Houston Amendments to the *2021 Uniform Mechanical Code*

CHAPTER 1
ADMINISTRATION

101.1 Title. ~~This document~~ These regulations shall be known as the ~~"Uniform~~ *City of Houston Mechanical Code*,~~" may be cited as such, and will be referred to~~ hereinafter referred to as "this code~~.~~" and also known as the *Mechanical Code*.

The *Construction Code* collectively includes this volume and certain other codes, pamphlets, specifications and documents that are adopted in or by reference through the adopting ordinance, City of Houston Ordinance No. 2021-1037[1].

102.1 Conflicts Between Codes. ~~Where the requirements within the jurisdiction of this mechanical code conflict with the requirements of the plumbing code, the plumbing code shall prevail.~~ In instances where this code, applicable standards, or the manufacturer's installation instructions conflict, the more stringent provisions shall prevail. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall prevail.

Where, in any specific instance, provisions of this code, including adopted appendices, specify different materials, different methods of construction, or other requirements that differ from those provided in the *City Code* or other volumes of the *Construction Code,* including adopted appendices, other than the *Fire Code* and its adopted appendices and standards, the most restrictive shall prevail. Where, in any specific instance, provisions of this code, including adopted appendices, specify different materials, different methods of construction, or other requirements that differ from those provided in the *Fire Code*, including its adopted appendices and standards, and the building official and the fire marshal are unable to mutually reconcile the requirements by issuing a written interpretation, then either of them may refer the matter to the General Appeals Board created under the *Building Code*, which shall conduct a review of the matter and issue a written code interpretation based upon the apparent intent of the codes involved. Notwithstanding any other provision, interpretations that are issued by the General Appeals Board shall not be subject to further appeal.

102.3 Mechanical Integrity ~~Maintenance~~. Mechanical systems, materials, and appurtenances, both existing and new, of a premise under the Authority Having Jurisdiction shall be maintained in operating condition. Devices or safeguards required by this code shall be maintained in accordance with the code edition under which installed.

The owner or the owner's designated agent shall be responsible for maintenance of mechanical systems. To determine compliance with this subsection, the Authority Having Jurisdiction shall be permitted to cause a mechanical system to be reinspected.

102.8 Appendices. The provisions in the appendices are intended to supplement the requirements of this code and shall not be considered part of this code unless formally adopted as such. Appendix G shall be adopted as part of this code.

102.9 Retroactive Provisions. Notwithstanding any other provision of this section, those provisions of this code that are designated as being "retroactive" shall apply to existing installations and alterations thereof.

1. The City Secretary shall insert the number of the adopting ordinance.

102.10 Residential Code. Mechanical systems for detached one- and two-family dwellings and townhouses not more than three stories above grade plane in height, each with separate means of egress, and their accessory structures shall comply with the *Residential Code*. Mechanical systems for residential occupancies to which the *Residential Code* does not apply shall be governed by this code.

102.11 Energy Conservation. The *Energy Conservation Code* and Chapter 11 of the *Residential Code*, as well as any amendments adopted thereto as authorized by state law, shall be enforced by this jurisdiction in accordance with state law.

103.2 Liability. ~~The Authority Having Jurisdiction charged with the enforcement of this code, acting in good faith and without malice in the discharge of the Authority Having Jurisdiction's duties, shall not thereby be rendered personally liable for damage that accrues to persons or property as a result of an act or by reason of an act or omission in the discharge of such 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 building official shall not personally be liable in damages 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 building official shall not personally be liable in damages for any act or omission taken in the course and scope of employment. Where and to the extent consistent with the provisions of Chapter 2, Article X, of the *City Code*, this jurisdiction shall provide legal representation and indemnification for any suit or claim brought against the building official or any deputies because of acts or omissions performed in the implementation or enforcement of this code.

This code shall not be construed to relieve from or lessen the responsibility of any person owning, operating, or controlling any building, structure or system or other construction for any damages to persons or property caused by defects, nor shall the code enforcement agency, or any member of the board of appeals, or the jurisdiction be held as assuming any such liability by reason of the inspections authorized by this code or any permits or certificates issued under this code.

103.5 Hearing Procedures.

103.5.1 Hearing notices. Unless otherwise specifically provided, whenever notice is to be given to any person concerning the right to a hearing, the notice may be given by personal hand delivery, certified mail, or private delivery service, return receipt requested. If there is documented proof that these methods are not successful, the written notice may be sent by email.

If the notice is being given to an applicant for a license or to a licensee or to a state license registrant, the notice may be mailed to the address set out in the application for the registration or license unless the applicant or registrant has given the Authority Having Jurisdiction written notice of a change of address, under which circumstances any notice concerning a hearing shall be sent to the most recent address shown on the notice. If any notice mailed to an applicant for a license or to a licensee or registrant is returned without delivery, notice shall be effective if posted where the public may observe it in the Permit Office.

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 records and the applicable records of Houston Public Works, the County Appraisal District, the electrical company, the gas company, and the water utility provider, notice shall be mailed to the billing addresses of the building as shown on the records of the electrical company and the gas company 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 to the building.

103.5.2 Hearings. Except where otherwise specifically provided, all hearings held pursuant to this code shall be conducted by the jurisdiction's 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 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 right to a hearing.

104.3.2 Plan review fees. Where a plan or other data is required to be submitted in accordance with Section 104.3.1, a plan review fee shall be paid at the time of submitting construction documents for review.

The plan review fees for mechanical systems work shall be charged as described in Section 118.1.11 of the *Building Code* and the city fee schedule ~~determined and adopted by this jurisdiction~~.

The plan review fees specified in this subsection are separate fees from the permit fees ~~specified in Section 104.5~~.

~~Where plans are incomplete or changed so as to require additional review, a fee shall be charged at the rate shown in Table 104.5.~~

When approved plans are lost or changed so as to require an additional plan review or when a plan review is required and there is no building permit required, a plan review fee shall be charged as described in Section 118.2.8 of the *Building Code* and the city fee schedule.

104.3.2.1 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 administrative fee. The plan review fees specified in this subsection are separate fees from the permit fees.

104.3.3 Time Limitation of Application. An application for which no permit is issued within 180 days following the date of application shall become inactive, and plans and other data submitted for review thereafter shall be returned to the applicant or destroyed by the *Authority Having Jurisdiction*. The *building official* is authorized to grant one or more extensions of time for additional periods not to exceed 180 days each, for a maximum of two years from the date of the original application, upon written request and justifiable cause demonstrated by the applicant. If an application for permit does not result in a permit within two years after the date of original application, the permit application shall expire. In order to renew action on an application after expiration, the applicant shall submit a new permit application and plans and shall pay a new plan review fee. ~~Applications for which no permit is issued within 180 days following the date of application shall expire by limitation, 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 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.~~

104.4.2 Validity of Permit. The issuance of a permit or approval of ~~construction documents~~ 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.

The issuance of a permit based upon ~~plans~~ construction documents, specifications, or other data shall not prevent the Authority Having Jurisdiction from thereafter requiring the correction of errors in ~~said plans~~ the construction documents, specifications, and other data or from preventing building operations being carried on thereunder where in violation of this code or of any other applicable law ~~ordinances of this jurisdiction~~.

Where a Texas license is not required to obtain a mechanical permit or complete the proposed mechanical work, Section 105.4 of the *Building Code* shall apply. Where a Texas license is required to perform specific work, a permit shall be valid only for work performed under the licensed mechanical contractor or licensed HVAC contractor named on the application.

A name change on an application or an existing permit must be obtained if the licensed mechanical contractor or licensed HVAC contractor 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 licensed mechanical contractor or licensed HVAC contractor has been provided by the property owner to the building official, the building official shall issue an amended permit. A name change fee and an administrative fee shall be charged as provided in Section 118.1 of the *Building Code* and the city fee schedule.

In the case of the death or dissolution of the original property owner or licensed mechanical contractor or licensed HVAC contractor, pursuant to a timely name change request within 45 calendar days after such death or dissolution, the permit will be transferred to the new property owner or licensed mechanical contractor or licensed HVAC contractor at no fee except for the administrative fee established in Section 118.1.1. of the *Building Code* and the city fee schedule. A property owner, licensed mechanical contractor or licensed HVAC contractor requiring a re-permit who fails to re-permit any applicable work within the time frames established by this code shall be subject to permit fees established in Section 118 of the *Building Code* and the city fee schedule based on the scope of work for all remaining construction and uninspected work.

104.4.3 Expiration. ~~A~~ Every permit issued by the Authority Having Jurisdiction under the provisions of this code shall become inactive unless ~~expire by limitation and become null and void where~~ the work authorized by such permit ~~is not~~ has commenced and been inspected by a city inspector within 180 days after its issuance, or if ~~from the date of such permit, or where~~ the work authorized by such permit is suspended or abandoned ~~at a time after the work is commenced~~ for a period of 180 days after the time the work was commenced. ~~Before such work is recommenced, a new permit shall first be obtained to do so, and the fee therefore shall be one-half the amount required for a new permit for such work, provided no changes have been made or will be made in the original construction documents for such work, and provided further that such suspension or abandonment has not exceeded 1 year.~~ If work has not commenced under a permit within two years after the date of issuance or is suspended or abandoned at any time for a period of two years, the permit shall expire and become null and void. 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 the previously uninspected portion of the work.

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

104.4.4 Extension. ~~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.~~ The building official is authorized to grant, in writing, one or more extensions of time, for periods not more than 180 days each. The permit holder shall request the extension in writing and demonstrate justifiable cause.

104.4.5 Suspension or Revocation. ~~The~~ After notice is provided of a right to a hearing pursuant to Section 103.5, 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, on the basis of incorrect information supplied, or in violation of other ordinance or regulation of the jurisdiction.

104.5 Fees. Fees shall be assessed in accordance with the provisions of this section and as set forth in the city fee schedule~~, Table 104.5. The fees are to be determined and adopted by this jurisdiction~~.

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.

104.5.2 Investigation 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, subject to applicable minimum investigation fees stated in the city fee schedule. 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.

104.5.3 Fee Refunds. ~~The Authority Having Jurisdiction shall be permitted to authorize the refunding of a fee as follows:~~

~~(1) The amount paid hereunder that was erroneously paid or collected.~~

~~(2) Refunding of not more than a percentage, as determined by this jurisdiction where no work has been done under a permit issued in accordance with this code.~~

The building official may authorize the refund of any fee paid hereunder that was erroneously paid or collected due to an error by a city employee. This provision shall not be applicable if the error occurred because of incorrect information provided by the applicant.

The building official may authorize a refund of not more than 90 percent of the amount in excess of the minimum permit fee paid when no work has been done under a permit issued in accordance with this code. If work has been done under the permit, no refund shall be authorized. The originally paid administrative fee and the plan review portion of the permit fee shall be nonrefundable.

The building official ~~Authority Having Jurisdiction~~ shall not authorize a refund~~ing~~ of any fee paid except upon written application filed by the original permit~~tee~~ holder not ~~to exceed~~ later than 180 calendar days after the date of fee payment.

104.5.4 Annual Fee Increase. Notwithstanding any maximum fee established pursuant to the *Construction Code*, the fees in this 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*.

{EDITORIAL NOTE: DELETE TABLE 104.5 IN ITS ENTIRETY.}

105.2.6 Reinspections. The building official may assess a ~~A~~ reinspection fee ~~shall be permitted to be assessed~~ for each inspection or reinspection when an inspector arrives to perform the inspection and finds the ~~where such~~ portion of work for which inspection is called is not complete or ~~where required~~ when corrections called for in a previous inspection report have not been made.

This ~~provision~~ section shall not to be interpreted as requiring reinspection fees the first time a job is rejected for failure to comply ~~be in accordance~~ with the requirements of this code, but as controlling the practice of calling for inspections before the job is ready for inspection or reinspection.

The building official may assess a reinspection fee ~~Reinspection fees shall be permitted to be assessed where~~ when the inspection record card is not posted or otherwise available on the work site, when the approved plans are not readily available to the inspector, for failure to provide access on the date for which the inspection is requested, or for deviating from plans requiring the approval of the Authority Having Jurisdiction.

To obtain reinspection, the applicant shall ~~file an application therefore in writing upon a form furnished for that purpose~~ make a request and pay the reinspection fee in accordance with ~~Table 104.5~~ Section 118 of the *Building Code* and the city fee schedule.

In instances where reinspection fees have been assessed, no additional inspection of the work will be performed until the required fees have been paid.

105.4.1 Temporary Operation Inspection. For inspection of a boiler or a heating, ventilation, refrigeration, or air-conditioning system to be used on a temporary basis, a licensed air-conditioning contractor shall request the inspection and pay the fee stated for this provision in the city fee schedule. If the system is not approved for temporary operation on the first inspection, the reinspection fee will be charged for each subsequent inspection for such purpose.

No permit for temporary use shall be valid for a period longer than 30 calendar days. The Authority Having Jurisdiction is authorized to reissue a temporary permit upon payment of the fees stated for this provision in the city fee schedule for each successive period of not more than 30 days.

106.3 Penalties. A person, firm, or corporation violating or failing to comply with a provision of this code shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be punishable by the following penalties: where no specific penalty is otherwise provided in this code, a fine~~,~~ of not less than $500.00 and not more than $2,000.00; imprisonment~~,~~; or both set forth by the governing laws of the jurisdiction. Each separate day, or a portion thereof, during which a violation of this code occurs or continues, shall be deemed to constitute a separate offense. Where any conduct in violation of this code also constitutes a violation of state penal law, the offense shall be punishable as provided in the applicable state law. In prosecutions under this code, the various provisions hereof that are designated as an “exception” or “exceptions” shall not be treated as exceptions within the meaning of Section 2.02

of the *Texas Penal Code*, and instead, they shall constitute defenses to prosecution within the meaning of Section 2.03 of the *Texas Penal Code*.

106.4 Stop Work Orders. Where work is being done contrary to the provisions of this code, the Authority Having Jurisdiction shall be permitted to order the work stopped by notice in writing served on persons engaged in the doing or causing such work to be done, and such persons shall forthwith stop work until authorized by the Authority Having Jurisdiction to proceed with the work.

At the time a stop work order is issued, the person performing the work and the permit holder shall be given notice of a right to a hearing on the matter pursuant to Section 103.5. On written request from the permit holder, such a hearing shall be held within three business days from the issuance of the stop work order unless the permit holder or person who was doing the work requests an extension of time. Any stop work order that has been issued shall remain in effect pending any hearing that has been requested unless the stop work order is withdrawn by the Authority Having Jurisdiction.

106.5 Authority to Disconnect Utilities in Emergencies. The Authority Having Jurisdiction shall have the authority to disconnect a mechanical system to a building, structure, or equipment regulated by this code in case of emergency where necessary to eliminate an immediate hazard to life or property. The Authority Having Jurisdiction shall, wherever possible, notify the serving utility, the owner, and the occupant of the building, structure, or premises of the decision to disconnect prior to taking such action, and shall notify such serving utility, owner, and occupant of the building, structure, or premises in writing of such disconnection immediately thereafter.

The notice shall also inform the owner and the occupant of the building (or the user if the mechanical equipment is not within a building) of a right to a hearing on the matter pursuant to Section 103.5. On request, a hearing shall be conducted within three business days unless the owner or the owners authorized agent requests an extension of time.

106.6 Authority to Condemn. Where the Authority Having Jurisdiction ascertains that a mechanical system or portion thereof, regulated by this code, has become hazardous to life, health, or property, or has become insanitary, the Authority Having Jurisdiction shall order in writing that such mechanical system either be removed or placed in a safe or sanitary condition. The order shall fix a reasonable time limit for compliance of not less than three days from the date of the order's issuance and shall inform the owner and the occupant of the right to a hearing on the matter pursuant to Section 103.5. No person shall use or continue using ~~maintain~~ a defective mechanical system after receiving such notice.

Where such mechanical system is to be disconnected, written notice shall be given to the owner, or the occupant of the building as specified by Section 106.5. In cases of immediate danger to life or property, such disconnection shall be permitted to be made immediately without such notice.

107.0 ~~Board of Appeals~~ Boards and Licenses.

107.1 General. ~~In order to hear and decide appeals of orders, decisions, or determinations made by the Authority Having Jurisdiction relative to the application and interpretations of this code, there shall be and is hereby created a Board of Appeals consisting of members who are qualified by experience and training to pass upon matters pertaining to mechanical system design, construction, and maintenance and the public health aspects of mechanical 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.~~ The Mechanical Code Review Board and the Boiler Code Review and Licensing Board shall hear and decide appeals of orders, decisions or

determinations made by the Authority Having Jurisdiction relative to the application and interpretations of this code, as applicable. (See Sections 110 and 111.)

107.2 Limitations of Authority. The ~~Board of Appeals~~ aforesaid boards shall have no authority relative to interpretation of the administrative provisions of this code, which shall be the purview of the General Appeals Board (see Section 113 of the *Building Code*), unless otherwise specified, nor shall the aforesaid boards be empowered to waive requirements of this code.

108.0 Emergency Work.

108.1 General. Notwithstanding any requirement in this code or in the *Construction Code* that requires the issuance of a permit under this code prior to commencing work or that imposes an additional fee for work commenced without a permit being first obtained, a permit or additional fee is not required to commence work if:

(1) The work involves the emergency repair or replacement of an existing air-conditioning, heating, ventilation or refrigeration system;

(2) The work needs to be commenced immediately in order to protect property or to preserve the health of persons;

(3) Notice is given to the Authority Having Jurisdiction by mail, telephone, email, fax or other approved method when the work was commenced; and,

(4) A permit is then obtained within 48-hours as provided in Subsection 108.2.

The Authority Having Jurisdiction shall promulgate regulations and forms as required to administer this section.

108.2 Time Limit for Obtaining Permit. The licensed contractor, in order to avoid penalties for failure to obtain a permit prior to commencing such emergency work, in addition to complying with Section 108.1, must also apply for a permit for the emergency work within 48 hours after 8:00 a.m. of the first day that the city permit office is opened for business after the date on which the contractor commences such repair or replacement.

108.3 Operation of System. If the repair or replacement is completed prior to the time that the licensed air-conditioning contractor is required to apply for a permit under these provisions, at the contractor's sole risk and responsibility for any and all injuries and damages that might result therefrom, the contractor may place the system or equipment in operation, provided that the contractor then remains at the job site and checks the operation for a period of at least 15 minutes before leaving the premises. The contractor shall instruct the occupant of the premises or the person in charge of the premises regarding the manner in which the system or equipment may be immediately shut off in case of malfunction in its operation and shall provide the aforesaid occupant or person with a telephone number(s), where the licensed contractor can be reached in case of an emergency resulting from operation of the system or equipment prior to inspection by the jurisdiction.

108.4 Emergency Appeal. In the event of a dispute between the jurisdiction's inspector and the licensed air-conditioning and refrigeration contractor doing the job as to the existence of the emergency requiring the commencing of the job without a permit, the dispute shall be first considered by the Authority Having Jurisdiction. The contractor may appeal the decision of the Authority Having Jurisdiction to the Mechanical Code Review Board or Boiler Code Licensing and Review Board, as applicable, for its consideration and decision. In reviewing the decision of the Authority Having Jurisdiction, the Board shall base its decision on the evidence and testimony presented by both parties.

109.0 Temporary Operation Permit.

109.1 General. Any heating, ventilating, refrigerating or air-conditioning system being altered or installed by authority of a permit issued under the provisions of this code may be operated for limited periods of time only for testing purposes prior to passing final inspection, on the following conditions:

(1) The licensed air-conditioning contractor in whose name said permit is issued shall request that the Authority Having Jurisdiction inspect the system.

(2) If, upon inspection, the system is approved for operation for testing purposes, the Authority Having Jurisdiction shall indicate the length of time that the system may be operated for testing purposes, based upon the size and type of system and the extent of the installation or alteration involved.

(3) Upon expiration of the temporary operation permit for testing purposes, the system shall be given a final inspection. If the system is not approved, a reinspection fee will be charged on all subsequent inspections until the system is approved as complying with the requirements of the code, or is uninstalled.

109.2 Extension of Time. The time period permitted for operating the system for testing purposes only may be extended by the Authority Having Jurisdiction when necessary to complete the testing of the system to determine that it is operating safely. The extension of such time period shall be noted in writing on the permit, and the system shall still be subject to Section 109.1(3).

For the temporary operation permit fee, see the city fee schedule.

110.0 Mechanical Code Review Board.

110.1 Creation of Board. There is hereby created a Mechanical Code Review Board, hereinafter in this section called the "board," consisting of seven members. Each member of the board except the members in Position Nos. 1 and 2 shall be appointed by the mayor and confirmed by the city council. The mayor shall designate a member to be chairperson. The contractor members filling Position Nos. 5 and 6 shall have been actively engaged in the air-conditioning business in the jurisdiction for at least five years prior to the date of their appointment.

The positions on said board shall be filled as follows:

Position No. 1 shall be filled by the Authority Having Jurisdiction.

Position No. 2 shall be filled by the fire marshal of the jurisdiction.

Position No. 3 and 4 shall each be filled by a registered professional engineer licensed by the State of Texas who is actively engage in mechanical engineering.

Position No. 5 shall be filled by a duly licensed Class A air-conditioning and refrigeration contractor licensed under the Texas Air Conditioning and Refrigeration Contractor License Law.

Position No. 6 shall be filled by a duly licensed Class B air-conditioning and refrigeration contractor licensed under the Texas Air Conditioning and Refrigeration Contractor License Law.

Position No. 7 shall be filled by a representative of the public generally.

The Authority Having Jurisdiction and the fire marshal each, from time to time, may designate in writing a person under their supervision to act in their place as their duly authorized representative. The representative shall enjoy all rights and privileges of the position. A copy of such a designation, specifying the dates any such person shall act as representative of the Authority Having Jurisdiction or of the fire marshal, shall be filed with the minutes of the board.

The terms of office for the appointees to Position Nos. 3, 5 and 7 on the board will expire on the second day of January of odd-numbered years. The terms of office for the appointees to Position Nos. 4 and 6 will expire on the second day of January of even-numbered years. However, each member shall continue in office until a successor has been appointed and qualified.

Those members of the board in Position Nos. 1 and 2 shall serve ex officio.

The amendment of this code section shall not terminate the term of office of any person currently serving on the board. Any person who is currently serving on the board shall continue to serve in the position for which he was appointed and confirmed until a successor is appointed and qualified.

In addition to other qualifications hereinabove required, each member of the board shall be a citizen of the United States. All appointed members of the board shall be selected on the basis of their technical and professional qualifications, except that the appointee to Position No. 7 is not required to have the technical and professional qualifications required for other members of the board. Each member of the board shall be subject to removal by the mayor. Four members of the board at any meeting shall constitute a quorum for transaction of all business of the board. A majority vote of the members present at any meeting at which a quorum is present shall prevail.

Whenever any position on the board becomes vacant by reason of death, resignation or removal, said vacancy shall be filled for the unexpired term of the member being replaced. Should a vacancy occur on the board, the mayor shall appoint, with the approval of the city council, another qualified person to serve the unexpired term of the vacancy.

The board shall hold regular annual meetings in Houston, Texas, the exact time and place to be designated by the chairperson of the board, who is also authorized to call special meetings when deemed necessary. The Authority Having Jurisdiction, or a duly authorized representative, shall act as secretary of the board. Each member of the board shall receive $50.00 for each meeting the member attends (not to exceed three meetings in a calendar month) at which a quorum is present, provided, however, each member of the board who is an employee of the jurisdiction will be paid only for those meetings the member attends that are neither held during nor continue beyond the member's regular working hours.

The secretary of the board shall keep the minutes of the board meetings and other business of the board, including correspondence received and sent by the board. The minutes of the board shall be public records available for inspection by the public at all reasonable times.

110.2 Duties. The board shall serve as the Board of Appeals for matters relating to the provisions of this code and shall serve in an advisory capacity to the Authority Having Jurisdiction in technical matters pertaining to provisions of this code. In addition, the board is hereby authorized to perform such other duties as specified in this division and to make recommendations to city council regarding the provisions of this code pertaining to or affecting air-conditioning, ventilation, or refrigeration.

Exception: As provided by Section 111 of this code, matters within the jurisdiction of the Boiler Code Review and Licensing Board shall be heard by that board.

110.3 Restriction on Participation in Certain Matters. No board member shall vote on any matter or participate as a board member in the discussion of any matter in which the member has a personal or financial interest other than as a member of a class or group, of which each member will be affected substantially to the same extent by the board's action or decision in the matter as will the other members of the class or group. (For restrictions on jurisdiction officials, see Chapter 171 of the *Texas Local Government Code*.)

110.4 Approval of New Materials. A person, firm, or corporation (hereinafter called "person") desiring approval of any material, device, fixture, method of assemblage, installation, appurtenance, or appliance that is a part of or pertains to heating, air-conditioning, ventilation, refrigeration or heat-

producing appliances or systems (hereinafter individually and collectively referred to as "item") may submit the item to the Authority Having Jurisdiction for approval along with a written application containing such information as the Authority Having Jurisdiction may require for determination of approval under Section 302.2.

If the Authority Having Jurisdiction denies a request for an approval, the person who made the request may appeal that decision by delivering a written notice of appeal to the secretary of the board within 10 days of receipt of the notice of the decision of the Authority Having Jurisdiction. Upon receipt of the notice of appeal, the board shall set the matter for hearing. The board may request any additional tests be conducted that it finds are necessary to determine whether the decision of the Authority Having Jurisdiction should be upheld or overturned. All such tests shall be at the expense of the person requesting the approval. The burden shall be on that person to show that the decision of the Authority Having Jurisdiction should be overturned.

The decision of the board upholding or overturning the decision of the Authority Having Jurisdiction shall be set out in the minutes of the board. If the board overturns the decision of the Authority Having Jurisdiction, it shall set forth in its minutes any conditions or limitations to which the approval is made subject.

110.5 Appeals. Any owner, user, license applicant, license holder, or interested person who is affected and aggrieved by a decision of the board may appeal the board's decision to the city council, pursuant to Rule 12 of Section 2-2 of the *City Code*.

Upon appeal to the city council from the board's decision, the board's secretary shall file with the city secretary a copy of the minutes of the board setting forth the board's decision and a copy of any minutes of the board reflecting any discussion or motions concerning the matter. Upon receipt of all materials required by the city secretary's Office, the city secretary shall set the matter for consideration.

All orders or decisions of the Authority Having Jurisdiction shall be in writing and shall be and remain in full force and effect until reversed, suspended, cancelled or annulled by the board or the city council.

The decision of the city council shall be final.

110.6 License Required. Except as otherwise provided herein, a person who does not hold a current and applicable license as required by the Texas Air Conditioning and Refrigeration Contractor License Law shall not install, alter or repair any heating, ventilating, air-conditioning or refrigeration system, or any part thereof, or obtain any permit to do so.

Note: The Texas Air Conditioning and Refrigeration Contractor Licensing Law, which is codified as Chapter 1302 of the *Texas Occupations Code*, includes certain exemptions from the requirement of obtaining a state license, which will be honored by this jurisdiction. These exemptions include: work performed by homeowners on their own homes, certain maintenance work by employees of the property owner or management company, certain work performed by employees of regulated electric and gas utility companies, and certain work performed by licensed professional engineers in connection with their business operations.

110.7 State License Notification Requirement. Each person licensed under the Texas Air Conditioning and Refrigeration Contractor License Law shall notify and register his notification with the Authority Having Jurisdiction in a form and manner prescribed by the Authority Having Jurisdiction prior to performing any work pertaining to that license within the jurisdiction. The notification shall be registered and maintained on file within the jurisdiction offices of the Mechanical Inspections Section, Code Enforcement Branch, Houston Public Works. Each notification registration shall expire on December 31 of each year. Additionally, a notification registration shall expire upon the registrant's failure to provide proof of current insurance coverage or proof of license renewal.

110.8 Liability Insurance. Each person who is required to register shall, upon registration and continuously thereafter for as long as the registration is renewed, maintain proof of current liability insurance coverage in the amount and form specified in applicable state laws and regulations. The proof shall be in the form of a copy of the certificate furnished to the state and evidence that the carrier of the insurance will provide 10 days' notice to the Authority Having Jurisdiction in the event that the policy is reduced or terminated prior to the expiration date specified on the certificate.

110.9 Violations. It shall be unlawful for any person, partnership, firm or corporation who is not licensed under the Texas Air Conditioning and Refrigeration Contractor License Law to display a sign or advertise in any other manner that such person, partnership, firm or corporation is authorized to engage in business as an air-conditioning and refrigeration contractor.

It shall be unlawful for a licensed air-conditioning and refrigeration contactor to:

(1) Permit a license to be used in any manner contrary to any of the provisions of this code;

(2) Obtain a permit required under this code in another person's name or allow the use of his name by another person for the purpose of obtaining a permit when the licensed air-conditioning and refrigeration contractor does not intend to or does not, in fact, do or supervise the work authorized by the permit; or,

(3) Take out permits for air-conditioning work to be done by a person, partnership, firm or corporation other than the person, firm, partnership, or corporation by whom the permittee is employed.

Licensed air-conditioning and refrigeration contractors shall not be simultaneously employed by, or work for, more than one business entity for the purpose of obtaining permits under this code or for the purpose of doing or supervising work that can be done only by authority of a permit obtained under the provisions of this code.

110.10 Identification of Vehicles and Sites. Each vehicle used in conjunction with air-conditioning and refrigeration contracting shall be marked as required by Title 16 *Texas Administration Code* Section 75.71(g). When an unlicensed subcontractor is at a job site not identified by a marked vehicle, the site shall be identified either by a temporary sign on the subcontractor's vehicle or on a sign visible and readable from the nearest public street containing the contractor's license number and company name.

110.11 Contractor Records. Each time that a licensed air-conditioning and refrigeration contractor or any employee thereof does any installation, replacement, or repair of any type on any air-conditioning, refrigeration, ventilation or heating system, or combination of such systems, the contractor shall make a record of the work. The contractor shall readily make available the records, upon request, for inspection and copying by the Authority Having Jurisdiction and the contractor must hold the records on file for at least two years. Before leaving the premises where the work is performed, the contractor shall deliver one copy of the record to the owner or the owner's representative. These records shall contain the following information:

(1) Name and address of licensed contractor.

(2) License number of licensed contractor.

(3) Name of owner.

(4) Date.

(5) General nature of work performed.

(6) Any other information required by applicable provisions of the Texas Air Conditioning and Refrigeration Contractor License Law and regulations issued thereunder.

111.0 Boiler Code Review and Licensing Board.

111.1 Creation and Composition. There is hereby created a Boiler Code Review and Licensing Board consisting of five members, hereinafter in this section called the "board." The members in Position Nos. 1 through 4 of the board shall be appointed by the mayor and confirmed by the city council. The mayor shall designate a member to be chairperson. Each of the five positions shall be filled as follows:

Position No. 1 shall be filled by a registered professional engineer licensed by the State of Texas who is actively engaged in the design of mechanical systems using boilers as a source of heat energy.

Position No. 2 shall be filled by an owner, partner, officer, or manager of a firm that is actively engaged in the manufacture, sale, repair or installation (or combination thereof) of boilers.

Position No. 3 shall be filled by a licensed stationary engineer who has held a first-grade license issued by the jurisdiction for not less than 10 years.

Position No. 4 shall be filled by a person who is an owner, partner, officer, or manager of a firm that is the user of a boiler.

Position No. 5 shall be filled by the Authority Having Jurisdiction.

The Authority Having Jurisdiction, from time to time, may designate in writing a member of the jurisdiction's Boiler Inspection Section to act in his place as a duly authorized representative. The representative shall enjoy all rights and privileges of the position. A copy of the designation, specifying the dates such a person shall act as representative of the Authority Having Jurisdiction, shall be filed with the minutes of the board.

111.2 Appointments, Removals, Etc. The terms of office for the appointees to Position Nos. 1 and 3 shall expire on the second day of January of odd-numbered years, and the terms of the appointees to Position Nos. 2 and 4 shall expire on the second day of January of even-numbered years. However, each member shall continue in office until a successor is appointed and qualified. The amendment of this code section shall not terminate the term of office of any person currently serving in any position of the board. Any appointed member who is currently serving on the board shall continue to serve in the position to which he was appointed and confirmed until a successor is appointed and confirmed by city council under this code. Each appointed member of the board shall be subject to removal at any time by the mayor. Each member of the board shall receive $50.00 for services for each meeting of the board the member attends at which a quorum is present, provided, however, each member of the board who is an employee of the jurisdiction shall be paid only for those meetings that are not held during the board member's regular working hours.

Three members of the board present at any meeting shall constitute a quorum for the transaction of all business of the board. A majority vote of board members present at any meeting at which a quorum is present shall prevail.

The board shall meet twice each month. The chairperson shall have the power to call a special session of the board when deemed necessary, but no more than three meetings may be held in any month. In the absence of the chairperson at any meeting, the board members present may, by majority vote, select a temporary chairperson for that meeting.

111.3 Restriction on Participation in Certain Matters. No board member shall vote on any matter or participate as a board member in the discussion of any matter in which the member has a personal or financial interest other than as a member of a class or group, of which each member will be affected substantially to the same extent by the board's action or decision in the matter as will the other members of the class or group. (For restrictions on jurisdiction officials, see Chapter 171 of the *Texas Local Government Code*.)

111.4 Records. The board shall keep or cause to be kept a written record of its meetings. The records shall be open to inspection by the public at all reasonable times.

111.5 Authority Having Jurisdiction. The Authority Having Jurisdiction is hereby charged with determining compliance with the provisions of this code. The Authority Having Jurisdiction shall prepare and maintain a record of all persons qualified to install and operate boilers under the provisions of this code. The Authority Having Jurisdiction or duly appointed representative shall act as secretary to the board at all meetings.

111.6 Examinations. The board shall develop and administer examinations for stationary engineer's licenses. The examinations shall determine the applicant's capacity and ability to understand and safely operate boilers, steam equipment and the various auxiliary machinery, appliances and appurtenances in conjunction with the operation of such boilers and steam equipment. The board shall perform such other duties as may be required of it by the governing body and mayor of the jurisdiction. The board shall adopt rules and regulations which, insofar as they relate to boilers, shall conform to the ASME Code and shall not be inconsistent with the terms and provisions of this code.

111.7 Review and Action of the Boiler Board. Disputes arising between inspectors and any person or persons concerning the application of the provisions of this code to the installation of boiler facilities serving the property of such person or persons may be submitted to the Authority Having Jurisdiction. An interested party (other than an inspector) who is dissatisfied with the decision of the Authority Having Jurisdiction in the matter may appeal that decision to the board. Upon such an appeal, each party to the dispute shall be entitled to present its side of the matter to the board, and the board shall render its decision on the matter based on the information presented by both sides and the board's interpretation of applicable provisions of this code.

The board shall have the power, by a majority vote, to revoke or cancel a stationary engineer's license, operator's license, or operator's permit for dishonesty, incompetency, or misconduct by the license or permit holder while discharging his duties or for neglect of his duties.

No license or permit shall be permanently revoked or canceled without first giving the license or permit holder an opportunity to be heard by the board. The Authority Having Jurisdiction shall provide notice of a right to a hearing on the matter pursuant to Section 103.5.

The Authority Having Jurisdiction shall have the authority to suspend for just cause a stationary engineer's license, operator's license, or operator's permit. The holder of a suspended license or permit shall not engage in activities authorized by the license or permit while such license or permit is suspended but shall be given an opportunity to be heard by the board within five working days after delivering to the Authority Having Jurisdiction a written request for a hearing.

111.8 Review of New Materials, Methods and Revisions to the Code. Any person whose boiler products are not approved under this code may file a petition in writing for approval thereof. The petition shall be delivered to the Authority Having Jurisdiction, who shall determine whether the material or method should be approved pursuant to Section 302.2 of this code. If the Authority Having Jurisdiction denies approval of the material or method, the person who made the request may appeal that decision by delivering a written notice of appeal to the secretary of the board within 10 days of receipt of the notice of the decision of the Authority Having Jurisdiction. Upon receipt of the notice of appeal, the board shall set the matter for hearing. The board may request any additional tests be conducted that it finds are necessary to determine whether the decision of the Authority Having Jurisdiction should be upheld or overturned. All such tests shall be at the expense of the person requesting the approval. The burden shall be on that person to show that the decision of the Authority Having Jurisdiction should be overturned.

The decision of the board upholding or overturning the decision of the Authority Having Jurisdiction shall be set out in the minutes of the board. If the board overturns the decision of the

Authority Having Jurisdiction, it shall set forth in its minutes any conditions or limitations to which the approval is made subject.

The board shall receive requests for revisions to those provisions of this code that affect matters relating to boilers, and it shall be the duty of the board to recommend to the city council any changes to this code that the board deems necessary. The board shall make a report to the city council annually stating its recommended changes.

111.9 Appeals. Any owner, user, license applicant, license holder, or interested person who is affected and aggrieved by a decision of the board may appeal the board's decision to the city council, pursuant to Rule 12 of Section 2-2 of the *City Code*.

Upon appeal to the city council from the board's decision, the board's secretary shall file with the city secretary a copy of the minutes of the board setting forth the board's decision and a copy of any minutes of the board reflecting any discussion or motions concerning the matter. Upon receipt of all materials required by the city secretary's Office, the city secretary shall set the matter for consideration.

All orders or decisions of the Authority Having Jurisdiction shall be in writing and shall be and remain in full force and effect until reversed by the board or the city council or suspended, cancelled or annulled.

The decision of the city council shall be final.

112.0 Stationary Engineer's License.

112.1 License. Persons who desire to secure a stationary engineer's license shall apply to the board and pay to the Authority Having Jurisdiction the applicable fee stated in the city fee schedule.

Licenses shall be granted in three grades:

(1) A first-grade stationary engineer's license authorizes the licensee to have direct charge of, operate or supervise any power boiler of any size.

(2) A second-grade stationary engineer's license authorizes the licensee to have direct charge of, operate, and supervise any power boiler having an aggregate amount of heat output not to exceed 8,380,000 Btu per hour and to act as assistant or watch engineer under the charge and supervision of the holder of a first-grade stationary engineer's license of any power boiler.

(3) A third-grade stationary engineer's license authorizes the licensee to have direct charge of, operate, or supervise any power boiler having an aggregate amount of heat output not to exceed 3,352,000 Btu per hour and to act as assistant or watch engineer under the charge and supervision of the holder of a first- or second-grade stationary engineer's license of any power boiler having an aggregate amount of heat output not to exceed 8,380,000 Btu per hour.

112.2 Stationary Engineer Examination Application. An applicant for a first-grade stationary engineer's license shall present to the board service letters showing that he has: (i) at least four years of hands-on boiler operating experience on boilers used to heat water or liquid for environmental heating or commercial processing purposes or for generating steam or vapor by direct application of heat; (ii) a graduation certificate from an accredited engineering school and at least two years of hands-on boiler operating experience with boilers used to heat water or liquid for environmental heating or commercial processing purposes or for generating steam or vapor by direct application of heat; or (iii) a United States Department of Labor diploma showing the applicant finished a full three-year course as an apprentice stationary engineer and two years of hands-on boiler operating experience with boilers used to heat water or liquid for environmental heating or commercial processing purposes or for generating steam or vapor by direct application of heat.

An applicant for a second-grade stationary engineer's license shall present to the board service letters showing that he has: (i) at least three years of hands-on boiler operating experience with boilers used to heat water or liquid for environmental heating or commercial processing purposes or for generating steam or vapor by direct application of heat; or (ii) a graduation certificate from an accredited engineering school and at least one year of hands-on boiler operating experience on boilers used to heat water or liquid for environmental heating or commercial processing purposes or for generating steam or vapor by direct application of heat.

An applicant for a third-grade stationary engineer's license shall present to the board service letters showing that he has: (i) at least two years of hands-on boiler operating experience with boilers used to heat water or liquid for environmental heating or commercial processing purposes or for generating steam or vapor by direct application of heat; or (ii) a graduation certificate from an accredited engineering school and at least six months of hands-on boiler operating experience on boilers used to heat water or liquid for environmental heating or commercial processing purposes or for generating steam or vapor by direct application of heat.

No person may take an examination for a stationary engineer's license unless he has submitted the service letters, certificates, and/or diplomas to the board as required by this section and the submitted documents have been accepted by the board.

Applicants will be required to correctly answer at least 70 percent of the questions comprising the examination to qualify for a stationary engineer's license of any grade. All questions and answers will be written in the English language.

An applicant for a stationary engineer's license who fails to satisfactorily pass an examination shall not be entitled to a refund of the examination fee paid to the jurisdiction and shall not be reexamined for the grade in which the applicant failed, or examined for a higher grade, within a period of less than 30 days.

Each applicant shall pay the examination fee stated for this provision in the city fee schedule for each examination for which the applicant applies. The fee is to be paid to the Authority Having Jurisdiction at the time the application is filed. Service letters shall be filed with the application. An applicant shall be eligible for examination on the date of the next regularly scheduled examination that is held at least *seven* days after the date of application.

Applicants who have successfully passed the examination shall pay the license fee stated for this provision in the city fee schedule to the Authority Having Jurisdiction prior to the issuance of the license. The license shall expire on December 31 of the year of issuance, unless suspended or *revoked.* Thereafter, the license may be renewed annually pursuant to the provisions set forth below. The receipt for payment of a license renewal fee shall be displayed with the license. Failure to do so shall constitute grounds for the suspension or *revocation* of the license.

112.3 License Renewals. License renewals shall be granted without reexamination upon payment of the fee stated for this provision in the city fee schedule, provided such fee is paid within 30 days after the expiration date of the license and not thereafter. When a renewal application is filed more than 30 days after the expiration of the license, the fee for renewal shall be as stated for this provision in the city fee schedule. When the annual license renewal fee has not been paid for a period of *five consecutive* years, the license shall not be renewed until the applicant has successfully passed a reexamination.

Each certificate or license issued under the terms and provisions of this section shall be signed by the person to whom it was issued as required by the board.

112.4 Validity, Replacement of License. When the holder of a license is examined by the board and granted a license in a higher grade, the higher-grade license shall not be issued until the license of the lower grade is surrendered and all required fees are paid to the Authority Having Jurisdiction.

When a license becomes lost or destroyed, the board shall grant a new license in the same grade, provided proof of such loss or destruction is presented to the satisfaction of the board. The fee for a replacement license shall be stated for this provision in the city fee schedule. If the proof of such loss or destruction is not satisfactory to the board, reexamination in the same grade shall be required, and the fee for the reexamination shall be as provided in Section 112.2.

112.5 Reciprocity. A person who holds a current and valid marine engineer's license issued by the United States Coast Guard shall be qualified for examination by the board for a stationary engineer's license of equal or lower grade, provided the license fee set forth in Section 112.2 has been paid.

A person who holds a current and valid stationary engineer's or a steam engineer's license issued by a state, municipality, or government agency shall be qualified for examination by the board in the grade of the equivalent license in this jurisdiction, as determined by the board, provided the holder of the license presents proof to the satisfaction of the board that the license was granted as a result of boiler operating experience and a passing grade on a written examination on the operation, maintenance and repair of boilers and boiler accessories and safety rules for the boilers.

No license issued by a foreign government, graduation certificate from a foreign school, college, or university, or any service letter from an employer in a foreign country shall qualify the holder thereof to be examined by the board for a stationary engineer's license of any grade unless the submitted document and the information contained therein are determined valid by the board and equivalent to the standards prescribed above. Upon examination of the information presented, the board shall designate the grade in which the applicant may be examined, if such evidence is found by the board to be valid.

112.6 Expiration of License. Each license issued for stationary engineers that was in effect the day prior to the adoption of this code by city council shall expire on the 31st day of December of the year in which this code is adopted. Any such license may be renewed as though it had been originally issued pursuant to this code.

112.7 Limitations of Operator. Except as provided in Section 113.1, no person shall:

(1) Have direct charge, control, or supervision of any power boiler; or,

(2) Act as or perform the duties of a stationary engineer or assistant watch engineer on any power boiler.

Nor shall any owner, user or person operate or use, or cause or permit any boiler to be operated or used unless the persons responsible for the operation of the boiler have current and valid licenses for the applicable classes as required in Section 112.1.

112.8 Duties of the Certificate Holder. Each holder of a certificate of stationary engineer's license shall file with the board the name of the employer, the plant location, and the amount of Btu-per-hour heat output of the boiler that the holder is operating. Each holder of a stationary engineer's license shall enclose his license certificate under glass in a dustproof frame and shall display it in a conspicuous place in the plant where the holder is employed.

The operator's permit issued under Section 113.1 designating the person in charge of the boiler shall be enclosed under glass in a dustproof frame and prominently displayed as near as possible to the boiler to which the operator's permit applies.

112.9 Responsibility of the Boiler Owner or User. Every owner or user of a power boiler that has heat output that exceeds 2,100,000 Btu per hour shall establish a method of operation utilizing one or more licensed stationary engineers of the herein required license grade. The operating method shall include direct physical examination of the boiler by the licensed stationary engineer at reasonable time intervals to ensure its safe operation. The owner or user shall establish the operation method based on accepted boiler industry practices commensurate with load characteristics, use, and configuration of the boiler.

113.0 Boiler Operator's Permit.

113.1 Application, Issuance, Fee and Expiration. An owner or user of any hot-water-heating boiler, low-pressure hot-water-heating boiler, or steam-heating boiler at pressure of 15 pounds per square inch or less used to heat water or liquid for environmental heating or commercial processing purposes or a power boiler having an heat output that does not exceed 2,100,000 Btu per hour, may apply to the Authority Having Jurisdiction for a permit to allow the boiler to be operated by the owner or user or by a person knowledgeable in the operation of the boiler, instead of by a licensed stationary engineer. The person who is to operate the boiler shall be the owner of the boiler or his bona fide employee and shall demonstrate competency to do so in a manner determined by the board. The board shall establish the method of testing and the minimum knowledge, ability, and qualifications such person must demonstrate to show competency to operate the distinctive types of boilers. If a person demonstrates competency in the operation of the type of boiler for which the permit is sought, the permit shall be granted upon the payment of the permit fee stated in the city fee schedule. The permit shall expire on December 31st of each year, unless suspended or *revoked* before the expiration date.

113.2 Renewal Application and Fee. Renewal of such permits shall be granted upon the payment of the renewal fee stated for this provision in the city fee schedule if the renewal is applied for within 30 days after the expiration of such permit. If the renewal is not applied for within 30 days after the expiration of such permit, the applicant may renew the permit upon payment of the regular fee stated for this provision in the city fee schedule.

113.3 Permit Specific to Location and Boilers at the Location. A permit shall be valid only for the specific location and for the boilers at the location named on the permit. Separate permits may be issued for a person to operate boilers at two or more locations owned by the employer of the boiler operator listed on the permit. When a permit is issued for boiler operation at two or more locations, the applicant must file for a separate boiler operator permit for each location and pay the fee for each boiler operator permit received.

113.4 Replacement of Lost or Destroyed Permit. When an operator's permit becomes lost or destroyed, the Authority Having Jurisdiction may grant a replacement permit in the same manner as set forth for a stationary engineer's license in Section 112.4.

113.5 Expiration After Adoption of Code. All permits issued for the operation of boilers that were in effect the day prior to the adoption of this code by city council shall expire on the 31st day of December of the year in which this code is adopted. Any such permit may be renewed as though it had been originally issued pursuant to this code.

114.0 Boiler Related Inspections and Liabilities. The Authority Having Jurisdiction shall periodically inspect each location where a boiler is installed to determine if the boiler is being operated by an authorized person in accordance with all applicable laws. Such inspections shall be made annually or at such other intervals as the Authority Having Jurisdiction determines is necessary to ensure compliance with applicable laws.

Exception: Boilers used solely for the production of domestic water are exempted from 114.0.

If there is a conflict between this code and the State of Texas Boiler Law in Chapter 755 of the *Texas Health and Safety Code* and any amendments thereto, then state law will apply.

The provisions of this code shall not be construed to relieve from responsibility or lessen the responsibility of any person, firm, corporation, master plumber, appliance dealer, or installer owning, operating, or installing any boiler or other equipment described in this section for damages to persons or property caused by any defect therein, nor shall the jurisdiction be held responsible for any such liability as a result of an inspection authorized or an approval issued by this code.

CHAPTER 2
DEFINITIONS

201.2 Interchangeability. Words used in the present tense include the future; words in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural, the singular.

201.3 Specific Construction and Terms Defined in Other Codes. Where specific rules of construction or terms are not addressed or defined in this code and are addressed or defined in the *City Code* or another volume of the *Construction Code*, such terms or specific constructions herein shall have the meanings ascribed to them in those other volumes, as applicable to the construction and proposed scope of work hereunder.

203.0 – A –

Alteration. Any change in an original design or configuration.

Authority Having Jurisdiction. The Director of Public Works, who is appointed to administer and enforce the provisions of this code. ~~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 representatives.

204.0 – B –

Building Code. The ~~building code~~ *City of Houston Building Code*, as ~~that is~~ adopted and amended by this jurisdiction.

Building Official. The director of Houston Public Works or the duly authorized representative designated by the director to act as the chief construction code enforcement official of the jurisdiction; 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.

205.0 – C –

Certificate of Compliance. A certificate stating that materials and products meet specified standards or that the scope of work under a specific permit was done in compliance with approved construction documents. Any reference in the *Construction Code* to a "CC", certificate of completion, or a certificate of inspection issued by this jurisdiction, is a reference to a certificate of compliance as defined herein.

City Code. The *Code of Ordinances, City of Houston, Texas*.

City Fee Schedule. The schedule of fees charged by the city for various permits, licenses, authorizations and services, which is maintained on the city's website.

Code Official. The Houston Fire Department and Building Code Enforcement employees, including but not limited to, plan analysts, field inspectors, and other technical staff charged with the administration and enforcement of this code as specifically delegated by the Authority Having Jurisdiction. The code official is authorized to approve designs, construction, equipment, materials, installations, processes, procedures, practices, and other duties necessary to verify and document compliance with the *Construction Code*, ordinances, and other laws and policies as specifically delegated by the chief building official, fire chief, and the Authority Having Jurisdiction.

Construction Code. Has the meaning ascribed in Section 1-2 of the *City Code*.

206.0 – D –

Design Flood Elevation. See Chapter 19 of the *City Code* for provisions regarding the flood plain. ~~The elevation of the "design flood," including wave height, relative to the datum specified on the community's legally designated flood hazard map. In areas designated as Zone AO, the design flood elevation is the elevation of the highest existing grade of the building's perimeter plus the depth number (in feet) specified on the flood hazard map. In areas designated as Zone AO where a depth number is not specified on the map, the depth number is taken as being equal to 2 feet (610 mm).~~

207.0 – E –

Electrical Code. ~~The *National Electrical Code* promulgated by the National Fire Protection Association, as adopted by this jurisdiction~~ The *City of Houston Electrical Code*, as adopted and amended by this jurisdiction.

Energy Conservation Code. The *City of Houston Residential Energy Conservation Code* or the *City of Houston Commercial Energy Conservation Code*, both as adopted and amended by this jurisdiction.

208.0 – F –

Fire Code. ~~The fire code~~ The *City of Houston Fire Code*, as adopted by this jurisdiction.

Fire Code Official. The jurisdiction's fire marshal, who is charged with the administration and enforcement of the *Fire Code,* or an authorized representative.

Flood Hazard Area. See Chapter 19 of the *City* Code for provisions regarding the flood plain. ~~The greater of the following two areas:~~

~~(1) The area within a floodplain subject to a 1 percent or greater chance of flooding in any given year.~~

~~(2) The area designated as a flood hazard area on a community's flood hazard map, or otherwise legally designated.~~

212.0 – J –

Jurisdiction. The governmental unit that has adopted this code under due legislative authority.

215.0 – M –

Mechanical Integrity. The physical installation of products, systems, or equipment in accordance with their intended purpose and according to the manufacturer's specifications and manufacturer's installation instructions.

216.0 – N –

National Board Inspection Code. The manual for boiler and pressure vessel inspectors published by the *National Board of Boiler and Pressure Vessel Inspectors*.

218.0 – P –

Plumbing Code. The ~~Uniform Plumbing Code promulgated by the International Association of Plumbing and Mechanical Officials,~~ *City of Houston Plumbing Code*, as adopted by this jurisdiction.

Portable Boiler. A boiler primarily designed and intended for temporary use by anyone at any location.

220.0 – R –

Repair (Boilers). The work necessary to restore a boiler or a pressure vessel to a good and sound operating condition, provided there is no deviation from the original design.

Residential Code. The *City of Houston Residential Code*, as adopted and amended by this jurisdiction.

221.0 – S –

Safety Appliances. Safety devices such as safety valves or safety relief valves provided for the purposes of diminishing the danger of accidents.

Secondhand Boiler. A boiler for which both the location and ownership have changed.

{EDITORIAL NOTE: ALL OTHER PORTIONS OF CHAPTER 2 REMAIN AS SET FORTH IN THE 2021 UMC.}

CHAPTER 3
GENERAL REGULATIONS

303.8 Equipment and Appliances on Roofs. Equipment and a~~A~~ppliances on roofs shall be designed or enclosed so as to withstand climatic conditions in the area in which they are installed. Where enclosures are provided, each enclosure shall permit easy entry and movement~~, shall be of reasonable height,~~ and shall have not less than a 30 inch (762 mm) clearance between the entire service access panel(s) of the equipment and appliance, and the wall of the enclosure. [NFPA 54:9.4.1.1]

303.8.4 Edge of Roof Clearance. Equipment and appliances shall be installed on a well-drained surface of the roof. Not less than ~~6~~ 10 feet (~~1829~~ 3048 mm) of clearance shall be between a part of the equipment and appliance and the edge of a roof or similar hazard, or rigidly fixed rails, guards, parapets, or other building structures not less than 42 inches (1067 mm) in height shall be provided on the exposed side. [NFPA 54:9.4.2.2]

304.3 Access to Equipment and Appliances on Roofs. Equipment and a~~A~~ppliances located on roofs or other elevated locations shall be accessible. [NFPA 54:9.4.3.1]

304.3.1 Access. Buildings exceeding 15 feet (4572 mm) in height shall have a~~n inside~~ means of access to the roof in accordance with this section, unless other means acceptable to the Authority Having Jurisdiction are used. [NFPA 54:9.4.3.2]

304.3.1.1 Access Type. The inside means of access shall be a permanent or foldaway inside stairway, or ladder, terminating in an enclosure, scuttle, or trap door. Such scuttles or trap doors shall be not less than 22 inches by 24 inches (559 mm by 610 mm) in size, 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.

Not less than ~~6~~ 10 feet (~~1829~~ 3048 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 (1067 mm) in height shall be provided on the exposed side. Where parapets or other building structures are utilized in lieu of guards or rails, they shall be not less than 42 inches (1067 mm) in height. [NFPA 54:9.4.3.3]

304.4 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 the largest component of the appliance, ~~and~~ or not less than 22 inches by 30 inches (559 mm by 762 mm) whichever is more restrictive. Where an appliance is located within the attic a pull down stair shall be provided that is not less than 22 inches (559 mm) in width at its narrowest point with a load capacity of not less than 350 pounds.

305.2 Flood Hazard Areas. See Chapter 19 of the *City Code.* ~~For buildings located in flood hazard areas, heating, ventilating, air-conditioning, refrigeration, miscellaneous heat-producing, and energy-utilizing equipment and appliances shall be elevated at or above the elevation in accordance with the building code for utilities and attendant equipment or the elevation of the lowest floor, whichever is higher.~~

~~**Exception:** Equipment and appliances 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.~~

~~**305.2.1 Coastal High Hazard Areas.** Mechanical systems in buildings located in coastal high hazard areas shall be in accordance with the requirements of Section 305.2, and mechanical systems, pipes, and appurtenances shall not be mounted on or penetrate through walls that are intended to breakaway under flood loads in accordance with the building code.~~

~~**305.2.2 Air Exhaust and Intake Openings.** Outside air exhaust openings and air intake openings shall be located at or above the elevation required by the building code for utilities and attendant equipment or the elevation of the lowest floor, whichever is higher.~~

310.2 Condensate Control. Where an equipment or appliance is installed in a space where damage is capable of resulting from condensate overflow, ~~other than damage to replaceable lay-in ceiling tiles,~~ a secondary drain line shall be provided and shall be drained to a readily observed location in accordance with Section 310.1. When a secondary drain line cannot be installed, an additional protection method for condensate overflow shall be provided in accordance with one of the following:

{EDITORIAL NOTE: THE REMAINDER OF THIS SECTION REMAINS AS SET FORTH IN THE 2021 UMC.}

310.3.2 Insulation. Primary drain piping inside buildings shall be insulated for the first 15 feet (4572 mm) horizontally from the drain pan. The insulation shall be a minimum of ½ inch (12.7 mm) in thickness.

CHAPTER 4

VENTILATION AIR

TABLE 402.1
MINIMUM VENTILATION RATES IN BREATHING ZONE[1, 2, 4]
[ASHRAE 62.1: TABLE 6.2.2.1]

OCCUPANCY CATEGORY[4]	PEOPLE OUTDOOR Air Rate R_P (cfm/person)	AREA OUTDOOR Air Rate R_A (cfm/ft^2)	DEFAULT OCCUPANT Density[3] (people/1000 ft^2)	AIR CLASS
CORRECTIONAL FACILITIES				
Booking/waiting	7.5	0.06	50	2
Cell	5	0.12	25	2
Day room	5	0.06	30	1
Guard stations	5	0.06	15	1
DRY CLEANERS / LAUNDRIES				
Coin-operated dry cleaner	15	–	20	
Coin-operated laundries	7.5	0.12	20	2
Commercial dry cleaner	30	0.06	30	
Commercial laundry	25	–	10	
Storage, pick up	7.5	0.12	30	
EDUCATIONAL FACILITIES				
Art classroom	10	0.18	20	2
Classrooms (ages 5-8)	10	0.12	25	1
Classrooms (age 9 plus)	10	0.12	35	1
Computer lab	10	0.12	25	1
Daycare (through age 4)	10	0.18	25	2
Daycare sickroom	10	0.18	25	3
Lecture classroom [h]	7.5	0.06	65	1
Lecture hall (fixed seats) [h]	7.5	0.06	150	1
Media center [a]	10	0.12	25	1
Multi-use assembly [h]	7.5	0.06	100	1
Music/theater/dance [h]	10	0.06	35	1
Science laboratories [e]	10	0.18	25	2
University/college laboratories	10	0.18	25	2
Wood/metal shop	10	0.18	20	2
FOOD AND BEVERAGE SERVICE				
Bars, cocktail lounges	7.5	0.18	100	2
Cafeteria/fast food dining	7.5	0.18	100	2
Kitchen (cooking) [i]	7.5	0.12	20	2

OCCUPANCY CATEGORY[4]	PEOPLE OUTDOOR Air Rate R_P (cfm/person)	AREA OUTDOOR Air Rate R_A (cfm/ft^2)	DEFAULT OCCUPANT Density[3] (people/1000 ft^2)	AIR CLASS
Restaurant dining rooms	7.5	0.18	70	2
GENERAL				
Break rooms [h]	5	0.06	25	1
Coffee stations [h]	5	0.06	20	1
Conference/meeting [h]	5	0.06	50	1
Corridors [h]	–	0.06	–	1
Occupiable storage rooms for liquids or gels **b**	5	0.12	2	2
HOSPITALS, NURSING AND CONVALESCENT HOMES				
Autopsy rooms	–	0.5	20	
Medical procedure rooms	15	–	20	
Operating rooms	30	–	20	
Patient rooms	25	–	10	
Physical therapy	15	–	20	
Recovery and ICU	15	–	20	
HOTELS, MOTELS, RESORTS, DORMITORIES				
Barracks sleeping areas [h]	5	0.06	20	1
Bedroom/living room [h]	5	0.06	10	1
Dormitory sleeping areas	5	0.06	–	
Gambling casinos	7.5	0.16	–	
Laundry rooms, central	5	0.12	10	2
Laundry rooms within dwelling units	5	0.12	10	1
Lobbies/pre-function [h]	7.5	0.06	30	1
Multipurpose assembly [h]	5	0.06	120	1
OFFICE BUILDINGS				
Breakrooms	5	0.12	50	1
Main entry lobbies [h]	5	0.06	10	1
Occupiable storage rooms for dry materials	5	0.06	2	1
Office space [h]	5	0.06	5	1
Reception areas [h]	5	0.06	30	1
Telephone/data entry [h]	5	0.06	60	1
MISCELLANEOUS SPACES				
Bank or bank lobbies [h]	7.5	0.06	15	1
Bank vaults/safe deposit [h]	5	0.06	5	2
Computer (not printing) [h]	5	0.06	4	1
Freezer and refrigerated spaces (<50ºF) **e**	10	–	–	2
General manufacturing (excludes heavy industrial and processes using	10	0.18	7	3

OCCUPANCY CATEGORY[4]	PEOPLE OUTDOOR Air Rate R_P (cfm/person)	AREA OUTDOOR Air Rate R_A (cfm/ft^2)	DEFAULT OCCUPANT Density[3] (people/1000 ft^2)	AIR CLASS
chemicals)				
Pharmacy (prep. area)	5	0.18	10	2
Photo studios	5	0.12	10	1
Shipping/receiving [b]	10	0.12	2	2
Sorting, packing, light assembly	7.5	0.12	7	2
Telephone closets	–	–	–	1
Transportation waiting [h]	7.5	0.06	100	1
Warehouses [b]	10	0.06	–	2
PUBLIC ASSEMBLY SPACES				
Auditorium seating area [h]	5	0.06	150	1
Courtrooms [h]	5	0.06	70	1
Legislative chambers [h]	5	0.06	50	1
Libraries	5	0.12	10	1
Lobbies [h]	5	0.06	150	1
Museums (children's)	7.5	0.12	40	1
Museums/galleries [h]	7.5	0.06	40	1
Places of religious worship [h]	5	0.06	120	1
RESIDENTIAL				
Common corridors [h]	–	0.06	–	1
Dwelling unit [f, g, h]	5	0.06	See footnote [f]	1
RETAIL				
Sales (except as below)	7.5	0. 12	15	2
Barber shop [i]	7.5	0.06	25	2
Beauty and nail salons	~~20~~ 25	~~0.12~~ 0.25	25	2
Coin-operated laundries	7.5	0.12	20	2
Mall common areas [h]	7.5	0.06	40	1
Pet shops (animal areas)	7.5	0.18	10	2
Supermarket [h]	7.5	0.06	8	1
SPORTS AND ENTERTAINMENT				
Bowling alley (seating)	10	0.12	40	1
Disco/dance floors [h]	20	0.06	100	2
Gambling casinos	7.5	0.18	120	1
Game arcades	7.5	0.18	20	1
Gym, sports arena (play area)[e]	20	0.18	7	2

OCCUPANCY CATEGORY[4]	PEOPLE OUTDOOR Air Rate R_P (cfm/person)	AREA OUTDOOR Air Rate R_A (cfm/ft^2)	DEFAULT OCCUPANT Density[3] (people/1000 ft^2)	AIR CLASS
Health club/aerobics room	20	0.06	40	2
Health club/weight rooms	20	0.06	10	2
Spectator areas [h]	7.5	0.06	150	1
Stages, studios [d, h]	10	0.06	70	1
Swimming (pool & deck) [c]	–	0.48	–	2

For SI units: 1 cubic foot per minute = 0.0283 m^3/min, 1 square foot = 0.0929 m^2

Notes:

1 This table applies to no-smoking areas. Rates for smoking-permitted spaces ~~shall~~ must be determined using other methods.

2 Volumetric airflow rates are based on an air density of 0.075 pounds of dry air per cubic foot (lb_{da}/ft^3) (1.201 kg_{da}/m^3), which corresponds to dry air at a barometric pressure of 1 atm (101 kPa) and an air temperature of 70°F (21°C). Rates shall be permitted to be adjusted for actual density but such adjustment is not required for compliance with this chapter.

3 The default occupant density shall be used where actual occupant density is not known.

4 Where the occupancy category for a proposed space or zone is not listed, the requirements for the listed occupancy category that is most similar in terms of occupant density, activities, and building construction shall be used.

ITEM-SPECIFIC NOTES FOR TABLE 402.1

a For high school and college libraries, use values shown for Public Assembly Spaces – Libraries.

b Rate is capable of not being sufficient where stored materials include those having potentially harmful emissions.

c Rate does not allow for humidity control. Additional ventilation or dehumidification shall be permitted to be required to remove moisture. "Deck area" refers to the area surrounding the pool that would be expected to be wetted during normal pool use, i.e., where the pool is occupied. Deck area that is not expected to be wetted shall be designated as a space type (for example, "spectator area").

d Rate does not include special exhaust for stage effects, e.g., dry ice vapors, smoke.

e Where combustion equipment is intended to be used on the playing surface or in the space, additional dilution ventilation, source control, or both shall be provided.

f Default occupancy for dwelling units shall be two persons for studio and one-bedroom units, with one additional person for each additional bedroom.

g Air from one residential dwelling shall not be recirculated or transferred to other space outside of that dwelling.

h Ventilation air for this occupancy category shall be permitted to be reduced to zero where the space is in occupied-standby mode.

i Provide minimum 80% outdoor makeup air to air conditioning system through fixed openings.

j Where the hood is eliminated for enclosed single batch low temperature chemical dishwashers, the ventilation shall be designed by a licensed design professional to accommodate the latent and sensible heat load emitted from such appliances.

TABLE 403.7
MINIMUM EXHAUST RATES
[ASHRAE 62.1: TABLE 6.5]

OCCUPANCY CATEGORY[4]	EXHAUST RATE (cfm/unit)	EXHAUST RATE (cfm/ft^2)	AIR CLASS
Arenas[2]	–	0.50	1
Art classrooms	–	0.70	2
Auto repair rooms[1]	–	1.50	2
Barber shops	–	0.50	2
Beauty and nail salons	–	0.60	2
Cells with toilet	–	1.00	2
Copy, printing rooms	–	0.50	2
Darkrooms	–	1.00	2
Educational science laboratories	–	1.00	2
Janitor closets, trash rooms, recycling	–	1.00	3
Kitchens – commercial	–	0.70	2
Kitchenettes	–	0.30	2
Locker rooms for athletic, industrial and health care facilities	–	0.50	2
Other Locker rooms	–	0.25	2
Paint spray booths	–	–	4
Parking garages [3]	–	0.75	2
Pet shops (animal areas)	–	0.90	2
Refrigerating machinery rooms [6]	–	–	3
Residential – kitchens [7]	25~~50~~/100	–	2
Soiled laundry storage rooms	–	1.00	3
Storage rooms, chemical	–	1.50	4
Toilets – private [5, 9]	20~~25~~/50	–	2
Toilets – public [4, 9]	50/70	–	2
Woodwork shop/classrooms	–	0.50	2

For SI units: 1 cubic foot per minute = 0.0283 m^3/min, 1 square foot = 0.0929 m^2

Notes:

1 Stands where engines are run shall have exhaust systems that directly connect to the engine exhaust and prevent escape of fumes.

2 Where combustion equipment is intended to be used on the playing surface, additional dilution ventilation, source control, or both shall be provided.

3 Exhaust rate is not required for open parking garages as defined in accordance with the building code.

4 Rate is per water closet, urinal, or both. Provide the higher rate where periods of heavy use are expected to occur, e.g., toilets in theatres, schools, and sports facilities. Otherwise the lower rate shall be permitted to be used.

5 Rate is for a toilet room intended to be occupied by one person at a time. For continuous system operation during normal hours of use, the lower rate shall be permitted to be used. Otherwise the lower rate shall be permitted to be used.

6 For refrigeration machinery rooms, the exhaust rate shall comply with Chapter 11.

7 For continuous system operation, the lower rates shall be permitted. Otherwise the higher rate shall be used.

8 For unlisted occupancies for a proposed space not listed in the table, the requirements for the listed occupancy that is most similar in terms of occupant density and occupancy type shall be used.

9 Exhaust air that has been cleaned in accordance with the criteria of Class 1 shall be permitted to be recirculated.

10 Rate is per shower head

406.0 Smoke Control Systems. Smoke control systems shall be designed, installed, and tested based on the requirements of Section 909 of the Houston Fire Code.

CHAPTER 5
EXHAUST SYSTEMS

504.4.2.1 Length Limitation. Unless otherwise permitted or required by the dryer manufacturer's instructions and approved by the Authority Having Jurisdiction, domestic dryer moisture exhaust ducts shall not exceed a total combined horizontal and vertical length of ~~14~~ 35 feet (~~4267~~ 10,668 mm), including two 90 degree (1.57 rad) elbows. A length of 2 feet (610 mm) shall be deducted for each 90 degree (1.57 rad) elbow in excess of two. Where the exhaust duct is concealed within the building construction and exceeds the length limitation of this section, a permanent label or tag shall be located within 6 feet (1,829 mm)of the exhaust duct connection identifying the length of the exhaust duct.

Exception: Where an exhaust duct power ventilator, in accordance with Section 504.4.2.3 is used, the maximum length of the dryer exhaust duct shall be permitted to be in accordance with the dryer exhaust duct power ventilator manufacturer's installation instructions.

504.6 Gypsum Wallboard Ducts. Bathroom and laundry room exhaust ducts, and other environmental air ducts shall not ~~be permitted to~~ be constructed of gypsum wallboard ~~subject to the limitations of Section 602.5~~.

508.1 Where Required. Type I hoods shall be installed at or above commercial-type deep-fat fryers, broilers, grills, hot-top ranges, ovens, barbecues, rotisseries, and similar equipment that emits comparable amounts of smoke or grease in a food-processing establishment. For the purpose of this section, a food-processing establishment shall include a building or portion thereof used for the processing of food, but shall not include a dwelling unit.

Exceptions:

(1) Cooking appliance that is in accordance with UL 710B for reduced emissions where the grease discharge does not exceed 2.9 E-09 ounces per cubic inch (oz/in^3) (5.0 E-06 kg/m^3) where operated with a total airflow of 500 cubic feet per minute (cfm) (0.236 m^3/s).

(2) Recirculating systems listed in accordance with UL 710B and installed in accordance with Section 516.0.

(3) Residential cooking equipment located in daycare facilities, churches, employee lunchrooms, or similar locations that are no more hazardous than kitchen facilities in an individual dwelling unit.

(4) Listed convection ovens.

510.9.1 Rooftop Terminations. Rooftop terminations shall be arranged with or provided with the following:

(1) Not less than 10 feet (3,048 mm) of horizontal clearance from the outlet to adjacent buildings, property lines, and air intakes.

Exception: Exhaust outlets for grease ducts serving commercial food heat-processing equipment may terminate not less than 5 feet (1,524 mm) from an adjacent building, adjacent property line or air intake opening into a building if the air from the exhaust outlet is discharged away from such locations.

{EDITORIAL NOTE: THE REMAINDER OF THIS SECTION REMAINS AS SET FORTH IN THE 2021 UMC.}

513.1 General. Fire-extinguishing equipment for the protection of grease removal devices, hood exhaust plenums, and exhaust duct systems shall be provided in accordance with this section or the *Fire Code*, whichever is most restrictive. [NFPA 96:10.1.1]

519.1 Where Required. Type II hoods shall be installed above equipment and dishwashers that generate steam, heat, or products of combustion, and where grease or smoke is not present.

Exceptions:

(1) Dishwashing machines connected to a Type II duct system and exhausted directly to the outdoors.

(2) Dishwashing machines with a self-contained condensing system listed in accordance with UL 921 and installed in a space where the HVAC system has been engineered to accommodate the latent and sensible heat load emitted from such appliances as approved by the Authority Having Jurisdiction. Such equipment shall be provided with an interlocking device to prevent opening of the appliance prior to completion of its cycle.

(3) Residential cooking equipment located in daycare facilities, churches, employee lunchrooms, or similar locations that are no more hazardous than kitchen facilities in an individual dwelling unit.

(4) Listed convection ovens.

519.4 Type II Exhaust Duct Systems. Ducts and plenums serving Type II hoods shall be constructed of rigid metallic materials in accordance with Chapter 6. Duct bracing and supports shall comply with Chapter 6. Ducts subject to positive pressure and ducts conveying moisture-laden or waste-heat-laden air shall be adequately sealed.

CHAPTER 6
DUCT SYSTEMS

602.4.2 Gypsum. Where gypsum products are exposed in return air ducts or plenums, the air temperature shall be restricted to a range from 50˚F (10˚C) to 125˚F (52˚C), and moisture content shall be controlled so that the material is not adversely affected. For the purpose of this section, gypsum products shall not be exposed in ducts serving as supply from evaporative coolers, and in other air-handling systems regulated by this chapter where the temperature of the gypsum product will be below the dew point temperature, and exhaust systems complying with the requirements of Chapter 5.

603.11 Underground Installation. Ducts installed underground shall be approved for the installation and shall have a slope of not less than $^1/_8$ inch per foot (10.4 mm/m). Ducts, plenums, and fittings shall be permitted to be constructed of concrete, clay, or ceramics where installed in the ground or in a concrete slab, provided the joints are tightly sealed. Metal ducts where installed in or under a concrete slab shall be stainless steel or galvanized and encased in not less than 2 inches (51 mm) of concrete.

605.1 General. Air ducts conveying air at temperatures exceeding 140˚F (60˚C) shall be insulated to maintain an insulation surface temperature of not more than 140˚F (60˚C). Factory-made air ducts and insulations intended for installation on the exterior of ducts shall be legibly printed with the name of the manufacturer, the thermal resistance (R) value at installed thickness, flame-spread index and smoke developed index of the composite material. Internal duct liners and insulation shall be installed in accordance with the *Energy Conservation Code* ~~SMACNA HVAC Duct Construction Standards—Metal and Flexible~~.

Exceptions:

(1) Factory-installed plenums, casings, or ductwork furnished as a part of HVAC equipment tested and rated in accordance with approved energy efficiency standards.

(2) Ducts or plenums located in conditioned spaces where heat gain or heat loss will not increase energy use.

(3) For runouts less than 10 feet (3,048 mm) in length to air terminals or air outlets, the rated R value of insulation need not exceed R-3.5.

(4) The rated R value of required insulation on the b~~B~~acks of air outlets and outlet plenums exposed to unconditioned or indirectly conditioned spaces with face areas exceeding 1~~5~~ square feet (0.0929~~5~~ m^2) need not exceed R-2; those 1~~5~~ square feet (0.0929~~5~~ m^2) or smaller need not be insulated.

(5) Ducts and plenums used exclusively for evaporative cooling systems.

606.5 Access and Identification. Fire and smoke dampers shall be provided with an approved means of access large enough to allow inspection and maintenance of the damper and its operating parts. The access shall not affect the integrity of the fire resistance-rated assembly. The access openings shall not reduce the fire resistance rating of the assembly.

Access shall not require the use of tools. Access doors in ducts shall be tight fitting and approved for the required duct construction. Access points shall be permanently identified visibly on the exterior of the duct and at the ceiling level by a label with letters not less than ½ of an inch (12.7 mm) in height reading as one of the following:

(1) Smoke Damper

(2) Fire Damper

(3) Fire/Smoke Damper

Access doors shall be not more than 2 inches (51 mm) less than the size of the duct up to 24 inches (610 mm), and 24 inch by 24 inch (610 mm by 610 mm) in ducts of 28 inches (711 mm) dimension or larger.

609.1 Air-Moving Systems and Smoke Detectors. Air-moving systems supplying air in excess of ~~2000~~ 2,200 cubic feet per minute (ft^3/min) (~~0.9439~~ 1.0382 m^3/s) to enclosed spaces within buildings shall be equipped with an automatic shutoff. Automatic shutoff shall be accomplished by interrupting the power source of the air-moving equipment upon detection of smoke in the main supply-air duct or return-air duct served by such equipment. Duct smoke detectors shall comply with UL 268A and shall be installed in accordance with the manufacturer's installation instructions. Such devices shall be compatible with the operating velocities, pressures, temperatures, and humidities of the system. Where fire-detection or alarm systems are provided for the building, the smoke detectors shall be supervised by such systems in an approved manner.

Exceptions:

(1) Where the space supplied by the air-moving equipment is served by a total coverage smoke-detection system in accordance with the fire code, interconnection to such system shall be permitted to be used to accomplish the required shutoff.

(2) Automatic shutoff is not required where occupied rooms served by the air-handling equipment have direct exit to the exterior and the travel distance does not exceed 100 feet (30,480 mm). For the purpose of this exception, occupied rooms shall not include rooms that have less than 300 square feet (27.8709 square meters) and are ancillary to the function of the space served by the air-handling system, such as restrooms, storerooms, or cashier or manager offices.

(3) Automatic shutoff is not required for Group R, Division 3 and Group U occupancies.

(4) Automatic shutoff is not required for approved smoke-control systems or where analysis demonstrates shutoff would create a greater hazard, such as shall be permitted to be encountered in air-moving equipment supplying specialized portions of Group H Occupancies. Such equipment shall be required to have smoke detection with remote indication and manual shutoff capability at an approved location.

(5) Smoke detectors that are factory installed in listed air-moving equipment shall be permitted to be used in lieu of smoke detectors installed in the main supply-air duct served by such equipment.

CHAPTER 9
INSTALLATION OF SPECIFIC APPLIANCES

913.1.1 Gasketed Fireplace Doors. A gasketed fireplace door shall not be installed on a factory-built fireplace, except where the fireplace system has been tested in accordance with UL 127 and the *Energy Conservation Code*.

{EDITORIAL NOTE: THE REMAINDER OF THIS SECTION REMAINS AS SET FORTH IN THE 2021 UMC AND IS NOT ADOPTED BY THIS JURISDICTION.}

927.0 Pool Heaters. Pool heaters shall comply with Appendix L of the *Plumbing Code*.

{EDITORIAL NOTE: THE REMAINDER OF SECTION 927REMAINS AS SET FORTH IN THE 2021 UMC AND IS NOT ADOPTED BY THIS JURISDICTION.}

CHAPTER 10

BOILERS AND PRESSURE VESSELS

1001.1 Applicability. The requirements of this chapter shall apply to the construction, installation, operation, repair, and alteration of boilers and pressure vessels. Low-pressure boilers shall comply with this chapter and Section 904.0. The installation or repair of gas and potable water piping and/or accessories shall be subject to the provisions of the *Plumbing Code*.

Exceptions:

(1) Listed and approved potable water heaters with a nominal capacity not exceeding 120 gallons (454 L) and having a heat input not exceeding 200,000 British thermal units per hour (Btu/h) (58.6 kW) used for hot water supply at a pressure not exceeding 160 pounds force per square inch (psi) (1,103 kPa) and at temperatures not exceeding 210°F (99°C), in accordance with the plumbing code.

(2) Pressure vessels used for unheated water supply, including those containing air that serves as a cushion and is compressed by the introduction of water and tanks connected to sprinkler systems.

(3) Portable unfired pressure vessels and Interstate Commerce Commission (I.C.C.) containers.

(4) Containers for liquefied petroleum gases, bulk oxygen, and medical gas that are regulated by the fire code.

(5) Unfired pressure vessels in business, factory, hazardous, mercantile, residential, storage, and utility occupancies having a volume not exceeding 5 cubic feet (0.14 m^3) and operating at pressures not exceeding 250 psi (1,724 kPa).

6) Pressure vessels used in refrigeration systems shall comply with Chapter 11.

(7) Pressure tanks used in conjunction with coaxial cables, telephone cables, power cables, and other similar humidity control systems.

(8) A boiler or pressure vessel subject to regular inspection by federal inspectors or licensed by federal authorities.

1001.1.1 Potable Water Boilers. Permits and inspections pertaining to boilers used exclusively for the production of potable hot water shall be administered by the Plumbing Inspection Section staff of the Authority Having Jurisdiction.

1001.1.2 Permit Required. Except for work exempted by Section 104.2 of this code, a permit shall be obtained from the Authority Having Jurisdiction prior to installation, reinstallation, alteration, repair or replacement of boilers and pressure vessels related to steam and hot water boiler systems. Alteration of safety control systems on automatic boilers or replacement, repair, or alteration of breeching, vent connector, vent pipe or chimney, and the conversion of solid fuel-fired boilers as permitted by Section 1010.0 shall also require a permit. See Chapter 1 for requirements for obtaining permits.

1001.1.3 Boiler Nameplate. A boiler nameplate shall be attached to each boiler. Lost or destroyed nameplates shall be replaced in accordance with the *National Board Inspection Code*.

1001.6 Makeup water connection to steam boilers. Approved backflow preventers shall be installed in accordance with the *Plumbing Code*.

1005.6 Authority to Set and Seal Safety Appliances. All safety and safety relief valves for ASME Section I, Section IV, and Section VIII Division 1 boilers must be repaired, tested, set, and sealed by one of the following, provided the scope of the issued certificate of authorization covers the work to be performed:

(1) An organization holding a valid V, HV, or UV certification or authorization, as appropriate, issued by the American Society of Mechanical Engineers (ASME);

(2) An organization holding a valid VR certificate of authorization issued by the National Board of Boiler and Pressure Vessel Inspectors; or

(3) An organization holding a valid owner/operate certificate of authorization issued by the Texas Department of Licensing and Regulation.

1006.0 Gas Shutoff Valves.

1006.1 General. An approved manual shutoff valve shall be installed within 3 feet (914 mm) of the boiler gas train, upstream of all control devices on the main burner of a gas-fired boiler. The takeoff point for the gas supply to the pilot shall be upstream of the gas shutoff valve of the main burner and shall be valved separately. A union or other approved means of disconnect shall be provided immediately down-stream of these shutoff valves.

1008.2 Low-Water Fuel Cutoff and Feed Water Pump Control Combined in a Single Device. Where a low-water fuel cutoff and feed water pump control combined in a single device is used, an additional separate low-water fuel cutoff with manual reset shall be installed, or be in accordance with the manufacturer's specifications of a listed device. The additional control shall be wired in series electrically with the existing low-water fuel cutoff.

1008.3 Low-Water Fuel Cutoff Housed in Either the Water Column or Separate Chamber. The installation shall be provided with a blow down pipe and valve not less than ¾ inch pipe size. The arrangement shall be such that when the water column is blown down, the water level in it will be lowered sufficiently to activate the low-water fuel cutoff device.

1013.1 General. An installation for which a permit is required shall not be put into service until it has been inspected and approved by the Authority Having Jurisdiction.

It shall be the duty of the owner or his authorized representative to notify the Authority Having Jurisdiction that the installation is ready for inspection and test. It also shall be the duty of the owner or his authorized representative to post in a conspicuous position on the installation a notice in substantially the following form: "Warning! This installation has not been inspected and approved by the Authority Having Jurisdiction and shall not be covered or concealed until so inspected and approved," and it shall be unlawful for anyone other than the Authority Having Jurisdiction to remove such notice. The Authority Having Jurisdiction shall require such tests as it deems necessary to determine that the installation is in accordance with the provisions of this section. Such tests shall be made by the owner or his authorized representative in the presence of the Authority Having Jurisdiction. All boiler installations shall be hydrostatically tested by the owner or owner's authorized representative in the presence of the Authority Having Jurisdiction and in accordance with the *National Board Inspection Code*.

Exception: On installation designed and supervised by a registered design professional, the Authority Having Jurisdiction shall have the authority to permit inspection and testing by such registered design professional.

Where the owner or his authorized representative requests inspection of a boiler prior to its installation, the Authority Having Jurisdiction shall make such inspection.

1013.2.1 Temporary Permit. ~~It shall be unlawful to operate a boiler or pressure vessel without first obtaining a valid operating permit to do so from the Authority Having Jurisdiction. Such permit shall be displayed in a conspicuous place adjacent to the boiler or vessel. The operating permit shall not be issued until the equipment has been inspected and approved by the Authority Having Jurisdiction.~~

~~**Exception:** The operation of steam-heating boilers, low-pressure hot-water-heating boilers, hot water supply boilers, and pressure vessels in residential occupancies of less than six dwelling units and in utility occupancies.~~

An installer of a boiler installed by authority of a permit issued under the provisions of this code may operate a temporary boiler and its appurtenances for a limited time for the purpose of cleaning, testing and adjusting, prior to passing final inspection, upon the following conditions:

(1) The installer in whose name the permit is issued shall request the Authority Having Jurisdiction to inspect the system for approval of such operation.

(2) If upon inspection the system is approved for operation as described in this section, the Authority Having Jurisdiction shall indicate in writing on said permit that a temporary operation is approved for the purpose of cleaning, testing, and adjusting for a period of 30 working days from date of inspection.

(3) On or before the expiration date of the temporary operating permit, the system shall be given a final inspection and if the system fails to be approved, a reinspection fee will be charged for each subsequent inspection until the system is finally approved as complying with the requirements of this code.

(4) Should the cleaning, testing, and adjusting of a boiler system not be completed within the time stipulated on the temporary operating permit, the Authority Having Jurisdiction may extend the time for just cause.

CHAPTER 11
REFRIGERATION

1101.1 Applicability. Part I governs the design, installation, and construction of refrigeration systems, equipment, refrigerant piping, pressure vessels, and safety devices for new buildings~~, replacement of parts, alterations, and substitution of different refrigerants~~. Replacement of existing refrigeration systems, conversion to a different refrigerant or installation of a new refrigeration system into an existing building shall conform to the requirements of this chapter. Part II governs the installation and construction of cooling towers.

1101.1.1 Existing Systems in Machinery Rooms. The requirements of this section shall apply to existing refrigerant systems, equipment or devices where a substitution of a different refrigerant or replacement or addition of a refrigeration system or equipment occurs, and:

(1) The quantity of refrigerant in the largest system in the room exceeds the allowable quantities per Table 1102.3; or

(2) The replaced, converted or altered system contains Group A1 refrigerant and has an aggregate horsepower of 100 or more for a single refrigerant system; or

(3) The system contains other than Group A1 refrigerant

1103.1.1 Safety Group. Table 1102.3 classifies refrigerants by toxicity and flammability, and assigns safety groups using combinations of toxicity class and flammability class. For the purposes of this chapter, the refrigerant Groups A1, A2L, A2, A3, B1, B2L, B2, and B3 shall be considered to be individual and distinct safety groups, as shown in Table 1103.1.1. Each refrigerant is assigned into not more than one group.

Table 1103.1.1

Refrigerant Safety Group Classifications

Higher Flammability	A3	B3
Flammable	A2	B2
Lower Flammability	A2L	B2L
No Flame Propagation	A1	B1
	Lower Toxicity	Higher Toxicity

1104.2 Refrigerant Concentration Limit. The concentration of refrigerant in a complete discharge of an independent circuit of high-probability systems shall not exceed the amounts shown in Table 1102.3, except as provided in Section 1104.3, ~~and~~ Section 1104.4 and Section 1104.6. The volume of occupied space shall be determined in accordance with Section 1104.2.1 through Section 1104.2.3.

Exceptions:

(1) Listed equipment containing not more than 6.6 pounds (2.99 kg) of refrigerant, regardless of the refrigerant safety classification, provided the equipment is installed in accordance with the listing and with the manufacturer's installation instructions.

(2) Listed equipment for use in laboratories with more than 100 square feet (9.29 m2) of space per person, regardless of the refrigerant safety classification, provided that the equipment is installed in accordance with the listing and the manufacturer's installation instructions. [{ASHRAE 15:7.2}]

1104.6 Group A2L Refrigerants for Human Comfort. High-probability systems using Group A2L refrigerants for human comfort applications shall comply with this section. [ASHRAE 15:7.6]

1104.6.1 Refrigerant Concentration Limits. Occupied spaces shall comply with the releaseable charge limitations of the equipment listing. Unoccupied spaces with refrigerant containing equipment, not including continuous piping or tubing, shall comply with the releaseable charge limitations of the equipment listing or Section 1104.6.4. {ASHRAE 15:7.6.1-7.6.1.2}

1104.6.2 Listing and Installation Requirements. Refrigeration systems shall be listed and shall be installed in accordance with listing, the manufacturer's instructions, and any markings on the equipment restricting the installation. [ASHRAE 15:7.6.2]

1104.6.2.1 Nameplate. The nameplate required by Section 1115.5 shall include a symbol indicating that a flammable refrigerant is used, as specified by the product listing. [ASHRAE 15:7.6.2.1]

1104.6.2.2 Labeling. A label indicating a flammable refrigerant is used shall be placed adjacent to service ports and other locations where service involving components containing refrigerant is performed, as specified by the product listing. [ASHRAE 15:7.6.2.2]

1104.6.2.3 Refrigerant Detection Systems. Refrigerant detection systems shall be in accordance with the listing and ASHRAE 15. 1104.6.2.4 Refrigerant Concentration Above Limit. When the refrigerant detection system senses a refrigerant concentration exceeding its setpoint, the following actions shall be taken:

(1) The supply air fan of the equipment shall activate with a minimum airflow rate specified by the manufacturer.

(2) Turn off the compressor and all other electrical devices, excluding the control power transformers, control systems, and the supply air fan. The supply air fan shall continue to operate for at least five minutes after the refrigerant detection system has sensed a drop in the refrigerant concentration below the value specified in Section 1104.6.5(2).

(3) Any device that controls airflow located within the product or in ductwork that supplies air to the occupied space shall be fully open. Any device that controls airflow shall be listed.

(4) Mitigation action required by the equipment shall be initiated. {ASHRAE 15:7.6.2.4} 1104.6.3 Ignition Sources Located in Ductwork. Open-flame-producing devices shall not be permanently installed in the ductwork that serves the space. Unclassified electrical devices shall not be located within the ductwork that serves the space. Devices containing hot surfaces exceeding 1290°F (700°C) shall not be located in the ductwork that serves the space unless there is a minimum airflow of 200 ft/min (1.0 m/s) across the heating device(s) and there is proof of airflow before the heating device(s) is energized. [ASHRAE 15:7.6.3-7.6.3.3]

1104.6.4 Compressors and Pressure Vessel Located Indoors. For refrigeration compressors and pressure vessels located in an indoor space that is accessible only during service and maintenance, the refrigerant charge shall be in accordance with the equipment listing where all of the following provisions are met:

a. Mechanical ventilation shall be provided that will remove leaked refrigerant from the space where refrigerant leaking from the equipment is expected to accumulate if the equipment is not labeled as enhanced tightness refrigerating system. The space shall be provided with an exhaust or transfer fan. Fans used to exhaust air from the space or transfer circulate the air to another indoor space shall in accordance comply with the following equation:

$Q_{min} = Q_{REQ}/CLFL$

where Q_{min} = minimum mechanical ventilation airflow rate, ft^3/min (m^3/h)

Q_{REQ} = the required ventilation, as determined from Table 1104.6.4-1

CLFL = the lower flammability limit conversion factor, as determined from Table 1104.6.4-2

Table 1104.6.4-1 Required Ventilation for A2L Systems[a]

Excluded Charge (M – MVOL)[b]		QREQ		Excluded Charge (M – MVOL)[b]		QREQ	
lb	kg	ft^3/min	m^3/hr	lb	kg	ft^3/min	m^3/hr
3.8	1.7	100	170	91.8	41.6	2400	4080
7.6	3.5	200	340	95.6	43.4	2500	4250
11.5	5.2	300	510	99.4	45.1	2600	4420
15.3	6.9	400	680	103.2	46.8	2700	4590
19.1	8.7	500	850	107.1	48.6	2800	4760
22.9	10.4	600	1020	110.9	50.3	2900	4930
26.8	12.1	700	1190	114.7	52.0	3000	5100
30.6	13.9	800	1360	118.5	53.8	3100	5270
34.4	15.6	900	1530	122.4	55.5	3200	5440
38.2	17.3	1000	1700	126.2	57.2	3300	5610
42.1	19.1	1100	1870	130.0	59.0	3400	5780
45.9	20.8	1200	2040	133.8	60.7	3500	5950
49.7	22.5	1300	2210	137.6	62.4	3600	6120
53.5	24.3	1400	2380	141.5	64.2	3700	6290
57.4	26.0	1500	2550	145.3	65.9	3800	6460
61.2	27.7	1600	2720	149.1	67.6	3900	6630

65.0	29.5	1700	2890	152.9	69.4	4000	6800
68.8	31.2	1800	3060	156.8	71.1	4100	6970
72.6	32.9	1900	3230	160.6	72.8	4200	7140
76.5	34.7	2000	3400	164.4	74.6	4300	7310
80.3	36.4	2100	3570	168.2	76.3	4400	7480
84.1	38.1	2200	3740	172.1	78.0	4500	7650
87.9	39.9	2300	3910	175.5	79.6	4590	7803

Note: a. Charge sizes and ventilation rates shown in this table are based on R-32.

a. (M – MVOL) is the amount of refrigerant charge that is removed by mechanical ventilation and is therefore not included in calculations to determine compliance with Section 1104.2. M and MVOL are as defined below.

Table 1104.6.4-2 Lower Flammability Limit Conversion Factor

Refrigerant Number	CLFL
R-32	1.00
R-452B	1.02
R-454A	0.92
R-454B	0.97
R-454C	0.95
R-457A	0.71

When the refrigerant charge necessary to be removed by ventilation is known, in order to be compliant with Section 1104.2, an alternative method to determine QREQ uses the following equations. This alternative method shall be used for all A2L refrigerants not listed in Table 7-2.

$$Q\_REQ = (M-M\_VOL)/(4\times LFL)\times 〚SF〛\_Vent \quad \text{(I-P)}$$

$$Q\_REQ = (M-M\_VOL)/(4\times LFL)\times 〚SF〛\_Vent\times 60 \quad \text{(SI)}$$

$$MVOL = RCL \times V \times FOCC$$

where QREQ = required minimum mechanical ventilation airflow rate, ft^3/min (m^3/h)

M = refrigerant charge of the largest independent circuit of the system, lb (kg)

MVOL = refrigerant charge permitted in the space

RCL = refrigerant concentration limit, lb/ft^3 (kg/m^3)

V = volume of space established in accordance with Section 7.3, ft^3 (m^3)

FOCC = occupancy adjustment factor. For all occupancies other than institutional, FOCC has a value of 1. For institutional occupancies, FOCC has a value of 0.5.

LFL = lower flammability limit, lb/ft^3 (kg/m3)

4 = assumed leak time (4 minutes)

SFVent = safety factor, value of 2

60 = conversion of minutes to hours

If the equipment is a listed and labeled enhanced tightness refrigerating system, mechanical ventilation shall be provided according to the following formula unless the releasable charge of the equipment complies with Section 1104.6.1.:

$$Q\_REQ = m / LFL \times [SF]\_Vent$$

where

QREQ = required minimum mechanical ventilation airflow rate , ft^3/min (m^3/h)

$\dot{m}$ = the expected maximum leak rate, value of 0,37 in lb/min(10 in kg/h)

LFL = lower flammability limit, lb per 1 000 ft^3 (kg/m3)

SFVent = safety factor, value of 4

b. *Mechanical ventilation shall be permitted to be continuous or activated by a refrigerant detection system. Building fire and smoke systems may override this function.

1. Continuous Ventilation. Where continuous ventilation is provided, ventilation function shall be continuously verified per Section 1104.6.4(b)(3).

2. Refrigerant Detection System Activated Ventilation. Upon refrigerant detection system activation, the mechanical ventilation shall be started and shall continue to operate for at least five minutes after the refrigerant detection system has sensed a drop in the refrigerant concentration below the setpoint value. Ventilation function of refrigerant detection system activated ventilation shall be verified in accordance with Section 1104.6.4(b)(3) by a monthly self-test.

3. Verification of Ventilation Function. Ventilation function shall be verified by a method that confirms operation of the required fans. Upon detection of a ventilation system failure, compressor operation shall be stopped, and a notification shall be provided. The notification shall be to an operator workstation through a building automation system or by a local audible alarm.

c. While the ventilation system is operating, makeup air shall be provided, and the volume of makeup air shall not exceed the volume of air being exhausted or transferred out of the space. Openings for makeup air shall be positioned to facilitate mixing of makeup air with leaked refrigerant. Inlets for exhaust air and inlets used to mechanically transfer air to another indoor location shall be located such that the bottom of the inlet is within 12 in. (30 cm) of the lowest elevation in the space where leaked refrigerant would be expected to accumulate.

d. The refrigerant concentration of an indoor effective dispersal volume shall not exceed the limit specified in Section 1104.6.1.

e. In addition to the requirements of Section 1104.6.3, there shall be no open-flame-producing devices that do not contain a flame arrestor, or hot surfaces exceeding 1290°F (700°C), installed within the space where the equipment is located.

f. Electric motors larger than 1 hp driving fans located in the airstream of the discharge side of the ventilation system shall be of the totally enclosed or hermetically sealed type.

g. Fan rotating elements shall be nonferrous or non-sparking, or the casing shall consist of or be lined with such material.

h. Ventilation fans shall be listed in accordance with UL 50720 or UL 70521. {ASHRAE 15:7.6.4}

1104.6.5 Refrigerant Sensors. Refrigerant sensors required by Section 1104.6.2 shall meet the following requirements:

(1) Refrigerant sensors shall be evaluated by the testing laboratory as part of the equipment listing.

(2) Refrigerant sensors shall be located such that refrigerant will be detected if the refrigerating system is operating or not operating.

(a) For refrigerating systems that are connected to the occupied space through ductwork, refrigerant sensors shall be located within the listed equipment.

(b) For refrigerating systems that are directly connected to the occupied space without ductwork, the refrigerant sensor shall be located in the equipment in accordance with the equipment listing. Additional remote refrigerant sensors shall be permitted within the occupied space when included as part of the equipment mitigation system. {ASHRAE 15:7.6.5}

~~**1104.6**~~ **1104.7 Applications for Human Comfort and for Nonindustrial Occupancies.** In nonindustrial occupancies, Group A2, ~~A2L,~~ A3, B1, B2L, B2, and B3 refrigerants shall not be used in high-probability

systems for human comfort. Use of Group A2L refrigerants used in high-probability systems for human comfort shall be in accordance with Section 1104.6.

1106.13 Existing Machinery Rooms.

1106.9.1 Isolation. Where the requirements of 1106.5 cannot be met for existing installations, open flame appliances or other heat producing appliances shall be isolated from the machinery room according to the requirements of Table 509 for Houston Building Code. Where sprinklers are used to prevent installing a one hour barrier, a physical barrier must still be installed to separate the open flame or heat producing appliance from the machinery room. Boilers and other heat-producing appliances shall be isolated from the machinery room by walls or partitions that create a reasonably distinct and separate atmosphere from the refrigeration machinery room. Combustion air shall be taken from other than refrigeration machinery rooms in accordance with Chapter 7 of this code. Partitions, doors and other components of the structure shall be made of materials as required for not less than a one-hour occupancy separation.

1106.13.2 Engines in Existing Refrigeration Machinery Rooms. Engines are permitted in refrigeration machinery rooms, provided:

(1) The refrigerant classification is Group A1 and Group B1 only;

(2) Combustion air is taken from outside the building and to the engine in substantially sealed ducts or pipes;

(3) Insulation is provided for all hot surfaces subject to a temperature of 800°F or higher;

(4) Ventilation is provided to dissipate the radiant heat from the engines to keep the room below 120°F (48.89°C); and

(5) There is no open flame or spark.

1106.13.3 Switchgear and Related Equipment in Machinery Rooms. Switchgear and related equipment may remain in an existing machinery room, provided:

(1) The refrigerant classification is Group A1 or Group B1 only; and

(2) The switchgear or related equipment possesses no clearance or work hazard in regard to the refrigeration machinery or the electrical switchgear.

1109.1.5 Piping Insulation. For minimum pipe insulation see the *Energy Code*.

CHAPTER 12
HYDRONICS

~~**1207.4 Solar Heat Collector Systems.** Solar water heating systems used in hydronic panel radiant heating systems shall be installed in accordance with the *Uniform Solar Energy Code* and *Hydronics Code* (USEHC).~~

CHAPTER 13
FUEL GAS PIPING

1301.0 Scope of Gas Piping. For provisions pertaining to fuel gas piping see Chapter 12 of the *Plumbing Code*.

{EDITORIAL NOTE: THE REMAINDER OF THIS CHAPTER REMAINS AS SET FORTH IN THE 2021 UMC AND IS NOT ADOPTED BY THIS JURISDICTION.}

CHAPTER 14
PROCESS PIPING

{EDITORIAL NOTE: THE REMAINDER OF THIS CHAPTER REMAINS AS SET FORTH IN THE 2021 UMC AND IS NOT ADOPTED BY THIS JURISDICTION. PROCESS PIPING SHALL COMPLY WITH SECTION 2907 AND OTHER APPLICABLE PROVISIONS OF THE *FIRE CODE* AS DEFINED HEREIN.}

CHAPTER 15
SOLAR ENERGY SYSTEMS

{EDITORIAL NOTE: THE REMAINDER OF THIS CHAPTER REMAINS AS SET FORTH IN THE 2021 UMC AND IS NOT ADOPTED BY THIS JURISDICTION. THE INSTALLATION OF SOLAR ENERGY SYSTEMS SHALL COMPLY WITH ALL APPLICABLE PROVISIONS OF THE *CONSTRUCTION CODE*, AS DEFINED HEREIN.}

CHAPTER 17
REFERENCED STANDARDS

TABLE 1701.1
REFERENCED STANDARDS

Standard Number	Standard Title	Application	Referenced Sections
ASTM B 68-2011	Specification for Seamless Copper Tube, Bright Annealed (Metric)	Miscellaneous	405.13.1
NFPA 70-2020~~14~~*	National Electrical Code	Miscellaneous	301.4, 511.1.6, 512.2.5, 516.2.7, 516.2.9(4), 602.2.1, 905.10.2, 1104.4(6), 1217.7.1, 1311.14.5(2), 1312.6, E 503.5(11)(c)
NFPA 92-2015	Standard for Smoke Control Systems	Smoke Control	405.7, 405.8
UL 864-2003	Standards for Control Units and Accessories for Fire Alarm Systems	Miscellaneous	405.12
ASHRAE 15-~~2016~~ 2022	Safety Standard for Refrigeration Systems	Refrigeration Systems	1102.1, 1104.6.1, 1104.6.2.3, 1104.6.4, 1104.6.5, 1106.1, Table 1113.5
ASHRAE 34-~~2016~~ 2022	Designation and Safety Classification of Refrigerants	Refrigeration Classifications	1102.3, Table 1102.3, 1103.1, Table 1106.2.5.2
UL 60335-2-40-~~2017~~ 2022	Household and Similar Electrical Appliances — Safety — Part 2-40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers	Appliances	903.1, 904.13
UL 60335-2-89-~~2017~~ 2021	Household and Similar Electrical Appliances – Safety – Part 2-89: Particular Requirements for Commercial Refrigerating Appliances with an Incorporated or Remote Refrigerant Unit or	Appliances	934.1, 934.2, 934.3

	Compressor		