with TCEQ requirements.

City of Houston Amendment

Analysis: 2012 amendment moved to 607.13. New amendment from 2012 Section 607.8.

Justification: Amendment needed to ensure conformity with state and local government policy and coincide with TCEQ requirements.

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<p>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 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.</p>	<p>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 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.</p>	
<p>607.9 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.</p>	<p>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.</p>	<p>City of Houston Amendment Analysis: New amendment from 2012 Section 607.9. Justification: Amendment needed to ensure conformity with state and local government policy and coincide with TCEQ requirements.</p>
<p>607.10 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.</p>	<p>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.</p>	<p>City of Houston Amendment Analysis: New amendment from 2012 Section 607.10. Justification: Amendment needed to ensure conformity with state and local government policy and coincide with TCEQ requirements.</p>
<p>608.5 Drains. Relief valves located inside a building shall be provided with a drain, not smaller than the relief valve outlet, of galvanized steel, hard-drawn copper piping and fittings, CPVC, PP, or listed relief valve drain tube with fittings that will not reduce the internal bore of the pipe or tubing (straight lengths as opposed to coils) and shall extend from the valve to the outside of the building, with the end of the pipe not more than 2 feet (610 mm) nor less than 6 inches (152 mm) aboveground or the flood level of the area receiving the discharge and pointing downward. Such drains shall be permitted to terminate at other approved locations. Relief valve drains shall not terminate in a building's crawl space. No part of such drain pipe shall be trapped or subject to freezing. The terminal end of the drain pipe shall not be threaded..</p>	<p>608.5 Discharge Piping. The discharge piping that serves 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:</p> <ol style="list-style-type: none"> (1) Equal Discharge pipe shall 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. (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. 	<p>City of Houston Amendment Analysis: New amendment adding reference to ASME. Amendments modified during City Legal review. Justification: Amendment needed to provide updated ASME reference to coincide with state law.</p>
<p>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.</p>	<p>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.</p>	<p>City of Houston Amendment Analysis: No change to COH amendment. Justification: Amendment needed to ensure conformity with state and local government policy and coincide with TCEQ requirements. Field wrapping helps prevent expansive soils from breaking pipes below concrete.</p>

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<p>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.</p>	<p>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.</p> <p>Exception: PEX, PP or PE-RT tube shall be permitted to be tested with air where permitted by the manufacturer's instructions.</p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: Amendment includes updated 2018 provisions that provide more flexible testing in certain conditions.</p>
<p>N/A</p>	<p>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.</p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: Amendment needed to provide reference to IECC for piping insulation.</p>
<p>N/A</p>	<p>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 inches (51 mm) for a pipe of 2 inches (50 mm) or more in diameter.</p> <p>Exceptions:</p> <p>(1) Piping that penetrates framing members shall not be required to have pipe insulation for the distance of the framing penetration.</p> <p>(2) Hot water piping between the fixture control valve or supply stop and the fixture or appliance shall not be required to be insulated.</p>	<p>City of Houston Amendment Analysis: New COH amendment striking section. Justification: Amendment needed to conform to the requirements of the IECC for piping insulation.</p>
<p>Figure 6.5</p> <p>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.</p>	<p>Figure 6.5</p> <p>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.</p>	<p>City of Houston Amendment Analysis: No change to COH amendment.</p>
<p>2012 Houston UPC – Chapter 7 Sanitary Drainage</p>	<p>2015 Houston UPC – Chapter 7 Sanitary Drainage</p>	<p>Code Analysis</p>
<p>701.1 Drainage Piping. Materials for drainage piping shall be in accordance with one of the referenced standards in Table 701.1 except that:</p>	<p>701.2 Drainage Piping. Materials for drainage piping shall be in accordance with one of the referenced standards in Table 701.2 except that:</p>	<p>City of Houston Amendment Analysis: UPC 2012 amendment in Section 701.1 is relocated to UPC 2015 Section 701.2. New COH amendment includes</p>

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<p>(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.</p> <p>(2) ABS and PVC DWV piping installations shall be installed in accordance with applicable standards referenced in Table 1401.1 and Chapter 15 "Firestop Protection." Except for individual single-family dwelling units, materials exposed within ducts or plenums shall have a flame-spread index of a maximum of 25 and a smoke-developed index of a maximum of 50, where tested in accordance with ASTM E 84 and UL 723.</p> <p>(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.</p> <p>(4) Copper tube for drainage and vent piping shall have a weight of not less than that of copper drainage tube Type DWV.</p> <p>(5) Stainless steel 304 pipe and fittings shall not be installed underground and shall be kept not less than 6 inches (152 mm) aboveground.</p> <p>(6) Cast-iron soil pipe and fittings shall be listed and tested in accordance with standards referenced in Table 1401.1. Such pipe and fittings shall be marked with country of origin and identification of the original manufacturer in addition to markings required by referenced standards.</p> <p>(7) SDR 35 plastic pipe shall be approved material for drainage piping size 8 inches or larger.</p>	<p>(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.</p> <p>(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.</p> <p>(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.</p> <p>(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.</p> <p>(5) Stainless steel 304 pipe and fittings shall not be installed underground and shall be kept not less than 6 inches (152 mm) aboveground.</p> <p>(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 or fitting and identification of the original manufacturer in addition to markings required by referenced standards.</p> <p>(7) SDR 35 plastic pipe shall be approved material for drainage piping size 8 inches or larger.</p>	<p>updated code provisions from the 2018 UPC code changes. COH amendment includes minor edits added during City Legal review.</p> <p>Justification: Amendment includes updated 2018 provisions to provide more safety for chemical dispensers. No justification to continue changes to #1.</p>
<p>701.6 Below Slab. Piping installed below a slab on grade or mat type foundation shall be not less than 2 inches in diameter.</p>	<p>701.8 Below Slab. Piping installed below a slab on grade or mat type foundation shall be not less than 2 inches in diameter.</p>	<p>City of Houston Amendment</p> <p>Analysis: Previous COH amendment UPC 2012 Section 701.6 is relocated to UPC 2015 Section 701.8. No changes made to the code or code intent.</p> <p>Justification: Amendment needed to continue adherence to TCEQ policies and minimize stoppages in the line.</p>
<p>704.3 Commercial Dishwashing Machines and Sinks. Pot sinks, scullery sinks, dishwashing sinks, silverware sinks, commercial dishwashing machines, silverware-washing machines, 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, 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 as required by this code.</p>	<p>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, 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.</p>	<p>City of Houston Amendment</p> <p>Analysis: No change to COH amendment.</p> <p>Justification: Amendment needed to coincide with Health department regulations.</p>
<p>711.1 General. Drainage connections shall not be made into a drainage piping system within 8 feet (2,438 mm) of a vertical to horizontal change of direction of a stack containing suds-producing fixtures. Bathtubs, 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.</p> <p>Exceptions:</p> <ul style="list-style-type: none"> (1) Single-family residences. (2) Stacks receiving the discharge from less than three stories of plumbing fixtures. 	<p>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, 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.</p> <p>Exceptions:</p> <ul style="list-style-type: none"> (1) Single-family residences (2) Stacks receiving the discharge from less than three stories of plumbing fixtures. 	<p>City of Houston Amendment</p> <p>Analysis: No change to COH amendment.</p> <p>Justification: Amendment needed to ensure conformity with state and local government policy.</p>

2012 Houston UPC Amendments

2015 Houston UPC Amendments

Code Change Summary

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<p>713.4 Public Sewer Availability. The public sewer shall be permitted to be considered as not being available where such public sewer or building or an exterior drainage facility connected thereto is located more than 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.</p>	<p>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.</p>	<p>City of Houston Amendment Analysis: No change to COH amendment. Justification: Amendment needed to ensure conformity with Code of Ordinances and Public Works utility policies.</p>
<p>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.</p>	<p>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. <u>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.</u></p>	<p>City of Houston Amendment Analysis: No change to COH amendment. Justification: Amendment needed to ensure conformity with state and local government policy.</p>
<p>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 F 1216.</p>	<p>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.</p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: Amendment provides 2018 updated provisions for cast-iron soil pipes and fittings in existing sewers.</p>
<p>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.</p>	<p>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. <u>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.</u></p>	<p>City of Houston Amendment Analysis: No change to COH amendment. Justification: Amendment needed to ensure conformity with state and local government policy; protects public water and sewer systems from infiltration.</p>
<p>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.</p>	<p>724.0 Private Sewage Disposal Systems. 724.1 General. <u>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.</u></p>	<p>City of Houston Amendment Analysis: No change to COH amendment. Justification: Amendment needed to ensure conformity with state and local government policy and coincide with TCEQ regulations.</p>
<p>2012 Houston UPC – Chapter 8 Indirect Wastes</p>	<p>2015 Houston UPC – Chapter 8 Indirect Wastes</p>	<p>Code Analysis</p>
<p>804.2 Accessible Receptors. Accessible indirect waste receptors may be fabricated utilizing a “P” trap, riser stub, and an increaser to form a funnel.</p>	<p>804.2 Accessible Receptors. <u>Accessible indirect waste receptors may be fabricated utilizing a “P” trap, riser stub, and an increaser to form a funnel.</u></p>	<p>City of Houston Amendment Analysis: No change to COH amendment. Justification: Amendment needed to provide more sanitary indirect waste system options.</p>
<p>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</p>	<p>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</p>	<p>City of Houston Amendment Analysis: No change to COH amendment. Justification: Amendment needed to ensure conformity with state and local government policy.</p>

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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 shall not be discharged to the jurisdiction's drainage system.**

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 (45°C) shall not be discharged to the jurisdiction's drainage system.

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.**

811.9 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.**

811.10 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.**

811.11 Sample Wells. Each chemical neutralization basin shall be provided with a sample well on the discharge side of the neutralization basin.

City of Houston Amendment

Analysis: No change to COH amendment.
Justification: Amendment needed to ensure conformity with state and local government policy.

Table 811.9

Sizes of Neutralization Basins

Number of Sinks	Tank Capacity (Gallons)
1	5
4	15
8	30
16	55
25	100
40	150
60	200
75	275
100	350
200	675
300	1200
500	2000

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.

Table 811.9

Sizes of Neutralization Basins^{1,2}

Number of Sinks	Tank Capacity (Gallons)
1	5
4	15
8	30
16	55
25	100
40	150
60	200
75	275
100	350
200	675
300	1200
500	2000

- 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.

City of Houston Amendment

Analysis: No change to COH amendment.
Justification: Amendment needed to ensure conformity with state and local government policy.

814.0 Condensate Wastes and Control. **See the mechanical code.**

814.0 Condensate Waste and Control.

814.1 Condensate Disposal. ~~Condensate from air washers, air-cooling coils, fuel-burning condensing appliances, the overflow from evaporative coolers, and similar water-supplied equipment or similar air-conditioning equipment shall be collected and discharged to an approved plumbing fixture or disposal area. If discharged into the drainage system, equipment shall drain by means of an indirect waste pipe. The waste pipe shall have a slope of not less than 1/8 inch per foot (10.5 mm/m) or one percent slope and shall be of approved corrosion-resistant material not smaller than the outlet size in accordance with Table 814.1 for condensing fuel-burning~~

814.1 Condensate Disposal. Condensate from air washers, air-cooling coils, condensing appliances, **and** the overflow from evaporative coolers and similar water-supplied equipment or similar air-conditioning equipment shall be collected and discharged to an approved plumbing fixture or disposal area. **Where** discharged into the drainage system, equipment shall drain by means of an indirect waste pipe. The waste pipe shall have a slope of not less than 1/8 inch per foot (10.4 mm/m) or 1 percent slope and shall be of approved corrosion-resistant material not smaller than the outlet size in accordance with Section **814.3** or Section **814.4** for air-cooling coils or

City of Houston Amendment

Analysis: COH amendment not carried forward.
Justification: Strikethrough unnecessary; coincides with requirements of the UMC.

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<p>appliances, respectively. Condensate of wastewater shall not drain over a public way.</p> <p>814.2 Size. The size of condensate waste pipes may be for one unit or a combination of units, or as recommended by the manufacturer. The capacity of waste pipes assumes a 1/8 inch per foot (10.4 mm/m) or 1 percent slope, with the pipe running three-quarters full at the following pipe conditions:</p> <p>Outside Air — 20% Room Air — 80% DB WB — DB WB 90°F 73°F — 75°F 62.5°F For SI units: °C = (°F - 32)/1.8</p> <p>Condensate drain sizing for other slopes or other conditions shall be approved by the Authority Having Jurisdiction.</p> <p>Air-conditioning waste pipes shall be constructed of materials specified in Chapter 7.</p> <p>814.3 Point of Discharge. Air-conditioning condensate waste pipes shall connect indirectly to the drainage system through an airgap or airbreak to properly trapped and vented receptors, dry wells, leach pits, or the tailpiece of plumbing fixtures.</p> <p>Condensate waste shall not drain over a public way.</p>	<p>condensing appliances, respectively. Condensate or wastewater shall not drain over a public way.</p> <p>814.1.1 Condensate Pumps. Where approved by the Authority Having Jurisdiction, condensate pumps shall be installed in accordance with the manufacturer's installation instructions. Pump discharge shall rise vertically to a point where it is possible to connect to a gravity condensate drain and discharged to an approved disposal point. Each condensing unit shall be provided with a separate sump and interlocked with the equipment to prevent the equipment from operating during a failure. Separate pumps shall be permitted to connect to a single gravity indirect waste where equipped with check valves and approved by the Authority Having Jurisdiction.</p>	
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2012 Houston UPC – Chapter 9 Vents

2015 Houston UPC – Chapter 9 Vents

Code Analysis

903.1 Applicable Standards. Vent pipe and fittings shall comply with the applicable standards referenced in Table 701.1, except that:

- (1) No galvanized steel or 304 stainless steel pipe shall 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 1401.1, and Chapter 15 "Firestop Protection." Except for individual single-family dwelling units, materials exposed within ducts or plenums shall have a flame-spread index of a maximum of 25 and a smoke-developed index of not more than 50 where tested in accordance with ASTM E 84 **or UL 723.**

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.**

City of Houston Amendment
Analysis: New COH amendment. Amendment modified by City Legal department.
Justification: Amendment provides 2018 updated provisions to provide safer vent testing.

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

908.2 Horizontal Wet Venting for a Bathroom Group. A bathroom group located on the same floor level shall be permitted to be vented by a horizontal wet vent where all of the conditions of Section 908.2.1 through Section 908.2.5 are met.

City of Houston Amendment
Analysis: Amendment not carried forward.
Justification: Provisions are now covered in 2015 base code and are no longer needed.

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<p>fixtures shall discharge downstream of the wet vent system and be conventionally vented</p>		
<p>908.2.1 Vent Connection. The dry vent connection to the wet vent shall be an individual vent or common vent for the lavatory, urinal, bidet, shower, or bathtub. One or two vented lavatory(s) shall be permitted to serve as a wet vent for a bathroom group. Only one wet-vented fixture drain or trap arm shall discharge upstream of the dry-vented fixture drain connection. All dry vent connections to the horizontal wet vent shall be in accordance with Section 905.2 and Section 905.3.</p> <p>908.2.2 Size. The wet vent shall be sized based on the fixture unit discharge into the wet vent. The wet vent shall be not less than 2 inches (50 mm) in diameter for 4 drainage fixture units (dfu) or less, and not less than 3 inches (80 mm) in diameter for 5 dfu or more. The dry vent shall be sized in accordance with Table 702.1 and Table 703.2 based on the total fixtures units discharging into the wet vent.</p>	<p>908.2.1 Vent Connection. The dry vent connection to the wet vent shall be an individual vent for the bidet, shower, or bathtub. One or two vented lavatory(s) shall be permitted to serve as a wet vent for a bathroom group. Only one wet-vented fixture drain or trap arm shall discharge upstream of the dry-vented fixture drain connection. Dry vent connections to the horizontal wet vent shall be in accordance with Section 905.2 and Section 905.3.</p> <p>908.2.2 Size. The wet vent shall be sized based on the fixture unit discharge into the wet vent. The wet vent shall be not less than 2 inches (50 mm) in diameter for 4 drainage fixture units (dfu) or less, and not less than 3 inches (80 mm) in diameter for 5 dfu or more. The dry vent shall be sized in accordance with Table 702.1 and Table 703.2 based on the total fixture units discharging into the wet vent.</p>	<p>City of Houston Amendment Analysis: Amendment not carried forward. Justification: Provisions are now covered in 2015 base code and are no longer needed.</p>
<p>908.2.3 Trap Arm. The length of the trap arm shall not exceed the limits in Table 1002.2. The trap size shall be in accordance with Section 1003.3. The vent pipe opening from the horizontal wet vent, except for water closets and similar fixtures, shall not be below the weir of the trap.</p> <p>908.2.4 Water Closet. The water closet fixture drain or trap arm connection to the wet vent shall be downstream of tall fixture drain or trap arm connections to the horizontal wet vent.</p> <p>908.2.5 Additional Fixtures. Additional fixtures shall discharge downstream of the wet vent system and be conventionally vented. Only the fixtures within the bathroom group shall connect to the wet-vented horizontal branch.</p>	<p>908.2.3 Trap Arm. The length of the trap atm shall not exceed the limits in Table 1002.2. The trap size shall be in accordance with Section 1003.3. The vent pipe opening from the horizontal wet vent, except for water closets and similar fixtures, shall not be below the weir of the trap.</p> <p>908.2.4 Water Closet. The water closet fixture drain or trap arm connection to the wet vent shall be downstream of fixture drain or trap arm connections to the horizontal wet vent.</p> <p>908.2.5 Additional Fixtures. Additional fixtures shall discharge downstream of the wet vent system and be conventionally vented. Only the fixtures within the bathroom group shall connect to the wet-vented horizontal branch.</p>	<p>City of Houston Amendment Analysis: Previous COH amendment was updated code provisions from the UPC 2015 editions. As such the COH amendment in no longer needed. Justification: Provisions are now covered in 2015 base code and are no longer needed.</p>
<p>2012 Houston UPC – Chapter 10 Traps and Interceptors</p>	<p>2015 Houston UPC – Chapter 10 Traps and Interceptors</p>	<p>Code Analysis</p>
<p>1007.0 Trap Seal Protection.</p> <p>1007.1 General. Floor drain or similar traps directly connected to the drainage system and subject to infrequent use shall be protected with a trap seal primer, except where not deemed necessary for safety or sanitation by the Authority Having Jurisdiction, Trap seal primers shall be accessible for maintenance.</p> <p>1007.2 N/A</p>	<p>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.</p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: Amendment provides 2018 updated references to ASSE that provide better guidance on trap seal primers.</p>
<p>1009.8 Sample Wells. Each interceptor shall be provided with a sample well on the discharge side of the interceptor.</p>	<p>1009.8 Sample Wells. Each interceptor shall be provided with a sample well on the discharge side of the interceptor.</p>	<p>City of Houston Amendment Analysis: No change to COH amendment. Justification: Amendment needed to continue established policy regarding with Health department regulations.</p>
<p>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.</p>	<p>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.</p>	<p>City of Houston Amendment Analysis: No change to COH amendment. Justification: Amendment needed to provide prescriptive guidance to plumbers, designers, and inspectors.</p>

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Figure M.T-1
Minimum Size and Construction

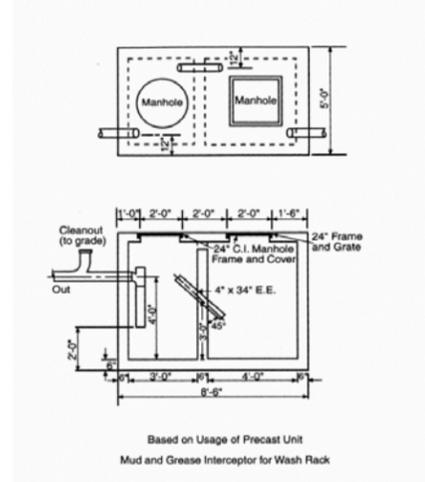
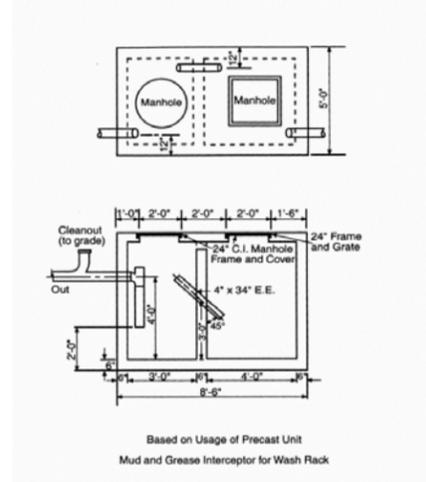


Figure M.T-1
Minimum Size and Construction



1012.1 General. Laundry equipment in commercial and industrial buildings that does not have integral strainers shall discharge into an interceptor having a wire basket or similar device that is removable for cleaning and that will prevent passage into the drainage system of solids 1/2 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.

An approved lint interceptor shall be installed for all commercial laundries.

Exceptions:

- (1) A laundry containing no more than 4 automatic clothes washers.**
- (2) A laundry in an R-2 occupancy containing no more than 10 automatic clothes washers.**

For 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 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 1/2 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.**

City of Houston Amendment

Analysis: 2012 amendment modified; exceptions not carried forward. Amendment modified by City Legal department.

Justification: No justification to carry forward exceptions to base code; remaining changes are required by City Ordinance 47-412.

1014.1.3 Food Waste Disposal Units and Dishwashers. Unless specifically required or permitted by the Authority Having Jurisdiction, no food waste disposal unit **or dishwasher** shall be connected to or discharge into any grease interceptor. Commercial food waste disposers shall be permitted to discharge directly into the building's drainage system.

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.**

City of Houston Amendment

Analysis: No change to COH amendment; base code exception also stricken.

Justification: Amendment needed to conform to local and state policies and protect the city water system.

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TABLE 1014.2.1
HYDROMECHANICAL GREASE INTERCEPTOR SIZING USING GRAVITY
FLOW RATES¹

DIAMETER OF GREASE WASTE PIPE (inches)	MAXIMUM FULL PIPE FLOW (gpm) ²	SIZE OF GREASE INTERCEPTOR	
		ONE-MINUTE DRAINAGE PERIOD (gpm)	TWO-MINUTE DRAINAGE PERIOD (gpm)
2	20	20	10
3	60	75	35
4	125	150	75
5	230	250	125
6	375	500	250

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

TABLE 1014.2.1
HYDROMECHANICAL GREASE INTERCEPTOR SIZING USING GRAVITY
FLOW RATES¹

DIAMETER OF GREASE WASTE PIPE (inches)	MAXIMUM FULL PIPE FLOW (gpm) ²	SIZE OF GREASE INTERCEPTOR	
		ONE-MINUTE DRAINAGE PERIOD (gpm)	TWO-MINUTE DRAINAGE PERIOD (gpm)
2	20	20	10
3	60	75	35
4	125	150	75
5	230	250	125
6	375	500/400	250/200

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

City of Houston Amendment

Analysis: New COH amendment for grease interceptors accepted during the Public Comment Period.

Justification: Amendment accepted during PCP to clarify intent and requirements of hydromechanical grease interceptors.

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 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.

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 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.

City of Houston Amendment

Analysis: No change to COH amendment.

Justification: Amendment needed to continue established policy for grease interceptors; helps eliminate buildups at the outlet.

Figure L.T-1

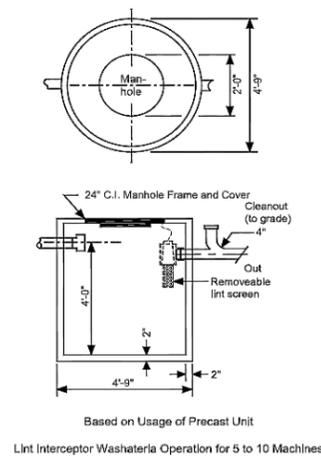
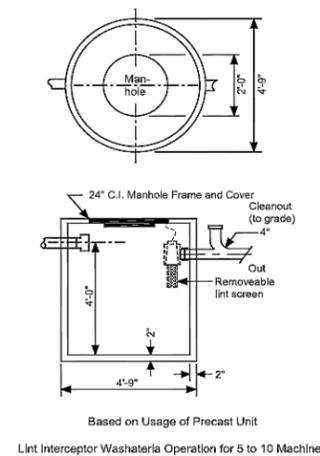


Figure L.T-1



City of Houston Amendment

Analysis: No change to COH amendment.

Figure L.T-2

Figure L.T-2

City of Houston Amendment

Analysis: No change to COH amendment.

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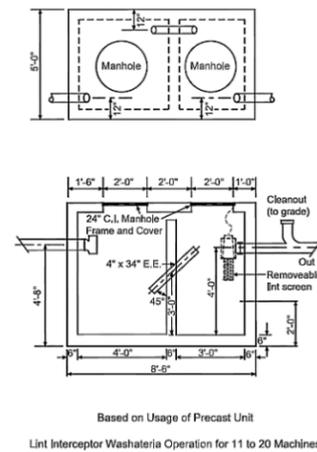
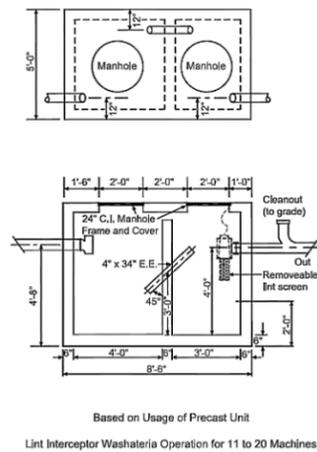


Figure L.T-3

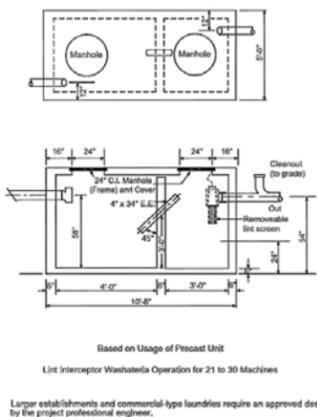
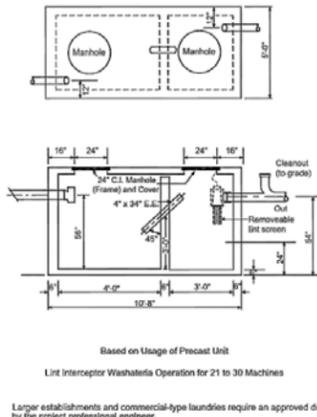


Figure L.T-3



City of Houston Amendment

Analysis: No change to COH amendment.

2012 Houston UPC – Chapter 11 Storm Drainage

2015 Houston UPC – Chapter 11 Storm Drainage

Code Analysis

1101.3 Material Uses. Rainwater piping placed within the interior of a building or run within a vent or shaft shall be of cast-iron, galvanized steel, wrought iron, brass, copper, 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 IS 5, IS 9, and Chapter 15 “Firestop Protection.” Except for individual single-family dwelling units, materials exposed within ducts or plenums shall have a flame-spread index of a maximum of 25 and a smoke-developed index of a maximum of 50, where tested in accordance ASTM E 84 and UL 723.

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 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.**

City of Houston Amendment

Analysis: Amendment moved from 2012 Section 1101.3; no change to COH amendment. Amendment modified by City Legal department.

Justification: Amendment needed to ensure conformity to local and state policies.

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<p>1102.1 Conductors. Conductors installed aboveground in buildings shall be in accordance with the applicable standards referenced in Table 701.1 for aboveground drain, waste, and vent pipe.</p> <p>1102.1.1 Inside of Conductors. The inside of conductors installed above ground level shall be of seamless copper water tube, Type K, L, or M; Schedule 40 copper pipe or Schedule 40 copper alloy pipe; Type DWV copper drainage tube; service weight cast-iron soil pipe or hubless cast-iron soil pipe; standard weight galvanized steel pipe; 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) above ground]; or Schedule 40 ABS or Schedule 40 PVC plastic pipe; or SDR 35 plastic pipe.</p>	<p>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:</p> <ol style="list-style-type: none"> (1) sSeamless 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) sService weight cast-iron soil pipe or hubless cast-iron soil pipe; (5) sStandard weight galvanized steel pipe; (6) sStainless 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. 	<p>City of Houston Amendment</p> <p>Analysis: Amendment moved from 2012 Section 1102.1.1; amendments includes new length req's. Amendment modified during City Legal review.</p> <p>Justification: Amendment needed to ensure conformity to local and state policies.</p>
<p>1102.2 Leaders. Leaders installed outside shall be in accordance with the applicable standards referenced in Table 701.1 for aboveground drain, waste, and vent pipe; aluminum sheet metal; galvanized steel sheet metal; or copper sheet metal; or SDR 35 plastic pipe.</p>	<p>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.</p>	<p>City of Houston Amendment</p> <p>Analysis: Amendment moved from 2012 Section 1102.2; amendment includes new length req's.</p> <p>Justification: Amendment needed to ensure conformity to local and state policies.</p>
<p>1101.11.1 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-1.1 (in Appendix D) for 100-year, 60-minute storms at various locations.</p>	<p>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-1.1 (in Appendix D) for 100-year, 60-minute storms at various locations.</p>	<p>City of Houston Amendment</p> <p>Analysis: Previous COH amendment in UPC 2012 Section 1101.11.1 is Relocated to UPC 2015 Section 1101.12.1. There is no change the model code or the COH amendment.</p> <p>Justification: Amendment needed to ensure conformity to local and state policies.</p>
<p>1101.11.2.2.(B) Combined System. The secondary roof drains shall connect to the vertical piping of the primary storm drainage conductor downstream of a horizontal offset 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 1106.0 based on double the rainfall rate for the local area.</p>	<p>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.</p>	<p>City of Houston Amendment</p> <p>Analysis: Amendment moved from 2012 Section 1101.11.2.2(B); no change to COH amendment.</p> <p>Justification: Amendment needed to ensure conformity to local and state policies.</p>
<p>1101.14 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 shall be provided with a vent system. Vent system shall comply with Chapter 9. Drains located on the top level of the enclosed parking garage and directly exposed to rain water shall be drained to the storm drainage system. Traps and vents are not required on these drains.</p> <p>1101.15 Open Parking Garages. All drains exposed to rain water and connected to the storm drainage system within an open parking garage shall not require a trap or to be vented.</p>	<p>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.</p> <p>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.</p>	<p>City of Houston Amendment</p> <p>Analysis: Previous COH amendment in UPC 2012 Section 1101.14 is relocated to UPC 2015 Section 1101.17. There is no change to COH amendment except for a minor editorial change added during City Legal review.</p> <p>Justification: Amendment needed to ensure conformity to local and state policies and establishes requirements for parking garages that are not covered in the base code.</p>

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TABLE 1101.7
SIZING OF HORIZONTAL RAINWATER PIPING^{1, 2}

SIZE OF PIPE	FLOW (1/8 in./ft. slope)	MAXIMUM ALLOWABLE HORIZONTAL PROJECTED ROOF AREAS AT VARIOUS RAINFALL RATES (square feet)							
		1 (in/h)	2 (in/h)	3 (in/h)	4 (in/h)	5 (in/h)	6 (in/h)	8 (in/h)	
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	1384	133,200	66,600	44,400	33,300	26,650	22,200	16,650	
15	2473	238,000	119,000	79,333	59,500	47,600	39,650	29,750	

TABLE 1101.8
SIZING OF HORIZONTAL RAINWATER PIPING^{1, 2}

SIZE OF PIPE	FLOW (1/8 in./ft. slope)	MAXIMUM ALLOWABLE HORIZONTAL PROJECTED ROOF AREAS AT VARIOUS RAINFALL RATES (square feet)							
		1 (in/h)	2 (in/h)	3 (in/h)	4 (in/h)	5 (in/h)	6 (in/h)	8 (in/h)	
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	

SIZE OF PIPE	FLOW (1/4 in./ft. Slope)	MAXIMUM ALLOWABLE HORIZONTAL PROJECTED ROOF AREAS AT VARIOUS RAINFALL RATES (square feet)							
		1 (in/h)	2 (in/h)	3 (in/h)	4 (in/h)	5 (in/h)	6 (in/h)	8 (in/h)	
3	48	4640	2,320	1546	1,160	928	773	580	
4	110	10,600	5,300	3533	2,650	2,120	1,766	1,325	
5	196	18,880	9,440	6293	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	29,000	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	

SIZE OF PIPE	FLOW (1/4 in./ft. Slope)	MAXIMUM ALLOWABLE HORIZONTAL PROJECTED ROOF AREAS AT VARIOUS RAINFALL RATES (square feet)							
		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	29,000	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	

SIZE OF PIPE	FLOW (1/2 in./ft. Slope)	MAXIMUM ALLOWABLE HORIZONTAL PROJECTED ROOF AREAS AT VARIOUS RAINFALL RATES (square feet)							
		1 (in/h)	2 (in/h)	3 (in/h)	4 (in/h)	5 (in/h)	6 (in/h)	8 (in/h)	
3	68	6,576	3,288	2,192	1,644	1,310	1,096	822	
4	156	15,040	7,520	5,010	3,760	3,010	2,500	1,880	
5	278	26,720	13,360	8,900	6,680	5,320	4,450	3,340	
6	445	42,800	21,400	14,267	10,700	8,580	7,140	5,350	
8	956	92,000	46,000	30,650	23,000	18,400	15,320	11,500	
10	1,721	165,600	82,800	55,200	41,400	33,150	27,600	20,700	
12	2,768	266,400	133,200	88,800	66,600	53,200	44,400	33,300	
15	4,946	476,000	238,000	158,700	119,000	95,200	79,300	59,500	

SIZE OF PIPE	FLOW (1/2 in./ft. Slope)	MAXIMUM ALLOWABLE HORIZONTAL PROJECTED ROOF AREAS AT VARIOUS RAINFALL RATES (square feet)							
		1 (in/h)	2 (in/h)	3 (in/h)	4 (in/h)	5 (in/h)	6 (in/h)	8 (in/h)	
3	68	6576	3288	2192	1644	1310	1096	822	
4	156	15 040	7520	5010	3760	3010	2500	1880	
5	278	26 720	13 360	8900	6680	5320	4450	3340	
6	445	42 800	21 400	14 267	10 700	8580	7140	5350	
8	956	92 000	46 000	30 650	23 000	18 400	15 320	11 500	
10	1721	165 600	82 800	55 200	41 400	33 150	27 600	20 700	
12	2768	266 400	133 200	88 800	66 600	53 200	44 400	33 300	
15	4946	476 000	238 000	158 700	119 000	95 200	79 300	59 500	

For SI units: 1 inch = 25 mm, 1 gallon per minute = 0.06 L/s, 1/8 inch per foot = 10.4 mm/m, 1 inch per hour = 25.4 mm/h, 1 square foot = 0.0929 m²

Notes:

- The sizing data for horizontal piping are based on the pipes flowing full.
- 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.

For SI units: 1 inch = 25 mm, 1 gallon per minute = 0.06 L/s, 1/8 inch per foot = 10.4 mm/m, 1 inch per hour = 25.4 mm/h, 1 square foot = 0.0929 m²

Notes:

- The sizing data for horizontal piping are based on the pipes flowing full.
- 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.

City of Houston Amendment

Analysis: Amended Table moved from 2012 Section 1101.7 to UPC 2015 Table 1101.8; No change to model code Table or the COH amendment.

Justification: Amendment needed to ensure conformity to local and state policies.

N/A

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

City of Houston Amendment

Analysis: New COH amendment.

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2012 Houston UPC – Chapter 12 Fuel Gas Piping	2015 Houston UPC – Chapter 12 Fuel Gas Piping	Code Analysis
<p>1202.1 Installation. The regulations of this chapter shall govern the installation of fuel gas piping, other than service pipe, in or in connection with a building or structure or within the property lines of any premises up to 5 pounds force per square inch (34 kPa), other than service pipe. Fuel oil piping systems shall be installed in accordance with NFPA 31.</p> <p>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)]</p>	<p>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.</p> <p>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)]</p>	<p>Justification: Amendment provides updated 2018 provisions for siphonic systems that are not covered in the 2015 base code.</p> <p>City of Houston Amendment</p> <p>Analysis: UPC 2012 Section 1202.1 is relocated to 2015 UPS Section 1201.1. The previous COH amendment is brought forward to the UPC 2015. No changes to the COH amendment.</p> <p>Justification: Amendment needed to ensure conformity to local and state policies.</p>
<p>1201.3 Application. This code shall not apply to the following (reference standards for some of which appear in Chapter 14):</p> <ol style="list-style-type: none"> (1) Portable LP-Gas appliances 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-fuel gas cutting and welding systems. (5) Industrial gas applications using gases such as acetylene and acetylenic compounds, hydrogen, ammonia, carbon monoxide, oxygen, and nitrogen. (4)(6) Petroleum refineries, pipeline compressor or pumping stations, loading terminals, compounding plants, refinery tank farms, and natural gas processing plants. (5)(7) 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. (6)(8) LP-Gas installations at utility gas plants. (7)(9) Liquefied natural gas (LNG) installations. (8)(10) Fuel gas piping in electric utility power plants. (9)(11) Proprietary items of equipment, apparatus, or instruments such as gas-generating sets, compressors, and calorimeters. (10)(12) LP-Gas appliances for vaporization, gas mixing, and gas manufacturing. (11)(13) 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. (12)(14) Installation of LP-Gas systems for railroad switch heating. (13)(15) Installation of LP-Gas and compressed natural gas systems on vehicles. (14)(16) 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 54-12:1.1.1.2] 	<p>1202.3 Applications. This code shall not apply to the following (reference standards for some of which appear in Chapter 17):</p> <ol style="list-style-type: none"> (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) 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. (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] 	<p>City of Houston Amendment</p> <p>Analysis: Previous COH amendment in UPC 2012 Section 1201.3 is relocated to UPC 2015 Section 1202.3. The amendment contains new provisions covering portable cutting and welding systems.</p> <p>Justification: Amendment needed to ensure conformity to local and state policies.</p>

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<p>(15) <u>Liquid petroleum gas facilities regulated by the Railroad Commission of Texas pursuant to Chapter 113 of the Texas Natural Resources Code.</u></p>	<p>(16) <u>Liquid petroleum gas facilities regulated by the Railroad Commission of Texas pursuant to Chapter 113 of the Texas Natural Resources Code.</u></p>	
<p>1201.4 Other requirements. All fuel oil facilities and piping shall conform to the requirements of Chapter 57 of the City of Houston fire code.</p> <p>1201.5 Gas Tests. A permit shall be required for all gas tests. Gas systems shall require a complete test and inspection in the following circumstances:</p> <ol style="list-style-type: none"> (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 City of Houston fire code. (6) Where service is not commenced within 180 days following a gas test. 	<p>1202.4 Other Requirements. All fuel oil facilities and piping shall conform to the requirements of Chapter 57 of the Fire Code.</p> <p>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:</p> <ol style="list-style-type: none"> (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. 	<p>City of Houston Amendment</p> <p>Analysis: Amendment moved from 2012 Section 1201.4 and 1201.5; no change to COH amendment. Amendment modified by City Legal department.</p> <p>Justification: Amendment needed to provide reference to IFC requirements; ensures conformity to local and state policies; establishes guidelines for gas system permits.</p>
<p>1203.3.1 Rough Piping Inspection. This inspection shall be made after gas piping <u>within the building</u> authorized by 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. <u>This inspection shall also include a pressure test. The gas piping shall pass an air pressure test of 25 psi for a period of 15 minutes with no perceptible drop.</u></p> <p>Exception: For metal welded piping, the test pressure shall be not less than 100 psi (689 kPa) for 30 minutes. These tests shall be made using air, CO₂, or nitrogen pressure only and shall be made in the presence of the inspector. All necessary apparatus for conducting tests shall be furnished by the permit holder.</p>	<p>1203.3.1 Rough Piping Inspection. This inspection shall be made after gas piping <u>within the building</u> authorized by 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. <u>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.</u></p> <p>Exception: For metal welded piping, <u>and for piping carrying gas at pressure greater than 14 inches (0.4 m) water column pressure (3.4878 kPa),</u> the test pressure shall be not less than 100 psi (689 kPa) for 30 minutes. These tests shall be made using air, CO₂, 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.</p>	<p>City of Houston Amendment</p> <p>Analysis: Amendment modified during City Legal review.</p> <p>Justification: Amendment needed to ensure conformity to local and state policies and TCEQ regulations; provides safer testing of rough piping.</p>
<p>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 <u>any</u> fixture, appliance, or shutoff valve has been attached thereto <u>and after the completed system is ready to be put into service.</u> This inspection shall comply with Section 1213.43. Test gauges used in conducting tests shall be in accordance with Section 318.0.</p>	<p>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 <u>any</u> fixture, appliance, or shutoff valve has been attached thereto <u>and after the completed system is ready to be put into service.</u> This inspection shall comply with Section 1213.43. Test gauges used in conducting tests shall be in accordance with Section 318.0.</p>	<p>City of Houston Amendment</p> <p>Analysis: No change to COH amendment.</p> <p>Justification: Amendment needed to ensure conformity to local and state policies.</p>
<p>1208.6.1.3 Additional Requirements. Gas meters shall not be located under a show window or 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.</p>	<p>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.</p>	<p>City of Houston Amendment</p> <p>Analysis: No change to COH amendment.</p> <p>Justification: Amendment needed to ensure conformity to Centerpointe installation requirements.</p>
<p>1210.1.6 Piping Underground Beneath Buildings. Where gas piping is installed underground beneath buildings, the piping shall be either:</p>	<p>1210.1.6 Piping Underground Beneath Buildings. Where gas piping is installed underground beneath buildings, the piping shall be one of the following:</p>	<p>City of Houston Amendment</p> <p>Analysis: No change to COH amendment.</p>

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<p>(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. [NFPA54-12:7.1.6] (3) Pipe must be removable without causing damage to the structure. Sleeves for corrugated stainless steel piping may terminate within the building.</p>	<p>(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) <u>Pipe must be removable without causing damage to the structure. Sleeves for corrugated stainless-steel piping may terminate within the building.</u></p>	<p>Justification: Amendment needed to ensure conformity to local and state policies.</p>
<p>1210.1.6.1 Conduit with One End Terminating Outdoors. The conduit shall extend into a normally usable and 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, and be graded to the outside. [NFPA 54:7.1.6.1]</p>	<p>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, <u>and be installed so as to prevent the entrance of water and insects, and be graded to the outside.</u> [NFPA 54:7.1.6.2]</p>	<p>City of Houston Amendment Analysis: No change to COH amendment. Justification: Amendment needed to ensure conformity to local and state policies and TCEQ regulations.</p>
<p>1210.1.7.2 Tracer Wire. An electrically continuous corrosion-resistant tracer wire (not less than AWG 14 yellow) or tape shall be buried with the plastic pipe to facilitate locating. One Both ends shall terminate be brought aboveground at a building wall or riser. [NFPA 54:7.1.7.3]</p>	<p>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. <u>One Both ends</u> of the tracer wire or tape shall <u>terminate be brought</u> aboveground at a building wall or riser. [NFPA 54:7.1.7.3]</p>	<p>City of Houston Amendment Analysis: No change to COH amendment. Justification: Amendment needed to ensure conformity to NEC requirements.</p>
<p>N/A</p>	<p>1210.2.4.3 Piping on Roof Tops. <u>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.</u> [NFPA 54:7.2.5.4]</p>	<p>City of Houston Amendment Analysis: New COH amendment. Amendment modified by City Legal department. Justification: Amendment provides updated 2018 provisions for piping on roof tops.</p>
<p>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: <u>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.</u> [NFPA 54:7.3.5.2]</p>	<p>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: <u>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.</u> [NFPA 54:7.3.5.2]</p>	<p>City of Houston Amendment Analysis: No change to COH amendment. Justification: Amendment needed to ensure conformity to local and state policies.</p>
<p>1210.4.3 Ventilation. A chase shall be ventilated to the outdoors and at the top. The openings shall have a minimum free area [in square inches (m²)] equal to the product of one-half of the maximum pressure in the piping [in psi (kPa)] times 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]</p>	<p>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 (m²)] 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]</p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: Amendment provides updated 2018 provisions for ventilation requirements.</p>

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<p>N/A</p>	<p>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]</p> <p>1211.2.2 Bonding Connections. Bonding connections shall be in accordance with NFPA 70. [NFPA 54:7.13.2.4]</p> <p>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]</p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: Amendment provides updated 2018 provisions for the bonding of CSST gas piping.</p>
<p>1210.17 Electrical Connections. Electrical connections between wiring and electrically operated control devices in a piping system shall comply with the requirements of NFPA 70. [NFPA54:7.15.1]</p>	<p>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]</p>	<p>City of Houston Amendment Analysis: New COH amendment. Amendment modified by City Legal department. Justification: Amendment provides updated 2018 provision to reference NFPA 70 for all electrical connections.</p>
<p>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 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]</p>	<p>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]</p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: Amendment provides updated 2018 provisions allowing safer alternative to testing piping systems.</p>
<p>1213.3 Test Pressure. This inspection shall include an air, CO₂, or nitrogen pressure test, at a pressure of at least 6 inches (152 mm) of mercury, measured with a manometer or slope gauge at 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. 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 1201.5. For annual gas tests and GTO's, the tests shall be done at the pressure required for the final gas inspection.</p> <p>Exception: In lieu of the mercury gauge one of the following may be used:</p> <p>(1) Low Pressure Systems - A low pressure diaphragm gauge with a minimum dial size of 3 1/2 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.</p> <p>(2) Medium Pressure Systems - A diaphragm type pressure gauge with a minimum dial size of 3 1/2 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.</p> <p>(3) High Pressure Systems - Gauges for high pressure tests shall be as follows:</p>	<p>1213.3 Test Pressure. This inspection shall include an air, CO₂, 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, CO₂, 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.</p> <p>Exception: In lieu of the mercury gauge one of the following may be used:</p> <p>(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</p>	<p>City of Houston Amendment Analysis: UPC 2012 Section 1213.3 model code has been restructured with specific prescriptive test requirements. from 2012 to 2015, COH amendment remains unchanged. Justification: Amendment needed to ensure conformity to local policies. Houston is more restrictive due to life-safety requirements; typical pressures are higher in Houston than what are listed in the base code.</p>

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- A.** Required pressure tests exceeding ten (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.

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. These tests shall be made using air, CO₂, 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.

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.

1216.6 Variable Gas Pressure. Where the 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 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.

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 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.

City of Houston Amendment

Analysis: New COH amendment.

Justification: Amendment provides updated 2018 provisions variable gas pressure devices.

N/A

EDITORIAL NOTE: DELETE AND REPLACE TABLES 1216.2(2) AND 1216.2(3) WITH THE FOLLOWING:

City of Houston Amendment

Analysis: New COH amendment.

Justification: Amendment replaces the two pipe sizing tables with the 2018 version to provide more up-to-date industry requirements.

N/A

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									
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	10 600	16 900	29 800	60 800
20	312	652	1230	2520	3780	7280	11 600	20 500	41 800
30	250	524	986	2030	3030	5840	9310	16 500	33 600
40	214	448	844	1730	2600	5000	7970	14 100	28 700
50	190	397	748	1540	2300	4430	7060	12 500	25 500
60	172	360	678	1390	2090	4020	6400	11 300	23 100
70	158	331	624	1280	1920	3690	5890	10 400	21 200

City of Houston Amendment

Analysis: New COH amendment.

Justification: Amendment replaces the two pipe sizing tables with the 2018 version to provide more up-to-date industry requirements.

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80	147	308	580	1190	1790	3440	5480	9690	19 800
90	138	289	544	1120	1670	3230	5140	9090	18 500
100	131	273	514	1060	1580	3050	4860	8580	17 500
125	116	242	456	936	1400	2700	4300	7610	15 500
150	105	219	413	848	1270	2450	3900	6890	14 100
175	96	202	380	780	1170	2250	3590	6340	12 900
200	90	188	353	726	1090	2090	3340	5900	12 000
250	80	166	313	643	964	1860	2960	5230	10 700
300	72	151	284	583	873	1680	2480	4740	9660
350	66	139	261	536	803	1550	2470	4630	8890
400	62	129	243	499	747	1440	2290	4050	8270
450	58	121	228	468	701	1350	2150	3800	7760
500	55	114	215	442	662	1280	2030	3590	7330
550	52	109	204	420	629	1210	1930	3410	6960
600	50	104	195	400	600	1160	1840	3260	6640
650	47	99	187	384	575	1110	1760	3120	6360
700	46	95	179	368	552	1060	1690	3000	6110
750	44	92	173	355	532	1020	1630	2890	5890
800	42	89	167	343	514	989	1580	2790	5680
850	41	86	162	332	497	957	1530	2700	5500
900	40	83	157	322	482	928	1480	2610	5330
950	39	81	152	312	468	901	1440	2540	5180
1000	38	79	148	304	455	877	1400	2470	5040
1100	36	75	141	289	432	833	1330	2350	4780
1200	34	71	134	275	412	794	1270	2240	4560
1300	33	68	128	264	395	761	1210	2140	4370
1400	31	65	123	253	379	731	1160	2060	4200
1500	30	63	119	244	366	704	1120	1980	4050
1600	29	61	115	236	353	680	1080	1920	3910
1700	28	59	111	228	342	658	1050	1850	3780
1800	27	57	108	221	331	638	1020	1800	3670
1900	27	56	105	215	322	619	987	1750	3560
2000	26	54	102	209	313	602	960	1700	3460

For SI units: 1 inch = 25 mm, 1 foot = 304.8 mm, 1 cubic foot per hour = 0.0283 m³/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.

N/A

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

City of Houston Amendment

Analysis: New COH amendment.

Justification: Amendment replaces the two pipe sizing tables with the 2018 version to provide more up-to-date industry requirements.

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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	1630	2040	3930	6260	11100	22600
150	153	319	601	1230	1850	3560	5670	10000	20500
175	140	293	553	1140	1700	3270	5220	9230	18800
200	131	273	514	1056	1580	3050	4860	8580	17500
250	116	242	456	936	1400	2700	4300	7610	15500
300	105	219	413	848	1270	2450	3900	6890	14100
350	96	202	380	780	1170	2250	3590	6340	12900
400	90	188	353	726	1090	2090	3340	5900	12000
450	84	176	332	681	1020	1960	3130	5540	11300
500	80	166	313	643	964	1860	2960	5230	10700
550	76	158	297	611	915	1760	2810	4970	10100
600	72	151	284	583	873	1680	2680	4740	9660
650	69	144	272	558	836	1610	2570	4540	9250
700	66	139	261	536	803	1550	2470	4360	8890
750	64	134	252	516	774	1490	2380	4200	8560
800	62	129	243	499	747	1440	2290	4050	8270
850	60	125	235	483	723	1390	2220	3920	8000
900	58	121	228	468	701	1350	2150	3800	7760
950	56	118	221	454	681	1310	2090	3690	7540
1000	55	114	215	442	662	1280	2030	3590	7330
1100	52	109	204	420	629	1210	1930	3410	6960
1200	50	104	195	400	600	1160	1840	3260	6640
1300	47	99	187	384	575	1110	1760	3120	6360
1400	46	95	179	368	552	1060	1690	3000	6110
1500	44	92	173	355	532	1020	1630	2890	5890
1600	42	89	167	343	514	989	1580	2790	5680
1700	41	86	162	332	497	957	1530	2700	5500
1800	40	83	157	322	482	928	1480	2610	5330
1900	39	81	152	312	468	901	1440	2540	5180
2000	38	79	148	304	455	877	1400	2470	5040

For SI units: 1 inch = 25 mm, 1 foot = 304.8 mm, 1 cubic foot per hour = 0.0283 m³/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.

2012 Houston UPC – Chapter 13
 Health Care Facilities and Medical Gas and Vacuum Systems

2015 Houston UPC – Chapter 13
 Health Care Facilities and Medical Gas and Medical Vacuum Systems

Code Analysis

1309.3 Terms. Where the terms "medical gas" or "vacuum" occur, the provisions shall apply to piped systems for oxygen, nitrous oxide, medical air, carbon dioxide, helium, medical-surgical vacuum, waste anesthetic gas disposal, and mixtures thereof. Where the name of a specific gas or vacuum service occurs, the provision shall apply to that gas. [NFPA 99:5.1.1.2]

1301.4 Terms. Where the terms "medical gas" or "medical support gas" occurs, 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]

City of Houston Amendment

Analysis: New COH amendment.

Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.

1301.1 Where Required. Construction and equipment requirements shall be applied to new construction and new equipment, except as modified in individual chapters. 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 code. Where the alteration, renovation, or modernization adversely impacts existing performance requirements of a system or component, additional upgrading shall be required. [NFPA 99:1.3.2 - 1.3.2.2]

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]

City of Houston Amendment

Analysis: New COH amendment.

Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.

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<p>1309.7 Existing Systems. An existing system that is not in strict compliance with the provisions of this code shall be permitted to be continued in use as long as the Authority Having Jurisdiction has determined that such use does not constitute a distinct hazard to life. [NFPA 99:5.1.1.4]</p>	<p>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]</p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>N/A</p>	<p>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]</p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>N/A</p>	<p>1302.1.1 Risk Assessment. Categories shall be determined by following and documenting a defined risk assessment procedure. [NFPA 99:4.2.1]</p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>N/A</p>	<p>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:</p> <ul style="list-style-type: none"> (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] 	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>N/A</p>	<p>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]</p> <p>Exception: Deep sedation and general anesthesia shall not be administered where using a Category 3 medical gas system. [NFPA 99:5.3.1.5]</p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>N/A</p>	<p>(EDITORIAL NOTE: DELETE SECTION 1304.3 AND REPLACE WITH THE FOLLOWING:)</p> <p>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:</p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to</p>

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	<p>(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.</p> <p>(2) The loss of the piped gas or piped vacuum systems is likely to cause minor injury to patients, staff, or visitors.</p> <p>(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]</p>	<p>new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>N/A</p>	<p>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:</p> <p>(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.</p> <p>(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.</p> <p>(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]</p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>1302.3 Installation. The installation of medical gas and vacuum systems shall be made by qualified, competent technicians who are experienced in making such installations. Installers of medical gas and vacuum systems shall meet the requirements of ASSE 6010. [NFPA 99:5.1.10.10.11.1- 5.1.10.10.11.2]</p>	<p>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]</p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>1310.5 Health Care Organization Personnel. Health care organization personnel shall be permitted to install piping systems where the requirements of this chapter are met during installation. [NFPA 99:5.1.10.1 0.11.5] Piping and Installation. Piping and installation procedures shall comply with NFPA 99, latest edition, as adopted by the Texas Department of Health.</p>	<p>1306.3 Health Care Organization Personnel. Health care organization personnel shall be permitted to install piping systems where the requirements of Section 1306.4 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.</p>	<p>City of Houston Amendment Analysis: UPC 2012 Section 1310.5 model code and COH amendment is relocated to UPC 2015 Section 1306.3. Justification: Amendment needed to ensure conformity to state law.</p>
<p>1310.6 Brazing Procedures. Brazing procedures and brazer performance for the installation of medical gas and vacuum piping shall be qualified in accordance with either Section IX of the ASME Boiler and Pressure Vessel Code or AWS B2.2, both as modified below. [NFPA 99:5.1.10.1 0.12.1]</p> <p>1310.6.1 Examination. Brazers shall be qualified by visual examination of the test coupon followed by sectioning. [NFPA 99:5.1.10.1 0.12.2]</p> <p>1310.6.2 Brazing Procedure Specification (BPS). The brazing procedure specification (BPS) shall address cleaning, joint clearance, overlap, internal purge gas flow rate, and filler metal. [NFPA 99:5.1.10.10.12.3]</p> <p>1310.6.3 Documentation. The brazing procedure specification and the record of brazer performance qualification shall document filler metal used, cleaning, joint clearance, overlap, internal purge gas, and flow rate during brazing of coupon, and the absence of internal oxidation in the completed coupon. [NFPA 99:5.1.10.10.12.4]</p>	<p>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 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]</p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>

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1310.6.4 Procedures. Brazing procedures qualified by a technically competent group or agency shall be permitted under the following conditions: ·

- (1) The brazing procedure specification and the procedure qualification record meets the requirements of this code.
- (2) The employer obtains a copy of both the brazing procedure specification and the supporting qualification records from the group or agency and signs and dates these records, thereby accepting responsibility for the qualifications that were performed by the group or agency.
- (3) The employer qualifies not less than one brazer following each brazing procedure specification used. [NFPA 99:5.1.10.10.12.5]

1310.6.5 Conditions of Acceptance. An employer shall be permitted to accept brazer qualification records of a previous employer under the following conditions:

- (1) The brazer has been qualified following the same or an equivalent procedure that the new employer uses.
- (2) The new employer obtains a copy of the record of brazer performance qualification tests from the previous employer and signs and dates these records, thereby accepting responsibility for the qualifications performed by the previous employer. [NFPA 99:5.1.10.10.12.6]

1310.6.6 Qualifications. Performance qualifications of brazers shall remain in effect indefinitely unless the brazer does not braze with the qualified procedure for a period exceeding 6 months, or there is a specific reason to question the ability of the brazer. [NFPA 99:5.1.10.10.12.7]

1315.4 Tubes. Tubes shall be hard-drawn seamless copper ASTM B 819 medical gas tube, Type L, except that where operating pressures are exceeding a gauge pressure of 185 psi (1276 kPa), Type K shall be used for sizes exceeding DN80 (NPS 3) (80 mm) (3-1/2 inches O.D.).

ASTM B 819 medical gas tube shall be identified by the manufacturer's markings "OXY," "MED," "OXY/MED," "OXY/ACR," or "ACR/MED" in blue (Type L) or green (Type K). [NFPA 99:5.1.10.1.4, 5.1.10.1.5]

Piping for vacuum systems shall be constructed of one of the following:

- (1) Hard-drawn seamless copper tube in accordance with one of the following:
 - (a) ASTM B 88 (Types K, L, M)
 - (b) ASTM B 280 (copper ACR tube)
 - (c) ASTM B 819 copper medical gas tubing (Types K or L)
- (2) Stainless steel tube [NFPA 99:5.1.10.2.1]:
 - (a) Piping systems shall be designed and sized to deliver the required flow rates at the utilization pressures.
 - (b) Mains and branches in medical gas piping systems shall be not less than DN15 (NPS 1/2) (15 mm) (5/8 of an inch O.D.) size.
 - (c) Mains and branches in medical-surgical vacuum systems shall be not less than DN20 (NPS 3/4) (20 mm) (7/8 of an inch O.D.) size.
 - (d) Drops to individual station outlets and inlets shall be not less than DN15 (NPS 1/2) (15 mm)(5/8 of an inch O.D.) size.

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 304/316L, 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)]~~
- ~~(3) CPVC CTS (copper tube size) plastic pipe manufactured in accordance with ASTM D2846, 1/2 of an inch (15 mm) through 2 inches (50 mm) in diameter. [NFPA 99:5.3.8.2.4(3)]~~

City of Houston Amendment

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<p>(e) Runouts to alarm panels and connecting tubing for gauges and alarm devices shall be permitted to be DN8 (NPS 1/4) (8 mm) (3/8 of an inch O.D.) size. [NFPA 99:5.1.10.10.1.1- 5.1.10.10.1.5]</p>		
<p>N/A</p>	<p>1308.6 Category 3 Systems. Category 3 systems shall comply with Section 1308.0 through 1309.0, except as follows:</p> <ol style="list-style-type: none"> (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: <ol style="list-style-type: none"> 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: <ol style="list-style-type: none"> 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] 	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>N/A</p>	<p>[EDITORIAL NOTE: DELETE SECTION 1309.2 AND REPLACE WITH THE FOLLOWING:]</p> <p>1309.2 Changes in Direction. Positive pressure patient gas systems, medical support gas systems, and vacuum systems shall have all turns, offsets, and other changes in direction made using fittings or techniques appropriate to any of the following acceptable joining methods:</p> <ol style="list-style-type: none"> (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] 	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>1318.4 Cleaning Procedures. The interior surfaces of tubes, fittings, and other components that are cleaned for oxygen service shall be stored and handled to avoid contamination prior to assembly and brazing. [NFPA 99:5.1.10.5.3.1] The exterior</p>	<p>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]</p>	<p>City of Houston Amendment Analysis: New COH amendment. Amendment modified by City Legal during review.</p>

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surfaces of tube ends shall be cleaned prior to brazing to remove surface oxides. [NFPA 99:5.1.10.5.3.2].

Where cleaning the exterior surfaces of tube ends, no matter shall be permitted to enter the tube. [NFPA 99:5.1.10.5.3.3]

Where the interior surfaces of fitting sockets become contaminated prior to brazing, they shall be recleaned for oxygen in accordance with Section 1316.1 and shall be cleaned for brazing with a clean, oil-free wire brush. [NFPA 99:5.1.10.5.3.4]

Clean, nonshedding, abrasive pads shall be used to clean the exterior surfaces of tube ends. [NFPA 99:5.1.10.5.3.5]

The use of steel wool or sand cloth shall be prohibited. [NFPA 99:5.1.10.5.3.6]

The cleaning process shall not result in grooving of the surfaces to be joined. [NFPA 99:5.1.10.5.3.7]

After being abraded, the surfaces shall be wiped using a clean, lint-free white cloth. [NFP A 99:5.1.10.5.3.8]

Tubes, fittings, valves, and other components shall be visually examined internally before being joined to verify that they have not become contaminated for oxygen service and that they are free of obstructions or debris. [NFPA 99:5.1.10.5.3.9]

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 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 I pound to 3 gallons (0.5 kg to 11 L) of potable water and thoroughly rinsing them with clean, hot potable water. [NFPA 99:5.1.10.5.3.10]

Material that has become contaminated internally and is not clean for oxygen service shall not be installed. [NFPA 99:5.1.10.5.3.12]

Joints shall be brazed within 8 hours after the surfaces are cleaned for brazing. [NFPA 99:5.1.10.5.3.13]

1318.7 Purge Gas. Where being brazed, joints shall be continuously purged with oil-free, dry nitrogen NF to prevent the formation of copper oxide on the inside surfaces of the joint. [NFPA 99:5.1.10.5.5.1] The source of the purge gas shall be monitored, and the installer shall be audibly alerted where the source content is low. [NFPA 99:5.1.10.5.5.2].The purge gas flow rate shall be controlled by the use of a pressure regulator and flowmeter or combination thereof. [NFPA 99:5.1.10.5.5.3] Pressure regulators alone shall not be used to control purge gas flow rates. [NFPA 99:5.1.10.5.5.4] In order to assure that ambient air has been removed from the pipeline prior to brazing, an oxygen analyzer shall be used to verify the effectiveness of the purge. The oxygen analyzer shall read below 1 percent oxygen concentration before brazing is to begin. [NFPA 99:5.1.10.5.5.5] During and after installation, openings in the piping system shall be kept sealed to maintain a nitrogen atmosphere within the piping to prevent debris or other contaminants from entering the system. [NFPA 99:5.1.10.5.5.6] While a joint is being brazed, a discharge opening shall be provided on the opposite side of the joint from where the purge gas is being introduced. [NFPA 99:5.1.10.5.5.7] The flow of purge gas shall be maintained until the joint is cool to the touch. [NFPA 99:5.1.10.5.5.8]

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]~~

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]

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]~~

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<p>After the joint has cooled, the purge discharge opening shall be sealed to prevent contamination of the inside of the tube and maintain the nitrogen atmosphere within the piping system. [NFPA 99:5.1.10.5.5.9] The final connection of new piping to an existing, in use pipeline shall be permitted to be made without the use of a nitrogen purge. [NFPA 99:5.1.10.5.5.10] After a final connection in a positive-pressure medical gas pipeline is made without a nitrogen purge, an outlet in the immediate downstream zone of the affected portions of both the new and existing in-use piping shall be tested in accordance with the following: [NFPA 99:5.1.10.5.5.11]</p> <ol style="list-style-type: none"> (1) 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 soapy water or other means safe for use with oxygen. [NFPA 99:5.1.12.3.9.2] (2) For pressure gases, immediately after the final connection is made and leak-tested, the specific altered zone and components in the immediate zone or area that is downstream from the point or area of intrusion shall be purged. [NFPA 99:5.1.12.3.9.3] (3) Before the new work is used for patient care, positive pressure gases shall be tested for operational pressure, and gas concentration in accordance with NFPA 99. [NFPA 99:5.1.12.3.9.4] (4) Permanent records of these tests shall be maintained. [NFPA 99:5.1.12.3.9.5] <p>Where using the autogenous orbital welding process, joints shall be continuously purged inside and outside with inert gas(es) in accordance with the qualified welding procedure. [NFPA 99:5.1.10.5.5.12]</p>		
<p>1315.6 Special Fittings. The following special fittings shall be permitted to be used in lieu of brazed joints:</p> <ol style="list-style-type: none"> (1) Memory-metal couplings having temperature and pressure ratings joints not less than that of a brazed joint. (2) Listed or approved metallic gas tube fittings that, where made up, provide a permanent joint having the mechanical, thermal, and sealing integrity of a brazed joint. (3) Dielectric fittings where required by the manufacturer of special medical equipment to electrically isolate the equipment from the piping distribution system. (4) Axially swaged, elastic strain preload fittings providing metal to metal seal having pressure and temperature ratings not less than that of a brazed joint and, where complete, are permanent and nonseparable. [NFPA 99:5.1.10.7] 	<p>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]</p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>1310.5 Health Care Organization Personnel. Health Care Organization personnel shall be permitted to install piping systems if all the requirements of this chapter are met during installation. [NFPA 99:5.1.10.10.11.5] Piping and Installation. Piping and installation procedures shall comply with NFPA 99, latest edition, as adopted by the Texas Department of Health.</p>	<p>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]</p>	<p>City of Houston Amendment Analysis: 2012 amendment moved to 1306.3.</p>
<p>1317.9 Testing. Two or more medical gas piping systems shall not be interconnected for testing or other reason. Leak testing shall be accomplished by separately charging and testing the individual piping system. [NFPA 99:5.1.10.10.8]</p>	<p>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]</p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to</p>

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		new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.
N/A	<p>1310.8.2 Medical Gas and Medical Vacuum. <u>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]</u></p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>1317.6 Positive-Pressure Medical Gas Piping Distribution Systems. 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 provisions of Section 1315.0 shall apply as if the system were new. [NFPA 99:5.1.10.10.10.1] A vacuum system shall not be permitted to be converted for use as a gas system. [NFPA 99:5.1.10.10.10.2]</p>	<p>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]</p>	<p>City of Houston Amendment Analysis: New COH amendment. Amendment modified by City Legal during review. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
N/A	<p>1310.10 Breaching or Penetrating Medical Gas Piping. Positive pressure patient medical gas piping <u>and medical support gas piping</u> 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]</p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>1319.1 General Requirements. Shutoff valves accessible to other than authorized personnel shall be installed in valve boxes with frangible or removable windows large enough to permit manual operation of valves. [NFPA 99:5.1.4.2.1]</p> <p>Shutoff valves for use in certain areas, such as psychiatric or pediatric, shall be permitted to be secured with the approval of the Authority Having Jurisdiction to prevent inappropriate access. [NFPA 99:5.1.4.2.2]</p> <p>1319.1.1 Enclosures. Where valves are concealed in an enclosure, the door or entry to the enclosure shall be identified and color coded with the type of gas service installed, as described in Section 1322.0. Enclosures shall be of sufficient size to permit valve operation. Valve handles in the off position shall prevent closure of the access panel or door.</p>	<p>{EDITORIAL NOTE: DELETE SECTION 1312.1 AND ITS SUBSECTIONS AND REPLACE WITH THE FOLLOWING:}</p> <p>1312.1 General. <u>New or replacement valves shall be permitted to be of any type as long as they meet the following conditions:</u></p> <ol style="list-style-type: none"> (1) <u>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.</u> (2) <u>They use a quarter turn to off.</u> (3) <u>They are constructed of materials suitable for the service.</u> (4) <u>They are provided with copper tube extensions by the manufacturer for brazing.</u> (5) <u>They indicate to the operator if the valve is open or closed.</u> (6) <u>They permit in-line serviceability.</u> (7) <u>They are cleaned for oxygen service by the manufacturer if used for any positive pressure service. [NFPA 99:5.1.4.1.6]</u> 	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
N/A	<p>1312.1.1 Security. <u>All valves, except valves in zone valve box assemblies, shall be secured by any of the following means:</u></p> <ol style="list-style-type: none"> (1) <u>Located in secured areas.</u> (2) <u>Locked or latched in their operating position.</u> (3) <u>Located above ceilings, but remaining accessible and not obstructed. [NFPA 99:5.1.4.1.2]</u> 	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>

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	<p>1312.1.2 Accessibility. <u>Zone valves shall be installed in valve boxes with removable covers large enough to allow manual operation of valves.</u></p> <p><u>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]</u></p> <p>1312.1.3 Labeled. <u>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]</u></p>	
<p>1319.4 Source Valves. A shutoff valve shall be placed at the immediate connection of each source system to the distribution piping to permit the entire source, including accessory devices (e.g., air dryers, final line regulators, etc.), to be isolated from the facility. [NFPA 99:5.1.4.4]</p> <p>1319.4.1 Location. The source valve shall be located in the immediate vicinity of the source equipment. [NFPA 99:5.1.4.4.1]</p> <p>1319.4.2 Labeled. The source valve shall be labeled in accordance with Section 1322.3, Source Valve for the (Source Name). [NFPA 99:5.1.4.4.2]</p>	<p>1312.2 Source Valves. A shutoff valve shall be placed at the immediate connection of each source system to the <u>pip</u>ed distribution system to <u>per</u>mit <u>allow</u> the entire source, including <u>all</u> accessory devices <u>(e.g. air dryers, final line regulators)</u>, to be isolated from the facility. [NFPA 99:5.1.4.2.1]</p>	<p>City of Houston Amendment</p> <p>Analysis: New COH amendment.</p> <p>Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>1322.5 Shutoff Valve Labeling. The shutoff valves described in Section 1319.0 shall be labeled to reflect the rooms that are controlled by such valves. Labeling shall be kept current from initial construction through acceptance. Valves shall be labeled in substance as follows:</p> <p>In-line shutoff valves shall be labeled in substance as follows:</p> <p style="text-align: center;">CAUTION (NAME OF MEDICAL GAS) VALVE DO NOT CLOSE EXCEPT IN EMERGENCY THIS VALVE CONTROLS SUPPLY TO ...</p> <p>Source valves shall be labeled in substance as follows:</p> <p style="text-align: center;">SOURCE VALVE FOR THE (SOURCE NAME)</p> <p>Main line valves shall be labeled in substance as follows:</p> <p style="text-align: center;">MAIN LINE VALVE FOR THE (GAS/ACUUM NAME) SERVING THE (NAME OF BUILDING)</p> <p>Riser valve(s) shall be labeled in substance as follows:</p> <p style="text-align: center;">RISER FOR THE (GAS/ACUUM NAME) SERVING (NAME OF THE AREA/BUILDING SERVED BY THE PARTICULAR RISER)</p> <p>Service valve(s) shall be labeled in substance as follows:</p> <p style="text-align: center;">SERVICE VALVE FOR THE (GAS/ACUUM NAME) SERVING (NAME OF THE AREA/BUILDING SERVED BY THE PARTICULAR VALVE) [NFPA 99:5.1.11.2.3 - 5.1.11.2.6]</p>	<p>1312.9.2 Labeling. Shutoff valves shall be labeled in substance as follows:</p> <p style="text-align: center;">Source valve(s) shall be labeled in substance as follows:</p> <p style="text-align: center;">SOURCE VALVE FOR THE (SOURCE NAME) [NFPA 99:5.1.11.2.3]</p> <p><u>Zone valve box assemblies shall be labeled outside of the valve box as to the areas that they control as follows:</u></p> <p style="text-align: center;">ZONE VALVES FOR THE (GAS/VACUUM NAME) SERVING (NAME OF AREA SERVED BY THE PARTICULAR VALVE) [NFPA 99:5.1.11.2.7]</p> <p>[EDITORIAL NOTE: REMAINDER OF SECTION REMAINS AS IS IN THE 2015 UPC.]</p>	<p>City of Houston Amendment</p> <p>Analysis: New COH amendment.</p> <p>Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>N/A</p>	<p>1312.10 Emergency Shutoff Valves. <u>Category 3 systems shall comply with Section 1312.0, except as follows:</u></p> <p>(1) <u>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</u></p>	<p>City of Houston Amendment</p> <p>Analysis: New COH amendment.</p> <p>Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date</p>

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	<p>so located in the single treatment facility to be accessible from all use-point locations in an emergency.</p> <p>(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.</p> <p>(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.</p> <p>(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]</p>	<p>regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>N/A</p>	<p>1313.1 General. Central supply systems and medical gas outlets for oxygen, medical air, nitrous oxide, carbon dioxide, and <u>all</u> other patient medical gases shall be piped <u>only to medical gas outlets complying with Section 1315.0</u> into areas where the gases will be used under the direction of licensed medical professionals for purposes congruent with the following:</p> <ol style="list-style-type: none"> (1) Direct respiration by patients. (2) Clinical application of the gas to a patient, <u>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.</u> (3) Medical device applications directly related to respiration. (4) Power for medical devices used directly on patients. (5) Calibration of medical devices <u>intended for</u> used in accordance with Section 1313.1(1) through Section 1313.1(4). [NFPA 99:5.1.3.5.2] (6) <u>Simulation centers for the education, training, and assessment of health care professionals. [NFPA 99:5.1.3.5.2]</u> 	<p>City of Houston Amendment Analysis: New COH amendment. Amendment modified by City Legal during review. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>1310.1.2 Materials. Materials used in central supply systems shall meet the following requirement. [NFPA 99:5.1.3.4.4]</p> <p>In those portions of systems intended to handle oxygen or nitrous oxide at gauge pressures of less than 300 pounds-force per square inches (psi) (2068 kPa), 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 99:5.1.3.4.4(2)]</p>	<p>1313.1.1 Materials. Materials used in central supply systems shall comply with the following requirements:</p> <ol style="list-style-type: none"> (1) In those portions of systems intended to handle oxygen at gauge pressures that <u>exceed 350 pounds-force per square inch (psi) (2413 kPa), the interconnecting hose shall contain no polymeric materials.</u> (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) <u>If potentially exposed to cryogenic temperatures, materials shall be designed for low temperature service.</u> (4) <u>All materials shall be installed per the manufacturer's requirements. [NFPA 99:5.1.3.5.4]</u> 	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>1320.2.3 Design. Pressure-relief valves shall be of brass or bronze and specially designed for the gas service involved.</p>	<p>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</p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date</p>

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	<p>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:</p> <ol style="list-style-type: none"> (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] 	<p>regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>N/A</p>	<p>{EDITORIAL NOTE: DELETE SECTION 1314 IN ITS ENTIRETY AND REPLACE WITH THE FOLLOWING:}</p> <p>1314.0 Medical Air Supply Systems.</p> <p>1314.1 Quality of Medical Air. Medical air shall:</p> <ol style="list-style-type: none"> (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/m³ (6.85 x 10⁻⁰⁷ lb/yd³) of permanent particulates sized 1 micron or larger in the air at normal atmospheric pressure. [NFPA 99:5.1.3.6.1] 	<p>City of Houston Amendment</p> <p>Analysis: New COH amendment. Amendment modified by City Legal during review.</p> <p>Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>N/A</p>	<p>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 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.</p> <p>1314.2.1 Required Components. Medical air compressor systems shall consist of the following:</p> <ol style="list-style-type: none"> (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)] 	<p>City of Houston Amendment</p> <p>Analysis: New COH amendment. Amendment modified by City Legal during review.</p> <p>Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>N/A</p>	<p>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</p>	<p>City of Houston Amendment</p>

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	<p>out of service. In no case shall there be fewer than two compressors. [NFPA 99:1.3.6.3.9(B)]</p> <p>1314.2.3 Category 2 Medical Air Supply Systems. Category 2 systems shall comply with Section 1314.0, except as follows:</p> <ol style="list-style-type: none"> (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] 	<p>Analysis: New COH amendment. Amendment modified by City Legal during review.</p> <p>Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>N/A</p>	<p>1314.2.4 Category 3 Dental Air Compressor Systems. Category 3 dental air compressor supply systems shall include the following:</p> <ol style="list-style-type: none"> (1) Disconnect switch(es). (2) Motor starting device(s). (3) Motor overload protection device(s). (4) One or more compressors. (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] 	<p>City of Houston Amendment</p> <p>Analysis: New COH amendment. Amendment modified by City Legal during review.</p> <p>Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>N/A</p>	<p>1314.3 Air Sources. Air sources for medical air compressors shall comply with Section 1314.5.1 or Section 1314.5.2.</p> <p>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)]</p> <p>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:</p> <ol style="list-style-type: none"> (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)] 	<p>City of Houston Amendment</p> <p>Analysis: New COH amendment. Amendment modified by City Legal during review.</p> <p>Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>

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	<p>1314.3.2 Source of Dental Air Compressor Intake. <u>Dental air sources for a compressor(s) shall meet the following requirements:</u></p> <ol style="list-style-type: none"> (1) If the intake is located inside the building: <ol style="list-style-type: none"> 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. (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] 	
<p>N/A</p>	<p>1314.4 Air Intakes. <u>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)]</u></p> <p>1314.4.1 Location. <u>Medical air intakes shall be located as follows:</u></p> <ol style="list-style-type: none"> (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)] <p>1314.4.2 Separate Compressors. <u>Air intakes for separate compressors shall be permitted to be joined together to one common intake where the following conditions are met:</u></p> <ol style="list-style-type: none"> (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)] <p>1314.4.3 Screening. <u>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)]</u></p>	<p>City of Houston Amendment</p> <p>Analysis: New COH amendment. Amendment modified by City Legal during review.</p> <p>Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>N/A</p>	<p>1314.5 Medical Air Receivers. <u>Receivers for medical air shall:</u></p> <ol style="list-style-type: none"> (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] <p>1314.5.1 Category 3 Dental Air. <u>Receivers shall:</u></p> <ol style="list-style-type: none"> (1) Have the capacity to prevent short-cycling of the compressor(s) 	<p>City of Houston Amendment</p> <p>Analysis: New COH amendment. Amendment modified by City Legal during review.</p> <p>Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>

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	<p>(2) Comply with Section VIII "Unfired Pressure Vessels" of the ASME Boiler and Pressure Vessel Code. [NFPA 99:5.3.3.6.1.2]</p> <p>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)]</p>	
<p>1325.2 Medical-Surgical Vacuum Sources. Medical surgical vacuum sources shall consist of the following:</p> <ol style="list-style-type: none"> (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 1315.4, except that stainless, galvanized, or black steel pipe shall be permitted to be used. (6) 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. [NFPA 99:5.1.3.6.1.2] <p>1325.2.1 Pumps. Additional pumps shall automatically activate where the pumps in operation are incapable of maintaining the required vacuum. Automatic or manual alternation of pumps shall allow division of operating time. Where automatic alternation of pumps is not provided, the facility staff shall arrange a schedule for manual alternation. [NFPA 99:5.1.3.6.6.1, 5.1.3.6.6.2]</p>	<p>1315.2 Medical-Surgical Vacuum Sources. Medical-surgical vacuum sources shall consist of the following:</p> <ol style="list-style-type: none"> (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] 	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>N/A</p>	<p>1315.2.1 Category 2 Medical-Surgical Vacuum. Category 2 systems shall comply with Section 1315.2, except as follows:</p> <ol style="list-style-type: none"> (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] <p>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]</p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>1325.3 Exhausts. The medical-surgical vacuum pumps shall exhaust in a manner and location that will minimize the hazards of noise and contamination to the facility and its environment.</p> <p>The exhaust shall be located as follows:</p> <ol style="list-style-type: none"> (1) Outdoors. (2) Not less than 10 feet (3048 mm) from a door, window, air intake, or other openings in buildings. (3) At a level different from air intakes. 	<p>1315.5.1 Location. The exhaust shall be located as follows:</p> <ol style="list-style-type: none"> (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 buildings 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 exhaust into occupied areas or prevent dispersion of the exhaust. [NFPA 99:5.1.3.7.2] 	<p>City of Houston Amendment Analysis: New COH amendment. Amendment modified by City Legal during review. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>

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(4) Where prevailing winds, adjacent buildings, topography, or other influences that would not divert the exhaust into occupied areas or prevent dispersion of the exhaust.

The end of the exhaust shall be turned down and screened or otherwise be protected against the entry of vermin, debris, or precipitation by screening fabricated or composed of a non-corroding material.

The exhaust shall be piped of materials approved for medical-surgical vacuum piping under Section 1315.4.

The exhaust shall be free of dips and loops that might trap condensate or oil. Where such low points are unavoidable, a drip leg and valved drain shall be installed. [NFPA 99:5.1.3.6.7.1 - 5.1.3.6.7.5]

N/A

1323.1 General. Master, area, and local alarm systems used for medical gas and vacuum systems shall include the following:

{EDITORIAL NOTE: THE REMAINDER OF THIS SECTION REMAINS AS IS IN THE 2015 UPC.}

{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 by 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.

{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 by 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.

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.}

City of Houston Amendment

Analysis: New COH amendment. Amendment modified by City Legal during review.

Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.

City of Houston Amendment

Analysis: New COH amendment. Amendment modified by City Legal during review.

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<p>N/A</p>	<p>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]</p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>N/A</p>	<p>{EDITORIAL NOTE: DELETE AND REPLACE SECTIONS 1318.2 AND 1318.3 WITH THE FOLLOWING:}</p> <p>1318.2 Category 2 Systems. 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, except as follows:</p> <ol style="list-style-type: none"> (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] <p>1318.3 Category 3 Systems. Category 3 warning systems shall comply with Section 1318.2 except as follows:</p> <ol style="list-style-type: none"> (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: <ol style="list-style-type: none"> 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] 	<p>City of Houston Amendment Analysis: New COH amendment. Amendment modified by City Legal during review. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>

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<p>1323.2 Components. Functioning of alarm components shall be verified in accordance with testing and monitoring requirements of the manufacturer and the Authority Having Jurisdiction.</p>	<p>1318.4 Components. Alarm components shall be verified in accordance with the testing and monitoring requirements of the manufacturer and the Authority Having Jurisdiction.</p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>1326.2.1 Breached. 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 vacuum systems and downstream for pressure gases at the point or area of intrusion. [NFP A 99:5.1.12.1.4, 5.1.12.1.5]</p>	<p>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]</p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>1321.2 Post Installation. After installation of the piping, but before installation of the station outlets/inlets and other medical gas and medical gas system components (e.g., pressure-actuating switches for alarms, manifolds, pressure gauges, or pressure relief valves), the line shall be blown clear by means of oil-free, dry nitrogen.</p>	<p>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]</p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>N/A</p>	<p>1319.4.1 Test Gas. The test gas shall be oil-free, dry nitrogen NF. [NFPA 99:5.1.12.2.1.2]</p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>1326.10 Initial Pressure Test - Piped Vacuum Systems. Each section of the piping in medical gas and vacuum systems shall be pressure tested.</p> <p>Initial pressure tests shall be conducted as follows:</p> <ol style="list-style-type: none"> (1) After installation of station outlets/inlets rough-in assemblies. Test caps shall be permitted to be used. (2) 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, line pressure-relief valves, manufactured assemblies with flexible hose, etc.). <p>The source shutoff valve shall remain closed during these tests.</p> <p>The test pressure for pressure gases shall be one and one-half times the system working pressure, and not less than a gauge pressure of 150 psi (1034 kPa).</p>	<p>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)]</p> <p>Initial pressure tests shall be conducted in accordance with the following:</p> <ol style="list-style-type: none"> (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)] 	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
	<p>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)]</p>	<p>City of Houston Amendment Analysis: New COH amendment.</p>

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<p>The test pressure for vacuum shall be not less than a gauge pressure of 60 psi (414 kPa).</p> <p>The test pressure shall be maintained until each joint has been examined for leakage by means of soapy water or other equally effective means of leak detection that is safe for use with oxygen.</p> <p>Leaks shall be located, repaired (where permitted), replaced (where required), and retested. [NFPA 99:5.1.12.2.3.1- 5.1.12.2.3.7]</p>		<p>Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>N/A</p>	<p>1319.5.4 Initial Pressure Test – Category 3 Copper Piping Systems. Initial pressure tests shall be conducted as follows:</p> <ol style="list-style-type: none"> (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] 	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
	<p>1319.5.5 Initial Leak Test – Category 3 Plastic Vacuum Piping Systems. Initial leak tests shall be conducted as follows:</p> <ol style="list-style-type: none"> (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] 	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>1326.8 Cross-Connection Test - Piped Gas Systems. It shall be determined that no cross-connections exist between medical gas and vacuum piping systems. Piping systems shall be reduced to atmospheric pressure. Sources of test gas shall be disconnected from piping systems except for the one system being tested. The system under test shall be charged with oil-free, dry nitrogen NF to a gauge pressure of 50 psi (345 kPa). After the installation of the individual faceplates with approved adapters matching outlet/inlet labels, each individual outlet/inlet (in each installed medical gas and vacuum piping system) shall be checked to determine that</p>	<p>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]</p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>

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<p>N/A</p>	<p>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:</p> <ol style="list-style-type: none"> (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] 	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>N/A</p>	<p>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:</p> <ol style="list-style-type: none"> (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) HqV. (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. (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] 	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>1326.9 Standing Pressure Test - Piped Gas Systems. After successful completion of the initial pressure tests under Section 1326.7, medical gas distribution piping shall be subject to a standing pressure test. 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, etc.). The source valve shall be closed during this test. The piping systems shall be subjected to a 24-hour standing pressure</p>	<p>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, 5.3.6.23.2.6]</p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>

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<p>test using oil-free, dry nitrogen NF. Test pressures shall be 20 percent above the normal system operating line pressure. [NFPA 99:5.1.12.2.6-5.1.12.2.6.4]</p>		
<p>N/A</p>	<p>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)]</p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>N/A</p>	<p>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]</p>	<p>City of Houston Amendment Analysis: New COH amendment. Amendment modified by City Legal during review. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
	<p>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. (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]</p>	<p>City of Houston Amendment Analysis: New COH amendment. Justification: The entirety of Ch. 13 has been updated to the 2018 version. These changes are needed to ensure up-to-date regulations concerning medical gas; and includes reference to new NFPA standard #99 that provides regulations for medical gas and medical vacuum systems.</p>
<p>2012 Houston UPC – Chapter 16 Alternate Water Sources for Nonpotable Applications</p>	<p>2015 Houston UPC – Chapter 15 Alternate Water Sources for Nonpotable Applications</p>	<p>Code Analysis</p>
<p>1601.2 System Design. Alternate water source systems in accordance with this chapter shall be designed by a person registered or licensed to perform plumbing design work. Components, piping, and fittings used in an alternate water source system shall be listed Exceptions: (1) A person registered or licensed to perform plumbing design work is not required to design rainwater catchment systems used for irrigation with a maximum storage capacity of 360 gallons (1363 L). (2) A person registered or licensed to perform plumbing design work is not</p>	<p>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.</p>	<p>City of Houston Amendment Analysis: Code provisions of UPC 2012 Section 1601.2 is relocated to UPC 2015 Section 1501.2. Previous COH amendment is relocated with the model code move. There is no changes to COH amendment. Justification: Amendment needed to ensure conformity to state law.</p>

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required to design rainwater catchment systems for single family dwellings where outlets, piping, and system components are located on the exterior of the building.

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

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

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.

(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.

2012 Houston UPC – Chapter 16
Alternate Water Sources for Nonpotable Applications

2015 Houston UPC – Chapter 16
Nonpotable Rainwater Catchment Systems

Code Analysis

1702.9.3.1 Prohibited Discharges. **Except for air conditioning condensate,** overflows and bleed-off pipes from roof-mounted equipment and appliances shall not discharge onto roof surfaces that are intended to collect rainwater.

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.

City of Houston Amendment

Analysis: Previous model code UPC 2012 Section 1702.9.3.1 and COH amendment is relocated to UPC 2015 Section 1602.9.3.2. The COH amendment is rearranged in the code text for clarity during City Legal review. No changes to the code requirements or code intent.

Justification: Amendment needed to ensure conformity to state law; provides safer alternative for condensate discharges.

2012 Houston UPC – Chapter 14 Referenced Standards

2015 Houston UPC – Chapter 17 Referenced Standards

Code Analysis

1401.0 General.
1401.1 Standards. The standards listed in Table 1401.1 are intended for use in the design, testing, and installation of materials, devices, appliances, and equipment regulated by this code.

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.

City of Houston Amendment

Analysis: New COH amendment.

Justification: Amendment provides clarification on referenced standards and is also updated from the 2018 version.

N/A

Table 1701.1
Referenced Standards

Standard Number	Standard Title	Application	Referenced Sections
ASME A112.4.2-2015 09/CSA B45.16-2015 *	Water closet Personal Hygiene Devices	Fixtures	301.2.2, 301.3, 411.4
ASME A112.6.7-2010 (R2015) *	Sanitary Floor Sinks	Fixtures	421.1
ASME A112.6.9-2005 (R2015-10) *	Siphonic Roof Drains	DWV Components	301.2.2, 301.3

City of Houston Amendment

Analysis: New COH amendment.

Justification: The entirety of the 2018 UPC Ch. 17 has been brought forward to provide the most up-to-date referenced standards. This amendment is needed to ensure life-safety and conformity with local and state law.

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ASME A112.14.3-2000 (R2014)*	Grease Interceptors	Fixtures	1014.1
ASME A112.14.6-2010 (R2015)*	FOG (Fats, Oils, and Greases) Disposal Systems	Fixtures	1015.2, 1015.4
ASME A112.18.2- 2011/CSA B125.2- 2011*	Plumbing Waste Fittings	Fittings	301.2.2, 301.3
ASME A112.18.6- 2009/CSA B125.6-2009 (R2014)*	Flexible Water Connectors	Piping	604.5, 604.12
ASME A112.19.3- 2008/CSA B45.4-2008 (R2013)*	Stainless Steel Plumbing Fixtures	Fixture	407.1, 408.1, 409.1, 410.1, 411.1, 411.2, 411.2.2, 412.1, 415.1, 420.1, L 402.2.1, L 402.2.2, L 402.3
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- 2011/CSA (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- 2011/CSA (R2011)*	Vitreous China Nonwater Urinals	Fixtures	412.1, L 402.3.1
ASME B16.1- 2011/CSA (R2011)*	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	<u>Ductile Iron Pipe and Flanged Fittings</u>	<u>Fuel Gas Piping</u>	
ASME B31.1- 2011/CSA (R2011)*	Process Piping	Piping	F 1201.1
ASME B36.10M- 2011/CSA (R2011)*	Welded and Seamless Wrought Steel Pipe	Piping, Ferrous	1208.5.2.1(1)
ASME BPVC Section VIII- 2011/CSA (R2011)*	Rules for Construction of Pressure Vessels Division 1	Miscellaneous	1314.2(2), 1315.4(2), E 413.6.2
ASME BPVC Section IX- 2011/CSA (R2011)*	Welding, Brazing, and Fusing Qualifications	Certification	225.0, 1307.1, 1309.5.1, 1309.5.2

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ASPE 45-2013	Siphonic Roof Drainage	Storm Drainage	1107.2
ASSE 1002 ASME A112.1002/CSA B125.12-2015-2009*	Anti-Siphon Fill Valves for Water Closet Tanks	Backflow Protection	413.3, Table 603.2
ASSE 1016- 2017 2014 /ASME A112.1016- 2017 2014 /CSA B125.16- 2017 2014 *	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 1090	Pressurized Flushing Devices (Flushometers) for Plumbing Fixtures	Backflow Protection	413.2
ASSE 1044- 2015 2004 *	Trap Seal Primer Devices – Drainage Types and Electronic Design Types	DWV Components	301.2.2, 301.3
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 2014 *	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	

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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 st	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
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 (R2014)	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 (R2015) 40	Borosilicate Glass Pipe and Fittings for Drain, Waste, and Vent (DWV) Applications (Note 1)	Piping, Non-Metallic	811.2
ASTM C1173- 2010 st (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 2014	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

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ASTM D2235-2004 (R201 6 4)*	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 ^e 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
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 (R20 14 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- 2014a 2008*	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-(R201 6 4)*	Solvent Cements for Transition Between Acrylonitrile-Butadiene-	Joints	705.8.4

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	Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Non-Pressure Piping Components		
ASTM D3261- 2016 2012 ^{ast} *	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- 2016a 2012a*	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
ASTM F441/F441M- 2015 2013 ^{ast} *	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 (R2014 ⁰⁹)*	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

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ASTM F1488- 2014 2009 ^{el*}	Coextruded Composite Pipe (Note 7)	Piping, Plastic	Table 701.2
ASTM F1673- 2010 <u>(R2016)*</u>	Polyvinylidene Fluoride (PVDF) Corrosive Waste Drainage Systems	Piping, Plastic	811.2
<u>ASTM F1760- 2001 (R2011)</u>	<u>Coextruded Poly (Vinyl Chloride) (PVC) Non-Pressure Plastic Pipe Having Reprocessed Recycled Content</u>	<u>Piping</u>	
ASTM F1807- 2015 2013 ^{a*}	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
ASTM F1974- 2009 <u>(R2015)*</u>	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 2014 [*]	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	Fuel Gas	1210.1.7.1(3)

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	Outside Diameter Controlled Polyethylene Gas Distribution Pipe and Tubing		
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
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

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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 2014	Polyolefin and Polyvinylidene Fluoride (PVDF) Laboratory Drainage Systems	Piping, Plastic	811.2
CSA LC 1 2016 b-2014 *	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)
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 2004 (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 2014 *	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 8.4 b)	Fuel Gas	1212.3.2
CSA Z21.69 a - 2015 2012 *	Connectors for Movable Gas Appliances (same as CSA 6.16 a)	Fuel Gas	1212.1.1
CSA Z21.75 a - 2016 2009 *	Connectors for Outdoor Gas Appliances and Manufactured Homes (same as CSA 6.27 a)	Appliances	1212.1(4)
CSA Z21.90 b - 2015 2006 (R2011) *	Gas Convenience Outlets and Optional Enclosures (same as CSA 6.24 b)	Fuel Gas	1212.7
IAPMO Z1001- 2016 2013 *	Prefabricated Gravity Grease Interceptors	DWV Components	1014.3.4

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IAPMO Z1033- 2015 2013*	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 2014	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 2014*	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, Cutting, and Allied Processes	Fuel Gas	507.9
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

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NFPA 1192-2015	Recreational Vehicles	Fuel Gas	
NSF 3-20 1249 *	Commercial Warewashing Equipment	Appliances	414.1
NSF 14-20 1642 *	Plastics Piping System Components and Related Materials	Piping, Plastic	301.2.3, 604.1, 611.3
NSF 42-20 1543 *	Drinking Water Treatment Units – Aesthetic Effects	Appliances	611.1, 611.3
NSF 44-20 1543 *	Residential Cation Exchange Water Softeners	Appliances	611.1, 611.3, L 410.1
NSF 53-20 1543 *	Drinking Water Treatment Units – Health Effects	Appliances	611.1, 611.3, K 104.2.1, L 504.2.1
NSF 55-20 1643 *	Ultraviolet Microbiological Water Treatment Systems	Appliances	611..1, 611.3
NSF 58-20 1543 *	Reverse Osmosis Drinking Water Treatment Systems	Appliances	611.1, 611.2, 611.3, L 410.3
NSF 61-20 1642 *	Drinking Water System Components – Health Effects	Water Supply Components	415.1, 417.1, 604.1, 604.9, 606.1, 607.2, 608.2
NSF 62-20 1543 *	Drinking Water Distillation Systems	Appliances	611.1, 611.3
NSF 350-20 1442 *	Onsite Residential and Commercial Water Reuse Treatment Systems	Miscellaneous	1504.7
NSF 359-20 1644 *	Valves for Crosslinked Polyethylene (PEX) Water Distribution Tubing Systems	Valves	606.1
PDI G-101-20 1542	Testing and Rating Procedure for Hydro Mechanical Grease Interceptors with Appendix of Installation and Maintenance	DWV Components	1014.1
UL 430-20 1509 *	Waste Disposers (with revisions through October 3, 2013)	Appliances	419.1
UL 441-20 1640 *	Gas Vents (with revisions through May 18, 2010)	Fuel Gas	509.1
UL 467-2013	Grounding and Bonding Equipment	Miscellaneous	1211.2.3
UL 778-20 1640 *	Motor-Operated Water Pumps (with revisions through May 25, 2012)	Appliances	1101.14
UL 921-20 1606 *	Commercial Dishwashers (with revisions through July 6, 2012)	Appliances	414.1
UL 1453-20 1604 *	Electric Booster and Commercial Storage Tank Water Heaters (with revisions through July 15, 2011)	Appliances	Table 501.1(2)
UL 1479-20 1503 *	Fire Tests of Through-Penetration Firestops (with revisions through October 19, 2012)	Miscellaneous	208.0, 222.0, 1404.3, 1405.3

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2012 Houston UPC – Appendix C Alternate Plumbing Systems	2015 Houston UPC	Code Analysis
<p>C 7.2.1 Vacuum Generating System. The vacuum generating station shall include vacuum pumps to create a constant vacuum pressure within the piping network and storage tanks. The discharge from the tank shall be through an airgap in accordance with Table 603.3.1. Operation of pumps, collection tanks, and alarms shall be automated by controls. The vacuum pumps shall be activated on demand and accessible for repair or replacement. The vent from the vacuum pump shall be provided for vacuum pump air exhaust, and shall be of a size capable of handling the total air volume of the vacuum pump.</p>	<p>C 501.2.1 Vacuum Generating System. The vacuum generating station shall include vacuum pumps to create a constant vacuum pressure within the piping network and storage tanks. Operation of pumps, collection tanks, and alarms shall be automated by controls. The vacuum pumps shall be activated on demand and accessible for repair or replacement. The vent from the vacuum pump shall be provided for vacuum pump air exhaust, and shall be of a size capable of handling the total air volume of the vacuum pump.</p>	<p>City of Houston Amendment Analysis: UPC 2012 Appendix C Section C7.2.1 COH amendment is not carried forward to the UPC 2015 Houston Plumbing Code. Justification: Amendment no longer needed; provisions now covered in 2015 base code.</p>
2012 Houston UPC – Appendix K Potable Rainwater Catchment Systems	2015 Houston UPC – Appendix K Potable Rainwater Catchment Systems	Code Analysis
<p>K 101.2 System Design. Potable rainwater catchment systems in accordance with this appendix shall be designed by a person registered, licensed, or 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.</p>	<p>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. <u>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.</u></p>	<p>City of Houston Amendment Analysis: No change to COH amendment. Justification: Amendment needed to ensure conformity to state law.</p>
<p>K 104.3.3 Exposure to Sunlight. Rainwater tank openings that are subject to degradation when exposed to sunlight shall not be exposed to direct sunlight.</p>	<p>K 104.4.4.3 Exposure to Sunlight. Rainwater tank openings <u>that are subject to degradation when exposed to sunlight</u> shall not be exposed to direct sunlight.</p>	<p>City of Houston Amendment Analysis: 2012 amendment moved from K 104.3.3; no change to COH amendment. Justification: Amendment needed to ensure conformity to state law.</p>