248 CMR: BOARD OF STATE EXAMINERS OF PLUMBERS AND GAS FITTERS

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248 CMR 3.00: GENERAL PROVISIONS GOVERNING THE CONDUCT OF PLUMBING AND GAS FITTING WORK PERFORMED IN THE COMMONWEALTH

Section

3.01: Scope and Application

(1) Scope. The provisions of 248 CMR 3.00 govern the administrative requirements regarding the installation, removal, alteration, repair, and inspection of all plumbing and gas fitting work pursuant to M.G.L. c. 142, §§ 13 and 21. 248 CMR 3.00 also governs the administrative functions of the Board in sanctioning Licensees who engage in the installation, alteration, repair and Inspection of plumbing and gas fitting work pursuant to M.G.L. c. 142, §§ 13 and 21, and M.G.L. c. 112, § 61.

(2) Sections Declared Independent. Each Section of 248 CMR 3.00 through 11.00 and every part of each Section is hereby declared to be an independent Section and the holding of any Section or part of Section to be void and ineffective for any cause shall not be deemed to affect any other Section or part of Sections.

3.02: Definitions

For the purpose of 248 CMR 3.00 through 11.00 the following terms shall have the meanings indicated in 248 CMR 3.02. No attempt is made to define ordinary words that are used in accordance with their established dictionary meaning except where it is necessary to define their meaning to avoid misunderstanding. Definitions in M.G.L. c. 142 are not repeated here unless further clarity is required.

Apprentice Gas Fitter. A person not less than 16 years of age who is licensed by the Board and learning and working at the business of gas fitting under the direct supervision of a master gas fitter or journeyman gas fitter while in the employ of a master gas fitter.

Apprentice Plumber. A person not less than 16 years of age who is licensed by the Board and learning and working at the business of plumbing under the direct supervision of a master plumber or journeyman plumber while in the employ of a master plumber.

Board. State Board of Examiners of Plumbers and Gas Fitters as established in M.G.L. c. 13, § 36 and defined as the Examiners in M.G.L. c. 142, § 1.

Code. 248 CMR 3.00 through 11.00, subsequent amendments thereto, or and any emergency rule or regulation that the Board promulgates.

Direct Supervision. Supervision that is on-site and present during the conducted work.

Executive Director. The Executive Secretary of the Board as provided for in M.G.L. c. 13, § 36.

Generally Accepted Standard. A specification, code, rule, guide, or procedure recognized and accepted throughout the plumbing and gas fitting profession as authoritative.

Inspector. Either the Local Inspector or the State Inspector, as determined in 248 CMR 3.05(1)(a), who is responsible for granting or denying Permit applications and performing Inspections of plumbing and/or gas fitting work.

3.02: continued

Inspection. The Inspector's act of reviewing plumbing or gas fitting workmanship for compliance with the provisions of 248 CMR.

Licensee. A person duly holding a license issued by the Board.

Local Inspector. The Inspector of plumbing and gas fitting who is appointed by the building inspector, board of health, or mayor of each city and town in the Commonwealth pursuant to M.G.L. c. 142, §§ 11 and 12 and who administers and enforces the provisions of 248 CMR 3.00 through 10.00. For purposes of 248 CMR 3.00, Assistant, Alternate, or Deputy Inspectors shall also be deemed Local Inspectors.

Permit. A written notice that the Inspector grants to a plumber or gas fitter to commence work on a given installation. The Permit may contain limitations and conditions of the work to be performed. The uniform permit application form approved by the Board may be considered a Permit after issuance by the Inspector.

Permit Holder. A non-apprentice Licensee who has signed the uniform application for permit, is authorized to be granted a Permit under 248 CMR and who has received a Permit from the Inspector.

Principal. A licensed master plumber or master gas fitter who is in charge of the plumbing and/or gas-fitting operations of a business entity subject to licensure under 248 CMR 3.00. For purposes of 248 CMR 3.00, a principal need not have an ownership interest in the business entity.

Product-accepted (Product-acceptance). A plumbing or gas fitting product that may be installed pursuant to 248 CMR 3.00 through 10.00 based on the Board's determination that it meets the standards of 248 CMR 3.00 through 10.00.

Special-permission. Explicit permission from the Board that is required before installing certain products, materials, or systems because the product, material, or system raises special safety considerations.

State Inspector. A person employed by the Commonwealth of Massachusetts's Division of Professional Licensure who grants Permits and performs Inspections of the plumbing and gas fitting work in all state owned, used, leased (including sub-leased) or constructed buildings that are subject to the provisions of M.G.L. c. 142, § 21.

3.03: Business and Apprentice Licenses, Renewal, and Inspector Requirements

(1) Business Licensure.

(a) Licenses Required. All corporations, LLC's, partnerships, or other such entities that have plumbing or gas fitting employees are required to maintain a business license. Such business entities shall be properly constituted and chartered business organization recognized by the Secretary of the Commonwealth, such as a general partnership, limited partnership (LP), limited liability partnership (LLP), limited liability company (LLC), corporation or professional corporation (PC). Individuals practicing under their own name or a DBA do not require a business license. A business license shall be a certificate for purposes of M.G.L. c. 142, § 3B.

(b) Exceptions. Businesses employing licensed plumbers or gas fitters do not need to have a business license if they meet one of the following criteria:

1. A non-plumbing/gas fitting business does not need a business license if it employs one or more licensed plumbers or gas fitters and the only work performed by licensees is for the premises owned/leased and operated by that non-plumbing/gas fitting business. Apprentices may only be employed by such business when under the supervision of a master licensee.

2. Businesses solely engaged in work regarding undiluted liquefied petroleum gas installation do not require a business license so long as all individuals doing the work hold the proper license.

3.03: continued

(c) Applications. Applicants for Plumbing or Gas Fitting Business licenses shall meet the following criteria for licensure:

1. submission of an application completely and properly filled out in the manner prescribed by the Board, attested to under the pains and penalties of perjury by a master plumber or master gas fitter, as the case may be, who is a principal of the entity, and accompanied by such other information that the Board may require.

2. all principals of the entity shall be of good moral character as determined by the Board; and

3. applicants for licensure must pay the nonrefundable fee as established by the Secretary of Administration and Finance pursuant to M.G.L. c. 7, § 3B, and 801 CMR 4.00: *Rates*.

4. Corporations.

a. Applications for Plumbing or Gas Fitting Corporations must include a signed and stamped copy of the Articles of Organization. Out of State Corporations must provide a signed and stamped copy of the filed Foreign Corporation Certificate or such other document as required by the Massachusetts Secretary of the Commonwealth.

b. The installation of plumbing work for a plumbing corporation, or the installation of gas fitting work for a gas fitting corporation, must be specifically stated and documented as one of the disciplines of the corporation on the Articles of Organization that is submitted.

c. The applicant for a plumbing corporation must be a master plumber who is a listed officer of the corporation; the applicant for a gas fitting corporation must be a master gas fitter who is a listed officer of the corporation.

5. Limited Liability Companies (LLC's).

a. Applications for Plumbing or Gas Fitting LLC's must include a signed and stamped copy of the Certificate of Organization. Out of State Corporations must provide a signed and stamped copy of the filed Foreign LLC Certificate or such other document as required by the Massachusetts Secretary of the Commonwealth.

b. The installation of plumbing work for a plumbing LLC or gas fitting work for a gas fitting LLC must be specifically stated and documented as one of the disciplines of the LLC on the Certificate of Organization that is submitted.

c. The applicant for a plumbing LLC must be a master plumber who is a listed manager of the LLC; the applicant for a gas fitting LLC must be a master gas fitter who is a listed manager of the LLC. For purposes of 248 CMR 3.03(1)(c)5.c., if an LLC is member managed, a listed member of the LLC may be considered a manager.

6. General Partnerships, Limited Partnerships, and Limited Liability Partnerships (LLP's).

a. All partners in a general partnership, limited partnership, or LLP shall possess current Master Plumber or Master Gas Fitter licenses.

b. In the case of a general partnership, applicants must include with their application a notarized written agreement signed by all partners creating the general partnership.

c. In the case of a Limited Partnership or LLP, Applicants must include a signed and stamped copy of the partnership certificate filed with the Massachusetts Secretary of the Commonwealth.

(d) Responsibilities and Duties of the Licensee of Record for Business Licenses.

1. All business licenses are issued to the applicant for licensure who is a master plumber or master gas fitter. Business licenses are not transferable.

2. Once licensed, the master plumber or master gas fitter who is considered the licensee on record for the business is required to ensure that:

a. all plumbing and gas fitting work performed by the business is accomplished by individuals with valid, current licenses; and

b. all licensees comply with the requirements of 248 CMR 3.00 through 11.00.

(e) Changes in the Licensee of Record for Businesses Licensed by the Board.

1. Routine Changes and Expiration of the Licensee of Record's License.

a. To withdraw as licensee of record from a business, a licensee must immediately notify the Board in writing and return all business licenses.

3.03: continued

b. So long as all other individuals performing plumbing or gas fitting for the business are validly licensed, the business may continue operating so long as a new application for a business license is filed by a licensed master plumber or gas fitter, as the case may be, within 15 days of the withdrawal of the licensee of record. The business may not continue to operate after 60 days or if the Board denies this application, whichever comes first.

c. In the event the qualifying officer's master license expires, the business may treat the expiration date as the equivalent of the date of withdrawal of the licensee of record from the business, however, any work performed by the master licensee with an expired license may lead to such disciplinary action as allowed by law.

2. Discipline against the Licensee of Record.

a. Any discipline against a licensee of record shall be considered discipline against the business, discipline against the business shall likewise apply against the licensee of record.

b. Should the license of the licensee of record be suspended or revoked, the business may not operate in the plumbing or gas fitting industry until such time as the suspension or revocation is lifted or a new license is granted by the Board by application of a new licensee of record.

3. Death of the Licensee of Record.

a. In the event its licensee of record dies, a business must notify the Board in writing of said death within 15 days.

b. So long as all other individuals performing plumbing or gas fitting of the business are validly licensed, the business may continue operating for 60 days. For good cause shown, the Board may extend this period.

(2) Apprentices.

(a) General Provisions.

1. No person shall work as an Apprentice unless he or she has been issued a license by the Board. Applicants for the Apprentice license must:

a. in conjunction with his or her employing master, complete an Apprentice registration form; and

b. submit the required fee and registration form to the Board.

2. The Apprentice license shall be exhibited whenever required by an Inspector.

3. The Apprentice and the employing Master Plumber or Master Gas Fitter shall be jointly responsible for completing the Apprentice registration form.

4. No Apprentice shall solicit by sign, listing or any other form of advertisement, work regulated or controlled by 248 CMR or M.G.L. c. 142.

5. Individuals learning the practice of undiluted liquefied petroleum gas installation pursuant to 248 CMR 11.00: *Education and Experience Standards and Requirements for Licensure* under the direct supervision of a properly licensed individual do not require an apprentice license.

6. Apprentices must retain all W-2 records demonstrating their employment throughout their apprenticeship as well as for a period of at least seven years after obtaining a journeyman license. Apprentices may not act as independent contractors and will not be credited for time performed as such. Master licensees retaining apprentices as independent contractors may be subject to disciplinary action for aiding and abetting unlicensed practice. For purposes of 248 CMR 3.03(2)(a)6., payments to an apprentice for plumbing/gas work, which is documented on an IRS form 1099, shall be considered sufficient evidence for the Board to find that an apprentice is acting as an independent contractor.

7. With proper documentation, including a written contract, a licensed apprentice shall be deemed employed when serving as an unpaid intern and accruing work experience hours so long as all work was performed under the supervision of a master licensee.

(b) Master's Duties Regarding Apprentice Licensure.

1. Before a prospective Apprentice begins employment as an Apprentice gas fitter or Apprentice plumber with a Master Plumber or Master Gas Fitter, the employing Master Plumber or Master Gas Fitter shall be responsible for insuring that the apprentice has complied with all licensing requirements.

3.03: continued

2. The Apprentice license application form shall be signed by the Apprentice and the employing Master Plumber or Master Gas Fitter.

3. The Master Plumber or Master Gas Fitter shall not charge a fee to the Apprentice in relation to the master's completion of the Apprentice license application form.

4. The master and/or licensed business entity must retain payroll records and other employment documentation for all apprentices so employed. These records must be made available to the Board upon request and must be retained by the master for at least seven years after the apprentice ceases employment with the master or such later date as allowed by law.

5. In the event an apprentice leaves the employment of a master prior to completing their apprenticeship, the master must provide the apprentice a signed statement of experience.

6. In the event the master separates from a business entity, thus ending a supervisory relationship with an apprentice, the master will be deemed to have satisfied the requirements of 248 CMR 3.03(2)(b)6. if he or she provides the apprentice with a signed statement of experience when leaving the business entity. However, the Board may seek employment records from the business entity as it deems necessary.

7. For purposes of businesses that do not need a license pursuant to 248 CMR 3.03(1)(b)1., apprentices may be employed and accrue valid experience time so long as said work is supervised by a master licensee who can verify said experience. Master licensees working for such businesses may sign work experience forms for apprentices on behalf of their employing business, however, they must still be able to verify with employment records any hours credited to said apprentices.

(3) Inspectors.

(a) No plumber or gas fitter may act as or claim to be a Local Inspector of plumbing or gas fitting, unless appointed by a city or town inspector of buildings, board of health, or mayor as described in M.G.L. c. 142, §§ 11 and 11A.

(b) Inspector Notification to the Board and Continuing Education.

1. To ensure compliance with Board enforced statutory mandates, a plumber or gas fitter appointed to be a Local Inspector of plumbing or gas fitting must notify the Board in writing, via completing a Board approved form, within 15 days of appointment. Said form must include:

a. The name and license number of the journeyman or master plumber or gas fitter appointed as a Local Inspector;

b. The mailing address where the Local Inspector will receive official correspondence related to local inspections; and

c. A letter on city or town letterhead certifying the appointment of the Local Inspector. In the event that two or more towns have formed an inspection district pursuant to M.G.L. c. 142, § 10, the Local Inspector must either produce a letter from each town in which he or she would be inspecting or a letter from one town appointing the Local Inspector which states that the town is part of an inspection district and specifies which other towns are a part of said district.

2. Any Local Inspector who will cease duties as a Local Inspector must notify the Board in writing within 15 days of their final day as an Inspector.

(c) Inspector Continuing Education Requirements.

1. Pursuant to M.G.L. c. 142, § 11B, Inspectors must complete 12 hours of Board approved continuing education each year. This continuing education is separate from continuing education approved by the Board for non-Inspector plumbers and gas fitters as described in 248 CMR 11.00: *Education and Experience Standards and Requirements for Licensure*. Exemptions in 248 CMR 11.00 do not apply for Inspector continuing education.

2. Inspector continuing education must be approved by the Board and must be completed during the Inspector's personal license renewal cycle. The completion of said continuing education is a condition of being an Inspector and shall also be considered a condition for the renewal of the Inspector's personal license.

3.03: continued

3. Upon appointment, the amount of continuing education that an Inspector must complete may be pro-rated by the Board based upon the time of appointment so long as the Inspector has completed the equivalent amount of continuing education specified in 248 CMR 11.00: *Education and Experience Standards and Requirements for Licensure* for the period of time prior to the Inspector's appointment.

(d) The plumbing or gas-fitting license of any Inspector may be subject to disciplinary action for any violations of 248 CMR 3.03. Should the Board suspend or revoke the license of an Inspector, or should the Inspector let his or her plumbing or gas fitting license lapse, that individual may not inspect again, unless he or she obtains a valid license issued by the Board.

(4) Any person licensed by the Board may carry on the work within the scope of their license.

(5) 248 CMR 3.00, in conjunction with M.G.L. c. 142, shall be deemed to occupy the whole field of the licensing of plumbers, gas fitters, and undiluted liquefied petroleum gas installers in Massachusetts.

(6) Procedures for Renewal of Licenses.

(a) Licensees must renew their licenses every two years.

(b) Individuals must submit to the Board, or its agent, a completed written or electronic renewal application and the required fees prior to the expiration date of the license.

(c) Individuals must fulfill and document, as specified by the Board, the satisfactory completion of any continuing education requirements.

(d) Each licensee shall disclose in writing to the Board any finding made against him or her made by a court, other state or federal agency or, where applicable, by a licensing board of another jurisdiction within 15 days of said finding. 248 CMR 3.03(6)(d) shall not require disclosure of civil traffic offenses or dismissals of actions brought by the licensee. The provision of such disclosures shall be considered a condition of license renewal.

(e) It shall be the responsibility of all Licensees to notify the Board of any changes of address within 15 days of relocation as well as changes to any email addresses previously provided to the Board. Licensees who fail to so notify the Board may be subject to disciplinary action and are responsible for any failure to receive official Board correspondence including renewal applications.

3.04: Product, Design, and Testing Standards

(1) Board Required Product-acceptance. Only products and materials that have been listed by the Board as Product-accepted shall be used for plumbing and gas fitting work performed in the Commonwealth and governed by M.G.L. c. 142 and 248 CMR. The Board accepts products to ensure compliance with M.G.L. c. 142 and 248 CMR. The Board additionally requires manufacturers to provide information/testing to ensure their products meet applicable standards and are safe for public use. In making such acceptances, the Board does not relieve manufacturers of their independent obligations to only sell products that are safe for public use.

(a) Record. The Board shall maintain a list of Product-accepted materials or products.

(b) Product-acceptance.

1. For products not already listed as Product-accepted by the Board, each manufacturer of materials and equipment used in the construction, installation, alteration, repair, or replacement of any plumbing or gas fitting system shall apply to the Board for product-acceptance of each individual item or model number that is to be made available for installation in the Commonwealth.

2. Should the Board grant product-acceptance, the grant shall be valid for such period as designated by the Board. The product will then be listed by the Board as Product-accepted. All permanent Product-approvals granted in the past are null and void.

3. No product that is subject to a product acceptance request shall be installed before the Board has voted to grant the product-acceptance request.

4. An applicant for a product-acceptance request shall:

a. provide a completed product acceptance application in compliance with 248 CMR 3.00;

3.04: continued

b. a nonrefundable application fee in the amount set by the Commission of Administration and Finance and made payable to the Commonwealth of Massachusetts;

c. at the Board's request, appear at the Board meeting wherein the Product acceptance application is scheduled to be discussed; and

d. fulfill any testing requirements or meet any applicable standards in their entirety required by the Board.

5. All modifications to a previously accepted product(s) or materials, including substantive changes to installation instructions, shall be resubmitted to the Board.

6. At the Board's discretion, in *lieu* of granting an applicant's product acceptance or request, the Board may convert such a request to a request for a Test-site under 248 CMR 3.00.

7. In *lieu* of requiring the renewal of a product's acceptance, the Board may periodically require applicants to certify that:

a. the product and its instructions have not been altered since first accepted by the Board; and

b. the product continues to meet the requirements of 248 CMR 3.00 through 10.00.

(c) Board Suspension/Rescission of Product Acceptance.

1. Board acceptance of a product may be withdrawn whenever any of the following conditions exist:

a. Plumbing laws or regulations have changed affecting the legal installation of the product;

b. The product has become the subject of a recall by the manufacturer;

c. The product has been deemed unsafe or defective by the Consumer Product Safety Commission, a court of competent jurisdiction, or other such legal entity operating under a state or federal law;

d. The product has been modified without Board notice and acceptance;

e. The installation of the product requires, but cannot meet, provisions of any non-plumbing laws/regulations;

f. The manufacturer has not responded to Board requests/investigations, including any Board requests to certify the product continues to comply with 248 CMR 3.04;

g. Board acceptance of the product was based on incomplete or incorrect information; or

h. The Board has substantial evidence that continued use of the product would pose a threat to the public's health, safety, or welfare.

2. The rescission of a product's acceptance may, if necessary for public safety, occur prior to the manufacturer being provided with an opportunity to respond to the Board with grounds that may challenge the rescission. The provision of this opportunity shall not be interpreted to create any hearing or other due process rights other than those required by law.

(d) The Board may waive the need for a product to be accepted per 248 CMR 3.04(1) when in the best interests of the public's health, safety, or welfare.

(2) Variances.

(a) The Board may allow an applicant to use an alternative method, material, system or product that does not comply with 248 CMR 3.00 through 10.00 when:

1. in the Board's opinion there is an unusual or extraordinary circumstance or an established hardship that warrants special terms or conditions; and

2. the applicant seeks permission from the Board for using the alternative method, material, system, or product for one instance at one location.

(b) No plumbing or gas-fitting work that is subject to a Variance request shall begin before the Board has voted to grant the Variance request. The Board may make an exception to this rule subject to the following limitations:

1. The work was performed, prior to a variance being requested, by an individual licensed by the Board operating pursuant to a validly issued permit;

3.04: continued

2. Variances after the fact shall be granted only if a hardship can be established which would have justified the variance if sought prior to the work being performed. For purposes of 248 CMR 3.04(2)(b)2., any work or costs incurred to remove noncompliant work or costs incurred to obtain compliant products or materials shall not be considered a qualifying hardship.

3. The applicant for the variance must be the licensee responsible for the work performed. This applicant must be able to certify the following in writing and using a form approved by the Board in order to qualify for a variance after the fact:

a. That the work performed violates specific provisions of M.G.L. c. 142 and/or 248 CMR as cited by the inspector in writing which the applicant must provide to the Board;

b. The applicant must certify that he or she understands how the provisions of M.G.L. c. 142 and/or 248 CMR have been violated and that the licensee will ensure all his or her future work will conform to those requirements;

c. That the noncompliant work was unintentionally noncompliant due to a condition that the applicant who was responsible for the work could not have reasonably foreseen;

d. That the applicant notified the inspector immediately when the work was discovered to be noncompliant; work performed after this notification shall not be eligible for a variance; and

e. That the applicant agrees that the nonconforming work is subject to immediate removal if the Board, in its discretion, rejects the variance.

4. The availability of such an exception shall not relieve a licensee of their obligation to adhere to applicable plumbing and gas fitting laws and regulations governing their work; failing to adhere to 248 CMR 3.04(2)(b)4. may subject a licensee to disciplinary action.

(c) The Variance application shall:

1. be made to the Board before filing for the related Permit application to the Inspector;

2. be submitted in writing and using the forms provided by the Board;

3. include a copy of the petition for a Variance that was made to the Board of Health or to the Health Department for variance applications that involve plumbing work that is not under the jurisdiction of state inspectors; and

4. include a copy of the Board of Health or Health Department's response to the petition for variance applications that involve plumbing work that is not under the jurisdiction of state inspectors. The Board may waive this requirement so long as it may confirm that the petition was made in a timely manner.

(d) The applicant for a Variance request shall:

1. provide a completed application;

2. include a nonrefundable fee in the amount set by the Secretary of Administration and Finance and made payable to the Commonwealth of Massachusetts;

3. appear at the Board meeting wherein the Variance application is scheduled to be discussed; and

4. fulfill any testing requirements and/or meet any other applicable standards in their entirety required by the Board.

(e) Variances shall not be permitted to waive requirements of Massachusetts law, nor shall they be permitted for education or licensing requirements in 248 CMR 3.00 through 11.00.

(3) Special-permission.

(a) When safety is of special consideration, provisions of 248 CMR 3.00 through 10.00 may require that a Licensee obtain Special-permission from the Board before installing or using a given product, system, design, or method.

(b) To obtain Special-permission an applicant shall:

1. submit a request to the Board; and

2. at the Board's request, appear at a Board meeting where the request is scheduled to be discussed.

3.04: continued

(c) The Special-permission request shall include:
1. a nonrefundable fee in the amount set by the Secretary of Administration and Finance and made payable to the Commonwealth of Massachusetts;
2. a completed application;
3. a certification that the system was designed or engineered by a qualified individual;
4. the submission of a set of construction documents that have been stamped by a Massachusetts Registered Professional Engineer; and
5. any other requested documentation.

(4) Test-site.
(a) The Board may allow an applicant to use an alternative method, material, system or technology that does not comply with 248 CMR to determine its feasibility or safety.
(b) A Test-site is appropriate when an applicant anticipates that the alternative method, material, system, or technology may be used for more than one installation and at more than one location.
(c) No work that is subject to a Test-site request shall begin before the Board has voted to grant the Test-site request.
(d) The Test-site application shall be made to the Board before filing for the related Permit application to the Inspector.
(e) The applicant for a Test-site request shall:
1. provide a completed application;
2. include a nonrefundable fee in the amount set by the Secretary of Administration and Finance and made payable to the Commonwealth of Massachusetts;
3. appear at the Board meeting wherein the product Test-site application is scheduled to be discussed; and
4. fulfill any testing requirements or applicable standards in their entirety required by the Board.
(f) Should testing prove nonconformance of the product, material, system, technology, or method at issue, the test-site grant may be subject to additional tests or rescission.

(5) Required Tests.
(a) For the purpose of verifying a claim relating to an application made for Product-acceptance, Variance, Test-site, or Special-permission, the Board may require that tests be performed and that such Board recognized tests are performed at the expense of the applicant.
(b) Any tests required by the Board for the purpose of verifying a claim relating to an application made under 248 CMR 3.04(5) shall be conducted in accordance with industry recognized standards acceptable to the Board.

(6) Board Recognized Testing.
(a) The Board no longer approves testing laboratories. All previous approvals shall be deemed null and void.
(b) The Board will only recognize testing performed by laboratories that have been certified to meet industry-based guidelines to ensure appropriate testing.
(c) Laboratory certification shall be performed by:
1. Neutral/third-party accreditation bodies;
2. Neutral/third-party conformity assessment bodies; and
3. Governmental bodies.
(d) The Board reserves the right to reject tests from laboratories that lose their certification and/or fail to meet standards necessary for reliable testing.
(e) The Board may recognize field testing performed by certified third-party testing agencies.

3.05: Permits and Inspections

(1) Permits.
(a) Jurisdiction of Inspectors.

3.05: continued

1. State Inspectors. Permits to perform plumbing and/or gas fitting work in buildings owned, used, leased, or constructed by the Commonwealth pursuant to M.G.L. c. 142, § 21, shall be submitted to State Inspectors who shall grant or deny such Permit applications and who shall perform the related Inspections.

2. Local Inspectors. For all buildings that are not owned or constructed by the United States Government or that are not owned, used, leased or constructed by the Commonwealth, pursuant to M.G.L. c. 142, §§ 11, 11A and 12, all Permit applications shall be submitted to the Local Inspectors who shall grant or deny all such Permit applications and who shall perform the related Inspections.

3. For those buildings owned or constructed by the United States Government, Permits and Inspections for those buildings are only required at the request of the Federal Government.

4. In cases of emergency, a plumbing fixture or gas appliance may be installed, repaired, or turned on temporarily by the licensee prior to obtaining a permit provided:

a. the licensee has performed all testing required by 248 CMR;

b. the licensee and gas supplier (if applicable) are satisfied that the installation or repair will assure safe operation; and

c. the Inspector is notified and a regular inspection is made at the earliest opportunity and in no case later than the next working day.

5. Violations of Other Codes. Whenever an Inspector observes an apparent or actual violation of a statute, code, regulation, standard, municipal bylaw or ordinance not within the explicit authority of the Inspector under M.G.L. c. 142, and 248 CMR 3.00, the Inspector should report the findings to an official or entity having jurisdiction over that matter. The resolution of this apparent or actual violation shall not be construed as a requirement of 248 CMR 3.00 and shall be enforced by the official or entity having jurisdiction over that matter, not the Inspector.

(b) Requirements.

1. Until a Permit has been issued by the Inspector, plumbing or gas fitting work shall not be:

a. installed;
b. altered;
c. removed;
d. replaced; or
e. repaired.

2. Any application for such Permit shall be made in writing to the Inspector before work commences.

3. Each application for the Permit shall include:

a. a statement of the work to be performed;

b. the location of the building;

c. the names of the people or companies for and by whom the work is to be done; and

d. for applications for permit sought for work performed by students in a Board approved vocational school program, the application must include explicit written approval by the Board for the work to be performed.

4. Each Permit that is issued by the Inspector shall be subject to the express conditions set forth therein as to compliance with M.G.L. c. 142, and 248 CMR.

5. As a condition of granting a permit, the Inspector may require the applicant to submit a set of construction or engineered plans.

6. A minimum of one Permit is required for each building.

7. Permits to perform plumbing work shall be issued in compliance with the following:

a. Permits shall be issued to properly licensed individuals only. Permits may not be issued to apprentices.

b. Where a person seeks a Permit on behalf of a corporation or LLC, only the Master Plumber who has been granted the license to conduct the plumbing business as a corporation or LLC and who is a manager of the LLC or an officer of the corporation under M.G.L. c. 142, § 3B shall be issued the Permit.

c. Where a person seeks a Permit on behalf of a general partnership, limited partnership, or LLP, only the Master Plumbers who are partners in the partnership under M.G.L. c. 142, § 3B shall be issued the Permit.

3.05: continued

d. Where a Permit is being sought for work by a non-plumbing/gas-fitting business exempt from business licensure pursuant to 248 CMR 3.03(1)(b), a Permit may be issued to any properly licensed journeyman or master licensee employed by said business who agrees to be responsible for said work.

8. Permits to perform gas fitting work shall be issued in compliance with the following:

a. Permits shall be issued to properly licensed individuals. Permits may not be issued to apprentices. The only exception to this general requirement is for gas permits sought by a gas company as defined in M.G.L. c. 164, in such cases, a Permit may be issued to any employee of said company who is authorized to make binding representations on behalf of the company.

b. Where a corporation or LLC seeks a Permit, only the Master Plumber or the Master Gas Fitter who is a manager of the LLC or the officer of the corporation under M.G.L. c. 142, § 3B shall be issued the Permit.

c. Where a general partnership, limited partnership, or LLP seeks a Permit, only the Master Plumbers or the Master Gas Fitters who are partners in the partnership under M.G.L. c. 142, § 3B shall be issued the Permit.

d. Where a Permit is being sought for work by a non-plumbing/gas-fitting business exempt from business licensure pursuant to 248 CMR 3.03(1)(b), a Permit may be issued to any properly licensed journeyman or master licensee employed by said business who agrees to be responsible for said work.

9. A business entity that is changing its master licensee due to non-disciplinary reasons (routine or death, as outlined in 248 CMR 3.03(1)(e)) may have a master or journeyman employee file a permit application so long as they provide documentation that they have notified the Board of the change pursuant to 248 CMR 3.00. Once a new master takes over for the entity, that master must notify the Inspector in each city or town where the business has existing permits, and assumes responsibility for the existing permits taken out by the entity.

10. An Inspector may not deny a permit application and/or refuse to issue a permit, unless one of the following applies:

a. The licensee applicant has failed to fully fill out the uniform permit application and submit any required fees;

b. The licensee applicant and, if applicable, the applicant's business entity, does not have a valid license (in the case of a gas company as defined in M.G.L. c. 164, the applicant need not be licensed if the applicant is an employee of the gas company);

c. The licensee applicant has failed to submit required construction or engineered plans or has submitted a set of construction or engineered plans which, if adhered to, would cause the subject installation to not adhere to 248 CMR;

d. The licensee applicant has failed to provide evidence of workers compensation insurance if required by M.G.L. c. 152, § 25C(6);

e. The licensee applicant owes local property taxes in the city or town he or she is seeking to obtain a permit in and that city or town has adopted the provisions of M.G.L. c. 40, § 57;

f. The licensee applicant is prohibited from obtaining a permit pursuant to a decision by the Board or a court of competent jurisdiction;

g. The work location has outstanding plumbing violations that had been previously cited by the Inspector in writing to the property owner and said violations have not been resolved. This provision shall not be used to deny a permit for work which, if unperformed, would leave the subject property without potable water, heat, or sanitary drainage; or

h. The licensee has left another work site in a hazardous condition. For purposes of this section, gas turned on to a piping system or other such equipment without an approved inspection shall be deemed a hazardous condition.

(c) Exceptions to the Permit Requirement. A Permit is not required for:

1. the repair of leaks in a faucet, valve, or other working part of a plumbing fixture;

2. the clearance of a stoppage; and

3. Adjustment of gas appliance controls when said adjustment does not require any changes to the connection to the gas supply or associated piping.

3.05: continued

(d) Permit Termination.

1. When any of the work outlined in the Permit has commenced but the Permit Holder will not complete the work outlined in the Permit, the Permit shall be terminated by:
   a. the Permit Holder; or
   b. the person or entity who hired the Permit Holder.
2. Termination consists of sending written notice to the Inspector who issued the Permit, wherein the notice includes:
   a. the Permit number;
   b. a description of the work completed; and
   c. a description of the work not to be completed.
3. The Inspector shall perform an Inspection on the work that was completed under the original Permit.

(e) Invalidity. Permits shall be invalid if work is not started within 90 days of the date of the Permit, unless the holder of the Permit or Permits can satisfactorily prove that failure to start within the 90-day period was beyond his or her control.

(f) Response Time for Permit Applications. Within two working days upon the Inspector's receipt of the Permit application, the Inspector must act upon a Permit application received from a licensee. Acting does not constitute an approval or issuance of a permit.

(g) Permit Applications and Fees.

1. Permit applications must be accepted by the Inspector if submitted in person or by mail, however, applicants may choose to utilize electronic means if offered by the Inspector.
2. The Inspector must issue the Permit to the applicant in person, by mail, or the inspector may utilize other electronic means if acceptable to the permit applicant.
3. Internet Permit Applications.
   a. Inspectors may accept permit applications over the internet, however, to ensure uniformity throughout the Commonwealth, the internet application must be based solely on, and require no more or less information than the permit application approved by the Board.
   b. No Inspector shall deny a licensee a permit to perform plumbing or gas fitting because the licensee chooses not to utilize an internet permit application.
4. Fees charged for locally issued permits shall be determined by cities and towns, said fees shall not be subject to Board review.

(h) Notification That Permit Has Been Granted. Prior to issuing a formal Permit, an Inspector may notify an applicant that a Permit has been granted, the Permit applicant may treat this notification as the equivalent of receiving a Permit for purposes of commencing work. However, this notification is subject to the following requirements:

1. The notification must inform the applicant that a formal Permit is being issued;
2. The notification cannot be oral, it must be made in a reproducible medium, such as an email or writing, which must be retained by the Applicant until receipt of a formal Permit; and
3. The notification must be issued directly by the Inspector and cannot be delegated to anyone else.

(2) Plans and Specifications.

(a) Whenever plans and specifications are necessary or requested by the Inspector for any plumbing or gas fitting work, the applicant shall submit such plans to the Inspector. The Inspector may review the plans for up to 30 days prior to issuing the Permit.

(b) The plans and specifications shall include:

1. the name and address of the designer;
2. a certification by the designer that said plans and specifications are in compliance with 248 CMR; and
3. the stamp of a Massachusetts Professional Engineer.

(c) Plans and specifications shall not be required for minor repairs and alterations.

(3) Inspections.

(a) To insure compliance with all the requirements of M.G.L. c. 142, and 248 CMR, the Inspector shall inspect:

1. all work where a Permit is required;

3.05: continued

2. all the Permit related plumbing and gas fitting work; and

3. all portions of existing systems that may be directly affected by the plumbing or gas fitting work outlined in the related Permit application.

(b) The Inspector may require that at least two Inspections be performed; one rough Inspection and one final Inspection.

(c) The Inspector may require that a test be performed as part of the Inspection process.

(d) Notification.

1. It shall be the duty of the Permit Holder or other non-apprentice licensee employed by the Master Plumber or gas fitter to give notice to the Inspector when plumbing or gas fitting work is ready for Inspection.

2. The non-apprentice licensee or the Permit Holder shall establish that the work will stand the prescribed test and that the roughing-in has been completed as far as practicable before giving the notification.

3. If the Inspector determines that the work will not pass the test and/or requirements of 248 CMR 3.00 through 10.00, necessary corrections shall be made and the work shall be resubmitted for Inspection. The inspector must cite the provision of 248 CMR for any findings justifying a determination that the work performed is deficient.

(e) Within two working days upon the Inspector's receipt of proper notification that the plumbing or gas fitting work is ready for Inspection, the Inspector must act upon the request for Inspection. Proper notification shall mean that the Permit Holder has had direct communication with the Inspector.

(f) Covering of Work.

1. New plumbing and gas fitting work as well as portions of existing systems that may be directly affected by new work shall not be covered until it has been tested if required by the Inspector, and the Inspector has certified that the work is in compliance with M.G.L. c. 142, and 248 CMR 3.00 through 11.00.

2. If new plumbing and gas fitting work and such portions of existing systems that may be directly affected by new work are covered before being tested and approved by the Inspector, the work shall be uncovered for Inspection after the Inspector has issued a notice to uncover the work to the Permit Holder responsible.

(g) Defective Materials and Poor Workmanship. If, at the time of Inspection, any leaks, defective or patched materials, or evidence of unskilled or inferior workmanship are found with a plumbing or gas installation, regardless of who installed the work or whether it was within the scope of the permit, the following procedures shall be followed:

1. The Inspector shall condemn the same affected part(s) or entire system.

2. The Inspector shall order the Licensee to remove or correct the defective parts, or unskilled or inferior workmanship.

3. No further progress shall be allowed on the work until the defective parts or the unskilled or inferior workmanship is made to be compliant with 248 CMR.

(4) Right of Entry. Subject to compliance with all relevant federal and state laws, the Inspector shall, after showing proper identification, have the right to enter any premises for the purpose of conducting an Inspection of a plumbing or gas fitting system at such times as may be reasonably necessary to protect the public health.

(5) Material and Labor for Inspection and Tests. The equipment, materials, power, and labor necessary for the Inspection and any required tests shall be furnished by the licensed plumber or licensed gas fitter.

(6) Advisory Opinions and Appeal Procedure.

(a) State Inspector Advisory Opinion.

1. Any party who disagrees with or is aggrieved by the decision or interpretation of a Local Inspector may seek an Advisory Opinion from the State Inspector.

2. A request for an Advisory Opinion may be made by phone, by letter, or by electronic means to the State Inspector.

3. The State Inspector may respond to the request for an Advisory Opinion by requesting information from the relevant parties and then offering his or her interpretation of the pertinent portions of 248 CMR.

3.05: continued

4. The State Inspector's interpretation is a nonbinding statement of opinion on a matter submitted for that purpose.

5. At the State Inspector's discretion, his or her Advisory Opinion may be issued in writing or orally.

6. State Inspector advisory opinions shall not be considered to be official policies or rulemaking by the Board and do not constitute advisory opinions by the Board pursuant to M.G.L. c. 30A, § 8.

(b) Appeal before the Board. Any person who disagrees with or is aggrieved by the decision or interpretation of an Inspector may appeal to the Board for a hearing.

1. The appeal shall be in writing on a form approved by the Board.

2. The appeal shall be accompanied by a fee in the amount set by the Secretary of Administration and Finance and made payable to the Commonwealth of Massachusetts.

3. The fee shall be submitted by the appellant with the Executive Director of the Board who shall schedule the hearing and notify all interested parties.

4. The decision of the Board is final.

3.06: Grounds for Imposition of Disciplinary Sanctions

(1) Grounds for Imposition of Disciplinary Sanctions.

(a) Any violation of or failure to comply with any of the laws or regulations of the Commonwealth relating to the practice of plumbing or gas fitting including, but not limited to:

1. M.G.L. c. 142;

2. M.G.L. c. 112, §§ 61 through 65A; and

3. Any violation of 248 CMR 3.00 through 11.00, which is considered unprofessional and improper conduct.

(b) A Licensee is convicted of or admits to sufficient facts or pleads *nolo contendre* to a crime in any jurisdiction, whether felony or misdemeanor, in the Commonwealth or outside of the Commonwealth, regardless of adjudication or sentence, that relates to the practice of plumbing or gas fitting.

(c) No person shall aid or abet any plumber or gas fitter to violate the provisions of M.G.L. c. 142, M.G.L. c. 112, §§ 61 through 65A or 248 CMR 3.00 through 11.00.

(d) No person shall employ an unlicensed person or employ any unlicensed person in the performance of any work that requires a license by M.G.L. c. 142 or 248 CMR 3.00 through 11.00.

(2) Deceptive Advertising. The following advertising practices are considered fraudulent, false, deceptive or misleading and are prohibited:

(a) advertising that contains a misrepresentation of facts or false statements regarding the Licensee's professional achievements, degrees, trained skills, and qualifications;

(b) advertising that makes only a partial disclosure of relevant facts, such as advertising a discounted price without identifying the specific discounted product or service or without specifying the usual price for the discounted product or services;

(c) advertising that contains a representation that a continuing education or training program is approved by the Board, if the content of the program departs from the content approved by the Board or is not in fact approved;

(d) advertising that contains any representation, statement or claim that the Board determines is misleading or deceptive to the public; or

(e) any sign, listing or advertisement authorized by the Licensee which does not contain his or her designation and license number.

(3) Ethical Standards and Professional Conduct. Requirement to respond to the Board:

(a) A Licensee shall respond within ten days to a written communication from the Board or its designee and shall make available to the Board any relevant and authorized records with respect to an inquiry or complaint about the Licensee. The ten-day period commences on the date the Board sends the communication to the Licensee's last known address. This deadline may be extended by the Board or its designee with good cause.

3.06: continued

(b) A Licensee shall cooperate with any reasonable request from the Division of Professional Licensure's agent or employee acting on behalf of the Board while investigating a complaint or allegation regarding the Licensee.
(c) A Licensee shall not provide any services beyond the scope of their Board issued license(s).
(d) Each Licensee shall fully inform persons served of the nature, possible effects, and limitations of services rendered or to be rendered.
(e) A Licensee shall not charge for services not rendered.
(f) Unless required by law, a Licensee shall not reveal to any unauthorized person any confidential information obtained from the client that the Licensee serves professionally without the client's permission.
(g) Each Licensee shall take all reasonable precautions to avoid injuring persons and property in the delivery of professional services.
(h) Each Licensee shall not discriminate on the basis of race, religion, gender, sexual orientation, age, or against any other class defined by law.
(i) Licensees shall maintain objectivity in all matters concerning the welfare of persons served professionally.

3.07: Complaint Handling Process

(1) Any person, organization, agent or employee of the Division of Professional Licensure, or member of the Board may file a complaint or provide information to the Board that alleges misconduct by a Licensee or unlicensed individual. If complainant is not anonymous, the complainant shall provide his or her name, address, and telephone number and a detailed description of the alleged act(s) that prompted the complaint. The complaint form shall be signed by the complainant or an authorized representative. The Board, at its discretion may investigate anonymous complaints.

(2) Inquiry and Investigation. After receipt and review of a written complaint, the Board may conduct any reasonable inquiry or investigation it deems necessary to determine the truth and validity of the allegation(s) set forth in such complaint. If the Board or an authorized agent of the Board determines that the complaint is lacking in merit, it may close the complaint.

(3) Request for Response and Response. If the Board or its duly authorized agent determines that a complaint has merit, the Board or its duly authorized agent may request that the Licensee or unlicensed individual who is the subject of the complaint provide a response to the complaint. A Licensee or unlicensed individual shall respond to a request for response, and such response may be made either personally or through an attorney. A response shall address the substantive allegation(s) set forth in the complaint or request for response and be provided in writing in a timely manner in accordance with 248 CMR 3.00.

(4) Investigative Conference. To facilitate disposition, the Board or its duly authorized agent may request any person to attend an investigative conference to discuss the complaint and response at any time prior to the commencement of a formal hearing conducted pursuant to M.G.L. c. 30A.

(5) Board Action Required. If a Licensee or unlicensed individual fails to respond as requested by the Board or its duly authorized agent, or at any other point in the course of investigation or inquiry into a complaint, the Board or its duly authorized agent determines that there is reason to believe that the alleged acts occurred and constitute a violation for that a Licensee or unlicensed individual may be sanctioned by the Board, the duly authorized agent or the Board may issue an order to show cause or offer to resolve the complaint by consent agreement.

REGULATORY AUTHORITY

248 CMR 3.00: M.G.L. c. 112, § 61; M.G.L. c. 142, §§ 13 and 21.

NON-TEXT PAGE

248 CMR 4.00: MASSACHUSETTS FUEL GAS CODE

Section

4.01: Purpose

248 CMR 4.00 through 8.00, collectively the Massachusetts Fuel Gas Code, governs the installation of fuel gas piping systems, fuel gas utilization equipment, and related accessories throughout the Commonwealth.

4.02: Definitions

For the purpose of 248 CMR 4.00 through 8.00, the following terms shall have the meanings indicated in 248 CMR 4.02. No attempt is made to define ordinary words that are used in accordance with their established dictionary meaning, except where it is necessary to define their meaning to avoid misunderstanding. Definitions in M.G.L. c. 142 are not repeated here, unless further clarity is required. These definitions shall not be interpreted to conflict with or otherwise expand or reduce the scope of the provisions of M.G.L. c. 142.

Buildings under Construction. Any structure being built, including tents, which utilize gas on a temporary basis.

Fuel Gas. A natural gas, manufactured gas, or other mixture of gases typically combusted, consumed, or otherwise utilized as the source of energy for power, refrigeration, heating or illuminating purposes. Hazardous industrial type gases or Category M liquids as defined in M.G.L. c. 146, § 81 which are not used for power, refrigeration, heating or illuminating purposes, but are instead used for processes, biopharma or semi-conductor manufacturing, shall not be considered fuel gases.

NFPA 54. The 2012 Edition of the *National Fuel Gas Code* published by the National Fire Protection Association.

NFPA 58. The 2011 Edition of the *National Liquefied Petroleum Gas Code* published by the National Fire Protection Association, including Errata Number 58-11-1 issued October 29, 2010 and Errata Number 58-11-2 issued November 30, 2011.

NFPA 85. The 2011 Edition of the *Boiler and Combustion Systems Hazards Code* published by the National Fire Protection Association including Errata Number 85-11-1 issued April 29, 2011.

NFPA 86. The 2011 Edition of the *Standard for Ovens and Furnaces* published by the National Fire Protection Association including Errata Number 86-11-1 issued February 13, 2014, Tentative Interim Amendment TIA 11-1 issued August 5, 2010, Tentative Interim Amendment TIA 11-2 issued August 5, 2010, Tentative Interim Amendment TIA 11-3 issued March 1, 2011, and Tentative Interim Amendment TIA 11-4 issued March 1, 2011.

Piping System beyond a Gas Meter Outlet or Regulator. All components of a piping system beyond a specialized flow meter installed by a serving gas supplier or initial specialized device which serves to reduce the pressure of a provided fuel gas installed by a serving gas supplier; such a system shall also include all piping for the intake of fuel gases such as oxygen which are not provided by a serving gas supplier.

Power, Refrigeration, Heating or Illuminating Purposes. Shall mean use for the production of energy, cooling, heat, or light, but shall not mean the conversion of a gas to another gas, liquid, or solid form, which is then used for a manufacturing or industrial purpose.

4.03: Scope of the Massachusetts Fuel Gas Code and Adoption of Relevant Codes

The Massachusetts Fuel Gas Code is comprised of the following:

(1) For most installations of gas piping systems in Massachusetts, the Board adopts NFPA 54 as modified by 248 CMR 5.00: *Amendments to NFPA 54*. The scope of this adoption shall be governed by NFPA 54 Chapter 1, Administration, subject to the following modifications:

(a) Replace NFPA 54 sub-section 1.1.1.1(A) with the following:

Jurisdiction of gases as defined in subsection 3.3.51 of NFPA 54 shall extend from the point of delivery to the provided connections with each gas utilization device as follows:

1. For natural and manufactured gas systems, the point of delivery shall be considered the outlet of the service meter assembly or the outlet of the service regulator or service shut off valve where no meter is provided.
2. For undiluted liquefied petroleum gas systems, the point of delivery shall be considered the supply source, or, if it exists, the outlet of the first regulator located at the cylinder/vessel.
3. This code shall regulate piping systems in permanent structures, buildings under construction, as well as exterior installations.

(b) Replace NFPA 54 sub-section 1.1.1.1(B) with the following:

All gas piping systems shall be low pressure, not in excess of 0.5 P.S.I.G. or 14 inch water column. Systems may exceed these requirements if designed and installed in accordance with 248 CMR 5.05(4)(B).

(c) Delete NFPA 54 sub-section 1.1.1.2 and replace with the following:

The provisions of NFPA 54 shall not apply to applications utilizing acetylene, hydrogen, ammonia, carbon monoxide, oxygen, or nitrogen; such installations shall be governed by 248 CMR 4.03(6).

(d) Delete NFPA 54 section 1.4

(2) For installations of undiluted liquefied petroleum gas not explicitly covered by NFPA 54 as modified, the Board adopts NFPA 58 as modified by 248 CMR 8.00: *Amendments to NFPA 58*. The scope of this adoption shall be governed by NFPA 58 Chapter 1, Administration, subject to the following modifications:

(a) Delete NFPA 58 sub-section 1.1 and replace it with the following:

1.1 Scope. This code applies to the installation of undiluted liquefied petroleum gas systems and appliances.

(b) Delete NFPA 58 sub-section 1.3.1 and replace it with the following:

1.3.1 Application of the Code. This code shall apply to the installation of undiluted liquefied petroleum gas systems commencing upon the point of delivery. For purposes of this code, the point of delivery shall be considered the supply source, or, if it exists, the outlet of the first regulator located at the cylinder/vessel. This code shall regulate piping systems in permanent structures, buildings under construction, as well as exterior installations.

(c) Delete NFPA 58 subsections 1.3.2(3), (4), (5), (6) and (11)

(3) For installations of fuel gas boilers with an input of 12,500,000 BTU per hour or greater or fuel gas fired steam generators, the Board adopts NFPA 85 chapters 1 to 8. The scope of this adoption shall be governed by NFPA 85 Chapter 1, Administration, subject to the following modifications:

5.10: continued

(29) Delete sub-section 10.23.1* and replace with the following:

10.23.1* Prohibited Installations.

(a) Room heaters shall not be installed in bathrooms, bedrooms, or other sleeping quarters unless permitted by M.G.L. c. 148, § 25A and 527 CMR 30.04: *Installation*.

(b) Exception: Notwithstanding sub-section 10.23.1*(a), room heaters may be utilized which are direct vented as defined in sub-section 3.3.6.3.

(30) Replace sub-section 10.23.2 with the following:

10.23.2 Unvented Room Heaters.

(a) Unvented room heaters shall be installed in accordance with M.G.L. c. 148, § 25A and 527 CMR 30.00: *Unvented Propane or Natural Gas-fired Space Heaters*.

(b) With regards to the installation of unvented room heaters, in the event of a conflict between 248 CMR 5.00 and M.G.L. c. 148, §25A and 527 CMR 30.00: *Unvented Propane or Natural Gas-fired Space Heaters*, the provisions of M.G.L. c. 148, § 25A and 527 CMR 30.00: *Unvented Propane or Natural Gas-fired Space Heaters* shall prevail.

(c) In addition to complying with the permit requirements of 248 CMR 3.00: *General Provisions Governing the Conduct of Plumbing and Gas Fitting Work Performed in the Commonwealth*, a permit shall be obtained from the head of the fire department.

(d) A final inspection by the Inspector shall not be performed until proof is provided that the head of the fire department having jurisdiction has granted a permit.

(e) Installations shall be of a permanent type, with a permanently piped fuel supply. LPG appliances shall be subject to the storage requirements in accordance with 527 CMR 6.00: *Liquefied Petroleum Gas Containers and Systems*.

(f) Unvented room heaters shall not exceed a maximum of 40,000 BTU input per room or space.

(g) At least one listed carbon monoxide detector, that is installed in accordance with the manufacturer's instructions, shall be installed and maintained in the same room where the heater is located, or otherwise in the location specified by the manufacturer's instructions.

(h) Unvented room heaters may not be the primary source of heat for any room or building.

(31) Delete sub-section 10.23.3.

(32) Delete sub-section 10.23.4 and replace with the following:

10.23.4 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. Only listed room heaters shall be installed and must be installed in accordance with the manufacturer's installation instructions. In no case shall the clearances be such as to interfere with combustion air and accessibility.

(33) Add a new-subsection 10.24.2 as follows:

10.24.2 Stationary Gas Engines Used for Life/Safety. When a dedicated gas fuel line is installed for a stationary gas engine used for life/safety purposes, it shall be installed immediately downstream of the meter assembly or shut off valve (if no meter is provided) and shall meet the following requirements:

(a) The fuel line for the stationary gas engine and the fuel line for the remaining appliances shall have shut off valves installed immediately downstream of the meter assembly to enable each line to operate independently;

(b) When pressure regulators are installed, they shall enable each fuel line to operate independently and not adversely affect the gas pressure of the other fuel line, and:

(c) The fuel line for the stationary gas engine shall be labeled at each shutoff valve with the following:

WARNING: Gas Used for Life/Safety, Avoid Shutting Off Gas Unless Necessary

5.10: continued

(34) Delete sub-section 10.26.2.1(2).

(35) Delete sub-section 10.26.2.2(3).

(36) Delete sub-section 10.28.2.2.

(37) Delete sub-section 10.28.3.

(38) Delete sub-section 10.28.4.

(39) Delete sub-section 10.28.5.

(40) Delete sub-section 10.32.2 and replace with the following:

Listed outdoor open flame decorative appliances do not require any product acceptance under 248 CMR 3.00: *General Provisions Governing the Conduct of Plumbing and Gas Fitting Work Performed in the Commonwealth*.

(41) Add a new section 10.33 as follows:

10.33 Gas-fired Kilns. Gas Fired Kilns must meet product acceptance requirements in 248 CMR 3.00: *General Provisions Governing the Conduct of Plumbing and Gas Fitting Work Performed in the Commonwealth*.

5.11: Modifications to Chapter 11, Procedures to Be Followed to Place Appliance in Operation

No modifications have been made to Chapter 11, Procedures to Be Followed to Place Appliance in Operation.

5.12: Modifications to Chapter 12, Venting of Appliances

(1) Delete sub-section 12.4.4.2 and replace with the following:

12.4.4.2 Venting *via* a Damper or with a Power Means of Exhaust. Where gas appliances or equipment are vented through a ventilating or exhaust system equipped with a damper or with a power means of exhaust, provisions shall be made to allow the flow of gas to the main burners only when the damper is open to a position to properly vent the appliance or equipment when the power means of exhaust is in operation. All gas lines serving such appliances or equipment shall be equipped with a solenoid valve which meets the following criteria:

(a) The solenoid valve may not be bypassed.

(b) The solenoid valve must be equipped with or connected to a manual reset device controlled by one of the following options:

1. at least one audible hard wired carbon monoxide detector listed for the environment in which the appliance or equipment is being installed. This carbon monoxide detector must be interlocked with the solenoid valve such that it will close the solenoid valve if an unsafe level of carbon monoxide is reached in the room or the detector becomes defective.
2. a draft proving switch which allows the solenoid valve to be open only when:
   a. the equipped damper is 100% open; or
   b. the power means of exhaust is fully operational.

(c) Notwithstanding the provisions of subsection 1.3 (Retroactivity), installers of replacement appliances or equipment used in connection with ventilating hoods or exhaust systems must ensure that the gas line(s) serving the replaced appliances or equipment meet the requirements of subsection 12.4.4.2.

(2) Delete sub-section 12.5.2 and replace with the following:

Plastic Piping. The only plastic piping which may be used for venting appliances shall be CPVC, polypropylene, and other pipes which have been Product-accepted for that purpose by the Board.

248 CMR 7.00: LARGE GAS UTILIZATION EQUIPMENT

Section

7.01: Definitions

Air Shutter. An adjustable device for varying the size of the air inlet or inlets regulating primary or secondary air.

Boiler. *See* NFPA 85, subsection 3.3.20.

Breeching. (*See* Chimney Connector.)

Burner. A device for the final conveyance of the gas, or a mixture of gas and air to the combustion zone.

(a) Injection (Bunsen) Type Burner. A burner employing the energy of a jet of gas to inject air for combustion into the burner and mix it with the gas.

(b)Atmospheric Injection Type Burner. A burner in which the air at atmospheric pressure is injected into the burner by a jet of gas.

(c)Luminous or Yellow Flame Burner. A burner in which secondary air only is depended on for combustion of the gas.

(d) Power Burner. A burner in which either gas or air or both are supplied at pressures exceeding, for gas, the line pressure and, for air, atmospheric pressure; this added pressure being applied at the burner. A burner for which air for combustion is supplied by a fan ahead of the appliance is commonly designated as a forced draft burner.

(e) Premixing Burner. A power burner in which all or nearly all of the air for combustion is mixed with the gas as primary air.

(f) Induced Draft Burner. A burner which depends on the draft induced by a fan beyond the appliance for its proper operation.

(g) Pressure Burner. A burner which is supplied with an air-gas mixture under pressure (typically from 0.5 to 14.0 inches of water and occasionally higher).

Burner Head. That portion of a burner beyond the outlet end of the mixer tube which contains the ports.

Burner, Automatically Lighted. One where fuel to the main burner is normally turned on and ignited automatically.

Burner, Manually Lighted. One where fuel to the main burner is turned on only by hand and ignited under supervision.

Chimney. A vertical shaft enclosing one or more flues for conveying flue gases to the outside atmosphere.

(a) Factory-built Chimney. A listed chimney.

(b) Masonry Chimney. A chimney of solid masonry units, bricks, stones, listed masonry

chimney units or reinforced concrete, lined with suitable flue liners.

(c) Metal Chimney. A field-constructed chimney of metal.

Chimney Connector. The pipe which connects a fuel-burning appliance to a chimney.

Combustion. The rapid oxidation of fuel gases accompanied by the production of heat or heat and light.

Combustion Control. A control which automatically regulates the firing rate at predetermined air-fuel ratios in accordance with load demand.

7.01: continued

(a) High-low Firing. The action of a combustion control which positions the air and fuel supply for low-fire and for high-fire in accordance with load demand.
(b) Modulating. The action of a combustion control which gradually varies the air and fuel supplies within limits in accordance with load demand.

Combustion (Input) Control Valve. An automatic gas-control valve for regulating equipment input.

Combustion Products. Constituents resulting from the combustion of a fuel gas with the oxygen of the air, including the inerts, but excluding excess air.

Condensate. The liquid which separates from a gas (including flue gases) due to a reduction in temperature.

Controls. Devices designed to regulate gas, air, water or electrical supply equipment. These may be manual, semi-manual, semi-automatic or automatic.

Control, Limit. An automatic control responsive to changes in liquid level; in fuel, steam or air pressure; in air, gas or liquid flow; or in temperature; for limiting the operation of the controlled equipment.

Control, Primary Safety. A control responsive directly to flame properties; sensing the presence of flame and causing fuel to be shut off in the event of ignition or flame failure requiring manual reset.

Control, Safety. Automatic controls and interlocks (including relays, switches, and other auxiliary equipment used in conjunction therewith to form a safety control system which are intended to prevent unsafe operation of the controlled equipment).

Damper. A valve or plate for controlling draft or flow of the flue gases. A damper is generally considered as being located on the downstream side or the combustion chamber usually in a flue passage of the appliance or in the chimney or vent connector.

Damper, Automatically Operated. A damper operated by an automatic control.

Damper, Manually Operated. An adjustable damper manually set and locked in the desired position.

Draft Regulator, Barometric. A device which functions to maintain a desired draft in the appliance by automatically reducing the chimney draft to the desired value.

Equipment. Any gas utilization equipment having inputs of more then 400,000 BTU's per hour per combustion chamber. This includes, but is not limited to, steam boilers, hot water boilers, water heaters, generators, and other similar gas utilization equipment.

Flame Safeguard. (*See* Control, Primary Safety.)

Flue Gases. Products of combustion and excess air.

Interlock. A device to prove the physical state of a required condition, and to furnish that proof to the primary safety control circuit.

Labeled. Equipment or materials to which has been attached a label of a nationally recognized testing laboratory that maintains periodic inspection of production of labeled equipment or materials and by whose labeling is indicated compliance with nationally recognized standards or has been tested and found safe for use in a specified manner.

7.01: continued

Listed. Equipment or materials included in a list published by a nationally recognized testing laboratory that maintains periodic inspections of production of listed equipment or materials and whose listing states either that the equipment or material meets nationally recognized standards or has been tested and found safe for use in a specified manner.

Low-fire Start, Proven. The firing of a burner with fuel and combustion air controls interlocked in a low-fire position to provide safe operating conditions during light off.

Lubricated Plug-type Valve. A valve of the plug-and-barrel type designed for maintaining a lubricant between the bearing surfaces.

Main Burner Flame-establishing Period. The length of time the main burner flue safety shutoff valves are permitted to be open before the flame sensing device is required to supervise the main burner flame.

Optimum Air-fuel Ratio. A ratio of air to fuel going to the furnace which will provide complete combustion of the fuel with sufficient range of excess air to maintain a stable flame envelope.

Pilot. A flame which is utilized to ignite the gas at the main burner or burners.

Pilot, Continuous. A pilot that burns without turndown throughout the entire time the burner is in service, whether the main burner is firing or not.

Pilot, Expanding. A continuously burning pilot that is automatically expanded so as to reliably ignite the main burner. This pilot may be turned down at the end of the main burner flame-establishing period.

Pilot Flame-establishing Period. The length of time fuel is permitted to be delivered to a proved pilot before the flame sensing device is required to detect pilot flame.

Pilot, Intermittent. A pilot which is automatically lighted each time there is a call for heat. It burns during the entire period that the main burner is firing.

Pilot Interrupted. A pilot which is automatically lighted each time there is a call for heat. The pilot fuel is cut off automatically at the end of the main burner flame-establishing period.

Pilot, Proved. A pilot flame supervised by a primary safety control.

Purge. To free a gas conduit of air or gas, or a mixture of air or gas.

Regulator, Gas Pressure. An automatic gas pressure reducing device for the purpose of maintaining a uniform gas supply pressure.

Safety Shutdown. The action of shutting off all fuel and ignition energy to the appliance by means of a safety control or controls such that restart cannot be accomplished without manual reset.

Safety Shutoff Valve. A gas-control valve that is automatically closed by the safety control

system or by an emergency device. The valve may be of the automatically or manually opened type.

Throttling. (*See* "Modulating" under Combustion Control.)

Trial-for-ignition Period. (*See* Main Burner Flame-establishing Period.)

Zero Governor. A regulating device which is normally adjusted to deliver gas at atmospheric pressure within its flow rating.

7.02: General Provisions

(1) Before arranging for the selection or installation of large gas equipment, the licensed plumber or gas fitter shall check with the serving gas supplier as to the availability of gas, specifying the gas input rating and the gas pressure required at the entrance to gas train. (*See* 248 CMR 7.03: *Figure 3*).

(2) Combustion Air Supply and Ventilation.

(a) General.

1. Figure 3 in Positive means for supplying an ample amount of outside air to permit combustion of the gas shall be provided. Automatic or manually adjustable control devices for outside air intake shall be interlocked with the burner.

2. To determine air requirements at the equipment, under standard atmospheric conditions (60EF and 30 inches mercury), the following minimum factors apply:

a. For equipment with draft hoods - 30 cubic feet per 1000 Btu input;

b. or equipment directly connected to a chimney without neutralizing air openings - 12 cubic feet per 1000 Btu input.

3. When equipment is located in an inside room or space, air supply shall be provided through ducts or openings leading to the outside air.

4. Openings to the outside shall be unobstructed and screens, if used, shall have a minimum of ½ inch mesh.

5. When a room or space in which equipment is installed is ventilated by mechanical means, air sufficient to replace that exhausted and consumed by combustion shall be supplied from a safe, uncontaminated source. The means for ventilation shall not create an unsafe pressure condition in the boiler room.

6. In addition to the combustion air required, sufficient air shall be supplied to the room to make the room safe for occupancy and proper operation of equipment.

(b) Equipment Equipped with Draft Hoods.

1. The effective cross-sectional area of the permanent outside air opening(s) to the room where equipment is located shall be large enough to supply the air required in that room.

2. For supplying combustion air, the area of the opening shall be of a size at least equal to the equipment breeching but not less than one square inch of free area per 5,000 Btu per hour input (approximately equal to 1.4 square feet per million Btu), except as noted in 248 CMR 7.02(2)(e).

(c) Equipment Utilizing Barometric Dampers.

1. The effective cross-sectional area of the permanent outside air opening(s) to the room where the equipment is located shall be large enough to supply the air required in that room.

2. For supplying air, the area of the opening shall be of a size at least equal to the equipment breeching but not less than one square inch of free area per 14,000 Btu per hour input (approximately equal to 0.5 square foot per million Btu), except as noted in 248 CMR 7.02(2)(e).

(d) Equipment Directly Connected to Chimney without Neutralizing Air Openings.

1. The effective cross-sectional area of the permanent outside air opening(s) to the room where the equipment is located shall be large enough to supply the air required in that room.

2. For supplying air, the area of the opening shall be of a size at least equal to the equipment breeching but not less than one square inch of free area per 17,500 Btu per hour input (approximately equal to 0.4 square foot per million Btu), except as noted in 248 CMR 7.02(2)(e).

(e) Exceptions.

1. Ducts to a Room where Equipment is Located: In determining the cross-sectional area of duct(s) used to convey air from the outdoors to the boiler room, the resistance to air flow imposed by the duct(s) shall be considered.

2. Forced Air Supply to a Room where Equipment is Located: If mechanical means for room air supply are used, the size of the duct or opening may be reduced to not less than that needed to provide the required quantity of air.

(3) Accessibility for Cleaning and Inspection. Sufficient and reasonable accessibility shall be offered for Inspection, cleaning, repair and replacement of all burners, combustion controls, safety devices and boiler components.

7.02: continued

(4) Venting of Flue Gases.

(a) Chimneys.

1. All equipment shall be securely connected to a chimney in good condition and of proper construction and ample size to carry away the flue gases and permit satisfactory burner operation under all weather and operating conditions.

2. The chimney shall be designed and built to sufficiently remove the maximum volume of flue gases which may be produced by the equipment connected to it, as well as any other combustion equipment, under the least conditions of draft which can be encountered. The design should also provide proper construction to resist wind forces, weathering, interior corrosion and flue gas temperatures.

3. The chimney shall be pre-inspected and, if necessary, tested to determine whether it is in suitable condition to handle the flue gases to be dispersed. Any defects shall be corrected.

4. An existing chimney shall be checked as to cross-sectional area, arrangement, and height to determine if it will sufficiently remove the volume of flue gases produced by the equipment, under the least condition of draft that may be encountered. This shall include consideration of pressure and temperature conditions at which the flue gases enter the chimney and the effect of flue gases which may be fed into the chimney from other combustion equipment.

(b) Chimney Connectors.

1. Connectors from equipment to a chimney shall be of noncombustible material capable of withstanding the corrosion effects and temperatures of the flue gases to be handled. They shall have sufficient strength to withstand the physical stresses likely to occur under the conditions of use and shall be securely supported.

2. The connector shall be installed so as to avoid excessive turns or other construction features which create unnecessary resistance to flow of flue gases.

3. The joint between the connector and the chimney shall be sealed to prevent gas leakage or air infiltration.

4. A connector shall not extend into a chimney beyond the inner wall of the chimney flue.

5. The connector shall be sized as recommended by the equipment or burner manufacturer. If the manufacturer's recommendations are not available, the connector shall be the size of the flue collar, or if a draft hood is used, shall be the size of the outlet of the draft hood unless the connector is designed and installed in accordance with industry recognized and approved engineering methods.

6. On multiple installations, separate connectors should be run to the chimney. When this is not practical, each connector shall be y-connected to a common breeching, the cross-sectional area of which shall be not less than the combined areas of the individual connectors.

(c) Draft Control.

1. Equipment requiring controlled chimney draft shall be capable of automatically regulating the draft as recommended by the equipment manufacturer. Such controls may be of the barometric type which regulates the draft in the breeching or the mechanically operated damper type which controls the pressure in the equipment firebox or the draft hood type which is nonadjustable.

2. A double-acting barometric draft regulator, if used, shall be equipped with a device with a manual reset which will automatically shut off the fuel to the burner in the event flue gas spillage exceeds 60 seconds.

3. Mechanically operated dampers shall be designed to maintain a safe damper opening at all times and be arranged to prevent firing of the burner unless the damper is in the proper position.

4. Draft Control:

a. When a draft control device is used, it shall be installed without alteration in accordance with the manufacturer's instructions.

b. In no case shall a barometric draft control device be installed in a false ceiling, in a different room or in any place or manner that will permit a difference in pressure between a draft relief opening and the combustion air supply.

7.02: continued

c. A draft control device shall be installed in the position for which it was designed with reference to the horizontal and vertical planes and shall be located so that a relief opening is not obstructed.

d. When induced or forced draft devices are used, provision shall be made to prevent flow of gas to the burners upon failure of these devices.

5. Adjustable manual dampers should be removed except when a damper must be used to control excess chimney draft. Positive means shall then be provided to lock the damper in the proper position by welding or riveting. As an alternate, a portion of the damper can be removed to prevent full closure.

6. Full closing outlet isolation dampers shall be interlocked so that the boiler firing system cannot be operated unless its isolation damper is in the proper open position.

7. Adjustable (modulating) dampers, shall be arranged to maintain a safe fuel-air ratio over the full operating range. Linkage shall be arranged to resist accidental damage and disengagement. Any counter-balancing arms or weights attached to the damper shall be located or shielded as to prevent personal injury or damage to equipment in case of breakage.

8. When a draft hood is used, it shall be installed without alteration in accordance with the manufacturer's instructions. In no case shall a draft hood be installed in a false ceiling, in a different room, or in a manner that will permit a difference in pressure between the draft hood relief opening and the combustion air supply.

7.03: Installation of Burners and Controls

(1) Main Burners.

(a) Each burner assembly and its component parts shall be installed according to the manufacturer's instructions and shall be properly and firmly secured in place to maintain correct alignment in normal use.

(b) The burner assembly shall be installed so that sufficient accessibility is afforded for cleaning, inspection, repair, and replacement of all burners, controls and safety devices.

(c) Burner assembly parts, when adjustable, shall be provided with suitable locking devices to prevent accidental shifting.

(d) Provision shall be made to permit ready observation of each pilot and main burner flame during adjustment and under operating conditions.

(e) A burner assembly, when adjusted according to the manufacturer's instruction, shall maintain satisfactory operating characteristics as specified in 248 CMR 7.04(5) at all firing rates called for by input and air-gas ratio controls applied to the installation.

(2) Control Application.

(a) Each control shall be supported in such a manner that it and its sensing element will remain in proper position. It shall be possible to determine by observation or test that each control is in its proper location and capable of functioning as intended.

(b) Nothing shall be provided for the purpose of permitting any safety control to be rendered ineffective or allowing firing of the burner assembly without the protection of all of the specified safety controls except as permitted by 248 CMR 7.03(2)(c).

(c) A low-water cutoff may be bypassed for blow-down purposes only. Such a bypass shall be of a type which must be manually held in the bypass portion and which is self-restoring when released.

(d) A burner assembly not equipped to provide safe automatic restarting shall be arranged to require manual restart after any control functions to cause the fuel supply to be shut off

and the following restoration of an interrupted power supply.

(e) The safety-control circuit shall be two-wire, one side grounded, having a nominal voltage of 150 volts or less. The circuit shall be connected to a branch circuit that can be protected against over current at not more than the value appropriate for the rating of the electrical components included in the circuit.

(f) A safety control or protective device switch shall interrupt the ungrounded conductor(s).

(g) Safety controls shall not depend on electricity to attain the off position.

(3) Control of Combustion Air.

(a) An air shutter shall be capable of being readily adjusted to any desired setting and securely locked to prevent accidental change in setting.

7.03: continued

(b) The air inlet(s) shall supply an adequate amount of air for combustion under the specified draft conditions and at the maximum firing rate of the burner assembly as installed. All air required for combustion shall be introduced in a manner so as to provide thorough mixing of the gas and air. If a burner is intended for installation with an air or wind box(es), it shall be supplied by the burner manufacturer or be built in accordance with the burner manufacturer's instructions.

(c) Linkage for controlling air and gas input rates shall be designed to reliably maintain the correct gas-air ratio and to resist accidental damage and disengagement.

(d) Equipment having forced or induced draft fans or both, shall be provided with means to automatically continue safe combustion or to shut off the gas supply upon failure of the equipment supplying the air.

(e) If air under pressure is mixed with the gas supply in a mixer, effective means shall be provided to prevent air from passing back into the gas line or gas into the air supply. The gas and air supply shall be controlled to prevent gas from entering burners until the air supply is available and, in the event of air failure, to shut off the gas supply.

(4) Primary Safety Control (Flame Safeguard).

(a) Unless a flame safeguard control is provided by the manufacturer, each burner assembly shall be provided with a non-recycling primary safety control that will de-energize the main gas safety shutoff valve(s) upon loss of flame at point of supervision.

(b) Safety control timings shall not exceed the values given in 248 CMR 7.03: *Table 1*.

(c) Gas to pilots shall be automatically shut off if the pilot is not proved, and safety shutdown established.

(d) Pilot supervision by the primary safety control shall be only at the point where the pilot flame will effectively ignite the gas at the main burner or burner group with the pilot burning at any flame that will actuate the safety control.

(e) Supervision of the main burner flame only shall begin at the end of the main burner flame-establishing period for:

1. Power burners having a firing rate per combustion chamber of 2,500,000 Btu per hour and over.

TABLE 1

Maximum Safety Control Timings

Maximum Firing Rate Per Combustion Chamber in Million Btu Per Hour

	2.5 or less	Over 2.5 to 12.5	Over 12.5
Pilot Flame Establishing Period	15 Seconds	10 Seconds	10 Seconds
Main Burner Flame Establishing Period (If Required)	15 Seconds *	10 Seconds	10 Seconds *
Flame Failure Response Time	4 seconds	4 Seconds	4 Seconds
Valve Closing Time	5 Seconds	1 Second	1 Second

* Main burner flame-establishing period may be 30 seconds for burner other than power burners equipped with a safety shutoff valve having a full opening time of not less than 25 seconds.

2. All types of burners with modulating or high-low firing rate per combustion chamber of 2,500,000 Btu per hour and over.
3. All types of burners with an interrupted pilot(s), and
4. Atmospheric type burners having a firing rate per combustion chamber of 5,000,000 Btu per hour and over. If the main burner flame is not proved, safety shutdown shall be established.

7.03: continued

(f) A burner assembly shall be equipped so that no gas can flow to the main burner on burner group operating as a unit unless the pilot is proved.

(g) If two or more burner assemblies are installed in a single piece of equipment, the primary safety control of each burner assembly shall operate independently of the other, or equivalent safety features shall be provided so that in no case can any one burner operate unsafely.

(5) Limit Controls.

(a) Limit Control.

1. A limit control shall be provided to prevent excessive steam pressure in a steam boiler or excessive pressure or temperature in a hot water boiler.

2. Each steam and hot water boiler shall be equipped with a control which will prevent firing of the boiler in the event of insufficient water in the boiler.

3. The limit control shall be in addition to operating controls. Manual restart shall be required after a pressure or temperature limit control functions.

(b) A limit control which functions by opening a switch shall directly open the electrical circuit to the safety shutoff valve(s).

(6) Combustion (Input) Control Systems.

(a) The combustion (input) control system shall maintain predetermined air-fuel mixtures within the limits required by the burner for stable combustion throughout the entire operating range of the burner and during changes in the firing rate.

(b) To accomplish changes in the firing rate, the fuel and air supplies shall be maintained at a pre-determined optimum air-fuel ratio, either manually or automatically.

(c) Burners having a firing rate per combustion chamber of 1,000,000 Btu per hour and over shall be equipped with a proven low-fire start.

(d) Burners having a firing rate per combustion chamber of 2,500,000 Btu per hour and over shall be provided with combustion control.

(7) Pilots.

(a) Main burners shall be equipped with a supervised pilot adequate to provide safe main burner ignition under all conditions of operation. Multiple burner heads operated as a single burner unit shall use a sufficient number of supervised pilots to accomplish safe ignition.

(b) A pilot burner not automatically lighted shall be located so that it can be safely lighted manually.

(c) Gas supply pressure to the pilot or group of pilots:

1. The gas supply pressure to the pilot or group of pilots shall be regulated.

2. The regulator(s) shall be listed; and vented in accordance with 248 CMR 7.03(11)(c), unless constructed or equipped to limit the escape of gas from the vent opening in the event of diaphragm failure to not more that 2.5 cubic feet per hour.

3. The pilot supply line shall be connected upstream of all main burner valves and the main gas pressure regulator.

(d) Primary air openings and orifices shall be easily accessible for servicing.

(e) An electric ignition system shall ignite only a pilot.

(f) If means for ignition is cut off at the termination of either the main burner flame-establishing period, the ignition shall remain off for the duration of that firing cycle and for the specified purge period.

(g) A pilot burner, electric igniter, and pilot flame sensing device shall be supported in such

a manner that their position relative to each other and to the main burner port(s) will remain fixed.

(8) Gas Valve Pressure Ratings.

(a) Gas valves shall be capable of withstanding without damage a pressure of not less than 10% above the relieving pressure of the nearest upstream relief device.

(b) In case no relief device is provided, the gas valves shall be capable of withstanding without damage a pressure of not less than the maximum inlet pressure of the nearest upstream gas pressure regulator or the maximum setting of the over-pressure protection device.

7.03: continued

(9) Manually Operated Gas Shutoff Valves. (*See* 248 CMR 7.03: *Figures 1 and 2*.)

(a) A manually operated main burner shutoff valve shall be installed in the line supplying all main burners of each piece of equipment and upstream of all other main burner control valves.

(b) A manually operated main pilot shutoff valve shall be located in the gas supply line to the pilot burner.

(c) Manually operated main shutoff and pilot shutoff valves in sizes larger than two inches or for pressures greater than ½ psig shall be of the lubricated plug or ball type with stops. Manually operated valves shall have the handle securely attached parallel to the gas flow in the open position, shall be readily accessible, and shall clearly indicate the "on" and "off" positions.

(d) A manually operated main burner test valve (checking gas cock) shall be provided downstream from the safety shutoff valve for each main burner. On manually lighted burners, the valves shall be interlocked with the safety control circuit and arranged so that the main burner safety shutoff valves must be opened against their associated closed test valves.

(e) In multiple burner installations a manual valve shall be provided for each main and each

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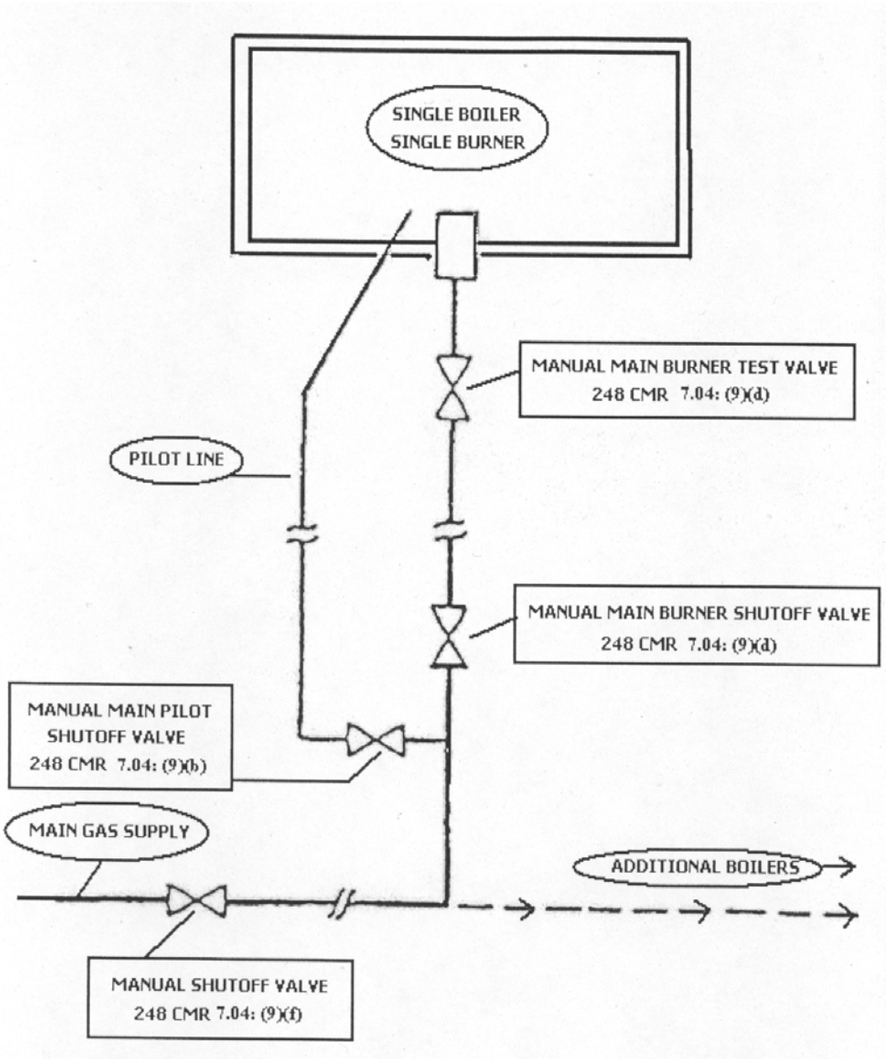

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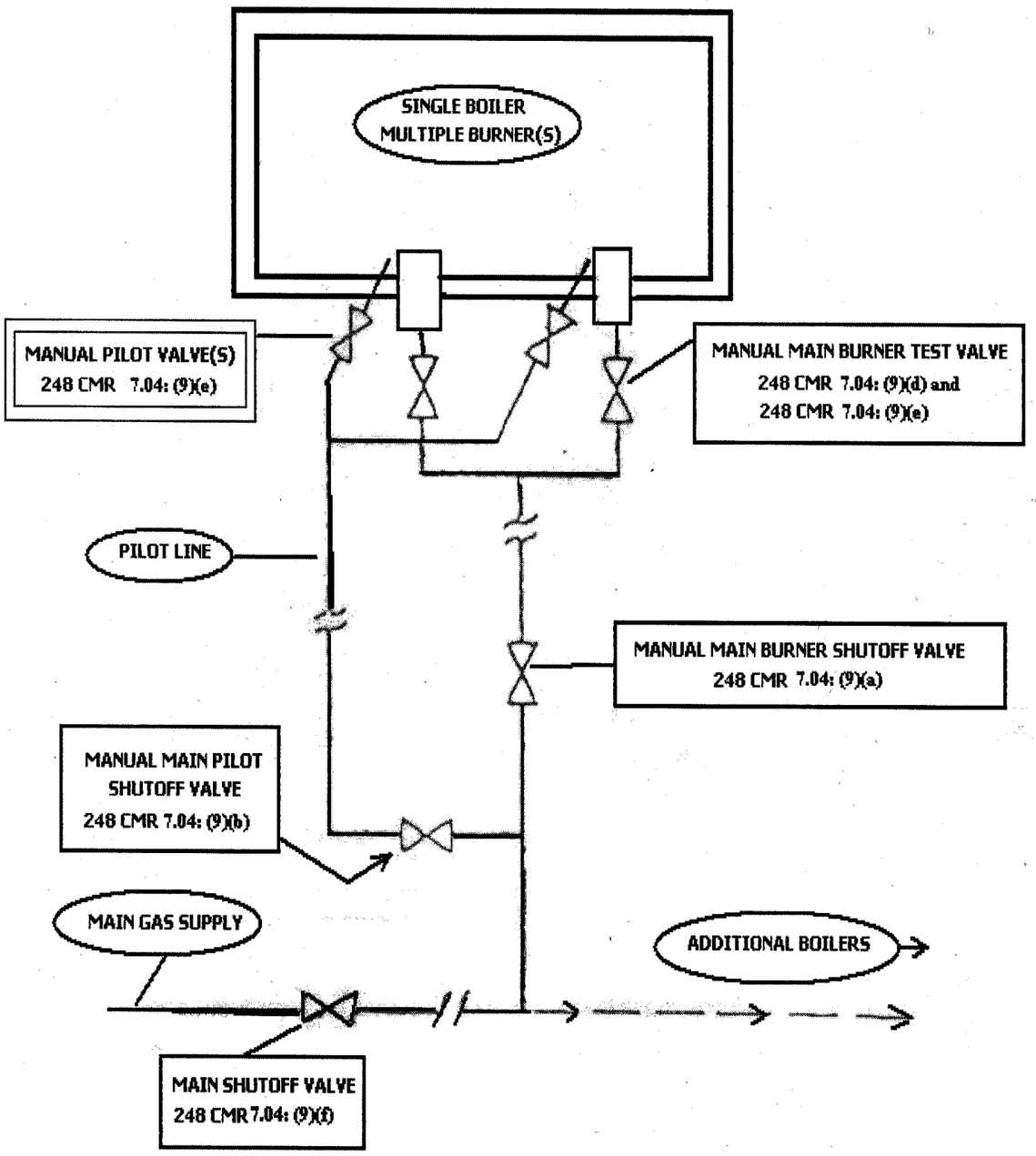
7.03: continued

FIGURE 2
Illustration of Manual Valving Arrangement for a Multiple Burner, Single Boiler Arrangement



(10) Control and Safety Shutoff Valves. (*See* 248 CMR 7.03: *Figure 3*.)

(a) An automatic input control valve may be in combination with a safety shutoff valve.

(b) A bypass to provide for minimum flame may be installed around a valve to control input only. A bypass shall not be installed around a safety shutoff valve or a combustion input control and safety shutoff valve.

(c) Safety Valves:

1. Each main burner supply line and each pilot supply line shall be equipped with a safety shutoff valve(s) which will close independent of external force.
2. The safety shutoff valve(s) shall close with sufficient force to provide tight shutoff under normal operating conditions and when closed by the safety control system or by an emergency device.
3. If the maximum firing rate per combustion chamber exceeds 1,000,000 BTU/hour, the main burner supply line shall be equipped as indicated in 248 CMR 7.03(10)(c)3.a. and b.:

7.03: continued

a. Two safety shutoff valves, in series, or one safety shutoff valve of the type incorporating a valve seal overtravel interlock, when the maximum firing rate per combustion chamber exceeds 1,000,000 BTU/hour but less than 5,000,000 BTU/hour.

b. Two safety shutoff valves, in series, one of which is of the type incorporating a valve seal overtravel interlock when the maximum firing rate per combustion chamber exceeds 5,000,000 BTU/hour.

The Board may prescribe two safety shutoff valves in series, for combustion chambers with inputs less than 1,000,000 BTU/hour, in buildings of public assembly.

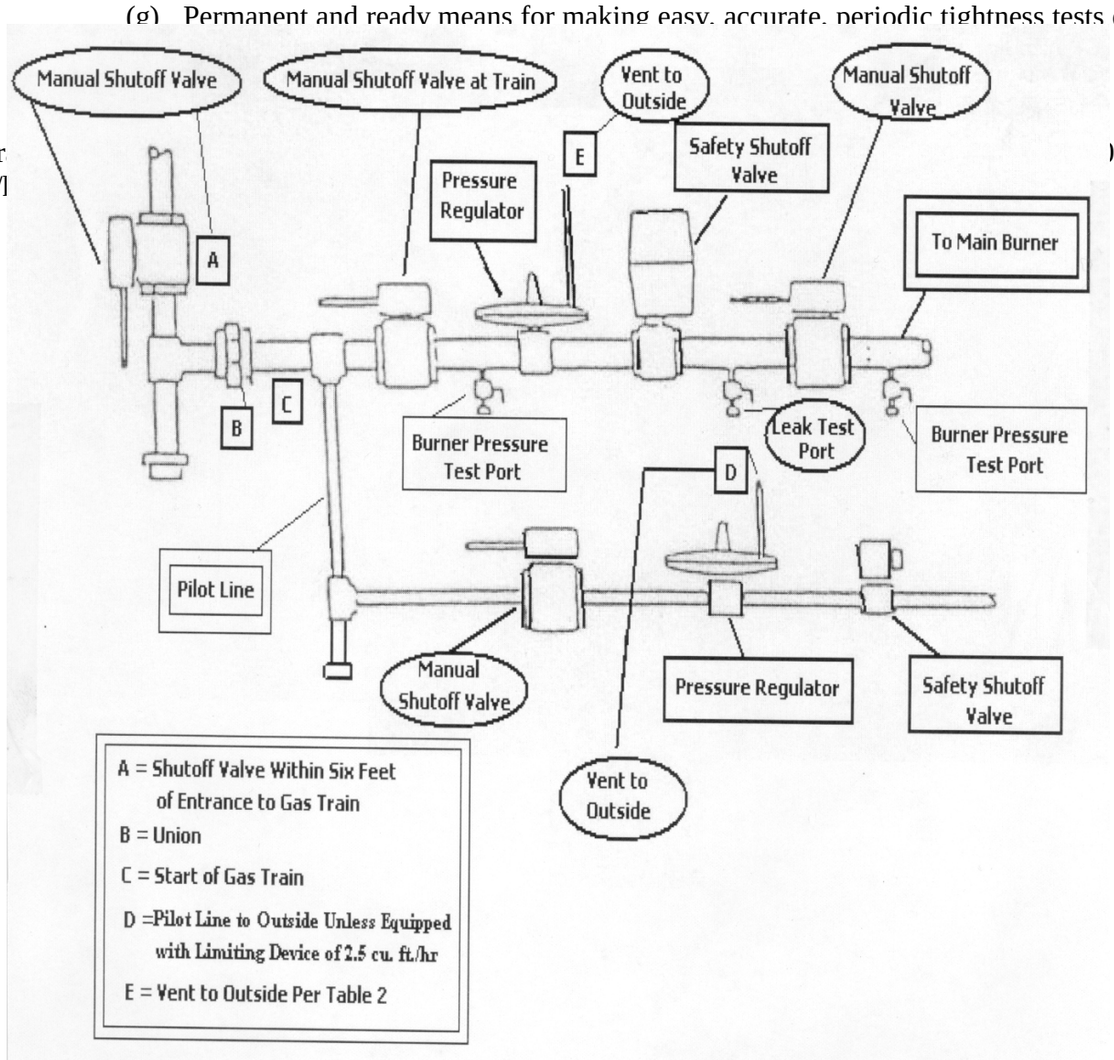
(d) Safety shutoff valves shall be suitable for the application and shall have a shutoff time not to exceed that specified in 248 CMR 7.03: *Table 1*. They shall be constructed so that they cannot be restrained or blocked in the open position. Such valves shall close upon being de-energized regardless of the positions of damper-operating levers or reset handles.

(e) An electrically operated safety shutoff valve shall not depend on electricity to shut off the gas supply.

(f) A pressure-operated safety shutoff valve shall close upon failure of its operating pressure.

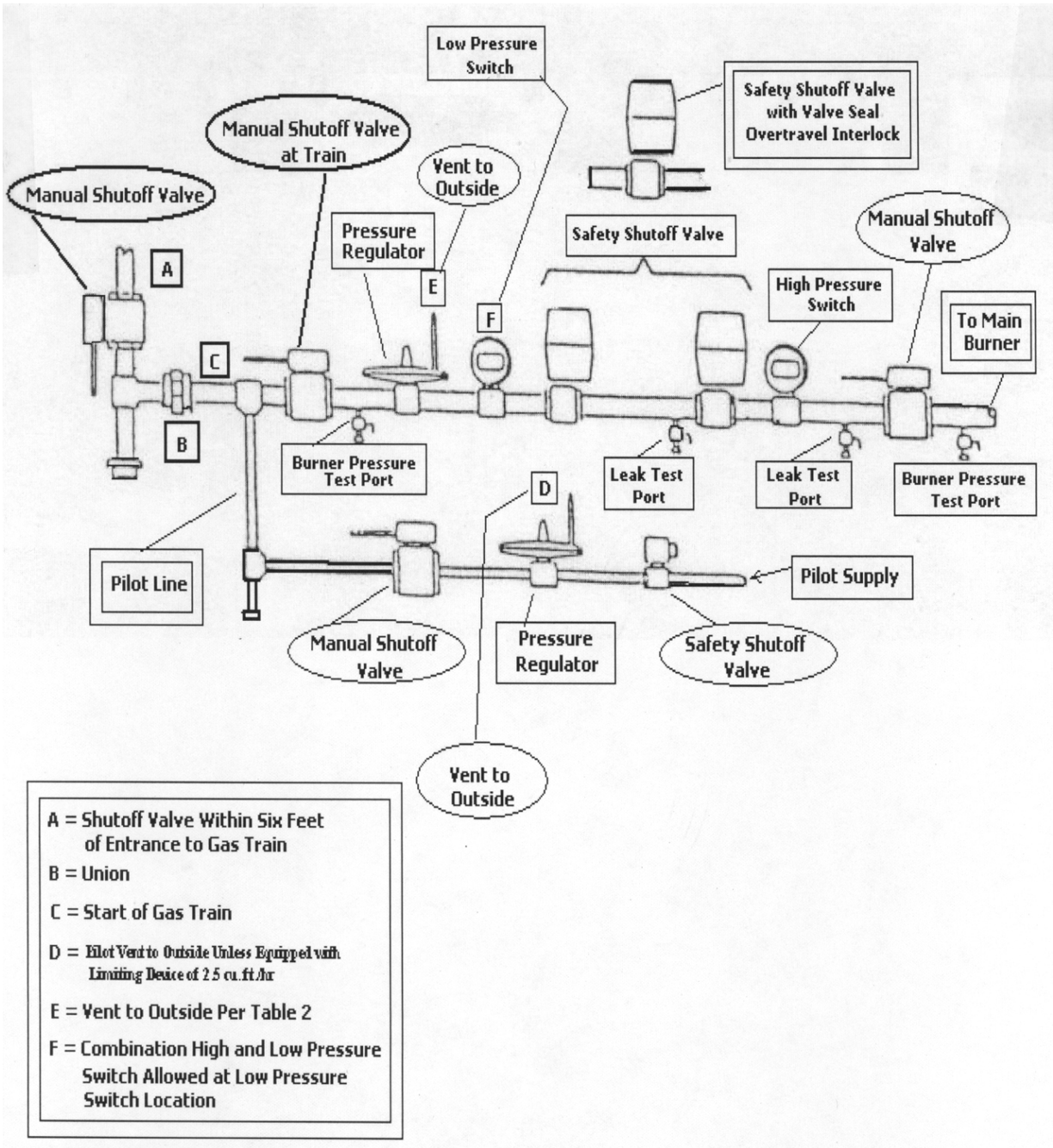
(g) Permanent and ready means for making easy, accurate, periodic tightness tests of the

Illustr)0,000 BTU/



7.03: continued

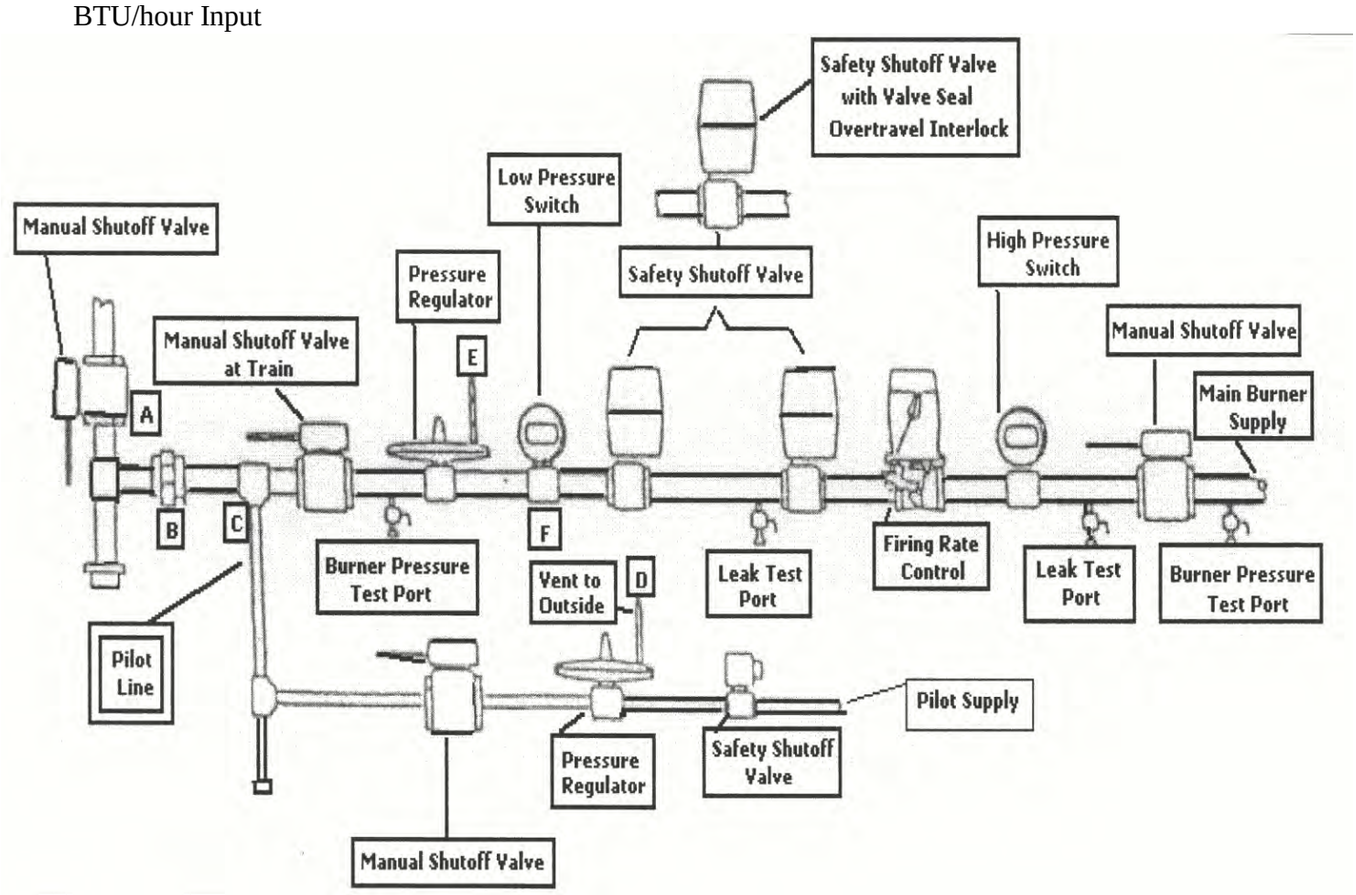
FIGURE 3B.
Illustration of Gas Train 248 CMR 3.00 through 7.00 1,000,000 to Less Than 2,500,000 BTU/hour Input



7.03: continued

FIGURE 3C.

Illustration of Gas Train 248 CMR 3.00 through 7.00 requirements for 2,500,000 to less than 5,000,000 BTU/hour Input



A = Shutoff Valve Within Six Feet of Entrance to Gas Train

B = Union

C = Start of Gas Train

D = Pilot Vent to Outside Unless Equipped with Limiting Device of 2.5 cu. ft./hr

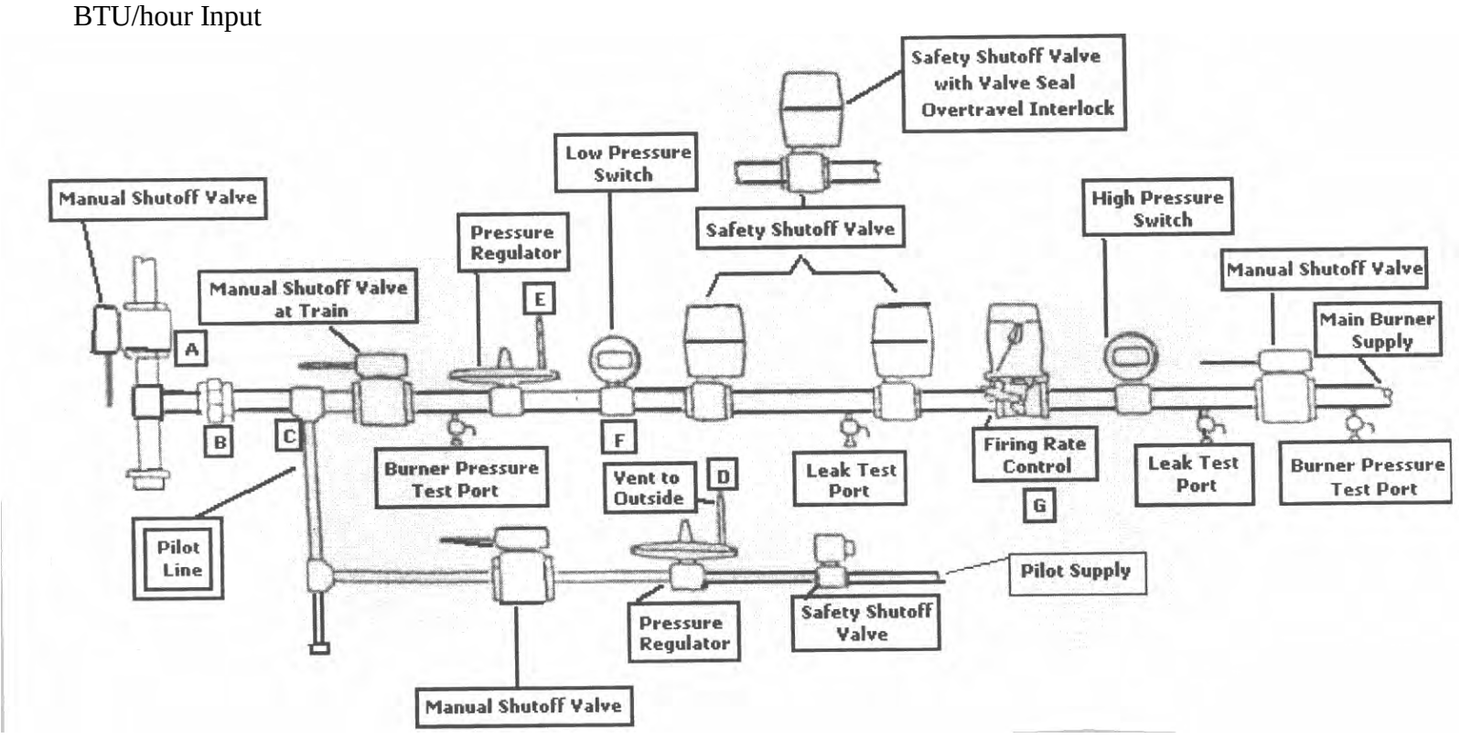
E = Vent to Outside per Table 2

F = Combination High and Low Pressure Switch Allowed at Low Pressure Switch Location

7.03: continued

FIGURE 3D

Illustration of Gas Train 248 CMR 3.00 through 7.00 requirements for 5,000,000 to less than 12,500,000 BTU/hour Input



A =	**Shutoff Valve Within Six Feet of Entrance to Gas Train**
B =	**Union**
C =	**Start of Gas Train**
D =	**Pilot Vent to Outside Unless Equipped with Limiting Device of 2.5 cu. ft./hr**
E =	**Vent to Outside per Table 2**
F =	**Combination High and Low Pressure Switch Allowed at Low Pressure Switch Location**
G =	**May be Part of SSOV**

(11) Main Gas Pressure Regulators and Gas Pressure Interlocks.

(a) Each burner assembly shall be equipped with a listed main gas pressure regulator that will regulate within plus or minus 10% of the operating pressure at all firing rates. (*See* 248 CMR 7.03: *Figure 3* for location).

(b) Spring or weight-loaded regulators shall have springs covered by a suitable housing. Under no circumstances shall a weight and lever type of regulator be used.

(c) Main Gas Pressure Regulators:

1. Except where zero governors are used in connection with air-gas mixers, all main gas pressure regulators shall be independently vented to a safe outdoor location.
2. Vent lines from main gas pressure regulators shall not be connected into a common line with the bleed line from gas operated diaphragm valves or from pressure relief valves.
3. Vent lines shall be steel, wrought iron pipe or corrugated stainless steel tubing (CSST) with Product-approved devices provided at termination points to prevent stoppage of the lines by foreign material, water or insects and, shall extend no less than 18 inches above the roof surface.
4. Vent lines shall be sized as specified in 248 CMR 7.03: *Table 2*.
5. Vent lines shall be supported in accordance with 248 CMR 1.00 through 10.00.

7.03: continued

6. Vent lines shall be run to the outside using the shortest practical route and shall not be trapped or installed in a manner that restricts air-flow.

7. Vent lines that penetrate roofs and sidewalls shall be run through metallic sleeves that are sealed from the weather and insects.

8. CSST vent lines that penetrate roofs shall transition to steel pipe no less than one foot inside the building.

9. Vent lines that terminate outside a building shall be located no less than four-feet away from any building opening or air intake and ten feet away from forced air intakes. Outside

(d) Pressure Switches.

1. If the maximum firing rate per combustion chamber is 1,000,000 BTU/hour or over, gas pressure supervision shall be provided by listed pressure switches, or listed combination high-low switch, interlocked to accomplish a non-recycling safety shutdown in the event of either high or low gas pressure.

2. Pressure setting shall be adjusted by the installer in accordance with the burner or equipment manufacturer's instructions.

3. Pressure switches that require venting to the outside atmosphere shall be vented in accordance with 248 CMR 7.03(11)(c). Pressure switches only may be manifolded.

(e) Accessible IPS plugged pressure tappings or connections shall be provided; one located upstream of the main gas pressure regulator and another located near the burner head to permit accurate measurement of gas pressure. (*See* 248 CMR 7.03: *Figure 3*.)

TABLE 2
Minimum Pipe Size/CSST for Venting
Gas Train Components in 248 CMR 7.04 Figures 3a, 3b, 3c, and 3d.

Gas Train Components	Maximum lengths of iron pipe or corrugated stainless steel tubing (CSST) from components to outside the building		
	0 - 40 feet	0 - 100 feet	0 - 200 Feet
Main Gas Pressure Regulator - Steel Pipe Size - CSST Size (Low Pressure Gas only)	¾ inch IPS 30/31 EHD	1 inch IPS 37 EHD	1¼ inch IPS 46/48 EHD
High & Low Gas Pressure Switches When Manifolded - Steel Pipe Size - CSST Size (Low Pressure Gas only	¾ inch IPS 30/31 EHD	1 inch IPS 37 EHD	1½ inch IPS 60/62 EHD
Block and Bleed Valves (when used) - Steel Pipe Size - CSST Size (Low Pressure Gas only	Full IPS Relief	Increase IPS/CSST one Size	Increase IPS/CSST two Sizes

(12) Operating Sequencing. (*See* also 248 CMR 7.04, Initial Start-Up and Final Adjustments). Each installation shall be equipped to provide for sequencing in accordance with the following and in the order listed.

(a) Natural and mechanical draft systems with continuously burning pilot(s) capable of igniting any gas flowing from the main burner shall, upon demand for heat:

1. Prove all interlocks.
2. Prove combustion air flow for mechanical draft systems.
3. Prove in light-off position, if either an automatically operated damper, or an automatically operated air shutter, or both, are employed.
4. Prove combustion (input) control, if employed, in light-off position.
5. Prove pilot(s).
6. Admit fuel to main burner.
7. Prove main flame, if required, in accordance with 248 CMR 7.03(4)(e).
8. Release combustion (input) control.
9. Upon flame failure at point of supervision, shut off fuel by primary safety control.
10. Shut off fuel to main burner on release from demand.

7.03: continued

(b) Natural draft systems with intermittent pilot or interrupted pilot shall, upon demand for heat:

1. Prove all interlocks.
2. Prove open for at least 90 seconds if either an automatically operated damper, an automatically operated air shutter, or both, are employed.
3. Prove in the light-off position if either an automatically operated damper, and automatically operated air shutter, or both are employed.
4. Prove combustion (input) control, if employed, in light-off position.
5. Prove pilot(s).
6. Admit fuel to main burner.
7. Prove main flame, if required, in accordance with 248 CMR 7.03(4)(e).
8. Release combustion (input) control.
9. Upon flame failure at point of supervision, shut off fuel by primary safety control.
10. Shut off fuel on release from demand.
11. If an automatically operated damper is employed, return to stand-by position.

(c) Mechanical draft systems with intermittent pilot or interrupted pilot shall, on demand:

1. Prove all interlocks.
2. If an automatically operated damper is employed, prove in open position.
3. Start fan(s) and prove air flow. Provide at least a four-air change purge of the combustion chamber and equipment passes. The four air changes must be accomplished in not more than 90 seconds with burners having maximum firing rate per combustion chamber of not more than 2,500,000 Btu per hour. With burners having maximum firing rates per combustion chamber in excess of 2,500,000 Btu per hour, the four air changes shall be accomplished without time limitation by an air flow rate not less than 60% of the air flow provided for the maximum firing rate.
4. Prove combustion (input) control and automatically operated damper, if employed, in light-off position.
5. Prove pilot(s).
6. Admit fuel to main burner.
7. Prove main flame, if required, in accordance with 248 CMR 7.03(4)(e).
8. Release combustion (input) control.
9. Upon flame failure at point of supervision, shut off fuel by primary safety control.
10. Shut off fuel on release from demand.
11. If an automatically operated damper is employed, return to stand-by position.

7.04: Initial Start-up and Final Adjustments

(1) For gas equipment with an input of one million BTU's or more per combustion chamber, an authorized representative of the equipment or burner manufacturer shall perform the initial start-up, final adjusting and testing of the burner and controls in the presence of the gas inspector. Additionally, the serving gas supplier must be notified at least 48 hours in advance of the initial startup to be given the opportunity to attend the startup.

(2) Purging of Gas Equipment. The furnace, passes, and connected flue piping shall be thoroughly purged before lighting of pilots or burners. This shall be done by creating air flow through the setting by fully opening flue dampers and air shutters and by operation of induced and forced draft fans, if present.

(3) Control Operating Tests.

(a) All controls shall be thoroughly checked for proper operation and sequencing before the burner is put into operation. Manufacturer's instructions shall be followed.
(b) All safety shutoff gas valves shall be tested for gas tightness while in the closed position before being placed in service. During this test, gas shall be shut off to all burners downstream from the safety shutoff gas valve.

(4) Pilot Operation Tests.
(a) After the gas piping has been thoroughly cleared of air and any foreign materials, the pilot burner shall be lighted and adjusted with the main burner manual and automatic valves in the closed position. Adjustment to the pilot shall be made in accordance with manufacturer's instructions.

7.04: continued

(b) Pilots shall not deposit carbon when adjusted according to the manufacturer's instructions.

(c) When escapement or bleed pilots are used, the discharge shall be in a fixed position and shall be freely ignited by the continuous burning pilot or vented to a safe location.

(5) Burner Operation Tests.

(a) The main burner shall be put into operation and tested only after 248 CMR 7.04(2) through (4) have been completed. Manufacturer's instructions shall be followed for light-off and adjustment of the main burner.

(b) Pilots shall reliably effect immediate ignition of the main burner even when the gas supply to the pilot(s) is reduced to a point where the pilot flame is just sufficient to actuate or energize the flame detection device. Follow the manufacturer's instructions in conducting this test.

(c) Continuously burning pilot flames shall not become extinguished: when the main burners are turned on or off in a normal manner, either manually or by automatic controls, when the air flow through the burner is rapidly changed from maximum to minimum or vice versa after the main burners are shut off following operation of the equipment at its maximum capacity, nor during any normal operating conditions that will occur. The above tests shall be repeated three times.

(d) The pilot burner shall reliably ignite the main burner under any normal condition of operation.

(e) The arrangement of burners, valves, and pilots shall be such that when only the pilots supervised by the flame safeguard equipment are in operation, any burner or combination of burners shall be effectively ignited without delayed ignition or flash back.

(f) Burner flames shall not flash back when fired at any rate within the installed operating range of the burner.

(g) Burner flames shall not flash outside the equipment when the gas is turned on or off by the automatic control mechanism.

(h) Proper air-gas ratio shall be maintained and combustion shall be complete over the full installed operating range of the burner.

(6) Test for Venting. A check shall be made for proper venting with the burner operating at maximum installed input and with all building exhaust fans operating which are in communication with the room containing the equipment and with all outside closeable boiler room openings shut.

(7) Instructions to the Operator.

(a) Complete written or printed instructions including wiring diagrams shall be supplied and made conveniently available or posted in a permanent form in a prominent place near the equipment. These instructions shall include complete start up as well as normal and emergency shutdown procedures. Start up shall be from the methods provided by the control system for that purpose.

(b) To guard against malfunctioning all controls should periodically be tested on a scheduled basis.

(c) Extended Shutdown. When equipment is shut down for an extended period it is recommended that in addition to closing all gas valves, as a further precaution, gas be prevented from leaking into the equipment by blocking off or disconnecting and capping or plugging the gas supply pipe.

248 CMR: BOARD OF STATE EXAMINERS OF PLUMBERS AND GAS FITTERS

REGULATORY AUTHORITY

248 CMR 7.00: M.G.L. c. 112, § 61; M.G.L. c. 142, §§ 13 and 21.

248 CMR 8.00: AMENDMENTS TO NFPA 58

Section

8.01: Modifications to Chapter 1, Administration

See 248 CMR 4.00: ***Massachusetts Fuel Gas Code*** for modifications to Chapter 1, Administration.

8.02: Modifications to Chapter 2, Referenced Publications

No modifications have been made to Chapter 2, Referenced Publications.

8.03: Modifications to Chapter 3, Definitions

(1) Replace sub-section 3.2.2* with the following:

Authority Having Jurisdiction (AHJ). Inspector as defined in 248 CMR 3.02: ***Definitions***, the Board, or such other authority approved by the Board.

(2) Add to sub-section 3.2.5* the following at the end of the subsection:

All listed equipment must meet product acceptance requirements in 248 CMR 3.00: ***General Provisions Governing the Conduct of Plumbing and Gas Fitting Work in the Commonwealth***.

8.04: Modifications to Chapter 5, LP-gas Equipment and Appliances

(1) This code does not adopt sub-sections 5.1 to 5.7.

(2) This code does not adopt sub-sections 5.21.1 to 5.21.7.

8.05: Modifications to Chapter 6, Installation of LP-gas Systems

(1) This code does not adopt sub-section 6.1.1*(2) and (3).

(2) This code does not adopt sub-sections 6.2 to 6.7.10.

(3) This code adopts sub-section 6.8 to the extent it applies to second stage regulators, however it does not adopt those portions applying to first-stage or two-stage regulators.

(4) This code does not adopt sub-sections 6.10 to 6.13.

(5) Delete sub-section 6.15 and replace it with the following:

6.15: Installation in Areas of Heavy Snowfall. Piping, regulators, meters, and other equipment installed in the piping system, when exposed to the elements, must be protected from damage from accumulated snow by either following manufacturer's installation instructions when specific to such issues or, when no such instruction is provided, by otherwise reinforcing and/or sheltering any exposed equipment. However, should the performance of gas-fitting work impact the structural integrity of building or roofing components, necessary corrective work falls outside the scope of this code. ***See*** 780 CMR: ***The Massachusetts State Building Code*** or 271 CMR: ***The Massachusetts Sheet Metal Code***, if applicable, for licensing and other requirements for said work.

(MA REG. #1275, Dated 12-5-14)

8.05: continued

(6) This code does not adopt sub-sections 6.16, 6.18, and 6.21 to 6.26.

8.06: Chapters of NFPA 58 not Adopted

This code does not adopt NFPA 58 Chapters 4, 7, 8, 9, 10, 11, 12, 13, and 14.

8.07: Modifications to Chapter 15, Pipe and Tubing Sizing Tables

No modifications have been made to Chapter 15, Pipe and Tubing Sizing Tables.

REGULATORY AUTHORITY

248 CMR 8.00: M.G.L. c. 112, § 61; M.G.L. c. 142, §§ 13 and 21.

10.05: continued

(14) Drainage below Sewer Level. Drainage piping which is located below the sewer shall be installed as provided in 248 CMR 10.15(10)

(15) Connections to Plumbing System Required. All plumbing fixtures, drains and appurtenances which are used to receive or discharge liquid waste or sewage waste shall be properly connected to the sanitary or storm drainage system of the building or premises in accordance with the requirements of 248 CMR 10.00.

(16) Sewage Disposal Connections (Buildings).

(a) The plumbing of each building shall have an independent connection to a public sanitary sewer outside of building, unless, in the opinion of the Inspector, a single separate connection is not feasible.

(b) If a public sanitary sewer is not available, the sewage shall be discharged into a sewage disposal system that complies with 310 CMR 15.00: *The State Environmental Code, Title 5: Standard Requirements for the Siting, Construction, Inspection, Upgrade and Expansion of On-site Sewage Treatment and Disposal Systems and for the Transport and Disposal of Septage*.

(17) Location of Fixtures.

(a) Light and Ventilation. Plumbing fixtures shall be located in compartments, rooms, spaces or areas that are provided with mechanical ventilation and illumination that conform to 105 CMR 410.000: *Minimum Standards of Fitness for Human Habitation (State Sanitary Code, Chapter II)* and 780 CMR: *State Board of Building Regulations and Standards*.

(b) Improper Location. Piping, fixtures, or plumbing devices and equipment shall not be installed in a manner that will interfere with the normal operation of windows, doors, or other openings.

10.06: Materials

(1) Materials.

(a) Minimum Standards. All materials, systems, and equipment used in the construction, installation, alteration, repair, replacement, or removal or any plumbing or drainage system or part thereof, shall conform at least to the standards listed in 248 CMR 10.06, except that:

1. the Inspector may allow the extension, addition to or relocation of existing water, soil, waste and/or vent pipes with materials of like grade or quality as permitted under 248 CMR 10.04(6)(a); or

2. materials not covered by the standards listed in 248 CMR 10.06 may be used with the approval of the Board as permitted under 248 CMR 3.04: *Product, Design, and Testing Standards*.

(b) Installation.

1. All materials installed in plumbing systems shall be so handled and installed as to avoid damage so that the quality of the material will not be impaired.

2. No defective or damaged materials, equipment or apparatus shall be installed or maintained.

3. All materials used shall be installed in strict accordance with the standards under which the materials are Product-accepted by the Board, including the appendices of the standards, and in strict accordance with the manufacturer's instructions.

(c) Standards and Approval. Materials shall be used only as provided for in 248 CMR 10.00 or as permitted in 248 CMR 3.04: *Product, Design, and Testing Standards*.

(2) Allowable Materials.

(a) When installing fittings or piping for renovations or alterations within an existing soil stack, waste stack, vent stack or drain, the fitting or piping shall be of the same material as the existing stack or drain and be compliant with a joining method outlined in 248 CMR 10.07.

Exception: In new residential construction cast iron pipe may be used exclusively with PVC for sound reduction.

(b) Sheet Lead. Sheet lead shall meet the following requirements:

1. For a safe pan, the sheet lead shall not be less than four pounds per square foot.

10.06: continued

2. For vent terminal flashing the sheet lead shall not be less than three pounds per square foot.

3. For bends or traps the sheet lead shall not have less than an ⅛ inch wall thickness.

(c) Sheet Copper. Sheet copper shall not be less than 12 ounces per square foot when used in the following applications:

1. safe pan;
2. shower pan;
3. flush tank linings;
4. vent terminal flashing; or
5. general use.

(d) Floor Flanges. A floor flange used for a toilet or other similar fixture shall conform to the following requirements.

1. If the flange is composed of brass, the flange shall have a minimum thickness of ⅛ inch.

2. If the flange is composed of cast iron the flange shall have a minimum thickness of ¼ inch, and the minimum caulking depth shall be two inches.

3. If the flange is composed of hard lead, it shall weigh at least one pound nine ounces and be composed of lead alloy with not less than 7.75% antimony by weight.

4. Copper and plastic flanges may be used.

5. A plastic flange must meet current NSF Standards and shall be of the same material to which it connects.

6. A flange shall be secured to the finished floor on which it sets by screwing or bolting and shall be connected to the specific piping by soldering, caulking or solvent welding as provided for in 248 CMR 10.07.

(e) Cleanouts. Cleanout plugs shall meet the following requirements.

1. Shall be composed of brass or plastic.
2. Shall meet the latest Standards.
3. Shall have raised or countersunk square or hexagon heads.
4. If a tripping hazard may exist, only a countersunk head shall be used.
5. A plastic cleanout plug shall be of the same material to which it connects.

(f) This Section is reserved.

(g) Storm and Sanitary below Ground. The following materials may be used for storm and sanitary piping that is located below ground level, except for materials that are to be used for Special Hazardous Wastes (for Special Hazardous Wastes, *see* 248 CMR 10.13).

1. Extra heavy or service weight cast iron soil pipe and fittings provided that the tarred or plain joints are made with packed oakum and molten lead or resilient gaskets.

2. Iron size brass or copper pipe with cast brass drainage fittings.

3. Hard drawn type K or L copper tubing, with cast brass drainage pattern fittings.

4. Copper alloy tubing "Heavy" weight conforming to ASTM Standard, color coded aqua and incised marked as "Heavy" with cast brass drainage pattern fittings.

5. Grade H or SL copper coated stainless steel tubing conforming to ASTM Standard, made of Type 430 or Type 439 stainless steel, marked in conformance with 248 CMR 10.06(2)(q); provided that the fittings are cast in the brass drainage pattern.

6. ABS (Acrylonitrile-Butadiene-Styrene) Schedule 40 pipe and fittings as specified under 248 CMR 10.06(2)(p).

7. PVC (Polyvinyl-Chloride) Schedule 40 pipe and fittings as specified under 248 CMR 10.06(2)(o).

8. Epoxy re-enforced fiberglass piping system may be used only for storm water drainage.

9. [this number is intentionally left blank]

10. Hubless Cast Iron Soil Pipe and Fittings.

a. Hubless cast iron soil pipe and fittings may be used in accordance with manufacturer installation instructions.

b. Installations. Installations of hubless systems underground shall conform to 248 CMR 10.05(1) and (2)(a) through (d) and 10.06(1)(b).

c. Trenching, Tunneling and Backfilling. Trenching, tunneling and backfilling procedures for hubless systems underground shall conform to 248 CMR 10.05(5)(a) through (d) and 10.06(2)(g)10.d.

10.06: continued

d. Hangers and Supports for hubless cast iron soil piping shall conform to the following requirements.

i. General piping shall be installed with provisions for expansion, contraction or structural settlement.

ii. Material. Hangers, anchors and supports shall be composed of metal having sufficient strength to support the piping and its contents, except that piers may be composed of concrete or brick.

iii. Attachments to Buildings or Structures. Hubless cast iron soil pipe shall be supported in accordance with the manufacturer's recommendations or as outlined in the most recent edition of the *Cast Iron Soil Pipe Institute (CISPI) Handbook*.

iv. Base of Stacks. Bases of stacks shall be supported on concrete, brick laid in cement mortar or metal brackets attached to the building or structure.

v. Hubless Fittings.

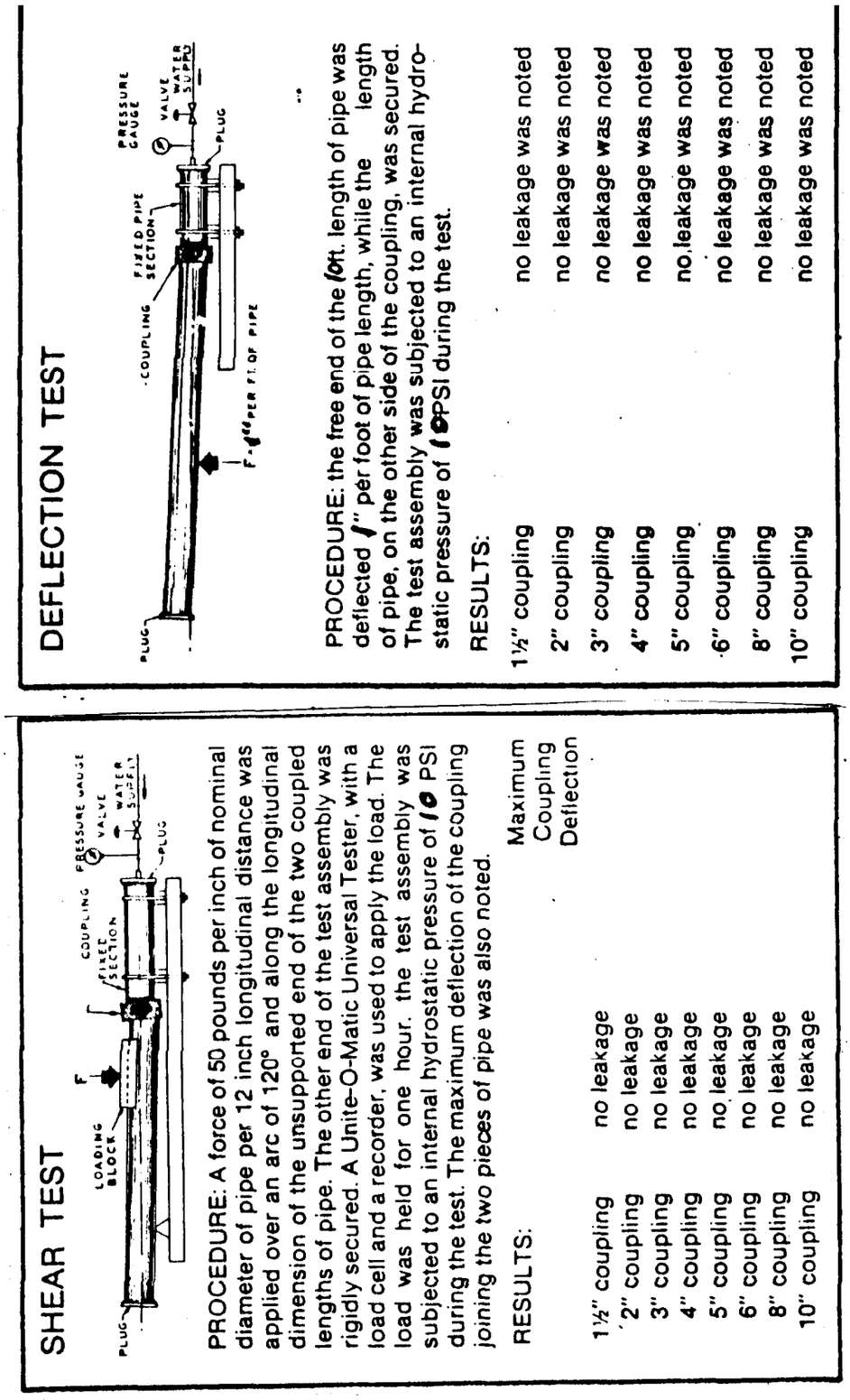
(i) There shall be a hanger installed at each change of direction.

(ii) When joining three or more fittings, there shall be a minimum of one hanger for every three feet or part thereof.

vi. Backfilling. The on-site licensed plumber or the holder of the permit for the underground hubless cast iron soil piping system shall notify the Inspector when the installation is to be backfilled. A licensed plumber shall be present during the backfilling procedure including when all concrete slabs are being poured. This notification provision shall not be subject to the 48-hour notice requirement of 248 CMR 3.05(3)(c).

11. Ductile pipe and approved compatible drainage fittings.
12. For Limited Use Only: Schedule 40 PVC. *See* 248 CMR 10.06(2)(o).

10.06: continued



(h) Storm and Sanitary above Ground. The following materials may be used for storm and sanitary piping that is located above ground level, except the following materials shall not be to be used for Special Hazardous Wastes (for Special Hazardous Wastes, *see* 248 CMR 10.13).

1. Extra heavy or service weight cast iron soil pipe and fittings provided that the tarred or plain joints are made with packed oakum and molten lead or resilient gaskets.
2. [this number is intentionally left blank]
3. Hubless cast iron soil pipe and fittings that are manufactured in accordance with CISPI Standard 301-75, and joined with a product approved clamp.

10.06: continued

4. Iron size brass or copper pipe with cast brass drainage fittings.
5. Hard drawn Type K, L, M or DWV copper tubing having cast brass or wrought copper drainage pattern fittings;
6. Copper alloy tubing "Heavy" and "Standard" weights conforming to ASTM Standard, color coded aqua and incised marked as either "Heavy" or "Standard" having cast brass or wrought copper drainage pattern fitting.
7. Grades H, G, SL or SM copper coated stainless steel tubing conforming to ASTM Standard, manufactured of Type 430 or Type 439 stainless steel that are plainly marked in conformance with 248 CMR 10.06(2)(q) and provided that the relevant fittings are cast in a brass or wrought copper drainage pattern.
8. Schedule 40 galvanized wrought iron or galvanized steel pipe provided that for sizes greater than two inches it has a plain or galvanized drainage pattern fittings.
9. Schedule 40 galvanized wrought iron or galvanized steel pipe for cases when pipe and fittings are end grooved and are to be joined with an approved split and bolted galvanized steel coupling with gasket;
10. Groove type couplings and fittings for applications that join storm water piping.
11. ABS (Acrylonitrile-Butadiene-Styrene) Schedule 40 pipe and fittings as specified under 248 CMR 10.06(2)(p).
12. PVC (Polyvinyl-Chloride) Schedule 40 pipe and fittings as specified under 248 CMR 10.06(2)(o).
13. For Storm Water Drainage Only. Approved epoxy re-enforced fiberglass piping system.
14. Aluminum DWV pipe with pipe end cap protectors manufactured and installed with hubless cast iron fittings manufactured according to CISPI Standard 301 and joined with a Product-accepted stainless steel no hub pipe clamp and elastomeric sealing sleeve.
15. Ductile pipe and approved compatible drainage fittings.

(i) Vent Pipe and Fittings below Ground. All materials listed under 248 CMR 10.06(2)(g)1. through 11. may be used.

(j) Vent Pipe and Fittings above Ground. For vent pipe and fitting above ground the following materials may be used.

1. All materials listed under 248 CMR 10.06(2)(h)1. through 15.
2. Galvanized wrought or galvanized steel pipe not lighter than schedule 40, with cast iron or malleable iron screw or grooved end fittings, plain or galvanized.

(k) Water Service Piping (Outside Building). The materials used shall be those specified by the local municipality.

(l) Water Distribution Piping below Ground (Inside Building). For water distribution piping that is installed inside a building and below ground, only the following materials may be used.

1. Type K or L tubing incised marked with cast brass fittings.
2. Copper alloy tubing "Heavy" weight conforming to ASTM Standard, color coded aqua and incised marked as "Heavy" with cast brass fittings.
3. Copper core pre-insulated cement pressure pipe that is PVC coated.
4. Any pipe, valve, pipe fitting, aerator, or faucet used in a potable water system shall comply with all applicable NSF-61 Standards.
5. Cross-linked Polyethylene (PEX) tubing and fittings installed in accordance with 248 CMR 10.06 and 10.08.

(m) Water Distribution Piping above Ground (Inside Building). For water distribution piping that is installed inside a building and above ground, only the following materials may be used:

1. Iron size brass or copper pipe with cast brass fittings.
2. Type K or L hard drawn copper tubing that is incised marked and has cast brass or wrought copper fittings.
3. Copper alloy tubing "Heavy" and "Standard" weight incised marked, color coded aqua, conforming to ASTM Standard and having cast brass or wrought copper fittings.
4. Exposed galvanized wrought iron or galvanized steel pipe and galvanized fittings only when used for replacement in existing buildings or structures or when used for replacement of large size water mains.

10.06: continued

5. CPVC (Chlorinated Polyvinyl Chloride) pipe and fittings may be used in the following situations provided that none of this material is located within 24 inches of any connection to a hot water tank as defined in M.G.L. c. 142, § 17:

a. for hot and cold water distribution that is located only in the dwelling portion of a residential dwelling, multiple family dwelling, hotel, motel, inn, condominium and similar building six stories; or

b. In a building that is predominantly residential with a single non-residential use on a single floor meeting the following requirements:

i. the non-residential use would be categorized exclusively as employee (non industrial) per 248 CMR 10.10(18): *Table 1* with no other uses;

ii. the non-residential use would be limited to a maximum of four plumbing fixtures; and

iii. the sole plumbing fixtures are toilets, sinks (lavatory, residential, and service sinks only), and drinking water stations.

c. for the exclusive cold water supply distribution beginning at the outlet of the water meter (or the control valve inside a building) directly dedicated to a drinking water fountain(s) in state licensed or accredited school buildings only.

6. Mechanically grooved pipe couplings and fittings when the following requirements are satisfied.

a. The couplings and fittings are used with exposed galvanized wrought iron pipe or exposed galvanized steel pipe on water supply distribution systems provided that the water supply systems operating condition temperature will not exceed 130°F.

b. The coupling housings and fittings are cast of malleable galvanized iron as described in ASTM A-47 or all products that meet the requirements of ASTM A-269.

c. The elastomeric gasket for the coupling has properties as designated by ASTM D-2000.

7. Cross-linked Polyethylene (PEX) Tubing and Fittings.

a. PEX may be used for residential dwellings/buildings if the installation conforms to the following requirements:

i. The PEX tubing is used for hot and cold water distribution in residential dwelling/buildings up to and including six stories in height.

ii. PEX tubing shall not be installed closer than 24 inches to any connection to a direct-fired water heater, tankless type hot water coil or heating boiler.

iii. Mechanical compression type fittings shall not be concealed and must be accessible.

iv. Fittings meet Board requirements, unless otherwise Product-accepted by the Board as provided for under 248 CMR 3.04: *Product, Design, and Testing Standards*.

v. PEX tubing and fittings shall be installed in accordance with the manufacturers recommendations and meet the U.L. flame spread requirements for return air plenums in commercial buildings in accordance with 780 CMR: *State Board of Building Regulations and Standards*.

b. PEX tubing may be utilized where a building is predominantly residential with a single non-residential use on a single floor meeting the following requirements:

i. the non-residential use would be categorized exclusively as employee (non industrial) per 248 CMR 10.10(18): *Table 1* with no other uses;

ii. the non-residential use would be limited to a maximum of four plumbing fixtures; and

iii. the sole plumbing fixtures are toilets, sinks (lavatory, residential, and service sinks only), and drinking water stations.

c. PEX tubing and fittings may additionally be used in commercial buildings if the installation conforms to the following requirements:

i. PEX tubing is used in a commercial building for the purpose of conveying reverse osmosis or other similar technology processes that produce (248 CMR 10.03: *Purified Water*), from the point of treatment to a point or multiple points of use for drinking water.

ii. PEX tubing shall be installed at a point which, begins on the outlet side of a Product-accepted reverse osmosis, (248 CMR 10.03: *Purified Water*) drinking water device and terminates at a point or multiple points of use *e.g.*, Product-accepted dispensers and faucets.

10.06: continued

iii. PEX tubing and fittings are not to be used for steam flushing of water purification systems. Only type 316 stainless steel tube and fittings shall be used for this purpose.

8. Polybutylene or polyethylene tanks when used for Storage Heaters and when the tanks have been reinforced with a Product-accepted material.

9. 316 stainless steel tanks when used for storage heaters.

10. Polybutylene, polyethylene, natural polypropylene, Type 1 Grade 1 polyvinyl chloride meeting ASTM standard D 1784 and D 1785, schedule 40 or 80 and cross-linked polyethylene shall be used for the purpose of conveying reverse osmosis purified water from a point of purification to a final point of use.

11. The use of a Product-accepted polypropylene homopolymer drain tube assembly that is designed to be vertically mounted in the downturned outlet of a horizontally mounted relief valve provided that the capacity of the relief valve served by the approved drain assembly does not exceed 100,000 BTU per hour.

12. Any pipe, valve, pipe fitting, aerator, or faucet used in a potable water system shall comply with all applicable NSF-61 standards.

(n) Pipe, Fittings and Gaskets. Resilient gaskets specified for use with cast iron soil pipe shall be marked as follows.

1. The exposed lip shall be marked clearly and legibly to include:
   a. Manufacturer's name and/or registered trade-mark;
   b. Neoprene;
   c. Date of manufacture; and
   d. ASTM standard.

2. Gaskets for service weight cast iron soil pipe shall bear the letters "SV" on the exposed lip.

3. Gaskets for extra heavy cast iron soil pipe shall bear the letters "XH" on the exposed lip.

(o) PVC Plastic Pipe and Fittings. The following requirements apply to PVC plastic pipe and fittings.

1. PVC shall not be used for drains, waste or vents in commercial kitchens, laundry rooms, public toilet facilities or other commercial areas located in assisted living facilities, hotels, motels, inns or similar establishments, except where provided for elsewhere in 248 CMR 10.06, *i.e.*, 248 CMR 10.06(2)(o)2.

2. PVC, Schedule 40 Pipe and Fittings, may be used for the drains, waste and vent piping that serve the sanitary or storm drainage systems in the following buildings:
   a. residential dwellings;
   b. assisted living facilities;
   c. hotels;
   d. motels;
   e. inns;
   f. condominiums; and
   g. other residential buildings that are similar to 248 CMR 10.06(2)(o)2.a. through f. and that are no greater than ten stories in height.
   h. PVC Schedule 40 Pipe and Fittings may be utilized where a building is predominantly residential with a single non-residential use on a single floor meeting the following requirements:
      i. the non-residential use would be categorized exclusively as employee (non industrial) per 248 CMR 10.10(18): *Table 1* with no other uses;
      ii. the non-residential use would be limited to a maximum of four plumbing fixtures; and
      iii. the sole plumbing fixtures are toilets, sinks (lavatory, residential, and service sinks only), and drinking water stations.

3. Additional Limited Use of PVC for Commercial Buildings. PVC pipe and fittings may be installed for limited purposes in commercial buildings or establishments, provided that the following requirements are satisfied.
   a. PVC is used for the drains, waste, or vents when the piping serves only the fixtures that are necessary to accommodate waste generated as a direct result of the conduct of business that is particular to the type of commercial establishment itemized in 248 CMR 10.06(2)(o)(3)b.

10.06: continued

b. PVC Schedule 40 may by used in the following buildings:
i. beauty salons;
ii. barber shops;
iii. manicure salons;
iv. pedicure salons;
v. photo-labs; and
vi. in commercial buildings that incorporate patron areas for the purpose of serving alcohol, soda or other similar carbonated type beverages where the carbonated liquid waste shall drain directly into a floor sink or floor drain.

c. The PVC Schedule 40 shall be installed in compliance with the following:
i. No PVC schedule 40 pipe and fittings may be used for the toilet fixtures and other plumbing connections in the building.
ii. The piping shall be connected to a main drain or branch drain from other fixtures to provide a point of waste dilution.
iii. A label shall be affixed at the point of dilution that reads "Limited Use Waste Drain" in one inch high lettering shall identify the piping.
iv. The vent piping from the fixture discharging the waste shall extend to a point six inches above the flood rim of the fixture and then shall re-transition to cast iron or copper piping material as used throughout the rest of the commercial building.

4. Use of PVC Schedule 40 for Dialysis Equipment. Type 1 PVC pipe and fittings may be used as indirect waste piping for dialysis equipment in medical buildings.

5. PVC Schedule 40 perforated pipe may be used for subsoil drainage in commercial buildings.

6. Pipe and Fittings shall be manufactured from Type I, Polyvinyl Chloride (PVC) materials having a deflection temperature of 169°F under a load of 264 P.S.I.G. when tested in accordance with ASTM D-648.

7. PVC materials shall be classified as self-extinguishing when tested in accordance with ASTM D-635 and have a flamespread rating of 0-25 when tested in accordance with ASTM E-84.

8. PVC materials shall meet the requirements of ASTM, CS, and/or NSF Standards.

9. At the request of the Board, the manufacturer of PVC pipe shall submit to the Board the results of tests conducted by an Approved-testing-lab in compliance with 248 CMR 3.00: *General Provisions Governing the Conduct of Plumbing and Gas Fitting Work Performed in the Commonwealth*.

10. Identification of PVC Pipe.
a. The pipe shall be in a light color such as beige, buff, grey, white, cream, and shall be marked in accordance with listed standards.
b. The following Listed Standards shall appear on opposite sides of the pipe: Schedule 40, "Size", PVC, DWV-NSF stamp of approval, manufacturer's name and registered trademark, Type and Grade.

11. Pipe and Fittings.
a. Identification of Fittings. Fittings shall be in light color as for pipe and shall bear the following markings by molding on the body or hub:
i. Manufacturer's name or registered trademark;
ii. NSF-DWV stamp of approval;
iii. PVC 1; and
iv. Size.
b. Use PVC fittings ONLY with PVC pipe and ABS fittings ONLY with ABS. Never use PVC solvent weld on ABS pipe or ABS solvent weld on PVC pipe.

12. Transition Fittings. Fittings used to connect PVC to other Product-accepted materials shall meet the proper standard and comply with the requirements of 248 CMR 3.04: *Product, Design, and Testing Standards*:

13. Installation. The following installation requirements and procedures shall be followed when assembling PVC and ABS piping materials.

10.06: continued

a. Solvent Welded Joint.

i. Clean joining surfaces of pipe and fitting with PVC primer.

ii. With a natural bristle brush one inch or larger, apply a heavy coat of solvent cement to the pipe joining surface and then a light coat to the socket joining surface.

iii. Immediately insert the pipe to the full socket depth while rotating the pipe fitting ¼ turn to insure even distribution of solvent cement.

iv. Wipe excess solvent cement from the outside of the pipe at the shoulder of the fitting.

v. Do not turn pipe spigot in the socket while wiping.

vi. If a fillet or bead of solvent cement is not visible after a joint is assembled, a heavier coat of solvent cement should be used on the pipe spigot.

vii. The assembly can be handled with care within two minutes.

vii. Do not attempt to adjust the joint after the solvent cement has set or damage will result.

ix. Pipe and fittings conforming to these standards will normally have an interference fit, which maintains pressure between the joining surfaces during the solvent cementing process. Fittings that do not have an interference fit shall have not more than 0.009 inch clearance to produce strong watertight joints.

x. (NOTE --- CAUTION!) When using primers and solvents for plastics, plumbers and apprentices shall always follow directions carefully and be in a well ventilated area.

xi. The solvent cement shall conform to the requirements of ASTM D2564-67 or CS 272-65 latest issue. The cleaner is a solvent that has a limited effect on PVC, but will remove dirt and grease. The solvent cement shall be labeled with the NSF Seal of Approval.

b. Threaded Joints (I.P.S.). When threads are required or used for connecting PVC-DWV pipe to other materials:

i. do not thread the pipe use proper PVC male or female threaded adapters for transitioning;

ii. note that threaded joints in a PVC-DWV system are primarily used for trap connections and clean out plugs.

14. Supports.

a. Conventional pipe clamps, brackets or strapping that have a bearing width of ¾ inch or more are suitable supports.

b. Supports for horizontal runs of pipe 1½ inches or less in diameter shall be at three-foot centers as a maximum.

c. Supports for larger diameters shall have a maximum spacing at four-foot centers.

d. Trap arms shall be supported at the trap discharge.

e. Vertical pipes shall be supported at each story height but not more than ten-foot intervals and elsewhere as required to maintain alignment.

f. All supports shall permit expansion and contraction of the pipe without binding.

g. Horizontal piping shall be supported at each change of direction.

15. Thermal Expansion.

a. Thermal expansion of PVC pipe occurs at the rate of approximately ⅜ inch per ten feet length per 100°F temperature change.

b. In a PVC-DWV system an expansion allowance of ½ inch per ten feet length of pipe is required.

c. Expansion fittings utilize a rubber o-ring that shall be lubricated with grease, petroleum jelly or other water-resistant grease to facilitate assembly.

d. Protect the operating end of the expansion fitting from grime.

e. Expansion joints shall be provided at every other branch interval up to and including ten stories in height.

f. The expansion fitting shall be installed in a accessible location in horizontal runs exceeding 20 feet in length.

g. Expansion joints shall not be required underground.

h. Expansion fittings shall be installed as designed in proper alignment with the piping being served.

10.06: continued

i. The expansion joint shall be set for the maximum expansion or contraction rate based on the installation temperature and manufacturer's recommendations.

16. Roof Flashing. The piping that penetrates through the roof shall be made weather tight with an approved flashing.

17. Lead Joints. Lead may be utilized as a joining method.

18. Sleeving.

a. The piping that penetrates concrete floors slabs or concrete walls shall be provided with sleeves. Maintain an annular space of one inch between the pipe and sleeve.

b. Pipes that penetrate concrete slabs placed on grade shall also provide a sleeve. Maintain an annular space of one inch between the pipe and sleeve.

19. Piping Trench Installations.

a. Prepare a smooth, uniformly compacted trench bottom using sand. Place the pipe in uniform alignment and grade with a continuous bearing on the bottom quadrant of the pipe along its entire length.

b. Using sand or other fine granular material, compact and backfill around the pipe to a point at least six inches over the crown of the pipe.

c. Do not allow large stones or pieces of earth to be dropped into the trench when completing the backfilling process.

d. The requirements of the above four sentences shall be the responsibility of the on-site licensed plumber.

20. Installation through Fire-walls or Rated Fire Separation Walls.

a. When piping passes through a rated fire separation wall or enclosure to another dwelling unit or space, the pipe shall be encased or shielded by a metal sleeve extended 20 inches on each side of the wall, floor or ceiling. The metal sleeve shall be 18 gauge (.040 in.) or heavier.

b. The annular space between the metal sleeve and the piping shall be sealed with approved noncombustible fire retardant material installed in accordance with 780 CMR: *The Massachusetts State Building Code*.

c. Alternate procedures and devices for fire-stopping may be used if installed in accordance with 780 CMR: *The Massachusetts State Building Code*.

d. The piping connections that penetrate fire-walls and ceilings in one and two family passenger car garages located beneath dwelling units are exempt and are not required to be encased.

e. The pipe penetrations should be sufficiently sealed by means of caulking or other approved materials to prevent the passage of smoke from space to space.

(p) ABS Plastic Pipe and Fittings. The following requirements apply to ABS plastic pipe and fittings:

1. ABS shall not be used for drains, waste, or vents in the commercial kitchens, laundry rooms, public restrooms or other commercial areas located in assisted living facilities, hotels, motels, inns and similar establishments, except where provided for elsewhere in 248 CMR 10.06, *i.e.,* 248 CMR 10.06(2)(p).

2. ABS - DWV (Acrylonitrile - Butadiene - Styrene) Schedule 40 Pipe and Fittings, may be used only for the drains, waste and vent piping that serve the sanitary or storm drainage systems in the following buildings:

a. residential dwellings;
b. assisted living facilities;
c. hotels;
d. motels;
e. inns;
f. condominiums; and
g. other residential buildings that are similar to 248 CMR 10.06(2)(p)2.a. through f. and that are no greater than ten stories in height.

h. ABS Pipe and Fittings may be utilized where a building is predominantly residential with a single non-residential use on a single floor meeting the following requirements:

i. the non-residential use would be categorized exclusively as employee (non industrial) per 248 CMR 10.10(18): *Table 1* with no other uses;

ii. the non-residential use would be limited to a maximum of four plumbing fixtures; and

10.06: continued

iii. the sole plumbing fixtures are toilets, sinks (lavatory, residential, and service sinks only), and drinking water stations.

3. Additional Limited Use of ABS for Commercial Buildings. ABS pipe and fittings may be installed for limited purposes in commercial buildings or establishments, provided that the following requirements are satisfied.

a. ABS is used for the drains, waste, or vents when the piping serves only the fixtures that are necessary to accommodate waste generated as a direct result of the conducts of business that is particular to the type of commercial establishment as itemized in 248 CMR 10.06(2)(p)3.b.

b. ABS may be used in the following buildings:

i. beauty salons;
ii. barber shops;
iii. manicure salons;
iv. pedicure salons;
v. photo-labs; and
vi. in commercial buildings that incorporate patron areas for the purpose of serving alcohol, soda or other similar carbonated type beverages where the carbonated liquid waste shall drain directly into a floor sink or floor drain.

c. The ABS Schedule 40 shall be installed in compliance with the following:

i. No ABS schedule 40 pipe and fittings may be used for the toilet fixtures and other plumbing connections in the establishment.
ii. The piping shall be connected to a main drain or drain from other fixtures to provide a point of waste dilution.
iii. A label at the point of dilution that reads “Limited Use Waste Drain” in one inch high lettering shall identify the piping.
iv. The vent piping from the fixture discharging limited use waste shall extend to a point six inches above the flood rim of the fixture and then shall transition back to compliant material in a commercial building.

4. Installation. ABS-DWV pipe and fittings shall be installed

a. using the same methods and requirements as stated in:

i. 248 CMR 10.06(2)(o)13.a.ii. through x.;
ii. 248 CMR 10.06(2)(o)12.; and
iii. 248 CMR 10.06(2)(o)14. through 18.

b. In addition, the following requirements shall be satisfied:

i. For solvent welded joints clean joining surfaces of pipe and fittings shall be made with an ABS primer.
ii. Expansion joints are not required.
iii. An ABS solvent that is recommended by the manufacturer that meets the required standard shall be used for solvent welding or cementing in connecting the ABS materials.
iv. The solvent cement shall conform to the requirements of ASTM D2564-67 or CS 272-65 latest issues. The cleaner is a solvent that has a limited effect on ABS but will remove direct and grease. The solvent cement shall be labeled with the NSF Seal or Approval.

5. Identification of Pipe and Fittings.

a. Identification of Pipe and Fittings. The pipe and fittings shall be black in color and shall be marked in accordance with listed standard. The following markings shall appear on two (opposite) sides of the pipe:

i. ABS-DWV Schedule 40 and the listed standard;
ii. NSF-DWV stamp of approval;
iii. Manufacturer's name and/or registered trademark;
iv Type;
v. Grade; and
vi. Size.

b. Use PVC fitting ONLY with PVC pipe and ABS fittings ONLY with ABS pipes. NEVER use PVC Solvent weld on ABS or ABS solvent weld on PVC.

(q) Stainless Steel Tube Marking. Stainless steel tubing shall be in conformance with ASTM designated standard, Type 430 or Type 439, and shall meet the following marking requirements:

10.06: continued

1. Tubing Grade H or SL shall be color-coded blue;
2. Tubing Grade G or SM shall be color-coded red;
3. Tubing shall be marked at intervals no greater than three feet in length in letters not less than ⅛ inch in height, with the following:
   a. manufacturer's name or registered trademark; and
   b. the ASTM designation nominal diameter and grade.
4. The name of the manufacturer shall be permanently incised in each tube at intervals not greater than 18 inches in length.

(r) Urinal Wastes. Urinal waste branches and urinal fixture wastes shall conform to the following:

1. They shall be made of:
   a. extra heavy or service weight cast iron soil pipe and fittings with caulked joints
   b. threaded cast iron pipe with cast iron drainage fittings; or
   c. iron size copper or brass pipe with cast brass drainage fittings.
2. Resilient gaskets and no hub clamps with elastomeric sealing sleeves.
3. PVC and ABS schedule 40 plastic pipe and fittings may be used only in residential type buildings. (Refer to 248 CMR 10.07(4)(f) for (alternative) schedule 80 nipple requirements for carriers.)

(s) Sumps and Tanks for Sewage. All sumps and tanks for receiving sewage removed by mechanical or ejector methods, shall be constructed as follows:

1. Concrete. Three-inch minimum wall.
2. Cast Iron. Minimum ¼ inch thickness.
3. Steel.
   a. Minimum ⅜ inch thickness for above ground.
   b. For below ground installation the sump or tank shall be encased in concrete having a thickness of at least three-inches.
4. Fiberglass. Reinforced polyester resin glass fibers that comply with ANSI listed standards.

(t) Single Stack Sanitary Drainage System - (So-vent). An engineered single stack system employing the use of aerator and de-aerator fittings, designed in compliance with *Cast Iron Sovent Design Manual No. 802* and ANSI standard ASME/ANSI B16.45-87 may be used in buildings provided the following requirements are satisfied:

1. Every such system shall be:
   a. designed or engineered by a qualified person;
   b. plans of such system shall be approved by a Massachusetts registered professional engineer; and
   d. Special-permission must be sought and granted by the Board pursuant to 248 CMR 3.04 before installation of such system.
2. Piping material shall be Type K, L, M, or DWV hard drawn copper tubing or cast iron.
3. All fittings shall be made of cast brass or drawn wrought copper or cast iron and must be of DWV design.
4. No part of a copper system shall receive the waste from urinals.
5. Any change or redesign in the So-Vent system shall be subject to the requirements of 248 CMR 10.06(2)(t).
6. Every So-Vent system shall have at least one full size vent stack that meets the following requirements:
   a. The diameter of the full size vent stack is no smaller than three inches.
   b. The vent stack shall run undiminished in size from the base of the soil or waste stack to a point 18 to 24 inches above the roof or reconnect to a stack vent installed in accordance with 248 CMR 10.16(4)(b).

(u) Alternate Materials, Methods, and Systems. The provisions of 248 CMR 10.06 are not intended to prevent the use of materials, methods or systems that are not specifically authorized or prescribed by 248 CMR 10.06, provided such alternate materials, methods and systems meet the standards, use and intent of 248 CMR 10.06 and the Board has granted Product-approval, a Variance, or a Test-site status pursuant to 248 CMR 3.00: *General Provisions Governing the Conduct of Plumbing and Gas Fitting Work Performed in the Commonwealth.*

10.08: continued

b. The developed length distance from the fixture outlet to the trap weir shall not exceed 24 inches.

c. No fixture shall be double trapped.

2. A fixture need not be separately trapped. Exceptions to the separate trapping requirements are as follows:

a. Fixtures having integral traps.

b. A combination plumbing fixture may be installed on one trap provided one compartment is not more than six inches deeper than the other and the waste outlets are not more than 30 inches apart.

c. One trap may be installed for not more than three single compartment sinks or lavatories, immediately adjacent to each other, and in the same room. The trap is to be centrally located when three such fixtures are installed. The center to center measurement of the waste outlets shall not exceed 30 inches apart.

d. The waste for a domestic type dishwasher may be separately trapped, or may connect to the manufactured inlet side opening of a food waste grinder. A "wye" fitting may be installed between the outlet of the food waste grinder and the inlet of the trap serving the kitchen sink.

(b) Size of Fixture Traps.

1. Fixture trap size (nominal diameter) shall be sufficient to drain the fixture rapidly and in no case less than outlined in 248 CMR 10.08: *Table 1* (Minimum Size of Fixture Traps).

2. No trap shall be larger than the drainage pipe into which it discharges.

TABLE 1
MINIMUM SIZE OF FIXTURE TRAPS

Plumbing Fixture	Trap Size in Inches
Bathtub (with or without overhead shower)	1½
Bidet	1½
Clothes washer (domestic)	2
Combination sink and wash tray	1½
Combination sink and wash tray with food waste grinder unit	1½
Dental unit or cuspidor	1½
Dental Lavatory	1½
Drinking Water Station, with Drain	1½
Dishwasher, commercial	2
Dishwasher, domestic	1½
Floor drain	2
Food waste grinder	1½
Kitchen sink, domestic, with food waste grinder unit	1½
Kitchen sink (two compartments)	1½
Kitchen sink, domestic	1½
Lavatory, common	1½
Lavatory (barber shop, beauty parlor or surgeon's)	1½
Lavatory, (multiple type) (wash fountain or wash sink)	1½
Laundry sink (one or two compartments)	1½
Shower stall	2
Sink (surgeon's)	1½
Sink (flushing rim type, flush valve supplies)	3
Sink (service type with floor outlet trap standard)	3
Sink (service trap with P trap)	2
Sink, commercial (pot, scullery, or similar type)	2
Sink, commercial (with food grinder unit)	2

(c) Prohibited Traps. The following type traps are prohibited.

1. Traps which depend upon moving parts to maintain their seal.

10.08: continued

2. Bell traps.
3. Crown vented traps.
4. Separate fixture traps which depend on interior partitions for their seal.
5. Full "S" traps.

(d) Design of Traps.

1. Fixture traps shall be self-scouring and shall have no interior partitions except where such traps are integral with the fixture.
2. Slip joints or couplings may be used on the trap inlet or within the trap seal of the trap if a metal-to-metal ground joint is used.
3. Each fixture trap, except a trap that is cast integrally or in combination with the fixture in which the trap seal is readily accessible or except when a portion of the trap is readily removable for cleaning purposes, shall have an accessible cleanout plug of ample size that is protected by the water seal.

(e) Fixture Trap and Connection Material (HOUSE SIDE) shall meet ASME A112.18.2-2002.

1. Fixture traps shall be made of cast brass, with a wall thickness of not less than .01 inches, or of schedule 40 ABS or PVC.
2. Cast iron traps may be used in connection with floor drains, slop sinks, building (house) traps, conductors (when necessary) and similar installations, weights and thicknesses to comply with like materials under 248 CMR 10.06.
3. Slip nuts used to connect fixture and appliance outlet piping to the trap, shall be composed of brass, copper or schedule 40 ABS or PVC.
4. Tubing traps made of brass or copper shall be of a thickness equal to a minimum of 17 gauge.
5. When devices including strainers, P.O. (pull out) plugs, tail pieces, waste arms, bathtub wastes and overflows, and any other similar fixture to trap connection, when of metal, shall be made of brass or other non-corrosive metal, and the device shall have a thickness greater than or equal to 17 gauge.
6. All items listed in 248 CMR 10.08(1)(e)4. and 5. when made of ABS or PVC may be used, provided that they all comply with ASME A112.18.2 for PVC and ABS Tubular Traps and Fittings.

(f) Trap Seal. Each fixture trap shall have a liquid seal of not less than two inches and not more than four inches, except where for special conditions, a deeper seal may be required.

(g) Trap Setting and Protection. Traps shall be set level with respect to their water seals and, where necessary, shall be protected from freezing.

(h) Building Traps.

1. Building (House/running traps) traps shall not be installed, unless in the opinion of the Inspector they are necessary.
2. Each building trap when installed shall be provided with a cleanout and with a relieving vent or fresh air intake which need not be larger than ½ the diameter of the drain to which it connects.

(i) Acid Resistant Trap. Where a vitrified-clay or other brittleware, acid-resistant trap is installed underground, it shall be embedded in concrete extending six inches beyond the bottom and sides of the trap.

(2) Drainage Pipe Cleanouts.

(a) Location. Cleanouts shall not be placed more than 50 feet apart in all horizontal drainage piping and branch drain piping that is four inch nominal diameter or less. On piping that is over four inch nominal diameter the cleanouts shall not be more than 100 feet apart.

(b) Underground Drainage. Cleanouts, when installed on an underground drainage piping, shall be:

1. extended vertically to or above the finished grade level; or
2. extended to an accessible location immediately outside the building.

(c) Change of Direction. Accessible cleanouts shall be installed:

1. at each change of direction of the building drain; or
2. at each change of direction of horizontal waste or soil lines and branch lines, that are greater then 45°.

10.10: continued

3. Toilets for public use shall be of the elongated style and the seats shall be solid plastic, non-porous and of the open front type. *Refer* to 248 CMR 10.10(5)(a) through (e).

4. When a urinal(s) is provided in a toilet facility the floor areas one foot in front of the urinal lip and one foot on each side of the urinal and the wall areas to four feet above the finished floor surface, shall be protected by non-absorbent building products and material. Wood and fiber boards are prohibited in these areas. *Refer* to 248 CMR 10.10(7)(c).

5. In a toilet facility with more than one toilet, or with a toilet and a urinal, each toilet shall be enclosed. Each urinal shall be side shielded for privacy.

6. When two or more urinals are required, a shield shall be provided between urinals.

(o) Laundries. Laundry facilities requirements. A washing machine connection that consists of a piping arrangement that includes a cold water supply, hot water supply and a sufficient drain connection shall be provided in conformance with the following:

1. One and Two Family Dwelling. At least one washing machine connection.

2. Multiple Dwellings.

a. Non-elderly Housing. In multiple dwellings that are not restricted to the elderly, one washing machine connection for every ten dwelling units, or fraction thereof.

b. Elderly Housing. In housing that is restricted to the elderly, one washing machine connection for every 20 dwelling units or fraction thereof.

c. Dormitories. In dormitories, one washing machine connection for every ten dwelling units or fraction thereof. For purposes of post-secondary school residential dormitories, the Board interprets one dwelling unit to be equivalent to four students.

d. The washing machine connection shall be located so that each occupant in the dwelling has access to the washing machine that may be affixed to the washing machine connection.

(p) Urinals.

1. Urinals may be substituted for toilets where indicated in 248 CMR 10.10(19): *Table 1* are listed by percentage.

2. Urinals listed for elementary, secondary, post-secondary and industrial factory/warehouse are in addition to the toilets required.

3. When urinals are used at least one shall be set for handicapped use.

(q) Bathroom Group Defined. a bathroom group shall consist of one bath tub or shower stall, one toilet, and one lavatory.

(r) Use of Gender-neutral Toilet Rooms. For purposes of the minimum fixture requirements of 248 CMR, wherever 248 CMR 10.00 requires two or more toilet fixtures designated by gender, those facilities may be replaced with single use Gender-neutral toilet rooms pursuant to one of the following options:

1. Every gender designated toilet fixture is replaced with an equal number of single use gender-neutral toilet rooms (such that there are no gender designated fixtures); or

2. Where the code requires four or more toilet fixtures combined for males and females, gender designated fixtures may be replaced by single use Gender-neutral toilet rooms in increments of two such that for every male designated fixture replaced by a Gender-neutral toilet room, a female designated fixture must also be replaced by a Gender-neutral toilet room, and vice-versa (*e.g.* instead of three men's toilets, four female toilets, there may be installed two men's toilets, three female toilets, and two single use Gender-neutral toilet rooms).

10.10: continued

Table 1: Minimum Facilities For Building Occupancy.

Building Clarification	Use Group	Toilets		Urinals Males	Lavatories Each Sex	Drinking Water Station with drain	Bath/ Show.	Other Fixtures	Pertinent Regulations. 248 CMR 10.10(18)
		Females	Males						
Theaters	A-1	1 per 30	1 per 60	50%	1 per 100	1 per 1000		1 service sink per floor	(b), (i)1., (m), (n), (p), (r)
Nightclubs, Pubs	A-2	1 per 30	1 per 50	50%	1 per 75				(b), (m), (n), (p), (r)
Restaurants	A-3	1 per 30	1 per 60	50%	1 per 200				(b), (m), (n), (p), (r)
Hall, Museums, Libraries *etc*.	A-3	1 per 50	1 per 100	50%	1 per 200				(b), (i)1., (m), (n), (p), (r)
Coliseums, Arenas	A-3	1 per 30	1 per 60	50%	1 per 150				(b), (i)1., (m), (n), (p), (r)
House of Worship	A-4	1 per 50	1 per 100	50%	1 per 200				(b), (c), (m), (n), (p), (r)
Stadiums *etc*.	A-5	1 per 30	1 per 60	50%	1 per 150				(i)1., (m), (n), (p), (r)
Pool/Fitness Centers	A-5	1 per 40	1 per 40	33%	1 per 60	At least one source	1 for every 40		(i)1., (m), (n), (p), (r). For pools, *see* 105 CMR for bather load.
Bathing (Public Beaches)		1 per 200	1 per 500	33%	1 per 1000		1 per 1000	1 Service Sink	(d), (m), (n), (p), (r)
Day Care Facility (Child)	E-I-3	1 per 20	1 per 20		1 per 20			1 Service Sink	(e), (m), (n), (r)
(Staff)	N/A	1 per 20	1 per 25	33%	1 per 40				(i), (m), (n), (p), (r)
Detention Facility (Detainee)	I-3	1 per 6	1 per 8	33%	1 per 6		1 per 8		(f), (m), (p), (r)
(Staff)	N/A	1 per 20	1 per 25	33%	1 per 40				(i), (m), (n), (p), (r)
Dwellings (Single)	R	One Bathroom Group and One Kitchen Sink							(o), (q), (r)
(Multiple)	R	One Bathroom Group and One Kitchen Sink per Unit							(o), (q), (r)
(Hotel/Motel)	R	One Bathroom Group per Unit							(m), (q), (r)
(Dormitories)	R-2	1 per 6	1 per 8	33%	1 per 8		1 per 8	1 Service Sink per Floor	(g), (m), (n), (p), (r)
Educational (Kindergarten)	E	1 per 20	1 per 20		1 per 20	1 per 75		1 Service Sink Per Floor	(h), (i), (m), (n), (p), (r)
(Elementary)	E	1 per 30	1 per 60	1 per 60	1 per 60	1 per 75			
(Secondary)	E	1 per 30	1 per 90	1 per 90	1 per 90	1 per 75			
(Post Secondary)	E	1 per 90	1 per 180	1 per 180	1 per 180	1 per 75			
(Staff)	E	1 per 20	1 per 25	33%	1 per 40				
Employee (Non-industrial)*		1 per 20	1 per 25	33%	1 per 40			1 Service Sink per Floor	(i), (m), (n), (p), (r)

10.10: continued

Building Clarification	Use Group	Toilets		Urinals Males	Lavatories Each Sex	Drinking Water Station with drain	Bath/ Show.	Other Fixtures	Pertinent Regulations. 248 CMR 10.10(18)
		Females	Males						
Employee (Industrial Factory/ Warehouse and Similar Usage	F	1 per 15	1 per 20	1 per 40	1 per 30		1 per 15		(j), (m), (n), (p), (r)
Institution Hospital (Private/Semi)	I	1 per Room Nursing Homes: 1 toilet and 1 lavatory with direct access from each bedroom (shared by 8 beds max), can be unisex.			1 per Room	1 Per each set of rest-rooms	1 per 15 (in ICU) 1 per 12 (inpatient facilities other than ICU) 1 per 6 patients (Psychi-atric Hosp.) 1 per 8 (Rehab facility)	1 Service Sink Per Floor	(i), (m), (n), (r),
Nursing Homes (Ward)		1 per 8	1 per 10	33%	1 per 10		1 per 15	1 Service Sink Per Floor	(i), (m), (n), (p), (r)
Malls (Covered)	M	1 per 750	1 per 1500	50%	1 per 2000	1 per 2000			(i), (l), (m), (n), (p), (r)
Medical/Health Care Building	B	1 per 45	1 per 55	50%	1 per 200	1 Per each set of rest-rooms (may be a Water Station, without drain)			(i), (k), (m), (n), (p), (r)
Office Buildings	B	1 per 20	1 per 25	33%	1 per 50	1 per Floor (may be a Water Station, without drain)			(i), (m), (n), (p), (r)
Retail (Mercantile)	M	1 per 20	1 per 20	33%	1 per 40				(i), (m), (n), (p), (r)
Waiting Rooms (Airports, Railroad and Bus Stations)	A	1 per 35	1 per 75	50%	1 per 200	1 per 500			(b), (m), (n), (p), (r)

(19) Funeral Establishment Preparation Rooms. Funeral establishment preparation rooms shall comply with the provisions of 239 CMR 3.07: *Preparation Room.*

(a) The preparation room of a Funeral establishment shall be provided with a floor drain and flooring that is compliant with 239 CMR 3.07(3): *Preparation Room.*

(b) The preparation room shall include a flushing rim sink and the preparation room shall be protected by proper backflow devices.

(c) An additional reduced pressure zone backflow preventer shall be installed on the water distribution system to the building at the outlet side of the meter or main control valve.

(d) Emergency Wash Stations shall be installed and be compliant with the provisions of 239 CMR: *Board of Registration in Embalming and Funeral Directing*.

10.11: Hangers and Supports

(1) General. Piping shall be installed with provisions, when necessary, for expansion, contraction or structural settlement.

(2) Material. Hangers, anchors, and supports shall be of metal or other material of sufficient strength to support the piping and its contents, except that piers may be of concrete, brick, or other Product-accepted material.

(3) Attachment to Building. Hangers and anchors shall be securely attached to the building at sufficiently close intervals to support the piping and its contents.

(4) Intervals of Supports.

(a) Vertical Piping. Vertical pipe of the following materials shall be supported at not more than the following distance intervals:

1. Cast iron soil pipe -- at base and at each story height.
2. Threaded pipe (SPS) -- every other story height.
3. Copper tubing -- at each story height but not more than ten-foot intervals.
4. Plastic (PVC and ABS) pipe at each story height, but not more than ten foot intervals and elsewhere as required to maintain proper alignment.
5. Stainless steel tubing at each story height, but not more than ten foot intervals.
6. Aluminum DWV --- at each height, or at intervals not exceeding ten feet.

(b) Horizontal Piping. Horizontal pipe of the following materials shall be supported at not more than the following distance intervals.

1. Cast Iron Soil Pipe -- five foot intervals except that where ten-foot lengths of cast iron soil pipe are used, ten-foot intervals between supports are acceptable.
2. Threaded pipe -- 12 foot intervals.
3. Copper tubing (1¼ inches or less) -- six-foot intervals.
4. Copper tubing (1½ inches or over) -- ten-foot intervals.
5. Plastic (PVC and ABS) pipe (1½ inches or less) -- three-foot intervals, (two inches or over) --- four-foot intervals, (*Refer* to 248 CMR 10.06(2)(o) and (p).
6. Cross-linked Polyethylene (PEX) Tubing shall meet the following requirements:
   a. the maximum hanger spacing is to be 32-inch intervals for all sizes;
   b. the tubing is to be secured rigidly to studs or joist with hangers and supports that enable adequate expansion and ease of movement;
   c. Plumber shall consult the individual manufacturers recommendations for other specific installation methods.
7. Stainless steel tubing at each story height, but not more than ten foot intervals.
8. Stainless Steel Tubing (1¼ inches or less) -- six-foot intervals.
9. Stainless Steel Tubing (1½ inches or over) -- ten-foot intervals.
10. Aluminum DWV pipe -- ten foot intervals.
11. CPVC pipe sizes one inch or less shall be supported at three-foot intervals and sizes 1¼ and greater shall be supported at four-foot intervals.

(5) Base of Stacks.

(a) Bases of cast iron stacks shall be supported on concrete, brick laid in cement mortar, metal brackets attached to the building, or by other methods approved by the Inspector.

(b) Other piping material shall be so anchored as to take the load off the stack at the base.

(6) Piping in Masonry.

(a) Piping which is installed in and parallel to the faces of reinforced concrete or masonry walls shall be installed in adequately sized pipe space chases formed in the concrete or masonry walls.

(b) The pipe chase spaces shall be accessible, or the piping shall be otherwise installed free of the reinforced concrete or masonry.

10.15: continued

(c) Clear water condensate waste that is produced in cumulative amounts of 12.5 gallons per hour or 300 gallons per day or less in buildings by air conditioning equipment, air compressor blow-down discharge (free of petroleum hydrocarbons) or other similar apparatus or appliances may be discharged to the sanitary drainage system in accordance with 248 CMR 10.12(1)(a)4. The clear water waste requirement is not withstanding any local ordinance, by-law, rule or regulation to the contrary.

(3) Selecting the Size of Drainage Piping. Pipe sizes shall be determined from 248 CMR 10.15(7): *Tables 1*, *2* and *3* on the basis of drainage fixture unit values calculated from 248 CMR 10.15(7): *Table 1* and (2)(b).

(4) Minimum Size of Soil and Waste Stacks. No soil or waste stack shall be smaller than the largest horizontal waste branch connected thereto. *See* 248 CMR 10.15(7): *Table 1* and *Table 3*. Exception: a 4 x 3 toilet connection shall not be considered as a reduction in pipe size.

(5) Minimum Size of the Stack Vent or Vent Stack. Any structure, in which a building drain is installed, shall have as a minimum one stack vent or a vent stack not less than three inches in diameter, (*see* 248 CMR 10.16(7): *Table 2* for fixture unit values when determining appropriate stack vent or vent stack sizing) that shall be carried undiminished in size through the roof.

(6) Provision for the Installation of Future Fixtures.

(a) When future drainage provisions are employed for the potential installation of other fixtures, the drains provided shall be considered in determining the final required sizes of drains and vent pipes.

(b) The future drain installations, (if provided) shall be terminated with approved material(s) and fittings.

(7) Size of Underground Drainage Piping.

(a) Underground or Basement Floor. No portion of the drainage system installed underground or below a basement floor, shall be less than two inches in diameter.

(b) Sanitary Piping Installed Through the Foundation Wall.

1. Sanitary pipes that pass through an exterior foundation wall shall be no less than four inches in diameter, except:

a. When serving a Hazardous Waste System installed in accordance with (248 CMR 10.13).

b. When serving a domestic laundry, wherein the laundry drain is conducted to a separate (Local Board of Health Authorized) dry-well disposal system and shall be at least two inches in diameter.

c. When serving as the waste for a church Sacrarium, wherein the church Sacrarium drain may be two inches in diameter (*see* 248 CMR 10.10(16)).

d. When serving exclusively as the discharge from a semi-positive displacement grinder pump, and if so, the following shall be satisfied:

i. The minimum pipe size for a semi-positive displacement grinder pump discharge shall be 1¼-inch and shall provide a self-cleaning velocity of no less than two feet per second.

ii. The velocity in the pipe shall not be more than seven feet per second.

iii. A full port discharge valve and check valve shall be provided and made accessible inside the building.

iv The waste discharge from semi-positive displacement grinder pumps shall be protected from freezing when the piping is installed less than four feet below grade in outside locations.

10.15: continued

TABLE 1
FIXTURE UNIT VALUES FOR VARIOUS PLUMBING FIXTURES

Type of fixture or group of fixtures	Fixture Unit Value
Automatic clothes washer (2-inch standpipe)	3
Bathroom group consisting of a toilet, lavatory and bathtub or shower stall:	
Flushometer valve closet	8
Tank type closet	6
Bathtub[1] (with or without overhead shower)	2
Bidet	3
Combination sink and drain board with food waste grinder	4
Combination sink and drain board with one 1½-inch trap	2
Combination sink and drain board with separate 1½-inch traps	3
Vegetable prep sink (residential or commercial)	2
Dental chair unit or cuspidor	1
Dental lavatory	1
Drinking fountain	½
Dishwasher, commercial	6
Dishwasher, domestic	1
Trough or trench drain 3-inch	5
Trough or trench drain 4-inch	6
Floor drains[2] with 2-inch waste	3
Kitchen sink, domestic, with one 1½-inch waste	2
Kitchen sink, domestic, with food waste grinder	2
Lavatory with 1¼-inch waste	1
Laundry Utility sink (1, 2 or 3 compartments)	2
Shower stall, domestic	2
Showers (group) per head	2
Sinks:	
Surgeons	3
Flushing rim (with valve)	6
Service (trap standard)	3
Service (P trap)	2
Commercial Pot, scullery, *etc*. (each section)	4
Shampoo	2
Toilet, tank operated	4
Toilet, valve operated	6
Urinal, pedestal, siphon jet blowout	6
Urinal, wall lip	4
Wash sink (circular or multiple) each 20 inches of usable length	1
Unlisted fixture drains or trap size:	
1¼ inch or less	1
1½ inches	2
2 inches	3
2½ inches	4
3 inches	5
4 inches	6

Note 1: A showerhead over a bathtub does not increase the fixture value.

Note 2: *See* 248 CMR 10.15(2)(b) for method of computing fixture unit values of devices with continuous or semi-continuous flows.

Note 3: The size of floor drains shall be determined by the area of the floor surface to be drained in accordance with 248 CMR 10.10(10)(a).

248 CMR 11.00: EDUCATION AND EXPERIENCE STANDARDS AND REQUIREMENTS FOR LICENSURE

Section

11.01: Scope and Application

(1) Scope. The provisions of 248 CMR 11.00 govern the educational and experience requirements for licensure as a journeyman plumber or journeyman gas fitter, licensure as a master plumber or master gas fitter and licensure as either an undiluted liquefied petroleum gas installer or limited undiluted liquefied petroleum gas installer. In addition, 248 CMR 11.00 governs the continuing education requirements for all licensed plumbers and gas fitters in the Commonwealth. Finally, the provisions of 248 CMR 11.00 govern the requirements for providers of plumbing and gas fitting primary and continuing education.

(2) Sections Declared Independent. 248 CMR 1.00 through 11.00 is hereby declared to be an independent section and part of section and the holding of any section or part of section to be void and ineffective for any cause shall not be deemed to affect any other section or part of section.

11.02: Education and Experience Requirements for Apprentices, Journeyman and Master Licensees; Education and Experience Requirements for Undiluted Liquefied Petroleum Gas Installers and Limited Undiluted Liquefied Petroleum Gas Installers

(1) Qualifications for Admission to the Journeyman Plumber Examination.

(a) Apprentice Plumber Licensed before September 1, 2008. An applicant who is a licensed apprentice plumber and the apprentice license was received prior to September 1, 2008 in accordance with M.G.L. c. 142, § 3A shall be required to fill out a Board approved application and meet the following requirements to be eligible for admission to the journeyman plumber examination:

1. Experience. The applicant shall furnish documentary proof satisfactory to the Board of having completed practical work experience performing plumbing and gas fitting that totals no less than 8,000 clock hours as a licensed apprentice working as an employee under the direct supervision of a Commonwealth of Massachusetts licensed master plumber or under the direct supervision of a Commonwealth of Massachusetts licensed journeyman plumber who is in the employ of a master plumber. Experience installing HVAC components for the installation of heating systems, steam piping and hydronic heat piping or other work not requiring a plumbing or gas fitting license shall not be considered qualifying experience.

2. Education.

a. The applicant shall furnish documentary proof of having received a high school diploma or the equivalent; and

b. The applicant shall furnish documentary proof of having successfully completed 300 clock hours of plumbing and gas fitting theory culminating in a school or instructor designed examination to ensure competency. This education must take place over a period of no less than four years and must meet the requirements of 248 CMR 11.00. For each calendar year, no more than 165 hours of education may be credited for licensure purposes.

11.02: continued

3. Applicants enrolled in Public Comprehensive High School Career/Vocational Technical School Programs prior to September 1, 2008.

a. Eligibility. To be considered equivalent to an individual obtaining an apprentice license prior to September 1, 2008, an applicant must meet the following criteria:

i. The applicant must have been a secondary school student enrolled in a Public Comprehensive High School Career/Vocational Technical School plumbing program (not including exploratory hours) prior to September 1, 2008; and

ii. The applicant must have obtained an apprentice license within five years of beginning the high school plumbing program.

b. Credit Granted. Eligible applicants under 248 CMR 11.02(1) shall be granted up to 300 hours of education and 1,700 clock hours of experience credit from the Public Comprehensive High School Career/Vocational Technical School program.

4. The provisions of 248 CMR 11.02(1)(a) shall expire on May 1, 2021. All applicants for a journeyman plumbing license who submit an application on or after May 1, 2020 shall, without loss of any lawfully earned education or work experience, be subject to the same upgrading requirements as those imposed on apprentice licenses issued pursuant to 248 CMR 11.02(1)(b). Exception: the Board may, in its discretion, waive this deadline for individuals who suffered from a relevant, documented hardship. However, no such waivers shall be granted on or after May 1, 2021.

(b) Apprentice Plumber Licensed on or after September 1, 2008. An applicant who is a licensed apprentice plumber and the apprentice license was issued on or after September 1, 2008 in accordance with M.G.L. c. 142, § 3A not otherwise meeting the criteria outlined in 248 CMR 11.02(1)(a) shall be required to fill out a Board approved application and complete the following education and experience criteria to be eligible for admission to the journeyman plumber examination:

1. Experience. The applicant shall furnish documentary proof satisfactory to the Board of having completed practical work experience that totals no less than 6,800 clock hours as a licensed apprentice working as an employee under the direct supervision of a Commonwealth of Massachusetts licensed master plumber or under the direct supervision of a Commonwealth of Massachusetts licensed journeyman plumber who is in the employ of a master plumber. Experience installing HVAC components for the installation of heating systems, steam piping and hydronic heat piping shall not be considered qualifying experience.

2. Education.

a. The applicant shall furnish documentary proof of having received a high school diploma or the equivalent; and

b. The applicant shall furnish documentary proof of having successfully completed 550 clock hours of plumbing and gasfitting theory culminating in a school or instructor designed examination to ensure competency. This education must take place over a period of no less than five years and must meet the Board administrated requirements of 248 CMR 11.00. For each calendar year, no more than 165 hours of education may be credited for licensure purposes.

c. Apprentices shall begin their education program within nine months of the initial issuance of their apprentice license.

3. Timeframes for Completing Education and Work Experience.

a. General Rule. An applicant will not receive credit for any work experience or education unless they were completed in conjunction with one another as measured by calendar years. For each year in which an apprentice obtains 165 clock hours of education (1½ tiers), that apprentice must accrue 1,700 clock hours of qualifying work experience as a licensed apprentice. 248 CMR 11.02(1)(b)3.a. is subject to exceptions as described in 248 CMR 11.02(1)(b)3.b. and c.

b. Exception 1. In the event that, due to a hardship, an Apprentice is enrolled in a tier but loses their employment, they shall be permitted to complete the tier they are enrolled in. However, the Apprentice must obtain employment prior to enrolling in any additional tiers.

c. Exception 2. A licensed apprentice may complete all 220 hours of Tier 1 and Tier 2 in a single calendar year.

11.02: continued

d. Exception 3. An unlicensed individual, who by definition may not accrue work experience, may complete Tier 1 of the education requirement prior to licensure. All remaining education and work experience must be accrued in compliance with the licensing and timeframes described in 248 CMR 11.02(1)(b)3.

4. Public Comprehensive High School Career/Vocational Technical School Program. An applicant who, as a secondary school student, successfully completes/graduates from a Public Comprehensive High School Career/Vocational Technical School Program following the CVTE (Career Vocational Technical Education) educational standard framework whose program is approved by the Board to meet the requirements of 248 CMR 11.00, may be granted a maximum of the first three tiers, comprising 330 hours of educational theory credit from that program. Additionally, secondary students may accrue a maximum of 1,700 hours of experience credit while enrolled in a Board approved Massachusetts Public Comprehensive High School Career/Vocational Technical School Program, said experience hours may be accrued as follows:

a. In a "shop" or "laboratory" facility at the school where students are under the direct supervision of one or more licensed plumbers who meet the educator licensing requirements of the Department of Elementary and Secondary Education;

b. In a Board-approved, off-campus construction and/or maintenance project overseen by the school; or

c. After obtaining an apprentice license, in a school arranged co-op employment relationship with a master plumber. Subject to the limitations of 248 CMR 11.00, students working as apprentices are eligible for experience hours above and beyond the 1,700 hours of experience for work experience in a co-op relationship that is documented by the employing master plumber to have occurred outside of normal school hours (such as evenings, weekends, and summers).

(c) Limitation on Examination Attempts. A licensed apprentice shall not be permitted to attempt the journeyman license examination more than six times without special Board approval demonstrating good cause.

(d) Apprentice Plumber License Renewal Limited.

1. An apprentice license shall not be renewed (nor shall the licensee be eligible for a new license) after ten years from the date the license was initially granted on or after September 1, 2018, whichever comes later.

2. Waivers of Renewal Restriction. An apprentice whose license is not eligible for renewal pursuant to 248 CMR 11.02(1)(d) to petition the Board for reinstatement, for good cause, of his or her apprentice license.

(e) Credit for Licensure, Education, and Experience Obtained Pursuant to Other Board Issued Licenses.

1. A Massachusetts licensed journeyman or master gas fitter may, upon petition to the Board, utilize up to 220 hours of gas fitting education and 3,400 hours of gas fitting work experience towards the requirements necessary to obtain a journeyman plumbing license.

2. A Massachusetts licensed apprentice gas fitter who has not obtained a higher level license may, upon petition to the Board, utilize up to 110 hours of gas fitting education and 1,700 hours of gas fitting work experience towards the requirements necessary to obtain a journeyman plumbing license.

3. A Massachusetts licensed undiluted liquefied petroleum gas installer or an unlicensed undiluted liquefied petroleum gas installer in training may, upon petition to the Board, utilize up to 110 hours of undiluted liquefied petroleum gas education and 1,700 hours of undiluted liquefied petroleum gas work experience towards the requirements necessary to obtain a journeyman plumbing license.

4. No credit shall be granted for education or work experience as a limited undiluted liquefied petroleum gas installer.

(2) Qualifications for Admission to the Master Plumber Examination.

(a) An applicant who is a licensed journeyman plumber shall be required to file a completed application and meet the following education and experience criteria to be eligible for admission to the master plumber examination:

11.02: continued

1. Experience. The applicant shall furnish documentation satisfactory to the Board demonstrating completion of no less than one year practical experience totaling a minimum of 1,700 clock hours of experience as the holder of a Commonwealth of Massachusetts journeyman plumber license and demonstrating that he or she has been actively engaged in or working at the business of installing repairing, or maintaining plumbing and gas fitting systems, apparatus, devices, fixtures or other appliances typical to the discipline of the plumbing and gas fitting industry only.

2. Education. The applicant shall furnish documentation satisfactory to the Board of having completed the 110 hour Tier Five of the five tier Plumber Educational Program as approved by the Board and described in 248 CMR 11.06. Individuals who completed this education as an apprentice shall not be required to complete any additional education.

(3) Qualifications for Admission to the Journeyman Gas Fitter Examination.

(a) Apprentice Gas Fitter Licensed before September 1, 2008. An applicant who is a licensed apprentice gas fitter and the apprentice license was received prior to September 1, 2008 in accordance with M.G.L. c. 142, § 3A shall be required to fill out a Board approved application and complete the following education and experience criteria to be eligible for admission to the journeyman gas fitter examination:

1. Experience. The applicant shall furnish documentation satisfactory to the Board demonstrating completion of practical work experience of no less than 3,400-clock hours as a licensed apprentice working as an employee under the direct supervision of a licensed master gas fitter or under the direct supervision of a licensed journeyman gasfitter who is in the employ of a master gasfitter in accordance with M.G.L. c. 142, § 3, installing, repairing, or maintaining gas piping systems, apparatus, devices, fixtures or other appliances typical to the discipline of the gasfitting industry only. Experience that is limited to installing HVAC components for the installation of heating systems, steam piping and hydronic heat piping shall not be considered qualifying experience.

2. Education.

a. The applicant shall furnish documentation to the Board of having received a high school diploma or the equivalent, and

b. The applicant shall furnish documentary proof of having completed 150 clock hours of gas fitting theory culminating in a school or instructor designed examination to ensure competency. This education must take place over a period of no less than two years and must meet the Board administered requirements of 248 CMR 11.00.

3. The provisions of 248 CMR 11.02(3)(a) shall expire on May 1, 2021. All applicants for a journeyman gas fitter who submit an application on or after May 1, 2020 shall, without loss of any lawfully earned education or work experience, be subject to the same upgrading requirements as those imposed on apprentice licenses issued pursuant to 248 CMR 11.02(3)(b). Exception: The Board may, in its discretion, waive this deadline for individuals who suffered from a relevant, documented hardship. However, no such waivers shall be granted on or after May 1, 2021.

(b) Apprentice Gasfitter Licensed on or after September 1, 2008. An applicant who is a licensed apprentice gasfitter and the apprentice license was received on or after September 1, 2008 in accordance with M.G.L. c. 142, § 3A shall be required to fill out a complete application and complete the following education and experience criteria to be eligible for admission to the journeyman gasfitter examination:

1. Experience. The applicant shall furnish documentation satisfactory to the Board demonstrating completion of practical work experience of no less than 5,100-clock hours as a licensed apprentice working as an employee under the direct supervision of a licensed master gasfitter or under the direct supervision of a licensed journeyman gasfitter who is in the employ of a master gasfitter in accordance with M.G.L. c. 142, § 3, installing, repairing, or maintaining gas piping systems, apparatus, devices, fixtures or other appliances typical to the discipline of the gas fitting industry only. Experience that is limited to installing HVAC components for the installation of heating systems, steam piping and hydronic heat piping shall not be considered qualifying experience.

2. Education.

a. The applicant shall furnish documentation to the Board of having received a high school diploma or the equivalent; and

11.04: continued

(b) Continuing education policies, procedures, course content, and providers are subject to Board approval and must adhere to Board rules, regulations and policies. Continuing education courses shall focus on 248 CMR. In addition, the Board may approve continuing education courses that may include industry related business, law, technology or other subject matters.

(2) Requirements for License Renewal.

(a) Except as otherwise permitted in 248 CMR 11.00, each journeyman and master plumber, journeyman and master gas fitter, or undiluted liquefied petroleum gas installer shall, as a condition of license renewal, complete the following as applicable:

1. 12-clock hours of approved continuing education courses for plumbers with an approved provider; and
2. six-clock hours of approved continuing education courses for gas fitters or undiluted liquefied petroleum gas installers with an approved provider.

(b) Each licensee shall retain all Mandatory Continuing Education documentation for no less than three renewal cycles and shall furnish this documentation to the Board for verification of completion of the Continuing Education requirements if requested by the Board.

(c) Online and Correspondence Courses.

1. Licensees shall only be allowed to take Board approved online or correspondence courses. The Board may deny the right to take online or correspondence courses to individuals whose licenses have lapsed or have been subject to discipline.
2. Online and correspondence courses must include a requirement that attendees pass a Provider designed, Board approved examination. A licensee taking an online or correspondence course shall only be permitted two attempts to pass the examination. Upon the second failure, the licensee shall not be given credit for the online/correspondence course and must then obtain their required continuing education for that session from a live, classroom based Provider

NON-TEXT PAGE

11.04: continued

3. The Board may impose additional requirements for Board approved online or correspondence courses in order to ensure their security and efficacy.

(d) It shall be the licensee's responsibility to ensure that their Provider has been authorized by the Board.

(3) Licensee Qualifications for Exemption of the (MCE) Mandatory Continuing Education Requirement.

(a) A licensee shall be exempt from completing mandatory continuing education requirements if one of the following applies prior to the end of the renewal cycle, unless otherwise specified:

1. The licensee, as an approved instructor, has taught all courses which, without duplication, would fulfill their continuing education requirement for that renewal cycle;

2. The licensee is a qualified and duly appointed Inspector, Assistant Inspector or Alternate Inspector of Plumbing and/or Gas Fitting appointed pursuant to M.G.L. c. 142, § 11B and has successfully completed the continuing education requirements of M.G.L. c. 142, § 11;

3. The licensee is a State Inspector/Investigator or is the Executive Director or Associate Executive Director for the Board of State Examiners of Plumbers and Gas Fitters and employed by the Commonwealth of Massachusetts Division of Professional Licensure (DPL);

4. The licensee was issued their license for the first time during the current renewal cycle. However, this exemption shall not relieve a journeyman plumber or gas fitter from the continuing education requirement during a renewal cycle in which they obtain a master's license;

5. Up until May 1, 2022, a Licensee who has appropriately petitioned the Board will be eligible for an exemption from the continuing education requirement starting the first full renewal cycle after the Licensee has attained 65 years of age. The Licensee shall still be responsible for completing continuing education, in the renewal cycle in which they turn 65 years old. Exemptions based on age shall expire on May 1, 2022, thereafter, all Licensees must complete continuing education, unless they qualify for some other exemption;

6. The Licensee is a member of the military on active duty and has met the requirements of M.G.L. c. 112, §1B. However, upon leaving active duty, as a condition of future licensure, the licensee must complete the continuing education hours for the current renewal cycle within 90 days of the date the licensee left active duty; or

7. The Licensee has been granted an inactive license.

a. A licensee who does not desire to engage in the profession of plumbing and gas fitting, but wishes to retain a license may apply for an inactive license by applying for said license with the Board. This inactive license must be renewed every two years, but does not require completion of continuing education. While holding an inactive license, licensees shall no longer be eligible to engage in the profession of plumbing and gas fitting in the Commonwealth. Engaging in the profession of plumbing and gas fitting while holding an inactive license shall constitute unlicensed practice under M.G.L. c. 112, § 65(b). Exception: The holder of an inactive license may, pursuant to a valid permit, perform plumbing and gas fitting in their owner occupied single family house.

b. An individual holding an inactive license who wishes to practice plumbing and gas fitting must reinstate their active license under the same provisions applicable to reinstating an expired license.

(b) Waivers for Other Good Cause.

1. The Board or Board authorized designee may consider the granting of a waiver of the mandatory continuing education requirements for other good cause shown. The waiver request shall be in writing and shall be accompanied by other supporting documentation that the licensee desires the Board to consider before ruling on the waiver request.

11.04: continued

2. Illness or Disability of the Licensee or Immediate Family Member. A request for a waiver based on illness, disability, or other medically-related condition shall be in writing and accompanied by a letter addressed to the Board written and signed by a licensed medical physician stating the nature of the licensee's or the immediate family member's medical condition and the correlation between that condition and circumstance and the licensee's inability to complete the required continuing education within the required period.

3. Unless the Board finds good cause for failing to do so, all requests for waiver of continuing education must be submitted prior to the expiration of the renewal cycle in which said education must be complete.

4. With the exception of individuals suffering a permanent disability, waivers granted in 248 CMR 11.04(3)(b)2. shall be deemed to be waivers of deadlines only, not of the requirement to ultimately complete continuing education. All waivers granted by the Board shall indicate when continuing education must be completed.

(4) Failure by a Licensee to Complete (MCE) Mandatory Continuing Education Requirement.

(a) Any licensee who does not complete the required clock hours of continuing education within the license renewal cycle shall be responsible for completing makeup classes covering the Board approved material for the continuing education missed.

(b) In addition to any makeup classes, all licensees who fail to complete continuing education requirements for any renewal cycle shall be subject to Board review and disciplinary action that may include, but not be limited to the issuance of fines, denial of a request for renewal, re-examination, suspension or revocation of existing licenses, and denial of applications for additional licenses. The Board is under no obligation to warn a licensee of non-compliance with continuing education requirements prior to commencing disciplinary action, however, said action shall be subject to any hearings required by law.

(5) Reinstatement of Lapsed/Expired/Suspended Licenses.

(a) Licensees who have failed to renew their licenses must fill out any applications required by the Board and must pay any back or late fees prior to board consideration.

(b) Licensees whose licenses have lapsed/expired must meet the following additional requirements for reinstating their licenses:

1. If expired for six years or less, licensees must complete all continuing education hours prior to applying to reinstate their license.

2. If expired for more than six years, licensees must complete the continuing education hours for the current renewal cycle and pass the full Board examination for their highest level license prior to being reinstated.

3. Without special Board approval, no waivers of continuing education granted under any other section of 248 CMR 11.00 shall apply for purposes of reinstating a lapsed or expired license.

(c) Unless a decision or consent agreement explicitly states otherwise, licensees who are suspended are subject to the same provisions as licensees who are expired and must complete any continuing education or examination requirements in order to qualify for reinstating their licenses. The Board may also remove a licensee's eligibility for waivers or exemptions of continuing education requirements as part of sanctions related to a disciplinary action.

(d) 248 CMR 11.04(5) shall not be deemed to sanction unlicensed practice. An individual practicing with an expired or suspended license may face disciplinary action up to and including revocation of the right to renew that license.

(6) Initial Certificate and Documentation of Completion of (MCE) Mandatory Continuing Education Requirements.

(a) Upon the successful completion of the clock hours of continuing education each licensee shall receive from his or her board approved continuing education provider a certificate of completion.

(b) Each licensee shall retain such documentation for three renewal cycles and shall furnish it to the Board for verification of completion of the mandatory continuing education requirements if so requested. Failure to provide proof of required documentation may result in non-renewal of a license or other disciplinary action by the Board.