

Houston Amendments to the 2012 Uniform Mechanical Code



Adopted by Ord. No. 2015-_____

Passed __/__/2015

Effective 01/10/2016

CHAPTER 1

ADMINISTRATION

Part I — General.

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

The City of Houston Construction Code collectively includes this volume and certain other codes, pamphlets, specifications and documents that are adopted in or by reference through the adopting ordinance, City of Houston Ordinance No. 2015-¹, which appears in the preamble of the building code.

101.3.1 Conflicts. Where, in a specific case, different sections of the City Code, the building code, the electrical code, the plumbing code, the energy conservation code, the residential code, the fire code, and this code, or referenced standards, specify different materials, methods of construction, or other requirements, the most restrictive shall govern as determined by the Authority Having Jurisdiction. Where there is a conflict between a general requirement and a specific requirement, in this code or another of the codes listed above, the specific requirement shall prevail.

101.3.3 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 D, containing conversion tables, and Appendix F shall be adopted as part of this code.

101.3.4 Residential Code. Mechanical systems for detached one- and two family dwellings and multiple single-family dwellings (townhouses) not more than three stories high with separate means of egress and their accessory structures shall comply with the City of Houston Residential Code, based on the International Residential Code for One- and Two-Family Dwellings, as adopted by the State of Texas in Subchapter G of Chapter 214 of the Texas Local Government Code, with amendments by this jurisdiction. Mechanical systems for residential occupancies to which the City of Houston Residential Code does not apply shall be governed by this code.

101.3.5 Energy Conservation. The energy conservation code and Chapter 11 of the residential code and any amendments adopted as authorized by state law shall be enforced by this jurisdiction in accordance with state law.

~~**102.4.1 Commercial HVAC Systems.** Commercial HVAC systems both existing and new, and parts thereof shall be inspected and maintained in operating condition in accordance with ASHRAE/ ACCA 180. The owner or the owner's designated agent shall be responsible for maintenance of mechanical systems and equipment. To determine~~

¹ City Secretary shall insert number of adopting ordinance.

~~compliance with this subsection, the Authority Having Jurisdiction shall be permitted to cause a HVAC system to be reinspected.~~

~~**102.4.2 Residential HVAC Systems.** Residential HVAC systems both existing and new, and parts thereof shall be inspected in accordance with ACCA 4 QM. The owner or the owner's designated agent shall be responsible for maintenance of mechanical systems and equipment. To determine compliance with this subsection, the Authority Having Jurisdiction shall be permitted to cause a HVAC system to be reinspected.~~

102.7 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.

Part II — Organization and Enforcement.

106.3 Right of Entry. Where it is necessary to make an inspection to enforce the provisions of this code, or where the Authority Having Jurisdiction has a reasonable cause to believe that there exists in a building or upon a premises a condition that is contrary to or in violation of this code that makes the building or premises unsafe, dangerous, or hazardous, the Authority Having Jurisdiction shall be permitted to enter the building or premises at reasonable times to inspect or to perform the duties imposed by this code, provided that where such building or premises be occupied that credentials were presented to the occupant and entry requested. Where such building or premises be unoccupied, the Authority Having Jurisdiction shall first make a reasonable effort to locate the owner or other person having charge or control of the building or premises and request entry. Where entry is refused, the Authority Having Jurisdiction shall have recourse to the remedies provided by law to secure entry.

When, due to an emergency, immediate entry is necessary to make an inspection to protect life or property or when the Authority Having Jurisdiction has obtained a proper inspection warrant or other remedy provided by law to secure entry, no owner or occupant or person having charge, care, or control of any building or premises shall fail or neglect, after the proper request is made as herein provided, to promptly permit entry therein by the Authority Having Jurisdiction for the purpose of inspection and examination pursuant to this code.

106.4 Stop Orders. Where work is being done contrary to the provisions of this code, the Authority Having Jurisdiction shall have the authority to order the work stopped by notice in writing served on persons engaged in 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 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 by the Authority Having Jurisdiction, who shall deliver the notice to the persons performing the work, if present at the site, or otherwise conspicuously post the notice at the site. Upon request, a hearing shall be held within three business days unless the permit holder or person who was doing the work requests an extension of time. Any stop order that has been issued shall remain in effect pending any hearing that has been requested unless the stop order is withdrawn by the Authority Having Jurisdiction.

106.5 Authority to Disconnect Utilities in Emergencies. The Authority Having Jurisdiction or authorized representative shall be permitted to disconnect fuel gas utility service or energy

supplies to a building, structure, premises, 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 106.10. On request, a hearing shall be conducted within three business days unless the owner requests an extension of time.

106.6 Authority to Condemn Equipment. Where the Authority Having Jurisdiction ascertains that an equipment, or portion thereof, regulated by this code has become hazardous to life, health, or property, it shall order in writing that the equipment either be removed or restored to a safe or sanitary condition. The written notice shall contain a fixed time limit for compliance of not less than three days, with such order and shall inform the owner and the occupant of the right to a hearing on the matter pursuant to Section 106.10. Persons shall not use or maintain defective equipment after receiving a notice.

Where equipment or an installation is to be disconnected, written notice of the disconnection and causes therefore shall be given within 24 hours to the serving utility, owner, and occupant of the building, structure, or premises. Where equipment is maintained in violation of this code, and in violation of a notice issued pursuant to the provisions of this section, the Authority Having Jurisdiction shall institute an action to prevent, restrain, correct, or abate the violation.

~~**106.8 Liability.** The Authority Having Jurisdiction charged with the enforcement of this code acting in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance shall not thereby be rendered personally liable for damages 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 by the Authority Having Jurisdiction or employee in the enforcement of a provision of such codes or other pertinent laws or ordinances implemented through the enforcement of this code or enforced by the code enforcement agency shall be defended by this jurisdiction until formal termination of such proceedings, and a judgment resulting therefrom shall be assumed by this jurisdiction. Except as otherwise provided by law, the Authority Having Jurisdiction 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 Authority Having Jurisdiction 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, the jurisdiction shall provide legal representation and indemnification for any suit brought against the Authority Having Jurisdiction because of acts or omissions performed in the enforcement of this code.~~

This code shall not be construed to relieve from or lessen the responsibility of a person owning, operating, or controlling an equipment regulated herein for damages to persons or property caused by defects, nor shall the code enforcement agency or its parent jurisdiction be held as assuming such liability by reason of the inspections authorized by this code, permits or certificates issued under this code.

106.10 Hearing Procedures.

106.10.1 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 delivery, by certified mail, return receipt requested.

If the notice is being given to an applicant for a jurisdiction 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 and the applicable records of the jurisdiction's Public Works and Engineering Department, the County Appraisal District, the electrical utility company, the gas utility 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.

106.10.2 Hearings. Except where otherwise specifically provided, all hearings held pursuant to this code shall be conducted by the jurisdiction's Director of Public Works and Engineering 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.

108.0 Board of Appeals. Boards and Licenses.

108.1 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 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 or 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. (See Sections 120 and 121.)~~

108.2 Limitations of Authority. ~~The Board of Appeals~~ aforsaid 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 board be empowered to waive requirements of this code.

Part III - Permits and Inspections.

110.2 Penalties. Where no specific penalty is otherwise provided in this code, the violation of any provision of this code shall constitute a misdemeanor punishable upon conviction by a fine of not less than \$500.00 and not more than \$2,000.00. Each day that any violation continues shall constitute and be punishable as a separate offense. Where any conduct in violation of this code also constitutes a violation of state penal law, 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.

110.3 Mechanical Integrity. All persons, firms, corporations and air-conditioning contractors installing, altering, repairing or demolishing systems, appliances, components and equipment regulated by this code must maintain the mechanical integrity of such work in accordance with the provisions of this code. Failure to maintain mechanical integrity shall constitute a violation of this code subject to the penalties set forth in Section 110.2.

112.2 Plans and Specifications. Plans, engineering calculations, diagrams, and other data shall be submitted in ~~one or more~~ two sets with each application for a permit. Where such plans are not prepared by an architect or engineer, the Authority Having Jurisdiction shall be permitted to require an applicant submitting such plans or other data to demonstrate that state law does not require that the plans be prepared by an architect or engineer. The Authority Having Jurisdiction shall also be permitted to require plans, computations, and specifications to be prepared and designed by an engineer or architect licensed by the state to practice as such even where not required by state law.

Exception: The Authority Having Jurisdiction shall be permitted to waive the submission of plans, calculations, or other data where it is found that the nature of the work applied for is such that review of plans is not necessary to obtain compliance with this code.

112.2.1 Amended construction documents. Work shall be installed in accordance with the approved construction documents, and any changes made during construction that are not in compliance with the approved construction documents shall be resubmitted for approval as an amended set of construction documents.

112.3 Information on Plans and Specifications. Plans and specifications shall be drawn to scale ~~upon substantial paper or cloth~~ and shall indicate the location, nature, and extent of the work proposed and show in detail that it is in accordance with the provisions of this code and relevant laws, ordinances, rules, and regulations.

112.3.1 Penetrations Detailed. Plans and specifications for buildings exceeding two stories in height of other than Group R, Division 3 and Group U Occupancies shall indicate how required structural and fire-resistive integrity will be maintained where a penetration will be made for electrical, mechanical, plumbing, and communication conduits, pipes, and similar systems.

112.3.2 Direct-Fired Gas Makeup and Industrial Air Heaters. The installer shall submit plans showing the proposed installation, indicating the location of the equipment and such accessories as shall be permitted to be required to ensure the proper and safe performance of its function.

113.3 Validity of Permit. The issuance of a permit or approval of plans, specifications, and computations shall not be construed to be a permit for, or an approval of, a violation of the provisions of this code or other ordinances of the jurisdiction. Permits presuming to give authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid.

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

A permit shall be valid only for work performed under the licensee who signed the application. A new permit must be obtained if the individual who signed the application ceases to perform the work. Provided that a refund has not been issued and written authority to transfer the permit from the original permit holder has been given, the cost of the new permit shall be charged at the rate listed for the minimum fee as stated in the city fee schedule. In the case of the death of the original licensee, the permit will be transferred to the new licensed contractor at no fee except for the administrative fee established in the city fee schedule. Applicants who fail to re-permit any applicable work within the time frames established by this code shall be subject to permit fees in the amount stated in the city fee schedule.

113.4 Expiration.~~A Every permit issued 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 commenced 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. The building official is authorized to grant, in writing, one or more extensions of time, for periods not more than 180 days each. The extension shall be requested in writing and justifiable cause demonstrated. Before such work is recommenced, a new permit shall be first obtained, and the fee therefore shall be one half the amount required for a new permit for such work, provided no changes have been made or will be made in the original plans and specifications for such work and provided further that such suspension or abandonment has not exceeded 1 year. No permit shall be extended more than once. To renew action on a permit after expiration, the permittee shall pay a new full permit fee.~~

~~———— A permittee holding an unexpired permit shall be permitted to apply for an extension of the time within which work shall be permitted to be commenced under that permit where the permittee is unable to commence work within the time required by this section. The Authority Having Jurisdiction shall have the authority 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 said permittee have prevented action from being taken.~~

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

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

113.5 Suspension or Revocation. The Authority Having Jurisdiction shall have the authority to suspend or revoke a permit issued under the provisions of this code where the permit is issued in error or on the basis of incorrect information supplied or in violation of other ordinances or regulations of the jurisdiction. Prior to taking such action, the Authority Having Jurisdiction shall provide notice of a right to a hearing on the matter pursuant to Section 106.10.

114.1 General. Fees shall be assessed in accordance with the provisions of this section ~~and as set forth in the fee schedule, Table 114.1. The fees are to be determined and adopted by this jurisdiction.~~

114.2 Permit Fees. The fee for each permit shall be as set forth in the city fee schedule Table 114.1.

114.3 Plan Review Fees. ~~Where plans or other data are required to be submitted in accordance with Section 112.2, a plan review fee shall be paid at the time of submitting plans and specifications for review. The plan review fees for mechanical work shall be determined and adopted by this jurisdiction.~~

~~_____ The plan review fees specified in this subsection are separate fees from the permit fees specified in Section 114.2 and are in addition to the permit fees.~~

~~_____ Where plans are incomplete or changed so as to require additional plan review, an additional plan review fee shall be charged at the rate shown in Table 114.1.~~

_____ 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 at the rate shown in the city fee schedule.

114.6 Fee Refunds. The Authority Having Jurisdiction shall be permitted to authorize the refunding of a fee paid hereunder that has been erroneously paid or collected due to an error by one or more city employees. This provision shall not be applicable if the error occurred due to incorrect information provided by the applicant.

114.6.1 Authorization. The Authority Having Jurisdiction shall be permitted to authorize a refund not exceeding 90 percent of the amount in excess of the minimum permit fee stated in the city fee schedule a percentage, as determined by this jurisdiction, where no work has been done under a permit issued in accordance with this code. If work has been done under the permit, no refund shall be authorized.

114.6.2 No Work. ~~The Authority Having Jurisdiction shall be permitted to authorize refunding not exceeding a percentage, as determined by this jurisdiction, where an application for a permit for which a plan review fee has been paid is withdrawn or canceled before a plan review effort has been expended.~~

114.7 Annual Fee Increase. Notwithstanding any maximum fee established pursuant to the City of Houston Construction Code, the fees in this or in any volume of the City of Houston Construction Code, as adjusted according to this section, shall be automatically increased on the first day of each subsequent calendar year as provided in Section 1-13 of the City Code.

115.2 Operation of Mechanical Equipment. The requirements of this section shall not be considered to prohibit the operation of mechanical systems installed to replace existing equipment or fixtures serving an occupied portion of the building ~~in the event~~ provided that a request for inspection of such equipment or fixture has been filed with the Authority Having Jurisdiction not exceeding 48 hours after such replacement work is completed equipment is made operational and before a portion of such mechanical system is concealed by a permanent portion of the building. It shall be a violation of this code, subject to the penalties set forth in Section 110.2, for a permit holder to fail to make all necessary arrangements for inspection so that this jurisdiction may perform the required inspection no later than the next work day immediately after the aforementioned 48 hour period expires.

115.3 Testing of Equipment. Refrigeration equipment regulated by this code shall be tested and approved in accordance with Section 1124.0 of this code.

Steam and hot water boilers and piping shall be tested and approved in accordance with Section 1021.1, Section 1201.3.9, and Section 1207.0 of this code.

Where applicable (see Section 101.3), fuel gas piping shall be tested and approved in accordance with ~~Section 1303.0 of this code~~ the plumbing code.

115.6 Reinspections. The Authority Having Jurisdiction shall be permitted to assess a reinspection fee for each inspection or reinspection where such portion of work for which inspection is requested is not complete or where required corrections have not been made.

This provision shall not be interpreted as requiring reinspection fees the first time a job is rejected for failure to 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.

Reinspection fees may be assessed 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 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 114.1 or as set forth in the city fee schedule adopted by the jurisdiction.~~

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

116.2.1 Temporary Operation Inspection. For inspection of a boiler or heating, ventilation, refrigeration or air-conditioning system to be used on a temporary basis, the fee stated for this provision in the city fee schedule shall be paid to the jurisdiction by a licensed air-conditioning contractor requesting such inspection. If the system is not approved for temporary operation on the first inspection, the usual 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.

117.0 Emergency Work.

117.1 General. It is an exception to any provision of this code or of the *City of Houston 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 that:

- (1) The work involved the emergency repair or replacement of an existing air conditioning, heating, ventilation or refrigeration system;
- (2) The work was required to be commenced immediately in order to protect property or to preserve the health of persons;
- (3) Notice was given to the Authority Having Jurisdiction by mail, telephone, fax or other approved method when the work was commenced; and
- (4) A permit was obtained as provided in Subsection 117.

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

117.2 Time limit for obtaining permit. The licensed air-conditioning contractor, in order to avoid penalties for failure to obtain a permit prior to commencing such job, in addition to complying with Section 117.1, must also obtain a permit for the job 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 alteration or installation.

117.3 Operation of system. If the alteration or installation is completed prior to the time that the licensed air-conditioning contractor is required to obtain a permit under these provisions, at the contractor's sole risk and responsibility for all injuries and damages that might result therefrom to persons and property, the contractor may place the system or installation in operation, provided that the contractor 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 the manner in which the equipment or system may be immediately shut off in case of malfunction in its operation and shall provide the aforesaid occupant or person with a telephone number, or numbers, where the licensed contractor can be reached in case of an emergency resulting from operation of the system or installation prior to inspection by the jurisdiction.

117.4 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 authorizing 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.

118.0 Temporary Operation Permit.

118.1 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, this time to be determined 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.

118.2 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 in order 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 118.1(3).

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

119.0 Approvals.

119.1 Installation Approvals. The installation of mechanical equipment or the alteration of any existing installation shall be approved only when such work is installed or performed in accordance with the provisions of this code.

An approved permit allows only the work authorized by that permit.

Part IV-Boards and Licensing

120.0 Mechanical Code Review Board.

120.1 Creation of Board. There is hereby created a Mechanical Code Review Board, hereinafter 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 chairman. 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.

Positions No. 3 and 4 shall each be filled by a registered professional engineer licensed by the State of Texas who is actively engaged 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 on 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 chairman 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 they attend that are neither held during nor continue beyond his 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.

120.2 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 121 of this code, matters within the jurisdiction of the Boiler Code Review and Licensing Board shall be heard by that board.

120.3 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 103.

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 the date that the notice of the decision of the Authority Having Jurisdiction was either hand delivered or mailed to such person. 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.

120.4 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 appeals to the City Council are subject to Rule 12 of Section 2-2 of the *City Code*.

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, the City Council, or suspended, cancelled or annulled.

The decision of the City Council shall be final.

120.5 License Required. Except as otherwise provided therein, a person who does not hold a current, valid 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.

120.6 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 duly registered and maintained on file within the jurisdiction offices of the Mechanical Inspections Section, Code Enforcement Branch, Department of Public Works and Engineering. The fee for initial notification registration shall be stated for this provision in the city fee schedule. A notification registration maintenance fee stated for this provision in the city fee schedule shall be paid annually thereafter as long as the notification registration is renewed. 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.

120.7 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.

120.8 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 contractor 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, firm, partnership 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.

120.9 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 75.70(i), which provides that "each licensee and air conditioning and refrigeration contracting company shall display the license number and company name in letters not less than two inches high on both sides of all vehicles used in conjunction with air conditioning and refrigeration contracting. 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.

120.10 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 records shall be readily made available upon request for inspection and copying by the Authority Having Jurisdiction and must be held 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.

121.0 Boiler Code Review and Licensing Board.

121.1 Creation and Composition. There is hereby created a Boiler Code Review and Licensing Board consisting of five members, which is herein referred to as 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 chairman. 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.

121.2 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 neither held during nor continue beyond his 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 regularly twice each month. The chairman 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 chairman at any meeting, the board members present may select a temporary chairman for that meeting.

121.3 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 Local Government Code.)

121.4 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.

121.5 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.

121.6 Examinations. The board shall develop and administer examinations for stationary engineer's licenses. The examinations shall determine the applicants' 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.

121.7 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 his 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 106.10.

The Authority Having Jurisdiction of the 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.

121.8 Review of New Materials, Methods and Revisions to the Code. Any person, firm, or corporation whose boiler products are not specifically approved by 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 103 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 the date that the notice of the decision of the Authority Having Jurisdiction was either hand delivered or mailed to such person. 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 Administrative 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.

121.9 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 appeals to the City Council are subject to Rule 12 of Section 2-2 of the *City Code*.

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, the City Council, or suspended, cancelled or annulled.

The decision of the City Council shall be final.

122.0 Stationary Engineer's License.

122.1 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.

122.2 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 either the following specified experience or combination of experience and education: (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 in order 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 90 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 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.

122.3 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.

122.4 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 122.2.

122.5 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 122.2 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.

122.6 Expiration of License. Each license issued for stationary engineers that was in effect immediately preceding 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.

122.7 Limitations of Operator. Except as provided in Section 123, 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 122.1.

122.8 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 aggregated 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 123 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.

122.9 Responsibility of the Boiler Owner or User. Every owner or user of a power boiler that has an aggregate heat output that exceeds 1,676,000 Btu per hour shall establish a method of operation utilizing one or more full time employed 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 operating method based on accepted boiler industry practices commensurate with load characteristics, use, and configuration of the boiler.

123.0 Boiler Operator's Permit.

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

aggregate heat output that does not exceed 1,676,000 Btu per hour, may apply to the board 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 31 st of each year, unless suspended or revoked before the expiration date.

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, the applicant may renew the permit upon payment of the regular fee stated for this provision in the city fee schedule .

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.

When an operator's permit becomes lost or destroyed, the board may grant a replacement permit in the same manner as set forth for a stationary engineer's license in Section 122.4.

All permits issued for the operation of boilers that were in effect immediately preceding 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.

124.0 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.

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.

{EDITORIAL NOTE: DELETE TABLE 114.1 IN ITS ENTIRETY.}

CHAPTER 2*

DEFINITIONS

203.0

- A -

Authority Having Jurisdiction. ~~The jurisdiction's Director of the Public Works and Engineering Department, 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 by this jurisdiction.

Building Thermal Envelope. The basement walls, exterior walls, floor, roof, and any other building elements that enclose conditioned space or provide a boundary between conditioned space and exempt or unconditioned space.

205.0

- C -

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

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, and the City of Houston Electrical Code.

Energy Conservation Code. The City of Houston Residential Energy Conservation Code or the City of Houston Commercial Energy Conservation Code, both based on the

International Energy Conservation Code, as adopted by the State of Texas, or on an alternate code that has been determined to be more stringent than the International Energy Conservation Code, as provided in Chapter 388 of the Texas Health & Safety 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.

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.~~

Flood Hazard Area Subject To High Velocity Wave Action. ~~An area within the flood hazard area that is subject to high velocity wave action, and shown on a Flood Insurance Rate Map or other flood hazard map as Zone V, VO, VE, or V1-30. See Chapter 19 of the City Code for provisions regarding the flood plain.~~

Full Time Employee. An employee who is present on the job/property either 40 hours a week or at least 80% of the time a boiler is in operation.

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.

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.

220.0

- R -

Residential Code. The City of Houston Residential Code, based on the International Residential Code for One- and Two-Family Dwellings, as adopted by the State of Texas in Subchapter G of Chapter 214 of the Texas Local Government Code, with amendments adopted by this jurisdiction.

*{EDITORIAL NOTE: ALL OTHER PORTIONS OF CHAPTER 2 REMAIN AS SET FORTH IN THE 2012 *UNIFORM MECHANICAL CODE*.}

CHAPTER 3

GENERAL REQUIREMENTS

303.1 Installation Practices. Mechanical systems shall be installed in a manner in accordance with this code, applicable standards, and the manufacturer's installation instructions. Where the requirements of referenced standards or manufacturer's instructions do not conform to minimum provisions of this code, the provisions of this code shall apply.

303.9.3 Roof Drainage and Rails. Equipment shall be installed on a well-drained surface of the roof. Not less than 6-10 feet (4829-3048 mm) between a part of the equipment and the edge of a roof or similar hazard, or rigidly fixed rail, 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]

304.2 Access to Equipment and Appliances on Roofs, or in Attics and Under Floor Spaces. Appliances located on roofs or other elevated locations, or in attics or underfloor spaces, shall be accessible. [NFPA 54:9.4.3.1]

304.2.1 Access to Roof from Inside. Buildings exceeding 15 feet (4572 mm) in height shall have an ~~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]

304.2.1.1 Door or Scuttle. The ~~inside~~-means of access to a roof, attic or underfloor space shall be a permanent or foldaway ~~inside~~-stairway or ladder, with a clear opening not less than 22 inches in width and a load capacity of not less than 350 pounds, 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 on the inside.

Not less than 6-10 feet (4829-3048 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]

304.2.1.2 Permanent Ladders. Permanent ladders required by Section 304.2.1.1 shall be constructed in accordance with the following:

- (1) Have side railings which extend not less than 30 inches (762 mm) above the roof or parapet wall.
- (2) Landings shall not exceed 18 feet (5486 mm) apart measured from the finished grade.
- (3) Width shall be not less than 14 inches (356 mm) on center.
- (4) Rungs shall not exceed 14 inches (356 mm) on center.
- (5) Toe space shall be not less than 7 6 inches (177 452-mm).

304.2.1.3 Platform. A furnace located on a roof shall be installed on a substantial, level platform. When the roof has a slope greater than 1 in 12, a level working platform at least 30 inches (762 mm) in depth and width shall be provided along the firebox and control sides of the furnace. Sides of a working platform facing the roof edge below shall be protected by a substantial railing 42 inches (1067 mm) in height with vertical rails not more than 21 inches (533 mm) apart, except that parapets at least 24 inches (610 mm) in height may be utilized in lieu of rails or guards.

308.1 Protection Against Damage. ~~Gas utilization a~~Appliances in garages and in adjacent spaces that open to the garage and are not part of the living space of a dwelling unit shall be installed so that burners, ignition sources and burner-ignition devices are located not less than 18 inches (457 mm) above the floor unless listed as flammable vapor ignition resistant. [NFPA 54:9.1.10.1]

308.2 Protection Against Flood Damage. ~~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 required by the building code for utilities and attendant equipment or the elevation of the lowest floor, whichever is highis higher. See Chapter 19 of the *City Code* for provisions regarding the flood plain.~~

Exception: ~~Equipment and appliances are permitted to be located below elevation required by the building code for utilities and attendant equipment or the elevation of the lowest floor, whichever is higher, provided that they are designed and installed to prevent water from entering or accumulating within the components and to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to such flood elevation in accordance with the flood-resistant construction requirements of the building code.~~

~~308.2.1 Walls Below Buildings in Flood Hazard Areas Subject to High Velocity Wave Action.~~ ~~In flood hazard areas subject to high velocity wave action, equipment and appliances, including piping, shall not be mounted on or penetrate walls intended to break away under flood loads.~~

~~308.2.2 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.~~

310.1 General. Equipment regulated by this code requiring electrical connections of more than 50 volts shall have a positive means of disconnect in accordance with the electrical code, adjacent to and in sight from the equipment served. A 120 volt receptacle shall be located within 25 feet (7620 mm) of the equipment for service and maintenance purposes. The receptacle need not be located on the same level as the equipment. Low-voltage wiring of 50 volts or less within a structure shall be installed in a manner to prevent physical damage.

312.2 Condensate Control. Where a cooling coil or cooling unit is located in an attic or furred space, or in any area where damage is capable of resulting from condensate overflow, an additional watertight pan of corrosion-resistant metal shall be installed beneath the cooling coil or unit top to catch the overflow condensate due to a clogged primary condensate drain, or one

pan with a standing overflow and a separate secondary drain shall be permitted to be provided in lieu of the secondary drain pan. The additional pan or the standing overflow shall be provided with a drain pipe, not less than $\frac{3}{4}$ of an inch (20 mm) nominal pipe size, discharging at a point that is readily observed.

Exception: The additional watertight pan may be of corrosion resistant material other than metal, when approved by the Authority Having Jurisdiction.

This requirement is in addition to the requirements in Section 312.3 and Section 312.4.

312.2.1 Water-Level Sensing Devices. On units and other coils on a roof or above a ceiling that do not have a secondary drain or means to install a secondary drain pan, a water-level sensing device shall be installed inside the primary drain pan. This device shall shut off the appliance in the event that the primary drain becomes restricted. Inline overflow devices installed in the primary drain line shall not be permitted.

314.5 Wood members in plenum. Floor joists or trusses that serve dwelling units shall not be located within a return air plenum.

CHAPTER 4

VENTILATION AIR SUPPLY

TABLE 402.1
MINIMUM VENTILATION RATES IN BREATHING ZONE^{1,2}
[ASHRAE 62.1: TABLE 6-1]

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)
CORRECTIONAL FACILITIES			
Booking/waiting	7.5	0.06	50
Cell	5	0.12	25
Day room	5	0.06	30
Guard stations	5	0.06	15
<u>DRY CLEANERS / LAUNDRIES</u>			
Coin-operated dry cleaner	<u>15</u>	—	<u>20</u>
Coin-operated laundries	<u>7.5</u>	=	<u>20</u>
Commercial dry cleaner	<u>30</u>	<u>0.06</u>	<u>30</u>
Commercial laundry	<u>25</u>	=	<u>10</u>
Storage, pick up	<u>7.5</u>	<u>0.12</u>	<u>30</u>
EDUCATIONAL FACILITIES			
Art classroom	10	0.18	20
Classrooms (ages 5-8)	10	0.12	25
Classrooms (age 9 plus)	10	0.12	35
Computer lab	10	0.12	25
Day care (through age 4)	10	0.18	25
Day care sickroom	10	0.18	25
Lecture classroom	7.5	0.06	65
Lecture hall (fixed seats)	7.5	0.06	150
Media center ^a	10	0.12	25
Music/theater/dance	10	0.06	35
Multi-use assembly	7.5	0.06	100
Science laboratories ^e	10	0.18	25
University/college laboratories	10	0.18	25
Wood/metal shop	10	0.18	20
FOOD AND BEVERAGE SERVICE			
Bars, cocktail lounges	7.5	0.18	100
Cafeteria/fast food dining	7.5	0.18	100
Kitchen (cooking) ^l	7.5	0.12	20
Restaurant dining rooms	7.5	0.18	70
GENERAL			
Break rooms	5	0.06	25

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)
Coffee stations	5	0.06	20
Conference/meeting	5	0.06	50
Corridors	—	0.06	—
Occupiable storage rooms for liquids or gels ^b	5	0.12	2
<u>HOSPITALS, NURSING AND CONVALESCENT HOMES</u>			
<u>Autopsy rooms</u>	—	—	<u>0.5</u>
<u>Medical Procedure rooms</u>	<u>15</u>	<u>20</u>	—
<u>Operating rooms</u>	<u>30</u>	<u>20</u>	—
<u>Patient rooms</u>	<u>25</u>	<u>10</u>	—
<u>Physical therapy</u>	<u>15</u>	<u>20</u>	—
<u>Recovery and ICU</u>	<u>15</u>	<u>20</u>	—
HOTELS, MOTELS, RESORTS, DORMITORIES			
Bedroom/living room	5	0.06	10
Barracks sleeping areas	5	0.06	20
<u>Dormitory sleeping areas</u>	<u>5</u>	<u>0.06</u>	—
<u>Gambling casinos</u>	<u>7.5</u>	<u>0.16</u>	—
Laundry rooms, central	5	0.12	10
Laundry rooms with in dwelling units	5	0.12	10
Lobbies/pre-function	7.5	0.06	30
Multipurpose assembly	5	0.06	120
OFFICE BUILDINGS			
Breakrooms	5	0.12	50
Occupiable storage rooms for dry materials	5	0.06	2
Office space	5	0.06	5
Main entry lobbies	5	0.06	10
Reception areas	5	0.06	30
Telephone/data entry	5	0.06	60
MISCELLANEOUS SPACES			
Bank or bank lobbies	7.5	0.06	15
Bank vaults/safe deposit	5	0.06	5
Computer (not printing)	5	0.06	4
General manufacturing (excludes heavy industrial and processes using chemicals)	10	0.18	7
Pharmacy (prep. area)	5	0.18	10
Photo studios	5	0.12	10
Shipping/receiving ^b	10	0.12	2
Sorting, packing, light assembly	7.5	0.12	7
Telephone closets	—	0.00	—
Transportation waiting	7.5	0.06	100

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)
Warehouses ^b	10	0.06	—
PUBLIC ASSEMBLY SPACES			
Auditorium seating area	5	0.06	150
Courtrooms	5	0.06	70
Legislative chambers	5	0.06	50
Libraries	5	0.12	10
Lobbies	5	0.06	150
Museums (children's)	7.5	0.12	40
Museums/galleries	7.5	0.06	40
Places of religious worship	5	0.06	120
RESIDENTIAL			
Common corridors	—	0.06	—
Dwelling unit ^{f, g}	5	0.06	See footnote f
RETAIL			
Sales (except as below)	7.5	0.12	15
Barber shop	7.5	0.06	25
Beauty and nail salons ^h	<u>20-25</u>	<u>0.12-0.25</u>	25
Coin-operated laundries	7.5	0.12	20
Mall common areas	7.5	0.06	40
Pet shops (animal areas)	7.5	0.18	10
Supermarket	7.5	0.06	8
SPORTS AND ENTERTAINMENT			
Bowling alley (seating)	10	0.12	40
Disco/dance floors	20	0.06	100
Gambling casinos	7.5	0.18	120
Game arcades	7.5	0.18	20
Gym, stadium (play area)	—	0.30	30
Health club/aerobics room	20	0.06	40
Health club/weight rooms	20	0.06	10
Sports arena (play area)	—	0.30	—
Spectator areas	7.5	0.06	150
Stages, studios ^d	10	0.06	70
Swimming (pool & deck) ^c	—	0.48	—

For SI units: 1 cubic foot per minute = 0.0283 m³/min, 1 square foot = 0.0929 m²

Notes:

- ¹ This table applies to no-smoking areas. Rates for smoking-permitted spaces 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 ($\text{lb}_{\text{da}}/\text{ft}^3$) ($1.201 \text{ kg}_{\text{da}}/\text{m}^3$), 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 Spaces- Library.
- ^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.
- ^d Rate does not include special exhaust for stage effects, (e.g., dry ice vapors, smoke).
- ^e No class of air has been established for this occupancy category.
- ^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 Provide minimum 80% outdoor makeup air to A/C System through fixed openings.
- ⁱ 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

CHAPTER 5

EXHAUST SYSTEMS

504.1 Makeup and Exhaust-Air Ducts. Environmental air ducts not regulated by other provisions of this code shall be in accordance with this section. Ducts shall be airtight as approved by the Authority Having Jurisdiction, and shall comply with the provisions of Chapter 6. Hazardous eExhaust ducts under positive pressure shall not extend into or through ducts or plenums. Exhaust ducts shall terminate outside the building and shall be equipped with back-draft dampers. Environmental air ducts that have an alternate function as a part of an approved smoke-control system do not require design as Class 1 product-conveying ducts.

504.2 Domestic Range Vents. Ducts used for domestic kitchen range ventilation shall be of metal and shall have smooth interior surfaces. Ducts for domestic range hoods shall serve cooking appliances.

Exception: Ducts for domestic kitchen downdraft grill-range ventilation installed under a concrete slab floor ~~may~~ shall be permitted to be of approved Schedule 40 PVC provided:

- (1) The under-floor trench in which the duct is installed shall be completely backfilled with sand or gravel.
- (2) Not more than 1 inch (25.4 mm) of a 6 inch diameter (152 mm) PVC coupling ~~may~~ shall be permitted to protrude above the concrete floor surface.
- (3) PVC pipe joints shall be solvent cemented to provide an air- and grease-tight duct.
- (4) The duct shall terminate a minimum of 12 inches (305 mm) above grade outside the building and shall be equipped with a back-draft damper.

504.3 Clothes Dryers. Moisture exhaust ducts shall terminate on the outside of the building a minimum of 9 inches above grade and shall be equipped with a back-draft damper. Screens shall not be installed at the duct termination. Ducts for exhausting clothes dryers shall not be connected or installed with sheet metal screws or other fasteners that will obstruct the flow. Clothes dryer moisture exhaust ducts shall not be connected to a gas vent connector, gas vent, or chimney, and shall serve clothes dryers. Clothes dryer moisture exhaust ducts under positive pressure shall not extend into or through ducts or plenums.

504.3.1.2 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 feet (4267 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 of the exhaust duct connection identifying the length of the exhaust duct.

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 602.1.~~

507.1 Exhaust System. Cooking equipment used in processes producing smoke or grease-laden vapors shall be equipped with an exhaust system in accordance with the equipment and performance requirements of this chapter. [NFPA 96:4.1.1] Such equipment and performance shall be maintained in accordance with this chapter during periods of operation of the cooking equipment. Specifically, the following equipment shall be kept in good working condition:

- (1) Cooking equipment
- (2) Hoods
- (3) Ducts (where applicable)
- (4) Fans
- (5) Fire suppression systems
- (6) Special effluent or energy control equipment [NFPA 96:4.1.2, 4.1.3]

Airflows shall be maintained. [NFPA 96:4.1.4] Maintenance and repairs shall be performed on components at intervals necessary to maintain these conditions [NFPA 96:4.1.3.1]:

- (1) The responsibility for inspection, maintenance, and cleanliness of the ventilation control and fire protection of the commercial cooking operations shall be the ultimate responsibility of the owner of the system provided that this responsibility has not been transferred in written form to a management company or other party. [NFPA 96:4.1.5]
- (2) Solid-fuel cooking equipment shall comply with the requirements of Section 517.0. [NFPA 96:4.1.6]
- (3) Multiple-tenancy applications shall require the concerted cooperation of design, installation, operation, and maintenance responsibilities by tenants and by the building owner. [NFPA 96:4.1.7]
- (4) Interior surfaces of the exhaust system shall be accessible for cleaning and inspection purposes. [NFPA 96:4.1.8]
- ~~(5) Cooking equipment used in fixed, mobile, or temporary concessions, such as trucks, buses, trailers, pavilions, tents, or a form of roofed enclosure, shall be in accordance with this chapter unless all or part of the installation is exempted by the Authority Having Jurisdiction. [NFPA 96:4.1.9].~~

508.1 Where Required. Type 1 hHoods shall be installed at or above commercial-type deep-fat fryers, broilers, fry grills, steam-jacketed kettles, hot-top ranges, ovens, barbecues, solid-fuel burning appliances, rotisseries, dishwashing machines, and similar equipment that produces comparable amounts of steam, smoke, grease, or heat in a food-processing establishment to collect and remove the grease and smoke. 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.

Type 2 hoods shall be installed at or above other commercial-type ovens, rotisseries, and dishwashing machines.

Exceptions:

- (1) Cooking appliance that has been listed in accordance with EPA 202 for reduced emissions where the grease discharge does not exceed 2.9 E-09 ounces per cubic inch (oz/in³) (5.0 E-06 kg/m³) where operated with a total airflow of 500 cubic feet per minute (cfm) (0.236 m³/s).
- (2) Recirculating systems listed in accordance with UL 710B and installed in accordance with Section 516.0.
- (3) Direct vent dishwashers connected to an approved exhaust system.
- (4) Under counter, and enclosed single-batch low temperature chemical dishwashers (maximum 140°F) 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.
- (5) Cooking equipment located in daycare facilities, churches, employee lunchrooms, or similar uses that are no more hazardous than kitchen facilities in an individual dwelling unit.
- (6) Listed convection ovens.
- (7) Dishwashing machines connected to a Type II duct system and exhausted directly to the outdoors.
- (8) 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.

508.4.1.1 Capacity of Hoods. Canopy-type commercial cooking hoods shall exhaust through the hood with a quantity of air not less than determined by the application of the following formulas:

Where:

A = the horizontal surface area of the hood, in square feet (m²).

P = that part of the perimeter of the hood that is open, in feet (mm).

D = distance in feet (mm) between the lower lip of the hood and the cooking surface.

Q = quantity of air, in cubic feet per minute (m³/s).

Where cooking equipment is installed back to back and is covered by a common island-type hood, the airflow required shall be calculated using the formula for three sides exposed. Type II hood airflow requirements shall be in accordance with the requirements for low-temperature appliance hoods. When all appliances are electric, the airflow required may be reduced to 80 percent of the formula value.

510.1 General. Ducts shall not pass through fire walls or fire partitions. [NFPA 96:7.1.1]

Exception: Steel supply and exhaust ducts may be protected with a duct wrap material approved for such use that provides an equivalent fire-rating when installed in accordance with the manufacturer's specifications and in an approved fire-rated design, including through-penetration fire-stop and sealants.

A letter sealed by the design professional or a special inspector certifying compliance with the fire-rated design and manufacturer's installation requirements for the finished installation must be provided to the authority having jurisdiction.

510.1.3 Duct Installation. Ducts shall be installed without forming dips or traps that might collect residues. [NFPA 96:7.1.4]

In manifold (common duct) systems, the lowest end of the main duct shall be connected flush on the bottom with the branch duct. [NFPA 96:7.1.4.1]

Duct systems serving a Type I hood shall be so constructed and installed that grease cannot become pocketed in a portion thereof, and the system shall slope not less than ¼ inch per lineal foot (20.8 mm/m) toward the hood or toward an approved grease reservoir. ~~Where horizontal ducts exceed 75 feet (22 860 mm) in length, the slope shall be not less than 1 inch per lineal foot (83.3 mm/m).~~

510.1.7 Ducts, Non-Grease. 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 shall be adequately sealed.~~ Ducts serving dishwasher exhaust shall be liquid tight and shall be constructed of aluminum or not less than 304 stainless steel.

~~**510.7.2.2 Protection from Physical Damage.** Measures shall be taken to prevent physical damage to a covering or enclosure material. A damage to the covering or enclosure shall be repaired and the covering or enclosure shall be restored to meet its intended listing and fire resistive rating and to be acceptable to the Authority Having Jurisdiction. [NFPA 96:7.7.3.1, 7.7.3.2]~~

510.8.1 Rooftop Terminations. Rooftop terminations shall be arranged with or provided with the following [NFPA 96:7.8.2.1]:

- (1) Not less than 10 feet (3048 mm) of clearance from the outlet to adjacent buildings, property lines, and air intakes. [NFPA 96:7.8.2.1(1)] Where space limitations absolutely prevent a 10 foot (3048 mm) horizontal separation from an air intake, a vertical separation shall be permitted, with the exhaust outlet being not less than 3 feet (914 mm) above an air intake located within 10 feet (3048 mm) horizontally.

Exceptions:

- (1) Exhaust outlets for grease ducts serving commercial food heat-processing equipment may terminate not less than 5 feet (1524 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.

- (2) Upon approval of the Authority Having Jurisdiction, the exhaust from any hood serving commercial food heat-processing equipment may terminate in a properly engineered air recovery system for recirculation to the room in which the hood is located when designed in accordance with Section 516.0.

CHAPTER 6

DUCT SYSTEMS

602.1 General. Supply air, return air, and outside air for heating, cooling, or evaporative cooling systems shall be conducted through duct systems constructed of metal ~~in accordance with SMACNA HVAC Duct Construction Standards—Metal and Flexible as set forth in Tables 6-1, 6-2, 6-3, 6-4, 6-7, 6-8, 6-9, and 6-10, or metal ducts complying with UMC Standard No. 6-2 or the referenced HVAC duct construction standard in Chapter 17.~~ Rectangular ducts exceeding 2 inches (51 mm) w.g. shall comply with ~~SMACNA HVAC Duct Construction Standards—Metal and Flexible~~ UMC Standard No. 6-2 or the referenced HVAC duct construction standard in Chapter 17. 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.

Corridors shall not be used to convey air to or from rooms where the corridor is required to be of fire-resistive construction in accordance with the building code.

Concealed building spaces or independent construction within buildings shall be permitted to be used as ducts or plenums.

Where gypsum products are exposed in 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~~ used as 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.~~

See Chapter 8 for limitations on combustion products venting systems extending into or through ducts or plenums.

See Chapter 5 for limitations on environmental air systems exhaust ducts extending into or through ducts or plenums.

~~Hazardous or product conveying-~~Exhaust ducts under positive pressure and venting systems shall not extend into or pass through ducts or plenums. For appliance vents and chimneys, see Chapter 8.

602.2 Combustibles ~~W~~within Ducts or Plenums. Materials exposed within ducts or plenums shall be noncombustible or shall have a flame spread index not to exceed 25 and a smoke developed index not to exceed 50, where tested as a composite product in accordance with one of the following test methods: NFPA 255, Method of Test of Surface Burning Characteristics of Building Materials, ASTM E84, Surface Burning Characteristics of Building Materials, or UL 723, Test for Surface Burning Characteristics of Building Materials, except as indicated below.

Exceptions:

- (1) Return-air and outside-air ducts, plenums, or concealed spaces that serve a dwelling unit shall be permitted to be of combustible construction.
- (2) Air filters meeting the requirements of Section 314.2 and Section 503.3.
- (3) Water evaporation media in an evaporative cooler.
- (4) Charcoal filters where protected with an approved fire suppression system.

- (5) Electrical wiring in plenums shall comply with NFPA 70, National Electrical Code. Electrical wires and cables and optical fiber cables shall be listed and labeled for use in plenums and shall have a flame spread distance not exceeding 5 feet (1,524 mm), an average optical density not exceeding 0.15, and a peak optical density not exceeding 0.5, where tested in accordance with NFPA 262, Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces.
- (6) Nonmetallic ~~fire sprinkler~~ piping in plenums shall be listed and labeled for use in plenums and shall have a flame spread distance not exceeding 5 feet (1,524 mm), an average optical density not exceeding 0.15, and a peak optical density not exceeding 0.5, where tested in accordance with UL 1887, Fire Test of Plastic Sprinkler Pipe for Visible Flame and Smoke Characteristics.
- (7) Nonmetallic pneumatic tubing in plenums shall be listed and labeled for use in plenums and shall have a flame spread distance not exceeding 5 feet (1,524mm), an average optical density not exceeding 0.15, and a peak optical density not exceeding 0.5, where tested in accordance with UL 1820, Fire Test of Pneumatic Tubing for Flame and Smoke Characteristics.
- (8) Loudspeakers and recessed lighting fixtures, including their assemblies and accessories, in plenums shall be listed and labeled for use in plenums and shall have a peak rate of heat release not exceeding 134 horsepower (hp) (100 kW), an average optical density not exceeding 0.15, and a peak optical density not exceeding 0.5, where tested in accordance with UL 2043, Fire Test for Heat and Visible Smoke Release for Discrete Products and their Accessories Installed in Air-Handling Spaces.
- (9) Smoke detectors.
- (10) Duct insulation, coverings, and linings and other supplementary materials complying with Section 604.0.
- (11) Materials in a Group H-5, ~~Division 6~~, HPM fabrication area including the areas above and below the fabrication area sharing a common air recirculation path with the fabrication area.

602.4 Joints and Seams of Ducts. Joints of duct systems shall be made substantially airtight by means of tapes, mastics, gasketing, or other means. Sealant materials and methods of assemblage shall be in accordance with the manufacturer's instructions and conform to SMACNA Method A.

Crimp joints for round ducts shall have a contact lap of not less than 1½ inches (38 mm) and shall be mechanically fastened by means of not less than three sheet-metal screws equally spaced around the joint, or an equivalent fastening method.

Joints and seams for 0.016 of an inch (0.41 mm) (No. 28 gauge) and 0.013 of an inch (0.33 mm) (No. 30 gauge) residential rectangular ducts shall comply with SMACNA HVAC Duct Construction Standards - Metal and Flexible for 0.019 of an inch (0.48 mm) (No. 26 gauge) material.

Joints and seams for rectangular duct systems shall comply with SMACNA HVAC Duct Construction Standards- Metal and Flexible.

Joints and seams for flat oval ducts and round ducts in other than single-dwelling units shall comply with SMACNA HVAC Duct Construction Standards - Metal and Flexible.

Joints and seams and reinforcements for factory-made air ducts and plenums shall comply with the conditions of prior approval in accordance with the installation instructions that shall accompany the product. Closure systems for rigid air ducts and plenums shall be listed in accordance with UL 181A. Closure systems for flexible air ducts shall be listed in accordance with UL 181B.

604.0 Insulation of Ducts.

604.1 General. Supply-air ducts, return-air ducts, and plenums of a heating or cooling system shall be insulated to achieve the minimum thermal (R) value 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 (3048 mm) in length to air terminals or air outlets, the rated R value of insulation need not exceed R-3.5 (R-0.6).
- (4) Backs of air outlets and outlet plenums exposed to unconditioned or indirectly conditioned spaces with face areas exceeding 1 5 square foot (0.09 m²) need not exceed R-2 (R-0.4); ~~those 5 square feet (0.5 m²) or smaller need not be insulated.~~
- (5) Ducts and plenums used exclusively for evaporative cooling systems.

Approved materials shall be installed within ducts and plenums for insulating, sound deadening, or other purposes. Materials shall have a mold, humidity, and erosion-resistant surface that meets the requirements of the referenced standard for air ducts in Chapter 17. Duct liners in systems ~~operating with air velocities~~ exceeding 18 inches (5486 mm) in height and width 2000 feet per minute (10.16 m/s) shall be fastened with both adhesive and mechanical fasteners, and exposed edges shall have approved treatment to withstand the operating velocity.

Insulation applied to the surface of ducts, including duct coverings, linings, tapes, and adhesives, located in buildings shall have a flame-spread index not to exceed 25 and a smoke developed index not to exceed 50, where tested in accordance with ASTM E 84 or UL 723. The specimen preparation and mounting procedures of ASTM E 2231 shall be used. Air duct coverings and linings shall not flame, glow, smolder, or smoke where tested in accordance with ASTM C 411 at the temperature to which they are exposed in service. In no case shall the test temperature be less than 250°F (121°C).

Factory-made air ducts and faced 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, and the flame-spread index and smoke developed index of the composite material.

605.5 Access and Identification. Dampers shall be provided with an approved means of access large enough to permit inspection and maintenance of the damper and its operating parts. The access shall not impair fire-resistive construction. Access shall not require the use of tools, keys, or special knowledge. 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 1 ½ of an inch (25.4 42.7 mm) in height reading: **SMOKE DAMPER** or **FIRE DAMPER**. Access doors in ducts shall be tight fitting and approved for the required duct construction. 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-inch (211-mm) dimension or larger.

608.1 General. Air-moving systems supplying air in excess of 2,200 2,000 cubic feet per minute (ft³/min) (0.9439 1.0382 m³/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. Smoke detectors shall be labeled by an approved agency for air duct installation 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 required by this section shall be supervised by such systems.

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 rom). For the purpose of this exception, occupied rooms shall not include rooms that have less than 300 square feet 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

902.8 Prohibited installation. Air-handling units shall not be located in the same room with gas utilization equipment.

Exception: Listed central heating furnaces.

~~904.4 Temperature- or Pressure-Limiting Devices.~~ ~~Steam and hot water boilers, respectively, shall be provided with approved automatic limiting devices for shutting down the burner(s) to prevent boiler steam pressure or boiler water temperature from exceeding the maximum allowable working pressure or temperature. Safety limit controls shall not be used as operating controls. [NFPA 54:10.3.4] See Chapter 10 of this code.~~

~~904.5 Low-Water Cutoff.~~ ~~See Chapter 10 of this code. Hot water boilers installed above the radiation level and steam boilers shall be provided with an automatic means to shut off the fuel supply to the burner(s) where the boiler water level drops to the lowest safe water line. [NFPA 54:10.3.5]~~

~~904.6 Steam Safety and Pressure-Relief Valves.~~ ~~See Chapter 10 of this code Steam and hot water boilers shall be equipped, respectively, with listed or approved steam safety or pressure-relief valves of discharge capacity and shall comply with ASME requirements. A shutoff valve shall not be placed between the relief valve and the boiler or on discharge pipes between such valves and the atmosphere. [NFPA 54:10.3.6]~~

~~904.6.1 Discharge.~~ ~~Relief valves shall be piped to discharge near the floor. [NFPA 54:10.3.6.1]~~

~~904.6.2 Size.~~ ~~The entire discharge piping shall be not less than the same size as the relief valve discharge piping. [NFPA 54: 10.3.6.2]~~

~~904.6.3 End Connections.~~ ~~Discharge piping shall not contain a threaded end connection at its termination point. [NFPA 54:10.3.6.3]~~

{EDITORIAL NOTE: DELETE AND RESERVE SECTION 922 POOL HEATERS IN ITS ENTIRETY.}

~~924.1 Prohibited Installations.~~ ~~Unless specifically permitted by the Authority Having Jurisdiction, unvented room heaters shall not be installed as primary heat sources. Unvented room heaters shall not be permitted in spaces that do not have the required volume of indoor air as defined in section 701.4.~~

~~924.1.1 Unvented room heaters shall not be installed in bathrooms or bedrooms. [NFPA 54:10.23.1]~~ ~~This subsection shall not apply to portable oil fired unvented heating appliances used as supplemental heating in Group S (Divisions 3, 4, and 5), and Group U Occupancies, and regulated by the fire code.~~

Exceptions:

(1) ~~Where approved by the Authority Having Jurisdiction, one listed wall-mounted unvented room heater equipped with an oxygen depletion safety shutoff system~~

~~shall be permitted to be installed in a bathroom provided that the input rating shall not exceed 6000 Btu/h (1.76 kW) and combustion and ventilation air is provided as specified in Section 902.2.~~

- ~~(2) — Where approved by the Authority Having Jurisdiction, one listed wall-mounted unvented room heater equipped with an oxygen depletion safety shutoff system shall be permitted to be installed in a bedroom provided that the input rating shall not exceed 10 000 Btu/h (3 kW) and combustion and ventilation air is provided as specified in Section 902.2 [NFPA 54:10.23.1]~~

924.1 Vented Freestanding. Vented freestanding room heaters shall be installed with clearances from combustible material as set forth in Table 303.4.

Exception: Heaters listed for reduced clearances may be installed at the clearances specified on the required manufacturer's label.

Vented freestanding room heaters shall not be located so that a door can swing within less than 12 inches (305 mm) of a warm-air outlet of the heater, measured at right angles to the outlet. Doorstops or door closers shall not be installed to obtain such clearance.

Vented freestanding room heaters shall be located at least 36 inches (914 mm) below any part of a structure projecting over the heater. This projection shall include doors or windows that could project over the heater.

Vented freestanding room heaters shall be safely and securely installed to prevent accidental displacement.

924.2 Installations in Institutions. Room heaters shall not be installed in the following occupancies:

- ~~(1) — Residential board and care
(2) — Health care. [NFPA 54:10.23.3]~~

924.2 Vented Overhead. Vented overhead room heaters shall be safely and securely supported with hangers and brackets of noncombustible material and shall be installed with clearances from combustible material as specified on the required manufacturer's label.

Exception: Installation of overhead heaters in aircraft storage or servicing areas of aircraft hangars shall comply with requirements of Section 911.0.

924.3 Clearance. A room heater shall be placed so as not to cause a hazard to walls, floors, curtains, furniture, doors when open, and so on, and to the free movements of persons within the room. Heaters designed and marked, "For use in noncombustible fireplace only," shall not be installed elsewhere. Listed room heaters shall be installed in accordance with their listings and the manufacturers' instructions. In no case shall the clearances be such as to interfere with combustion air and accessibility. Unlisted room heaters shall be installed with clearances from combustibles material not less than the following:

- ~~(1) — Room heaters having an outer jacket surrounding the combustion chamber, arranged with openings at top and bottom so that air circulates between the inner and outer jacket, and arranged without openings in the outer jacket to permit direct radiation, shall have clearance at sides and rear of not less than 12 inches (305 mm).
(2) — Room heaters other than those of the circulating type described in Section 924.3(a) shall have clearance at sides and rear of not less than 18 inches (457 mm), except that heaters that make use of metal, asbestos, or ceramic material to direct radiation to the front of the heater shall have a clearance of 36 inches (914 mm) in front and, where~~

~~constructed with a double back of metal or ceramic, shall be permitted to be installed with a clearance of 18 inches (457 mm) at sides and 12 inches (305 mm) at rear. Combustible floors under unlisted room heaters shall be protected in an approved manner. [NFPA 54:10.23.4]~~

924.3 Unvented. Unvented fuel-burning room heaters and decorative appliances shall be prohibited.

924.4 Wall-Type Room Heaters. Wall-type room heaters shall not be installed in or attached to walls of combustible material unless listed for such installation. [NFPA 54:10.23.5]

924.4 Overhead Radiant Heaters. Listed or approved unvented overhead room heaters may be installed in a Group A, B, F, M, S or U Occupancy, provided the installation conforms to all the following requirements:

924.4.1 All portions of the heater are located at least 8 feet (2438 mm) above the floor.

924.4.2 At least two unobstructed permanent openings are provided to the room or space containing such heaters. These openings shall open directly to the outside of the building through the floor, roof or wall. The minimum combined total area of these openings shall be at least 1 square inch (645 mm²) for each 1000 Btu/h (293 W) input of the heater or heaters, with a minimum total area of 100 square inches (64 516 mm²). One-half of the required openings shall be above the heater or heaters, and one-half shall be located below the heater or heaters.

Exception: When approved by the Authority Having Jurisdiction, provisions may be made to exhaust the products of combustion to the exterior by mechanical means.

924.4.3 Heaters shall be safely and securely supported with hangers and brackets of noncombustible material and installed with clearances from combustible material as specified on the required manufacturer's label.

CHAPTER 10

STEAM AND HOT-WATER BOILERS

1001.2 Definitions.

Alteration. A change in an original design or configuration.

Detached Boiler. Any class of boiler that remains in its original installed location and has been permanently disconnected from its energy source (i.e. natural gas, electricity, etc.)

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

Non-Standard Boiler. A boiler that does not qualify as a standard boiler.

Portable Boiler. A boiler primarily intended for temporary use at a location.

Repair. The work necessary to restore a boiler or a pressure vessel to a safe and satisfactory operating condition, provided there is no deviation from the original design.

Safety Appliances. Safety devices such as safety valves or safety relief valves (within the jurisdictional limits as prescribed by the Authority Having Jurisdiction) provided for the purposes of diminishing the danger of accidents.

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

Standard Boiler. A boiler that bears the Texas stamp, the ASME stamp, or the stamp of any jurisdiction that has adopted a standard of construction equivalent to that required by the State of Texas.

1004.6 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. Reference Section 1001.1, Exception 1. Permits and inspections pertaining to boilers used for other than the production of potable hot water shall be administered by the Mechanical Inspection Section staff of the Authority Having Jurisdiction.

1004.7 Permit Required. Except for work exempted by Section 111.2 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 1012.0 shall also require a permit. See Chapter 1 for requirements for obtaining permits.

1004.8 Moving Boilers. Any owner, user, or person desiring to remove, transfer, or relocate any boiler in the jurisdiction shall first obtain a new permit to install and have that same boiler inspected or tested by the Authority Having Jurisdiction.

1004.9 Reinstallation. Any installed boiler in the jurisdiction may be reinstalled, provided an application is filed with the Authority Having Jurisdiction and a permit is granted. A permit to install shall be issued provided that:

- (1) The boiler is inspected internally;
- (2) A hydrostatic pressure test is applied if deemed necessary by the Authority Having

Jurisdiction; and

- (3) The Authority Having Jurisdiction determines that the boiler meets inspection and test requirements.

Exception: A horizontal return tubular boiler having continuous lap seam of more than 12 feet (3658 mm) in length shall not be reinstalled for a gauge pressure in excess of 15 psi.

1004.10 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*.

1004.11 Automatic Controls. No low-pressure gas-fired boiler or furnace capable of consuming 200,000 Btu or more per hour shall be installed, and no boiler designed for other fuels having that Btu capacity shall be converted to the use of gas fuel unless equipped with either a thermostatic pilot light or other approved equipment constructed and adjusted so that no gas can flow through the main burner unless the pilot light is burning.

In the case of a steam boiler, it shall be equipped with a low-water cutoff and an excess pressure switch to close the main gas supply valve on a low-water condition or an excess pressure condition. In the case of a hot-water boiler, it shall be equipped with a low-water fuel cutoff and an excess temperature switch to close the main gas supply valve on a low-water condition or an excess temperature condition. In the case of a forced or mechanical draft boiler, a means to prove airflow shall be provided to prevent gas flow to the main burner in the absence of airflow.

1005.2 Systems with Open Expansion Tanks. Systems equipped with an open expansion tank to satisfy thermal water expansion shall be provided with an indoor overflow from the upper portion of the expansion tank in addition to an open vent. The indoor overflow shall be carried within the building to an approved plumbing fixture or plumbing drain to the basement.

1006.0 Safety or and Safety Relief Valves Discharge.

1006.1 Safety and Safety Relief Valves. All safety valves used on boilers in the jurisdiction shall conform to the prescribed or recommendatory rules of the ASME Code and the State of Texas Boiler Law and shall have the necessary provisions so that the safety valve can be sealed in such a manner that the pressure-relieving mechanism of the safety valve cannot be changed, altered or adjusted unless the seal is broken.

1006.2 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 certificate of 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/operator certificate of authorization issued by the Texas Department of Licensing and Regulation.

1006.3 General. The discharge from relief valves shall be piped to an approved location within 18 inches (457 mm) of the floor or to an open receptacle, and where the operating temperature

is in excess of 212°F (100°C), shall be equipped with a splash shield or centrifugal separator. Where the discharge from safety valves would result in a hazardous discharge of steam inside the boiler room, such discharge shall be extended outside the boiler room. No valve shall be placed between the safety or relief valve and the boiler, nor on the discharge pipe between the safety valve and the atmosphere. Discharge piping shall not be connected to any other piping system, and the cross-sectional area shall not be less than the full area of the valve outlet, or the total areas of the valve outlets discharging thereinto, whichever is greater. See also Section 1010. Discharges from relief valves on industrial boilers shall be discharged to an approved location.

1007.0 Gas Shutoff Valves.

1007.1 General. An approved manual shutoff valve with handle 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

1009.1 ~~General~~ Hot-Water-Heating Boilers. Hot-water-heating boilers, other than manually fired, shall be equipped with a low-water cutoff, except that a coil-type boiler or a water-tube boiler that requires forced circulation to prevent overheating of the coils or tubes shall have a flow-sensing device installed in the outlet piping in lieu of the low-water cutoff. The required low-water cutoff or flow switch, as applicable, shall be mounted so as to prevent damage to the boiler and to permit testing of the fuel-supply cutoff without draining the heating system, except that such boilers used in Group R Occupancies of less than six dwelling units and Group U Occupancies need not be equipped with the low-water cutoff or flow switch.

1009.2 Low-Water Fuel Cutoff and Feed Water Pump Control Combined in a Single Device. Where such a device is used, an additional separate low-water fuel cutoff with manual reset shall be installed. The additional control shall be wired in series electrically with the existing low-water fuel cutoff.

1009.3 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.

1009.4 Newly Installed Automatically Fired Hot Water Heating Boilers. Such boilers, when installed in a forced circulation system, shall be equipped in the manner described in this section and Sections 1009.1 and 1009.2. A coil-type boiler or a water-tube boiler requiring forced circulation to prevent overheating of the coils or tubes shall have a device to prevent burner operation if the flow rate becomes inadequate to protect the boiler unit from overheating.

1009.5 Water Feed Device. Where a water feed device is used, it shall be constructed to prevent feed water from entering the boiler through the water column or separate chamber of the low-water fuel cutoff.

1011.1 General. Automatic boilers shall be equipped with controls and limit devices in accordance with Table 1011.1. Automatic boilers shall be equipped with the following gauges, as applicable:

- (1) Oil temperature
- (2) Oil suction pressure
- (3) High and low gas pressure
- (4) Stack temperature
- (5) Windbox pressure

Except as otherwise specified, all gas-fired boilers exceeding 400 000 Btu/h (117 kW) input shall comply with nationally recognized standards approved by the Authority Having Jurisdiction.

The Authority Having Jurisdiction shall have the authority to approve solid-fuel-fired boilers that comply with the safety requirements for automatic gas- or oil-fired boilers

1020.1 General. ~~Hot water boiler installations, u~~ Upon completion, all boiler installations shall have controls set, adjusted, and tested by the installing contractor. A complete control diagram of a permanent legible type, together with complete boiler operating instructions, shall be furnished by the installer for each installation.

1020.2 Manufacturer's Instructions. The installation of each boiler covered by this chapter shall conform to the conditions of approval as specified in the manufacturer's installation instructions pertaining to safety and to the requirements of this chapter. The installer shall leave the manufacturer's instructions attached to the boiler or readily available for the benefit of the inspector.

1021.1 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~~ permit holder 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~~ permit holder or his authorized representative 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 installation shall not be covered, or concealed, or operated until so inspected and approved by the Authority Having Jurisdiction. The Authority Having Jurisdiction shall require such tests as it deems necessary to determine that the installation complies with the provision of this section. Such tests shall be made by the ~~owner~~ permit holder or his authorized representative in the presence of the Authority Having Jurisdiction.

Exception: On installations designed and supervised by a registered professional engineer, the Authority Having Jurisdiction ~~shall have the authority to permit inspection and testing by such engineer may accept the written report bearing the engineer's seal of a hydrostatic test performed and/or witnessed by said engineer.~~

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

1021.2 Inspection Codes and Standards. All inspections or tests shall be made in compliance with the prescribed or recommendatory rules or instructions of this code, the ASME Code and the *National Board Inspection Code* as applicable. The installation or repair of gas and potable

water piping and/or accessories shall be subject to the provisions of the plumbing code.

1021.3 Hydrostatic tests. A hydrostatic test is required for each secondhand boiler or detached boiler being placed back into service. Such boilers shall be tested by hydraulic pressure, in accordance with the *National Board Inspection Code*, at 50 percent greater than their allowed safe working pressure. If for any reason or on account of leakage the boiler will not hold this pressure, the owner shall have all repairs made before the boiler is placed into service and the inspector shall witness a second test upon receipt of notification that repairs have been made. If upon making the second test, the boiler is still defective, the Authority Having Jurisdiction shall, for each subsequent test, collect an additional inspection fee as herein provided for, but in no case shall the Authority Having Jurisdiction approve the boiler for use until fully satisfied of safe condition of such boiler. The installer or owner shall supply the equipment and labor to conduct the hydrostatic test on the boiler.

When there is a question or doubt about the condition of a boiler, the inspector may require a hydrostatic test, as follows:

1021.3.1 In preparing a boiler for a hydrostatic test, the boiler shall be filled with water to the stop valve and all air vented off. If the boiler to be tested is connected with other boilers that are under pressure, such connections shall be blanked off unless they have double stop valves on all connection pipes with a drain between.

1021.3.2 During a hydrostatic test of a boiler, the safety valve or valves shall be removed or each valve disc shall be held to its seat by means of a testing clamp and not by screwing down the compression screw under the spring.

1021.3.3 The temperature of the water used to apply a hydrostatic test shall be between 70EF and 120EF.

1021.3.4 When a hydrostatic test is to be applied, the pressure shall be as follows:

1021.3.4.1 For all cases involving the question of tightness, the pressure shall be equal to the set pressure of the safety valve or valves having the lowest setting.

1021.3.4.2 For all cases involving the question of safety, the pressure shall be equal to one and one-half times the maximum allowable working pressure.

1021.3.4.3 The pressure applied for a hydrostatic test shall not exceed one and one-half times the maximum allowable working pressure. In no case shall the test pressure be exceeded by more than 2 percent.

1022.0 Temporary Operating Permit.

1022.1 General. ~~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 only of steam heating boilers, low pressure hot water heating boilers, hot water supply boilers, and pressure vessels in Group R Occupancies of less than six dwelling units and in Group U 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 period of 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 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.

1023.0 Maintenance Inspection-Repairs.

~~1023.1 General.~~ ~~The Authority Having Jurisdiction shall inspect boilers and pressure vessels operated under permit in accordance with ASHRAE/ACCA 180 at such intervals as deemed necessary, but not less frequently than noted below.~~ Repairs, changes, or alterations made on a boiler shall conform with the prescribed or recommended rules of the ASME Code and the *National Board Inspection Code* and shall be subject to inspection (visual and/or hydrostatic test) by the Authority Having Jurisdiction before the boiler is coated with paint or other preservatives.

~~1023.2 Power and Miniature Boilers.~~ ~~Power boilers and miniature boilers shall be inspected externally annually. Where construction and operating conditions permit, they shall be subject to inspection internally annually.~~ **Major Repair.** The term "major repair" as used herein shall be considered as one upon which the strength of a boiler would depend. Where a major repair is necessary, it shall be subject to the approval of the Authority Having Jurisdiction. Repairs to all boilers and their appurtenances shall conform as nearly as practicable to the requirements of the *National Board Inspection Code*. See Section 1023.6.

~~1023.3 Steam and Water Heating Boilers.~~ ~~Steam heating boilers and hot water heating boilers shall be inspected externally annually. Where construction and operating conditions permit, they shall also be subject to inspection internally annually.~~ **Repairs by Welding Fusion.** All repairs by welding shall be completed in accordance with the recommended rules for repair by fusion welding to power boilers published in the *National Board Inspection Code*.

~~1023.4 Automatic Steam-Heating Boilers.~~ ~~Automatic steam heating boilers shall be inspected externally biennially. Where construction and operating conditions permit, they shall be subject to inspection internally biennially.~~ **Re-ending and Piecing Tube.** Re-ending or piecing tubes or pipes in either fire-tube or water-tube boilers is permitted, provided the thickness of the tube or pipe has not been reduced by more than 10 percent from that required by the ASME Code for the pressure to be carried.

~~1023.5 Unfired Pressure Vessels.~~ ~~Unfired pressure vessels shall be inspected externally biennially. Where subject to corrosion and construction permits, they shall be subject to inspection internally biennially.~~

~~Inspection of boilers and pressure vessels covered by insurance shall be permitted to be made by employees of the insuring company holding commissions from the National Board of Boiler and Pressure Vessel Inspectors, subject to approval of the Authority Having Jurisdiction. Approved insuring company inspectors shall make reports on prescribed forms on inspections authorized by the Authority Having Jurisdiction. The reports shall be filed in the Authority Having Jurisdiction office. Company inspectors shall notify the Authority Having Jurisdiction of suspension of insurance because of dangerous conditions, new insurance in effect, and discontinuance of insurance coverage.~~ **Repairs and Renewal of Fittings and Appliances.** Whenever repairs are made to fittings or appliances or it becomes necessary to replace them, the work must comply with this code and the ASME Code and the *National Board Inspection Code* for new installations.

1023.6 Repair/Alteration Forms. Completed State of Texas R-1 welder forms for a boiler repair and/or alteration shall be submitted to the inspector before final approval.

1023.7 Leaks or Cracks. If there is evidence of a leak or crack, or any defect, the covering of the boiler shall be removed to satisfy the inspector as to the safety of the boiler. If the covering cannot be removed at that time, the inspector may order operation of the boiler to be discontinued until such time as the covering can be removed and a proper examination made.

1025.0 Electrical Boilers

1025.1 Installation. Installation shall comply with the provisions of this chapter. All electrical wiring, devices, and components shall be in compliance with the electrical code and the State of Texas Boiler Law.

1025.2 Safety Relief Capacity. The minimum safety or safety relief valve relieving capacity for electric boilers shall be 3½ pounds of steam per hour per kilowatt input.

1026.0 New and Existing Boiler Installations.

1026.1 New installations. New boiler installations, including reinstalled boilers, shall be in accordance with the requirements of the latest revision of the applicable section of the ASME Code and this code. Secondhand boilers shall meet all the requirements for new installations, including code construction and stamping requirements and shall be hydrostatically tested if deemed necessary by the Authority Having Jurisdiction.

1026.2 Existing installations. The maximum allowable working pressure for standard boilers shall be determined in accordance with the applicable provisions of the edition of the ASME Code under which they were constructed and stamped. In no case shall the maximum pressure of an existing nonstandard boiler be increased to a greater pressure than would be allowed for a new boiler of the same construction.

1026.3 Makeup water connection to steam boilers. Approved backflow preventers shall be installed in accordance with the plumbing code.

1026.4 Boiler Discharge to Plumbing Systems. No steam pipe shall connect to any part of a drainage or plumbing system, nor shall any water above 140EF (60EC) be discharged into any part of a drainage system. Such pipes shall be indirectly connected by discharging into an interceptor, blowoff pit or similar appurtenances prior to delivery into the drainage system.

FOOTNOTES FOR TABLE 1011.1 (Continued)

- 9 Every automatic low-pressure steam-heating boiler, ~~small power boiler,~~ and power steam boiler shall be equipped with two high-steam pressure limit controls interlocked to shut off the fuel supply to the main burner with manual reset on the control, with the higher setting and two low-water-level limit controls, one of which shall be provided with a manual reset device and independent of the feed water controller. Coil-type flash steam boilers may use two high-temperature limit controls, one of which shall be manually reset in the hot water coil section of the boiler instead of the low-water level limit control.

{**EDITORIAL NOTE:** NO CHANGE TO THE REMAINDER OF TABLE 1011.1 AND FOOTNOTES NOT LISTED.}

CHAPTER 11

REFRIGERATION

1101.1 Applicability. Part I of this chapter covers refrigeration systems. Refrigeration systems, equipment, and devices for new buildings, including the replacement of parts, alterations, and substitution of a different refrigerant, shall conform to the requirements of this chapter and other applicable provisions of this code. 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 as modified by Section 1127.

Occupied spaces within refrigerated areas shall be in compliance with this chapter and the applicable portions of the building code.

Part II covers cooling towers.

1106.8 Prohibited Locations. Refrigeration systems or portions thereof shall not be located within a required exit enclosure. Refrigeration compressors exceeding 5 horsepower (3.7 kW) rating, and replacements of existing systems that contain other than A1 refrigerants, shall be located not less than 10 feet (3048 mm) from an exit opening in a Group A; Group B; Group E; Group F; Group H; Group I; Group R, Division 1 or 2; or Group S Occupancy, unless separated by a one-hour fire-resistive-occupancy fire barrier-separation.

The installation of air handling and refrigeration units within the same room is prohibited.

1106.10 Condensate. Condensate from air-cooling coils shall be collected and drained to an approved location. Drain pans and coils shall be arranged to allow thorough drainage and access for cleaning. Where temperatures drop below freezing, heat tracing and insulation of condensate drains shall be installed. 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.

1106.14 Refrigerant Port Protection. Air conditioning refrigerant circuit access ports located outdoors shall be protected from unauthorized access with locking-type tamper-resistant caps or in a manner approved by the Authority Having Jurisdiction.

Exception: Refrigerant ports in secure locations protected by walls or fencing and requiring key-access.

1108.3 Distribution of Ventilation. Exhaust inlets or permanent openings shall be located to provide ventilation throughout the entire refrigeration machinery room. Emergency exhaust intakes shall be located within 12 inches (305 mm) of the floor unless the refrigerant is lighter than air.

1108.6 Central Control of Ventilation Systems Flow Monitoring. Two colored and labeled indicator lamps responding to the differential pressure across the purge fan or current through

the fan motor shall be provided for each switch. One lamp shall indicate flow; the other shall indicate no flow.

1109.4 Emergency Control. A clearly identified switch of the break-glass type or with an approved tamper-resistant cover shall be provided immediately adjacent to and within 2 feet (610 mm) of the strike side of the door outside of the principal refrigeration machinery room exit. The switch shall provide off-only control of refrigerant compressors, refrigerant pumps, and normally closed, automatic refrigerant valves located in the machinery room. The switch shall be automatically shutoff where the refrigerant vapor concentration in the machinery room exceeds the vapor detector's upper detection limit or 25 percent of the LFL, whichever is lower.

1110.1.1 For minimum pipe insulation see Table 1110.1.1.

TABLE 1110.1.1
Minimum Pipe Insulation^a

Fluid	≤1.5 inch	>1.5-inch - 4-inch^e	>4 inch^e
<u>Steam and Steam Condensate</u>	<u>1½"</u>	<u>3</u>	<u>4</u>
<u>Heating Hot Water</u>	<u>1½"</u>	<u>2</u>	<u>2</u>
<u>Service Hot Water</u>	<u>1"</u>	<u>2</u>	<u>2</u>
<u>Chilled Water, Brine or Refrigerant</u>	<u>1"</u>	<u>1½"</u>	<u>2</u>
Footnotes:			
<p>a <u>Based on insulation having a conductivity (k) not exceeding 0.27 Btu per inch/h · ft² · °F.</u></p> <p>b <u>For insulation with a thermal conductivity not equal to 0.27 Btu · inch/h · ft² · °F at a mean temperature of 75°F, the minimum required pipe thickness is adjusted using the following equation:</u> $T = r[(1+tr)K/k-1]$ <u>where:</u> <u>T = Adjusted insulation thickness (in).</u> <u>r = Actual pipe radius (in).</u> <u>t = Insulation thickness from applicable cell in table (in).</u> <u>K = New thermal conductivity at 75°F (Btu · in/hr · ft² · °F).</u> <u>k = 0.27 Btu · in/hr · ft² · °F.</u></p> <p>c <u>These thicknesses are based on energy efficiency considerations only. Additional insulation is sometimes required relative to safety issues/surface temperatures.</u></p> <p>d <u>These thicknesses are based on energy efficiency considerations only. Issues such as water vapor permeability or surface condensation sometimes require vapor retarders or additional insulation.</u></p> <p>e <u>Nominal pipe size.</u></p>			

1110.3 Ferrous Materials. Iron and steel refrigeration piping, valves, fittings, and related parts shall be approved for the intended use. Pipe exceeding 2 inches (50 mm) iron pipe size shall be electric-resistance welded, submerged arc welded or seamless pipe.

1111.8 Identification. ~~Piping shall be in accordance with the reference standard for identification. The type of refrigerant, function, and pressure shall be indicated with labels affixed at 20 feet (6096 mm) intervals for exposed piping and at each side of a penetration of a wall or partition..~~

1112.4 Identification. Stop valves shall be identified by engraved brass tags with a minimum diameter of 1 inch (25.4 mm) ~~tagging in accordance with the reference standard for identification.~~ A valve chart shall be mounted under glass at an approved location near the principal entrance to a refrigeration machinery room.

Exception: Stop valves that are furnished as an integral part of manufactured refrigeration equipment.

1123.3 Permanent Sign. In a refrigeration machinery room and for a direct refrigerating system of more than ten horsepower (7.5 kW), there shall be a permanent sign ~~at an approved location located on or adjacent to the primary machinery room door and on each condensing unit in ½ inch high letters~~ giving the following information:

- (1) ~~Name of contractor installing the equipment.~~
- (2) Name and number designation of refrigerant in system.
- (3) Pounds of refrigerant in system.

1127.0 Requirements for Modifications to Existing Buildings.

1127.1 General. The requirements of this section shall apply retroactively to existing refrigeration 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 1102.1; 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.

Exception: Absorption systems, see Section 1129.

1127.2 Permits. Regardless of exemptions to the permit requirement set forth in Section 111.0, a mechanical permit shall be obtained for the replacement or addition of equipment or for conversion to another Group A1 refrigerant if mechanical refrigerating equipment is greater than 25 horsepower or conversion to a refrigerant other than Group A1 refrigerant in a system of any size.

1127.3 System Selection. Refrigerants used in replaced, added or refrigerant-converted systems shall be limited in application in accordance with Table 1105.1 and the requirements of Section 1105.

1127.4 Refrigerant Sensor and Alarms. A refrigerant vapor detection system and alarm system for the specific refrigerant shall be installed in accordance with Section 1107.4 and shall utilize alarm signaling. The refrigerant sensor shall energize the emergency ventilation system upon detection of refrigerant levels as specified in Section 1108.5.

1127.5 Ventilation. Both continuous and emergency ventilation shall be provided in accordance with Section 1108 to serve the machinery room.

Exception: In the event that compliance with Sections 1108.7 and 1108.9 are physically impractical, a system designed to minimize the hazard of contaminated exhaust shall be prepared and submitted for approval to the Authority Having Jurisdiction by a registered professional engineer licensed to practice as such in the State of Texas. Such design is subject to the provisions of Sections 103, 104, and 105 of this code.

1127.6 Overpressure Protection. Pressure vessels of replaced, added or refrigerant-converted refrigeration machinery shall be provided with over-pressure protection as specified in this chapter.

1127.7 Machinery Room Construction. Construction joints and penetrations shall be sealed to restrict passage of refrigerant vapor in accordance with Section 1107.5.

Exception: Where it is found to be physically impractical to rehabilitate a machinery room to comply with the above requirement (one- or two-hour construction), an evaluation and report by a registered professional engineer or registered architect licensed to practice in the State of Texas shall be submitted to the Authority Having Jurisdiction for approval, clearly stating measures necessary to attain a reasonably complete fire-rated separation and to minimize the possibility of refrigerant escaping the machinery room into other parts of the building. Such design is subject to the provisions of Sections 103, 104, and 105 of this code.

1127.8 Equipment Identification. Equipment in the machinery rooms shall be identified as indicated in Section 1123 of this chapter.

1127.9 Ductwork. New ductwork, except for ventilation as required by this chapter and combustion air, is not permitted in an existing refrigeration machinery room. Where it is impractical to relocate existing duct or where it is necessary to add ductwork for combustion air, all joints and seams in both new and existing ductwork shall be sealed substantially air tight. Refer to Section 602.4.

1128.0 Boilers in Existing Machinery Rooms

1128.1 Isolation. 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.

Exceptions:

- (1)** Where it is physically impractical to comply with the above requirement, an evaluation report by a registered engineer or registered architect licensed to practice in the State of Texas shall be presented to the Authority Having Jurisdiction for approval. The walls, partitions and doors need not comply with the requirements set forth for a fire barrier, but may consist of one-hour material designed and constructed to isolate the machinery room from the boilers to create a reasonably distinct and separate atmosphere within the respective rooms.
- (2)** Where it is found to be physically impractical to construct a separation of boilers and refrigeration machinery containing Group A1 or Group B1 refrigerant, a registered professional engineer licensed to practice in the State of Texas shall evaluate the effect

that ventilation, both emergency and continuous, will have on the operation of boilers within the refrigeration machinery room. A report, including a statement clearly indicating that a boiler will operate safely shall be submitted to the Authority Having Jurisdiction for review and approval prior to placing the boilers and ventilation into operation simultaneously. If the registered professional engineer determines that the required continuous ventilation will not have a detrimental effect on the operation of boilers but that emergency ventilation will have a detrimental effect on boiler operation, an electrical interlock designed to shut off the fuel supply to boilers when emergency ventilation is energized may be used in lieu of isolation of the boilers from the machinery room.

1128.2 Engines in Existing Refrigeration Machinery Rooms. Engines are permitted in refrigeration machinery rooms provided:

- (1) The refrigerant classification is Group A1 or 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 800EF or higher;
- (4) Ventilation is provided to dissipate the radiant heat from the engines to keep the room below 120EF; and
- (5) There is no open flame or spark.

1128.3 Switchgear and Related Equipment in Machinery Room. 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.

1128.4 Emergency Control. Emergency control in accordance with Section 1109.4 shall be provided for the refrigeration equipment and existing air-handling equipment except machinery room ventilation fans.

1129.0 Absorption Refrigeration.

1129.1 Lithium Bromide Absorption Refrigeration. Lithium bromide absorption refrigeration equipment using water as the refrigerant and steam or hot water as the energy source is exempt from refrigeration machinery room requirements and may be located in the same room with refrigeration equipment requiring a machinery room.

1129.2 Direct Fired Absorption Refrigeration. Direct fired absorption refrigeration equipment shall be installed in a room constructed as required for a boiler of similar Btu input. This equipment shall not be installed in a refrigeration machinery room.

1129.3 Ammonia Absorption Refrigeration. Ammonia absorption refrigeration equipment larger than 5 tons shall be installed in a refrigeration machinery room with the relief piped in accordance with Section 1120.

Part II – Cooling Towers

~~4127.0~~ 1130.0 **General.**

~~4127.4~~ 1130.1 **Applicability.** Cooling towers, evaporative condensers, and fluid coolers shall be readily accessible. Where located on roofs, such equipment having combustible exterior surfaces shall be protected with an approved automatic fire-extinguishing system.

~~4128.0~~ 1131.0 **Support and Anchorage.**

~~4128.4~~ 1131.1 **General.** Cooling towers, evaporative condensers, and fluid coolers shall be supported on noncombustible grillage designed in accordance with the building code. Seismic restraints shall be as required by the building code.

~~4129.0~~ 1132.0 **Drainage.**

~~4129.4~~ 1132.1 **General.** Drains, overflows, and blow-down provisions shall have an indirect connection to an approved disposal location. Discharge of chemical waste shall be as approved by the regulatory authority.

~~4130.0~~ 1133.0 **Chemical Treatment Systems.**

~~4130.4~~ 1133.1 **General.** Chemical treatment systems shall comply with the fire code. Where chemicals used present a contact hazard to personnel, approved emergency eye-wash and shower facilities shall be installed.

~~4131.0~~ 1134.0 **Location.**

~~4131.4~~ 1134.1 **General.** Cooling towers, evaporative condensers, and fluid coolers shall be located such that their plumes cannot enter occupied spaces. Plume discharges shall be not less than 25 feet (7620 mm) away from a ventilation inlet to a building. Location on the property shall be as required for buildings by the building code.

~~4132.0~~ 1135.0 **Electrical.**

~~4132.4~~ 1135.1 **General.** Electrical systems shall be in accordance with the electrical code. Equipment shall be provided with a vibration switch to shut off fans operating with excessive vibration. In climates commonly subject to electrical storms, lightning protection shall be provided on roof-mounted equipment.

~~4133.0~~ 1136.0 **Refrigerants and Hazardous Fluids.**

~~4133.4~~ 1136.1 **General.** Equipment containing refrigerants as a part of a closed-cycle refrigeration system shall comply with Part I of this chapter. Equipment containing other fluids that are flammable, combustible, or hazardous shall be in accordance with the fire code.

CHAPTER 13

FUEL GAS PIPING

1301.0 ~~Scope of Gas Piping.~~ General. For provisions pertaining to fuel gas piping, refer to Chapter 12 of the plumbing code.

{EDITORIAL NOTE: DELETE THE REMAINDER OF THIS CHAPTER IN ITS ENTIRETY.}

CHAPTER 14

PROCESS PIPING

{EDITORIAL NOTE: DELETE AND RESERVE THIS CHAPTER IN ITS ENTIRETY.}

CHAPTER 15

SOLAR SYSTEMS

{EDITORIAL NOTE: DELETE AND RESERVE THIS CHAPTER IN ITS ENTIRETY.}

APPENDIX D

UNIT CONVERSION TABLES

{EDITORIAL NOTE: INSERT THE FOLLOWING TABLE.}

TABLE D 2.1 METRIC / INCH CONVERSIONS

Metric / Inch Conversion Chart					
Millimeters	Fractions	Inches	Millimeters	Fractions	Inches
<u>.397</u>	<u>1/64</u>	<u>.015625</u>	<u>13.097</u>	<u>33/64</u>	<u>.515625</u>
<u>.794</u>	<u>1/32</u>	<u>.03125</u>	<u>13.494</u>	<u>17/32</u>	<u>.53125</u>
<u>1.191</u>	<u>3/64</u>	<u>.046875</u>	<u>13.891</u>	<u>35/64</u>	<u>.546875</u>
<u>1.588</u>	<u>1/16</u>	<u>.0625</u>	<u>14.288</u>	<u>9/16</u>	<u>.5625</u>
<u>1.984</u>	<u>5/64</u>	<u>.078125</u>	<u>14.684</u>	<u>37/64</u>	<u>.573125</u>
<u>2.381</u>	<u>3/32</u>	<u>.09375</u>	<u>15.081</u>	<u>19/32</u>	<u>.59375</u>
<u>2.778</u>	<u>7/64</u>	<u>.109375</u>	<u>15.478</u>	<u>39/64</u>	<u>.609375</u>
<u>3.175</u>	<u>1/8</u>	<u>.125</u>	<u>15.875</u>	<u>5/8</u>	<u>.625</u>
<u>3.572</u>	<u>9/64</u>	<u>.140625</u>	<u>16.272</u>	<u>41/64</u>	<u>.640625</u>
<u>3.969</u>	<u>5/32</u>	<u>.15625</u>	<u>16.669</u>	<u>21/32</u>	<u>.65625</u>
<u>4.366</u>	<u>11/64</u>	<u>.171875</u>	<u>17.066</u>	<u>43/64</u>	<u>.671875</u>
<u>4.762</u>	<u>3/16</u>	<u>.1875</u>	<u>17.462</u>	<u>11/16</u>	<u>.6875</u>
<u>5.159</u>	<u>13/64</u>	<u>.203125</u>	<u>17.859</u>	<u>45/64</u>	<u>.703125</u>
<u>5.556</u>	<u>7/32</u>	<u>.21875</u>	<u>18.256</u>	<u>23/32</u>	<u>.71875</u>
<u>5.953</u>	<u>15/64</u>	<u>.234375</u>	<u>18.653</u>	<u>47/64</u>	<u>.734375</u>
<u>6.350</u>	<u>1/4</u>	<u>.25</u>	<u>19.050</u>	<u>3/4</u>	<u>.75</u>
<u>6.747</u>	<u>17/64</u>	<u>.265625</u>	<u>19.447</u>	<u>49/64</u>	<u>.765625</u>
<u>7.144</u>	<u>9/32</u>	<u>.28125</u>	<u>19.844</u>	<u>25/32</u>	<u>.78125</u>
<u>7.541</u>	<u>19/64</u>	<u>.296875</u>	<u>20.241</u>	<u>51/64</u>	<u>.796875</u>
<u>7.938</u>	<u>5/16</u>	<u>.3125</u>	<u>20.638</u>	<u>13/16</u>	<u>.8125</u>
<u>8.334</u>	<u>21/64</u>	<u>.328125</u>	<u>21.034</u>	<u>53/64</u>	<u>.828125</u>
<u>8.731</u>	<u>11/32</u>	<u>.34375</u>	<u>21.431</u>	<u>27/32</u>	<u>.84375</u>
<u>9.128</u>	<u>23/64</u>	<u>.359375</u>	<u>21.828</u>	<u>55/64</u>	<u>.859375</u>
<u>9.525</u>	<u>3/8</u>	<u>.375</u>	<u>22.225</u>	<u>7/8</u>	<u>.875</u>
<u>9.922</u>	<u>25/64</u>	<u>.390625</u>	<u>22.622</u>	<u>57/64</u>	<u>.890625</u>

{EDITORIAL NOTE: REMAINDER OF APPENDIX D TO REMAIN AS SET FORTH IN 2012 UMC.}